Geochemical analysis of uranium mobilization from geologic formations in Nova Scotia, Canada

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Many rock formations, particularly granitic rocks and sandstones of Devonian to Carboniferous age, may have an impact on the water quality of surrounding areas. Weathering and geochemical processes can mobilize uranium, which allows uranium to accumulate in ground water systems in concentrations above recommended guidelines established by Health Canada. It may also be possible that anthropogenic modifications can mobilize uranium from soil or rock. This study is focused on discovering the chemical agent or agents responsible for mobilizing uranium from uranium-bearing rocks in Nova Scotia. It is believed that both natural and anthropogenic causes may be behind uranium mobilization in some Nova Scotian locations. Road salt and sea water introduce ions into geologic formations that have a potential impact on uranium. Gypsum, either in the form of gyprock in construction waste or as naturally occurring geologic formations, introduces sulfate into bedrock and soil, which adds another variable to analyze. Ions such as chloride, calcium, sulphate, and bicarbonate will be analyzed in an attempt to isolate the variable (or variables) that mobilize uranium. A leaching experiment using ground rock samples and controlled extraction fluids will aim to isolate the geochemical process or processes responsible for the accumulation of uranium in Nova Scotia ground water. [Poster]

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