



ses

school of environmental sciences

The Research Seminar Presentation by

James Hommersen

will be held on

Tuesday March 20, 2018

At 2:30 pm

ALEXANDER HALL 265

Assessing the nature and extent of nitrate contamination near two municipal pumping wells using high resolution methods in a shallow fractured dolostone aquifer

Abstract

Many agricultural areas are underlain by fractured sedimentary bedrock with thin overburden deposits, such that nitrate and other contaminants are readily able to enter the groundwater system. Elevated levels of nitrate have been observed in two municipal pumping wells located outside the town of Acton, Ontario. A new monitoring well was drilled on site following the Discrete Fracture Network (DFN) approach. This approach incorporates a number of techniques including physical core logging, geophysics, hydrophysics, contaminant sampling, and modelling. Novel techniques still to be implemented at the site include Distributed Temperature Sensing (DTS), packer testing, tracer injection testing, and the installation of a Multilevel System (MLS). Monthly sampling events using the MLS and rock core physical property analysis will allow for a conceptual site model to be constructed with focus on the physical and hydraulic properties of the site. A groundwater flow and contaminant transport model will also be developed using field-collected data to model nitrate transport under various pumping conditions and environmental factors. The main objectives in this study are to determine the extent of nitrate contamination within the fractured bedrock aquifer, determine the controlling processes influencing nitrate distribution, and predict future conditions of the site based on our observations. The work conducted here will help the Region of Halton to implement best management practices pertaining to agricultural activities and local hydrologic conditions.

Everyone is welcome to attend

(This is a Research Proposal presentation by students in ENVS*6900)