

Mineral Inventory Activities, 2006

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Mineral Inventory Project activities during 2006 were divided between field- and office-related work, and included maintenance of the department's Mineral Occurrence Database as well as several environmental geology initiatives pertaining to radionuclides in the province's groundwater, air and rocks.

Mineral Occurrence Database

Activities related to the Mineral Occurrence Database were both field- and office-based. Field work consisted of an examination of several mineral occurrences not previously visited, and also two mineral occurrences that were discovered during recent mapping projects by Natural Resources geologists. For example, interesting Pb-Zn occurrences in quartz-carbonate veins intruding granodiorite of the South Mountain Batholith were recognized in a recently excavated bedrock aggregate quarry at Castle Frederick, Hants County, by Central Region geologist D. Weir (O'Reilly, 2006a). This occurrence, although small, represents a style of base metal-bearing veins not previously known within the batholith and warrants more detailed exploration.

During geological mapping in the South Rawdon area in 2004, R. J. Horne discovered a system of several stratabound quartz veins in Goldenville Formation metasedimentary rocks at Hillsvale, Hants County. Limited follow-up work (Horne *et al.*, 2005) only returned mildly anomalous Au levels in the veins and overlying glacial till. The vein system occupies the same stratigraphic position and is along strike on the north limb of the same anticline as the Rawdon Au District 14 km to the northeast, however, make this occurrence an interesting site worthy of further exploration.

Other field activities included an examination of the possible genetic relationship between the province's Carboniferous, carbonate-hosted base metal and barite deposits, and the numerous iron deposits related to the Cobequid-Chedabucto Fault

Zone (CCFZ). These iron-oxide deposits display features suggesting an affinity to the economically significant iron-oxide-copper-gold (IOCG) deposit type. In Nova Scotia, these diverse mineral deposit types are of the same age and share the same host rocks, and both are genetically related to splay faults of the CCFZ. The features relating the two deposit types are described in more detail in O'Reilly (2006b) and O'Reilly (2007).

Several mineral occurrences in the Stewiacke River Valley, from the village of Brookfield to as far east as the community of Eastville, were field checked and included in a guidebook as part of a field trip to that region run for the Nova Scotia Prospectors Association during late September 2006. This trip included visits to the Coldstream Au Paleoplacer, Sibley Mountain Slate Quarry, Brookfield Barite Deposit, Chambers and Pearson Fe Mine, Middle Stewiacke Barite Deposit, Smithfield Pb-Zn-Cu Mine, Stewiacke River Au Prospect and Eastville Zn Prospect.

Office-related activities consisted of continued updating of records in the Mineral Occurrence Database, as well as addition of the newly discovered mineral occurrences checked during the field season. Information entered during the winter and spring included locations such as the eleven separate occurrences that collectively constitute the 330 Mt resource of the Shubenacadie River Ti Sands Deposit, the Smithfield Pb-Zn-Cu Deposit, the Lakevale Vein System, Newhouse Cove Be Pegmatite, Piper Lake Siderite Prospect, Lazy Head W Prospect and the Castle Frederick Pb-Zn Occurrence. These mineral occurrences, together with those updated during the fall of 2005, were included in an update of the Mineral Occurrence Database to Version 9, which was publically released in July 2006.

Following release of Version 9 of the Mineral Occurrence Database, the entries for twelve of the province's major past-producing gold districts were updated during the late summer and fall. These updates for the Forest Hill, Tangier, Dufferin, Cochrane Hill, Waverley, Wine Harbour, Oldham,

Rawdon, Moose River, Caribou, Renfrew and Goldenville gold districts will be released with Version 10 of the database during 2007.

Environmental Geology Studies

A considerable portion of the year was dedicated to study of the naturally occurring U and Rn in the various geological units of Nova Scotia. Much of this work stems from the senior author's participation in two interdepartmental and intergovernmental working groups comprising representatives of the provincial departments of Environment and Labour, Health, Education, Transportation and Public Works, Natural Resources, Community Services, and department of Communications, and the federal department of Health Canada. The Special Water Advisory Group (SWAG) was formed in 2002 to address the issue of elevated levels of U, Rn and radioactive Pb (Pb^{210}) in some groundwater aquifers. The Advisory Group on Radon (AGOR) was formed in 2005 to address the issue of elevated levels of Rn in air found in some dwellings throughout the province. Formation of AGOR was the result of the government taking proactive action in advance of Health Canada's anticipated lowering of their existing 800 Bq/m^3 guideline of allowable Rn in air within a dwelling.

The input of Natural Resources into SWAG and AGOR has been to provide information and advice on the distribution of radionuclides throughout the province, and their geological relationship to groundwater aquifers and air in homes and buildings. Geological data from a variety of sources were compiled in a GIS project in order to produce a map showing areas of the province more prone to having elevated levels of U and Rn in groundwater. This map drew on data from three main sources: (1) existing well water analyses for U, Rn and Pb^{210} ; (2) known occurrences of U and geological units in which uranium has been known to have been mobilized in the past; and (3) the results of federal government

airborne gamma-ray spectrometric surveys flown between 1976 and 1985. The well water data used were from well water analyses of U and/or Rn from uranium exploration projects run between 1976 and 1980, as well as results from federal and provincial government surveys (Fig. 1). A map of the province showing the areas of radionuclide elevation compiled from these data is in final preparation and will be released in 2007.

A similar project to produce a map showing areas of the province more prone to the phenomenon of elevated Rn in air within dwellings has also been initiated. This map will be published in the years to come after completion of several radon sampling programs planned by the provincial government.

References

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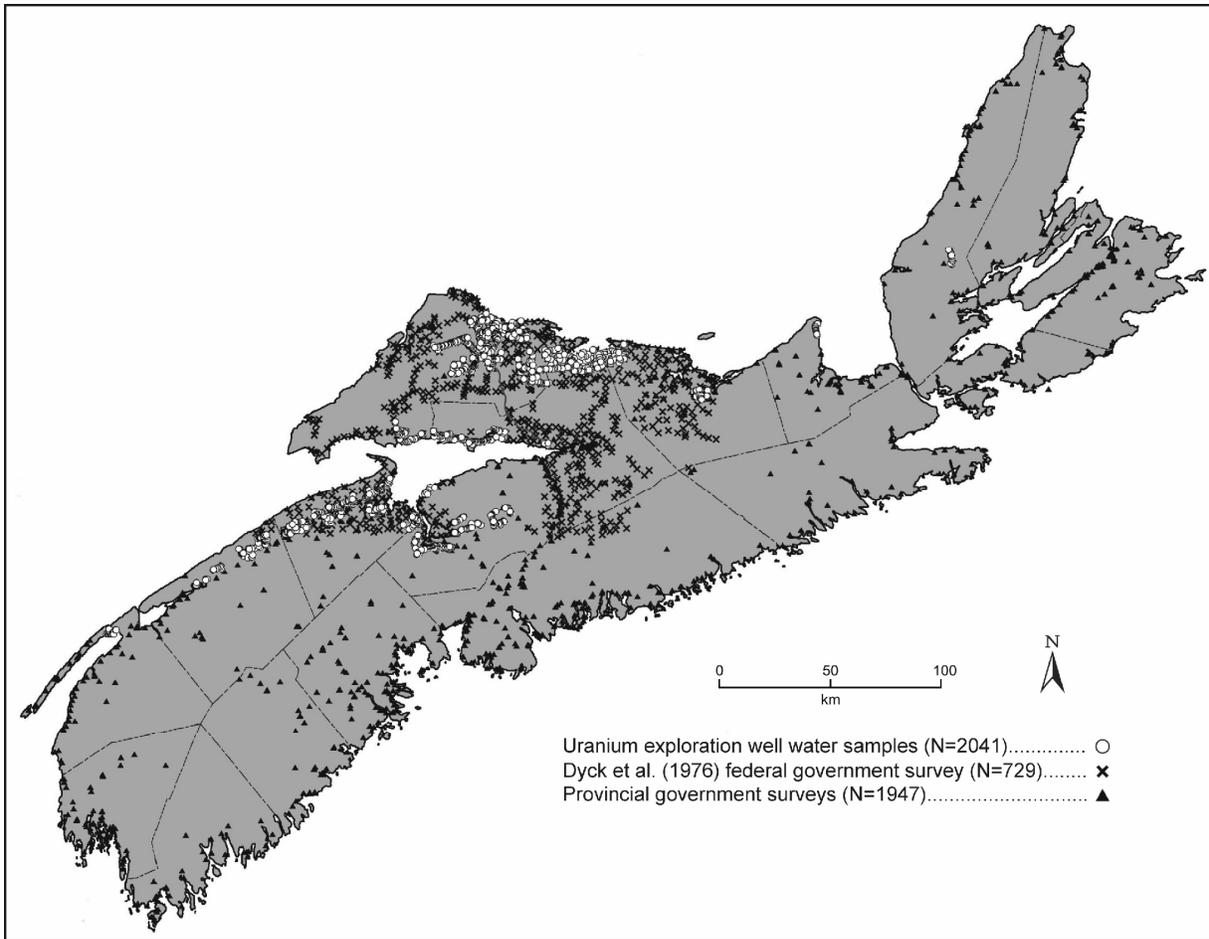


Figure 1. Map showing the location of the well water samples analyzed for U, Rn or Pb²¹⁰ in Nova Scotia.

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