

MODFLOW MODEL

North Simcoe Landfill (Site 41)



What is the MODFLOW model?

MODFLOW is complex computer modelling software created by the United States Geological Survey. It is used to simulate groundwater flow systems and is considered to be the gold standard in its field. The County's hydrogeological consultants, Jagger Hims Limited, used a version of this software to construct a calibrated model for the area of the North Simcoe Landfill to simulate the way in which water moves through the area's soils and to predict how the water movement may change with the operation of the landfill site.

The calibrated model considers work the engineers performed through conventional calculations. The site received Environmental Assessment Approvals prior to the common use of sophisticated computer modeling.

Extensive investigations

Over the thirty plus year history of the North Simcoe Landfill Site selection and development process various investigations of the subsurface soil conditions have been performed by the County's consultants through boreholes with dedicated sampling techniques from various soil layers. The County continues to monitor water levels at multiple borehole locations at the site and has a substantial history on this data dating back over 20 years. This information provided the background with which consultants constructed the model and allows for a continual review of the model predictions.

The reasonableness of the model's findings have been supported by the Ministry of the Environment through an independent review to evaluate the model calibration results.

Specialized Consultants

The County relies on specialized consultants for the MODFLOW analysis. The manner in which this information was assembled and provided for peer review and Ministry consideration is consistent with standard industry practice.

Access Provided

In an effort to provide understanding on the MODFLOW model to the Community Monitoring Committee for Site 41 (the CMC), the County actively participated in a three day "tri-party meeting" with the CMC and the MOE. These meetings were held on September 14, 24 and October 20, 2008 through a provincially appointed facilitator and the detailed meeting notes and findings are available on the County's website. These meetings brought together the experts for the County and the CMC to review issues of concern relating to the model.

The CMC representatives and their own experts were given the opportunity to create simulations using the model. In summary of his findings on the tri-party meetings the CMC's expert Dr. Kerri Rowe stated: "...the MODFLOW model appears to have been well constructed and for the cases examined in the Supplemental Hydrogeology Report and the additional scenarios run at my request, the predicted average water levels in the confined aquifer beneath the areas of the site approved for landfilling are high enough to provide inward gradients with an operating leachate collection system." The CMC's chair at the time had the following to say in a letter to the Minister of Environment about the tri-party meetings: "Moreover, the exercise has left me with a much higher confidence in the assessments undertaken by your Ministry with respect to Site 41."



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