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In Situ Bioremediation Of MTBE Through Biostimulation And Bioaugmentation

Methyl-tert butyl ether (MTBE) is widely used as a gasoline additive nationwide. MTBE persists for longer duration in the environment than other petroleum hydrocarbons. It has been established that naturally occurring MTBE degrading microbes are present in the environment, but their ability to degrade MTBE concentrations is poorly understood.

A pilot scale in situ field study is underway at a site in Texas. The objective of the test is to provide oxygen to promote and sustain the growth of indigenous microbes capable of MTBE biodegradation. The maximum concentrations of BTEX and MTBE at the site were 46.0 and 28.72 ppm respectively, in the source area. Presently, the BTEX plume is 800 ft and the MTBE plume is 2,200 ft long.

The field study consists of three adjacent plots (20ft x 40ft). One plot serves as a control and does not receive any amendment, the second plot receives oxygen only (bio-stimulation) and the third plot receives oxygen and an MTBE specific bacterial culture (bio-augmentation). The contaminated portion of the aquifer is oxygenated by using ORC[®] (Regenesis Bioremediation Products, CA), in the form of slurry.

A dense network of multilevel monitoring wells, both upgradient and downgradient of the treatment barrier is used to monitor the performance of the bio-stimulation/bio-augmentation project. This paper will present the results from the three plots and will demonstrate the efficacy of this treatment method relative to other remediation alternatives for MTBE.