G360 Centre for Applied Groundwater Research

THE IMPACT OF GLACIAL WATER INVASION ON THICK AQUITARDS IN SEDIMENTARY BASINS

Dr. Kent NOVAKOWSKI,

Head, Department of Civil Engineering,

Queen's University

Date and Location

Thursday, April 30th

10:00 to 11:00 a.m.

RICH 3504

Canada's Nuclear Waste Management Organization is presently studying the potential for locating a nuclear waste repository in the sedimentary rock of the eastern portion of the Michigan Basin. In order to predict the stability of the disposal environment over tens of thousands of years (as is required by the regulatory agency), an examination of past geological history over a similar time frame is warranted. In this study three separate numerical modeling approaches are used to explore the impact of glacial water invasion in the Basin. The modeling was conducted using pressure data and the paleo-hydrogeological record of solute transport obtained from the thick low-permeability shales in the sedimentary sequence as modeling objectives. The results show that lateral migration of glacial water through the higher-permeability aquifers over distances of 150 km or greater have influenced the water quality in the aquitards, and that this likely occurred as early as 2.5 million years ago and as recently as 50 thousand years ago.

Speaker Bio

Kent Novakowski obtained his PhD from the University of Waterloo in 1992. He joined the Department of Civil Engineering at Queen's University, Kingston, Ontario in August of 2000 and was appointed Head of the Department in 2009. Prior to Queen's, Dr. Novakowski led the Groundwater Contamination Project at the National Water Research Institute in Burlington, Ontario. Dr. Novakowski has more than 25 years of experience in the characterization and modelling of groundwater flow and contaminant transport in both crystalline and sedimentary fractured rock. Along with his duties as Department Head, he is currently the Director of the Water Research Centre, an affiliation of more than 45 water researchers from a wide variety of disciplines across Queen's and the Royal Military College.