

Project **RIVER WELLS GROUNDWATER FLOW MODEL**

Client **Regional Municipality of Waterloo (RMOW)**

Objectives

- Develop an integrated groundwater/surface water model of three wellfields in the Grand River basin
- Evaluate the sensitivity of the wellfields to surface-water contamination

Outcomes

- A detailed understanding of the interaction between the Grand River and the aquifer
- A useful management tool that allow RMOW staff to perform additional simulations

Key Aspects

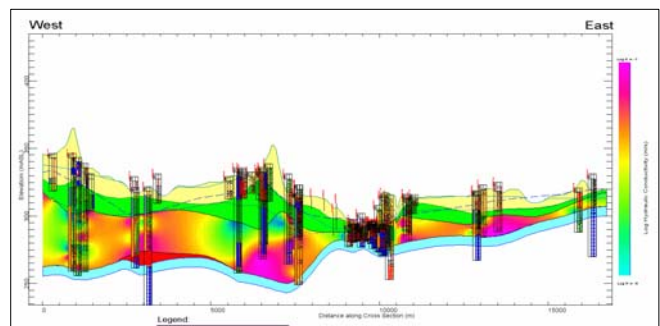
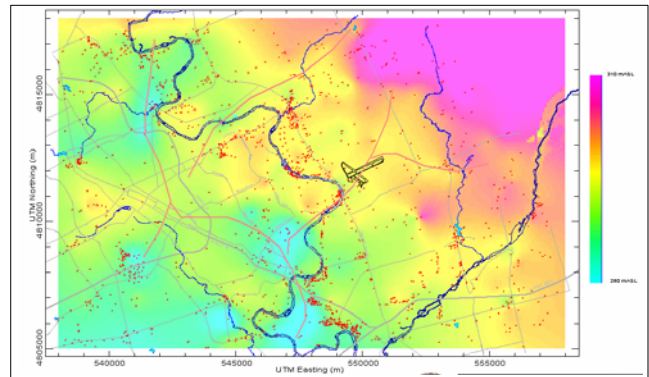
- A well database that is fully integrated with the hydrogeologic model simulations
- Fully transient calibration used to evaluate changes due to drought conditions

Project Description

Earthfx staff developed a wellfield-scale model of the Forwell, Pompeii and Woolner wellfields (referred to as the 'River Wells') along the banks of the Grand River, in south-east Kitchener, Ontario. The five-layer model was built on a comprehensive groundwater database that contains approximately 2,000 wells. Detailed calibration to surface-water flows demonstrated that as pumping increased, the flow direction from the aquifer to the river reversed, and up to 60% of the well water was drawn from the river at maximum pumping rates. Calibration to a long-term transient pumping test was used to calibrate the porosity estimate, which significantly affected capture zone analyses. Sensitivity analyses looked at the effects of urban development, drought conditions, gravel pit dewatering and extraction.

Applications:

The RMOW has standardized on the VIEWLOG groundwater management system for all hydrogeologic data management.



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