

Full-scale aquifer test approach for a high water-demand project

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The City of Thetford Mines, in the Province of Quebec, was forced by the Ministry of Environment to totally replace its drinking water source for its 27,000 inhabitants and its industrial water needs.

Surface water and groundwater were considered as replacement sources, but as stand-alone and individual solutions. The multi-year groundwater study ultimate aquifer test is presented to depict the approach, the engineering, the contingency management and the results.

It is daily practice by hydrogeologists to conduct aquifer tests, but it rarely needs to produce an Environmental Impact Assessment (EIA) prior to conducting an aquifer test. The EIA covered the temporary impacts related to conducting the aquifer test, as well as the temporary and permanent impacts related to the eventual permanent construction of a high-capacity pumping station.

A vast public-relations campaign was deployed, as the aquifer test raised regional concerns and was highly depicted in both regional and provincial media. The aquifer test is deemed to be the largest deployment in terms of investment and manpower in the Province of Quebec as far as an aquifer test is concerned.

The results of the seven-month aquifer test at 11,400 cubic metres per day were used to design a water-supply solution composed of a radial Ranney collector well, for which environmental impacts were predicted via a groundwater flow numerical model.

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Mr. Laforest has practiced physical hydrogeology since 1983. Most of his achievements focus on groundwater-based municipal engineering: drinking water supply, dewatering, monitoring and management of groundwater impacted by regular municipal activities (snow and septic sludge disposals, sanitary landfills, etc.). He was regularly involved in construction site and open pit dewatering as a field hydrogeologist and project manager. He has gained valuable experience over the years in surface-groundwater interconnectivity and management. He is regularly solicited as an expert witness and technical speaker given his significant field and broad groundwater assessment experience. He has designed and developed hundreds of various sizes and types of groundwater withdrawal installations for different needs: municipal drinking water supply, fish hatcheries, and industrial process water. His professional services have been regularly hired for groundwater issues related to contaminated sites. Mr. Laforest has practiced hydrogeology mainly in the province of Quebec, but also in New Brunswick, Ontario, and most recently in Alberta. He has also been involved in overseas projects in Cuba, China, Africa and Australia.