

PROJECT DESCRIPTION

Characterization Restoration Hydrogeology Modeling Risk analysis
 Research and development

SURFACE AQUIFER RESTORATION BY PUMP AND TREAT AND BIOSPARGING TECHNOLOGIES AT A QUEBEC SITE

Parameters of

Concern : BTEX
Project Duration: One year
Performance : "C" MEFQ's criteria obtained after six months of operation
Cost: \$170 000
Client : Petroleum Company

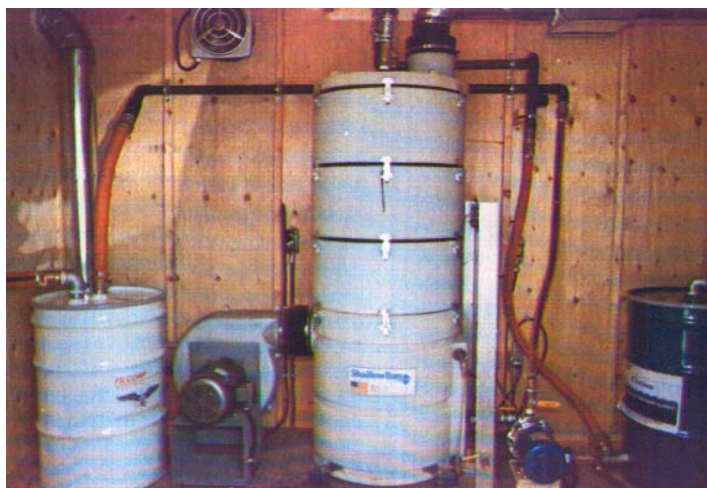


Issue

Characterization work clearly delineated a dissolved phase hydrocarbon plume in groundwater beneath a gas station located north of Montreal. The downgradient edge of the plume was found to be migrating within the shallow sand aquifer at an approximate speed of 20 m/year. As a result, mitigation work was urgently required in order to ensure that the plume didn't impact a nearby residential zone.

Work Performed

The first migration measure implemented was the creation of a hydraulic barrier through the installation of a 0.32 L/s pumping well. The resulting water is pumped to a treatment unit, which includes an iron filtration system, a green sand filter, an activated clay filter, and an aeration tower. The second mitigation measure enacted is designed to increase the rate of natural biodegradation. It involves increasing the oxygen supply within the surface aquifer by injecting air into at four wells and by reinjecting treated water upstream of the contaminant plume.



Results

After only three months of operation, the hydrocarbon concentrations observed in the groundwater decreased by over 15 times. In the most impacted zone, the BTEX concentrations were reduced by 97%; whereas, the mineral oil and grease concentrations were decreased by 90%. The mitigation measures were discontinued after only nine months of operation, as any residual impacts would be degraded through natural attenuation.