

Map Showing Uranium and Related Radionuclides in Groundwater in Nova Scotia

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Recent times have come with an increased awareness of the presence and potentially adverse effects of naturally occurring metals in the environment. In order to carry out any meaningful evaluation of these issues, it is paramount to first assess the extent and degree that these substances exist in the natural environment. To this end, staff of the Mineral and Energy Resources Branch of the Department of Natural Resources have been devoting considerable time working in concert with officials from other federal and provincial government departments to determine what the background levels are of a variety of naturally occurring metals throughout the province. One such initiative consists of an examination of the variation of uranium and its related radionuclides radon, radium and lead²¹⁰ within groundwater aquifers throughout the province.

Derivation of this radionuclide in groundwater map draws on data from several sources. Most important has been the use of well water analyses for uranium, radon, radium and lead²¹⁰ that have been collected by the federal and provincial governments during a variety of surveys since the mid 1970s. In addition, several regions of the province underwent concerted exploration for uranium deposits between 1976 and 1981. Several of these exploration projects, mostly those within well settled regions, included valuable well water and spring water surveys for uranium and radon. Some of the analytical data from these surveys existed in digital form, but the majority existed in hard copy and had to be sought out and digitized. In total, data for 3717 wells were used province-wide; 2041 from uranium exploration projects, 1947 from provincial government surveys, and 729 from federal government surveys.

In addition to the well water analytical data, the project drew on other, indirect sources of geological information from which logical inferences could be made as to their potential impact on providing radionuclides to groundwater. Knowledge of the geological terranes within the province in which uranium mineralization is known to occur was used, as well as federal government and province-wide airborne radiometric maps for equivalent uranium. Lastly, knowledge of several areas in the province where anomalous levels of radon are found in the air within homes was used as a suggestive guide to areas where anomalous levels of this radionuclide may also exist in groundwater.

All of these data sources have resulted in production of a map showing areas of the province where there is an increased likelihood of encountering elevated levels of radionuclides in the underlying groundwater. This map is in the final stages of preparation with the intention of publication in the spring of 2008.

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