From the Mineral Inventory Files

Does the Mt. Thom Cu-Co-Au Prospect Have an Igneous Parent?

In recent years I have spent a lot of time examining mineral occurrences related to the Cobequid-Chedabucto Fault Zone. I'm struck with how many of these deposits show affinities to the economically important Fe-oxide-Cu-Au association. Deposits of this association are commonly called Olympic Dam-type deposits, although that massive Australian example is just one subtype of a much larger class. Fe-oxide-Cu-Au deposits share many common features, the most important being the presence of large amounts of Fe-oxides in the ore.

Among the many mineral occurrences related to the Cobequid-Chedabucto Fault Zone, one of the better candidates to fall into this deposit class is the Mount Thom Cu-Co-Au prospect. This deposit, also known as Steele Run, is found at Mt. Thom in eastern Colchester County, a couple of kilometres north of the Trans Canada Highway (Fig. 1). Copper minerals were discovered there by Imperial Oil Enterprises Limited in 1970 in a follow-up to soil and stream sediment geochemical anomalies outlined the previous year. Between 1971 and 1974, trenching and a total of 49 diamond-drill holes (3 185 m) revealed the presence of fracture- and breccia-controlled pyrite, chalcopyrite, hematite and specularite concentrated in an intensely faulted area immediately north of Steele Run (Fig. 1).

The area is underlain by dark- and medium-grey, fine-grained siltstone and sandstone of the Carboniferous Mabou Group. Immediately downstream of the prospect are found grey to maroon medium- to coarse-grained sandstone and well rounded conglomerate of the Cumberland Group. Hydrothermal alteration is pervasive in the area, dominated by carbonate (ankerite, siderite, dolomite) and lesser, but locally intense, silica alteration. Where best developed along faults, the alteration totally overprints and bleaches the sedimentary country rocks. A strong structural control to the mineralization and alteration was recognized from the outset. Mapping, diamond-drilling and geophysical surveys all indicated the presence of pronounced northwest-trending faults, many of which dip at shallow angles to the west. These are believed to be splay faults related to the major east-west Cobequid Fault to the north and the North River Fault to the south. These two faults are major sutures of the Cobequid-Chedabucto Fault Zone.

Originally, the mineral occurrence was thought of as being essentially a copper prospect with mild enrichment in gold. It wasn't until K. E. Northcote of the Nova Scotia Department of Mines and Energy examined the site in 1989 that the presence of high cobalt concentrations was recognized. Mineralized intersections encountered in the drill core are abundant but low grade. Typical intersections over several metres range in the order of 0.5 to 2% Cu. Levels of up to 5 740 ppm Co and up to 296 ppb Au have also been reported.

The Mount Thom prospect has the characteristics of a classic Fe-oxide-Cu-Au deposit. I am particularly interested in what role granite and/or mafic rocks that outcrop to the south of Steele Run may have played in the genesis of the deposit (Fig. 1). Granite intrusions radiometrically dated as early Carboniferous are known within the Cobequid Mountains, but nowhere have these rocks actually been seen to intrude the Carboniferous Mabou and Cumberland groups. The role of igneous intrusions along the same northwest-trending fault system that hosts the sulphides warrants further examination, including more definitive dating of the granitic rocks. The area underlain by granite (Fig. 1) has only undergone cursory exploration and the presence there of very intense faulting and widespread alteration of the Carboniferous sediments suggests that it is an obvious exploration target.

G. A. O'Reilly

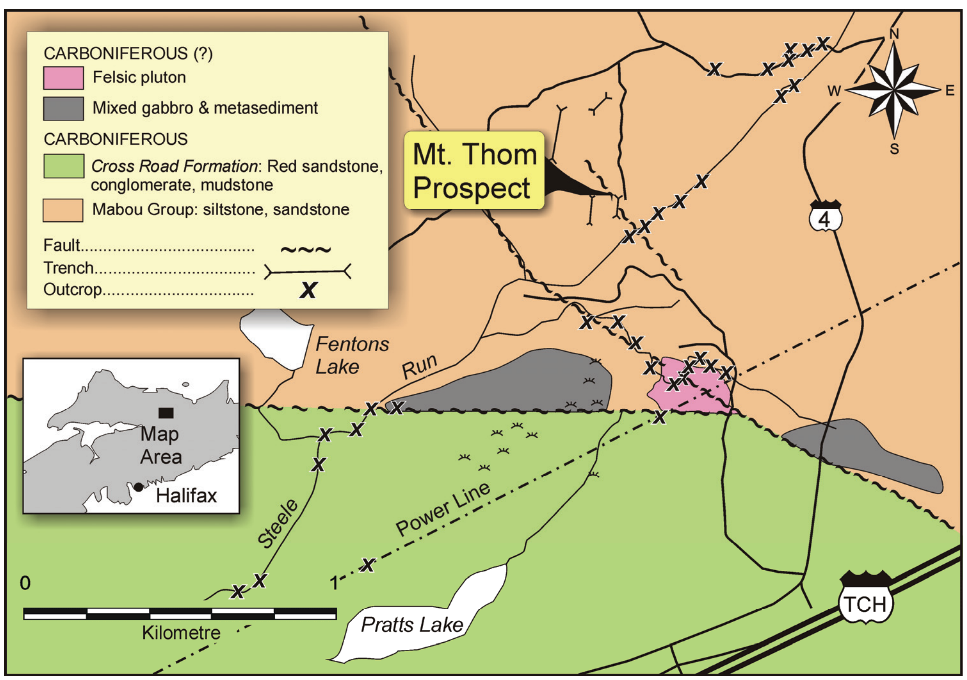

Figure 1. *Geological map of the Mount Thom area, Colchester County.*