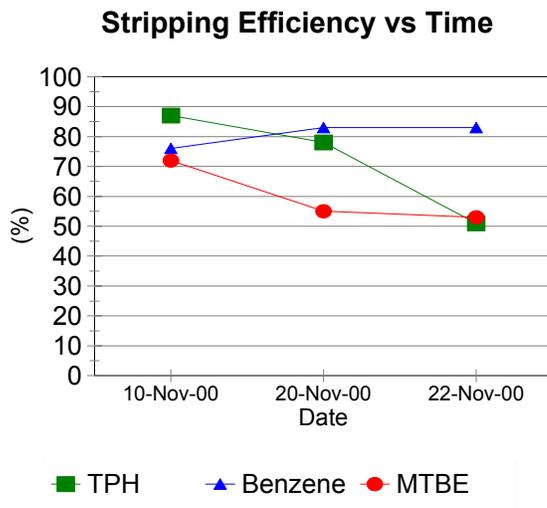


Oil Distribution Facility, Midwestern States

Performance Results

- **Benzene concentrations in groundwater are reduced by 98%**
- **Insitu stripping of MTBE from groundwater ranges from 53% to 78%**
- **Insitu stripping of MTBE is aided by hot air injection**

Soil and groundwater was impacted by a release of gasoline at a major petroleum distribution facility located in the upper Midwest. The impact to groundwater resulted in high dissolved MTBE (8900 ug/L), benzene (450 ug/L) and TPH (11,700 ug/L) concentrations. Wasatch was contracted by the energy company to evaluate the effectiveness of Density Driven Convection (DDC) to intercept and remediate the impacted groundwater at the facility boundary.



Under this contract, Wasatch developed and implemented a method of using hot air injection (250° F) in a DDC application. The use of hot air resulted in stripping efficiencies for MTBE ranging from 53 to 78 percent. This high stripping efficiency was maintained throughout the one month pilot test.

The remediation of benzene was also successful; dissolved concentrations within the radius of influence of the DDC well were reduced by 98 percent. Based on the pilot test results, a full scale DDC system (sixteen wells) has been constructed and is scheduled for startup in late July 2001.

The sixteen well system intercepts a groundwater plume which passes through a high permeability buried bedrock channel. The DDC system was installed across the buried channel in order to intercept the contamination prior to migrating beneath an adjacent subdivision. The full scale remediation equipment contains an acid drip system which is designed to prevent the precipitation of calcium carbonate on well screens. The acid system was designed after evaluating the site geochemistry including pH, total dissolved solids, bicarbonate, and calcium ion concentrations. The required volume and concentration of acid were determined through the use of the Ryznar Stability calculation.