

## **Overcoming Persistent Anaerobic Conditions Using Injectable Controlled-Release Oxygen to Treat a BTEX Plume**

*Benjamin D. Grove Jr.* (MWH Americas, Inc., Alpharetta, GA)

A 1950s-era leak of gasoline from a transmission pipeline resulted in a benzene, toluene, ethylbenzene and xylene (BTEX) plume in groundwater. The plume remained relatively undisturbed in the subsurface for approximately 50 years with very little natural degradation occurring as anaerobic conditions developed within the core of the plume. Fate and transport modeling predicted that the plume would persist for at least 50 more years. Concentrations of BTEX had reached 12 to 20 milligrams per liter (mg/L) with the most significant contaminant being benzene at 9 mg/L. The regulating authority requested that active remediation be performed.

Aerobic biostimulation was performed by injecting approximately one ton of an advanced, controlled-release oxygen compound. The application was completed using 40 injection points over an approximate 12,000 square foot treatment area. Direct-push technology was used to treat a 10 foot thickness from 15 to 25 feet below ground surface. Groundwater monitoring results 2 months, 6 months, and 9 months after the injection indicated favorable results. A shift of the groundwater geochemistry from anaerobic to aerobic was achieved and a one to two order-of-magnitude decrease was achieved in both BTEX (from 33 to 1.7 mg/L) and benzene (from 18 to 0.64 mg/L) concentrations. Further sampling is scheduled to determine the longevity of aerobic conditions.