From the Mineral Inventory Files

Gold in the Cape Breton Highlands: Inco Gold or Inca Gold?

During the mid- to late-1980s numerous occurrences of native gold were discovered in the central Cape Breton Highlands (Fig. 1). These discoveries piqued the interest of the local exploration community, and they became known simply as the Inco Gold Showings. In reality, they were discovered by Scominex in 1986 and explored under a joint effort by Inco Exploration, Technical Services Inc., and Scominex (Inco-Scominex). It all started with reconnaissance stream sediment surveys that indicated the Indian Brook watershed was gold positive. Follow-up prospecting quickly turned up quartz-hematite boulders with ore grade native gold along logging roads west of McMillan Flowage (Fig. 1). Subsequent trenching and diamond-drilling revealed quartz-hematite veins at what became known as the "Main Zone". One vein there returned 26.5 g Au/t over 0.67 m for a strike length of 70 m.

Numerous other auriferous boulders were discovered in the region. In almost all cases, the boulders were essentially "in place" with their source veins located directly beneath them. A study of the surficial geology of the property revealed that only very restricted pockets of glacial till are present and that much of the overburden draping the region is actually regolith, or *in situ* soil developed directly on pre-Ice Age bedrock. In other words, there has been little or no glacial transport.

The property is underlain by a mixed gneissic and amphibolitic terrain of Precambrian to lower Paleozoic age, intruded some 560 million years ago by the mostly dioritic, but locally granodioritic and granitic, Kathy Road Pluton. It became quickly apparent during exploration that the auriferous quartz veins are not restricted to any particular rock type: occurrences were found in essentially every rock unit on the property. Native gold was found in pyrite- and galena-bearing quartz veins but, in general, the highest grade gold is associated with veins containing abundant hematite. Wall rocks adjacent to the veins have undergone a variety of hydrothermal alterations including epidote, sericite, chlorite, argillic, carbonate, tourmaline and hematite alteration. The alteration zones are commonly enriched in gold.

The fact that the development of hematite in the veins is the most important feature associated with ore-grade Au levels means that understanding the timing and origin of this process is key. Some believe that development of the hematite was related to Pleistocene surficial weathering (under sub-Arctic conditions) of a pre-existing gold-bearing, but sub-economic, vein system. Examples of mobilization and redistribution of native gold under these conditions are known elsewhere.

Gold occurs in four styles at the Inco Showings: (1) within colloidal hematite; (2) within hematite replacing pyrite cubes; (3) as inclusions within pyrite; and (4) as inclusions and fracture fillings in galena. Electron microprobe analysis of gold grains from these styles has shown that they consist essentially of gold and silver, with gold contents ranging from 78 to 97 wt. %. Most importantly, the Au grains occurring in hematite replacing pyrite, and in colloidal hematite, displayed a wide variation of Au content but were generally the more Ag-rich grains. I consider this important as these two styles of mineralization are most consistent with crystallization under sub-Arctic weathering conditions. However, published studies have shown that gold formed under sub-Arctic weathering conditions occurs as relatively pure gold that is low in silver. This is the exact opposite of what is observed in the Inco Showings and is a strong suggestion that hematite alteration was probably of hydrothermal origin.

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Note: The title does not reflect any connection to the Incas of South America. It simply reflects the unknown age (ancient vs. Pleistocene) of gold deposition.

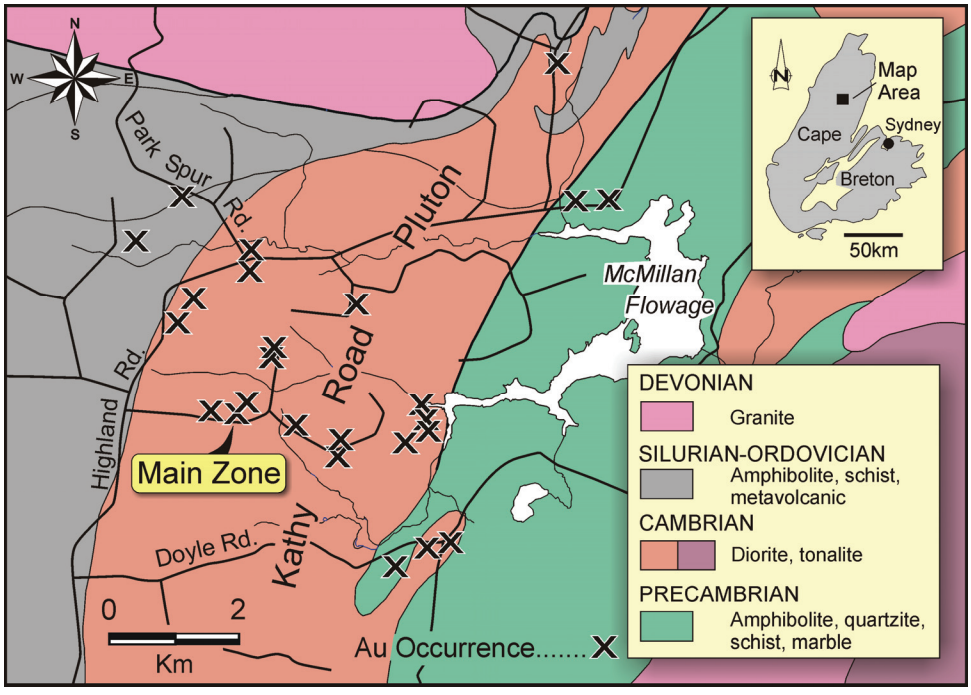

***Fig. 1**. Geology of the McMillan Flowage area showing locations of the Inco Au Showings.*