# Mineral Inventory Project Activities for 2003

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## Introduction

During 2003, Mineral Inventory staff were involved in several initiatives throughout the province (Fig. 1). Many of these activities were directly related to, and a continuation of, planned activities from the immediately preceding years. Others were related to initiatives outside of originally planned project activities. George O'Reilly worked on Mineral Inventory Project tasks on the mainland, while Garth DeMont worked on Cape Breton Island.

## Field Activities

Field activities on the mainland (O'Reilly) focused on the potential for iron oxide-copper-gold deposits (IOCG) associated with the regional scale, Cobequid-Chedabucto Fault Zone (CCFZ; Fig. 1). The geological relations of mafic and felsic intrusions with their enclosing lower and middle Carboniferous sedimentary country rocks was of particular interest. A small intrusion of granite within Mabou Group rocks at Mount Thom, Colchester County, and gabbroic and granitic dykes

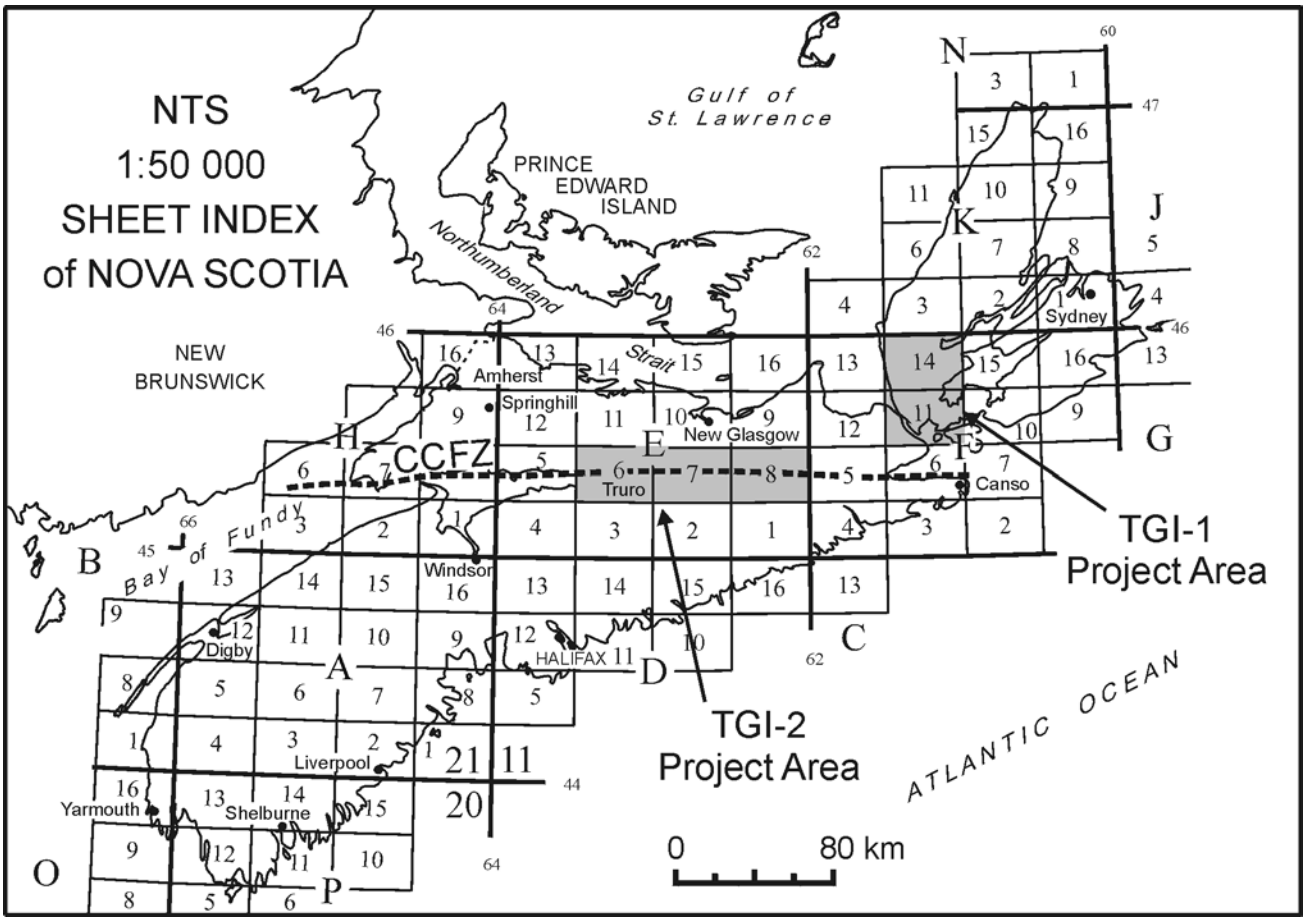


**Figure 1.** NTS map index of Nova Scotia, showing features discussed in this report.

O'Reilly, G. A. and DeMont, G. J. 2004: *in* Mineral Resources Branch, Report of Activities 2003; Nova Scotia Department of Natural Resources, Report 2004-1, p. 93-95.

and small plutons in the Lorne, Pictou County, within Mabou and Horton group rocks were examined. These investigations are considered preliminary and an initiation of mapping related to phase two of the joint federal - provincial Targeted Geoscience Initiative (TGI-2; Fig. 1). The investigations will continue through 2004 on NTS map areas 11E/06, 07 and 08 (Fig. 1). For more information on the Targeted Geoscience Initiative, see Naylor *et al.*, this volume.

Another area of interest is the geology of small, fault-bounded wedges of carbonate rocks that occur adjacent to, and within, some of the major fault splays of the CCFZ. Usually, past mapping assigned these carbonate enclaves to the Carboniferous Windsor Group marine sequence; however, evidence now suggests that at least some may have another origin. Some may have been formed by carbonate-rich hydrothermal fluids upwelling along the CCFZ, while others may actually be Triassic calcrete deposits.

Field activities on Cape Breton Island (DeMont) were mostly limited to an examination of the economic potential of Precambrian carbonate units in the Creignish Hills and North Mountain areas. This was a joint effort between DeMont (DNR), Nova Scotia Department of Economic Development, Strait Highlands Regional Development Agency, and Enterprise Cape Breton. DeMont's contribution was geological expertise, while the other organizations provided funds for trenching and sampling. This examination is a spin-off stemming from encouraging results from the recently completed federal - provincial Targeted Geoscience Initiative Phase 1 (TGI-1; Fig. 1), which showed a promising potential for high-calcium lime units within the highland blocks of south-central Cape Breton (NTS 11F/11 and 11F/14). High quality lime is used for applications like stack-scrubbers, agriculture lime, flux in steel making, and in the paper industry. Sources of this commodity are actively being sought by Glencoe Resources and ALVA Construction Limited.

Native gold in stream sediments in the watersheds of the south and western side of Whycocomagh Mountain have been known for many years. Although long known, and the focus of several exploration efforts, some of which involved trenching and construction of an adit, it is felt that the source of the gold anomalies has never been explained. DeMont carried out a preliminary gold panning assessment along some of the stream courses during 2003. This work returned encouraging results, with native gold being found in samples over a wide area, such that a more detailed and systematic evaluation is planned for 2004.

# Office Activities

## Version 7 of the Mineral Occurrence Database

The Mineral Inventory Project released Version 7 of the Mineral Occurrence Database in the spring of 2003. This data release is considered substantial, as it includes the final results of a mineral occurrence research compilation and field examinations for the TGI-1 study area (NTS map areas 11F/11, 11F/14). The update includes information for both metallic and industrial mineral occurrences. In addition, Version 7 includes updated information for several mineral occurrences in the Eastern Shore region of the mainland. These include records for the past-producing Fifteen Mile Stream and Lake Charlotte gold districts, and the currently producing Brookfield barite deposit and past-producing Brookfield iron mines.

## West Paradise Diamond-drill Core Review

The Department of Natural Resources currently maintains a drill core storage facility in West Paradise, Annapolis County. During 2003, the department decided to relinquish ownership of this facility. This required an assessment of the materials stored there and decisions as to what will be retained and transported to the department's Stellarton Core Library. The Paradise facility contains diamond-drill core and samples from a variety of exploration efforts carried out in southwest Nova Scotia over the years. O'Reilly agreed to examine the drill core from past projects of Falconbridge Limited. This task was carried out

over the field season and representative drill cores and drill profiles were selected for several of the projects. These materials will be moved to Stellarton and included in the departmental collection.

## Special Water Advisory Group (SWAG)

The departments of Education, and Transportation and Public Works carried out a full environmental review of Sir John A. MacDonald High School near Hubley (west of Halifax) in the spring of 2002 in response to some health concerns that arose among the students there. The review revealed that the school's drilled well water contained levels of radioactive lead ($Pb^{210}$) that exceeded the Canadian Guidelines for Drinking Water Quality guideline of 0.1 Bq/l. In response, the Department of Environment and Labour assembled a Special Water Working Group (SWAG) to assess the extent of the problem. SWAG consists of representatives from the provincial departments of Environment and Labour, Education, Transportation and Public Works, Health, and Natural Resources. As well, SWAG has a representative from Health and Welfare Canada. G. A. O'Reilly from the Mineral Inventory Project serves as the Natural Resources representative on SWAG and provides expertise on geological factors that relate to the occurrence of uranium and its related radiogenic daughters, of which $Pb^{210}$ is one. The mandate of SWAG is to assess the extent of the problem and make recommendations to government through the Department of Environment and Labour on appropriate action and treatment options.

It has been known for 25-30 years that groundwater in several geological terrains of the province frequently contain elevated levels of naturally occurring radionuclides, such as uranium and radon. $Pb^{210}$, a uranium decay series daughter, is related to this phenomenon. A sampling program by SWAG quickly determined that the elevated $Pb^{210}$ problem is not limited to Sir John A. MacDonald school and occurs in other regions of the province, but most notably within the corridor between Halifax and New Ross that is underlain by granitic rocks of the South Mountain Batholith. To date, all the 185 schools of the province that obtain their drinking water from drilled or dug wells have been tested. From these it has been determined that 18 schools have drinking water that exceeds the allowable level for U, $Pb^{210}$ or both. SWAG is currently assessing treatment options and carrying out additional sampling to further assess the extent of the phenomena.

## Formal Presentations and Field Trips

Staff of the Mineral Inventory Project were involved in several formal oral presentations and field trips throughout the year. G. J. DeMont prepared and presented a talk titled "Why All the Excitement About Carbonate Rocks" at the Mineral Resources Branch Mining Matters conference in November 2003. The talk summarized some of DeMont's activities related to TGI-1. G. A. O'Reilly co-authored a presentation with D. J. Kontak titled "Non-Meguma Gold Mineralization Environments in Nova Scotia" which was presented by Kontak at the Mining Matters conference. The talk summarized the features of many of the gold-mineralized environments in the province, other than the more widely known mesothermal, lode gold deposits that occur within the metasedimentary Meguma Group.

G. A. O'Reilly, along with H. V. Donohoe and R. F. Mills, prepared and lead two field trips for the Nova Scotia Prospectors Association. A spring trip visited several sites in the Walton Belt of Hants County. This included visits to places like the Walton barite-base metal deposit, Tennycape manganese mine and the Shubenacidie River titanium sands. A fall trip to the Antigonish Highlands and Mt. Thom area visited several sites of geological interest along the Northumberland Shore, the Cross Roads Ohio Cu-Pb-Zn deposit, Stellarton Coal Mine, and Mt. Thom Cu-Co-Au prospect.