

Accelerated JP-8 Enzyme Bioremediation

Location: Atlanta, Georgia

Client: Major Tank Line/Insurance Company

Contract Amount: \$430,000

PROBLEM

A tanker carrying 8,000 gallons of JP-8 on a major interstate highway rolled down an embankment releasing 2,600 gallons of jet fuel into a wetlands area adjacent to a stream feeding a major recreational lake in North Atlanta. The spill site was immediately adjacent to a golf course. Remtech was engaged by the insurance company to remediate the site.

SOLUTION

Remtech installed a series of interceptor trenches to collect free product. The interceptor trenches were also designed to serve as insitu bio-foam reactors. HC-2000 (a native microorganism bioremediation accelerator) was applied to enhance the biodegradation of jet fuel in the vadose (soil) and saturated (groundwater) zones.

During the first month of operation, 700 gallons of free product were recovered from the interceptor trenches (using recovery well pumps) and from an oxbow using a polypropylene rope mop. Leachates were pumped to Remtech's treatment system consisting of an oil/water separator, twin LPAS (Low-Profile Air Strippers), and aqueous phase activated carbon filter. Next surface and groundwater HC-2000 injection was initiated. The interceptor trenches were utilized to sparge the groundwater and generate bio-foam and to elevate groundwater dissolved oxygen levels from 0.5 mg/l to over 3.5 mg/l. Total groundwater heterotrophic plate counts increased from 10,000 CFUs/ml to over 1,000,000 CFUs/ml during the first month of BioSparging. Solution phase total petroleum hydrocarbons (TPH via EPA method 418.1) were reduced by over 83% during the first 30 days of treatment and soil TPH concentrations were reduced by over 70% during the first 30 days of treatment.

Over a four month period, soil TPH concentrations were reduced over 91% and groundwater TPH concentrations by over 94%. Benzene groundwater concentrations were reduced from 125 ppb to below detection limits. No rebound in groundwater benzene concentrations occurred six (6) years later.

COST/BENEFITS

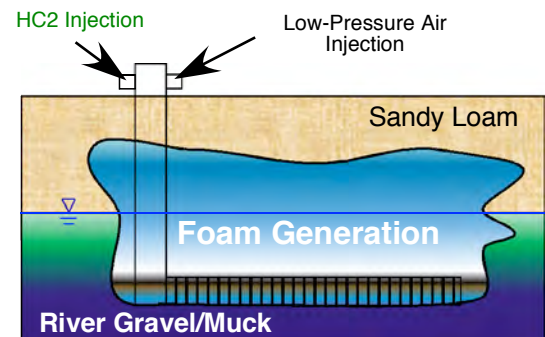
HC-2000 biostimulation was selected over other remedial strategies due to limited site access and significant cost savings over other methods, i.e. less than 50% of site excavation and restoration costs. Approximately 5,000 cy of contaminated media were treated for \$86/cy. By treating this site in place, traffic interruptions from hauling hundreds of loads onto the interstate and site erosion was avoided. Downstream erosion claims were proven to be from urban development that pre-existed the commencement of this project.



JP-8 Tanker Accident Site



Fuel Leachates Contained by River Boom



Cross Section
BioFoam Injection Reactor



Remtech Leachate &
BioSparge Treatment Plant

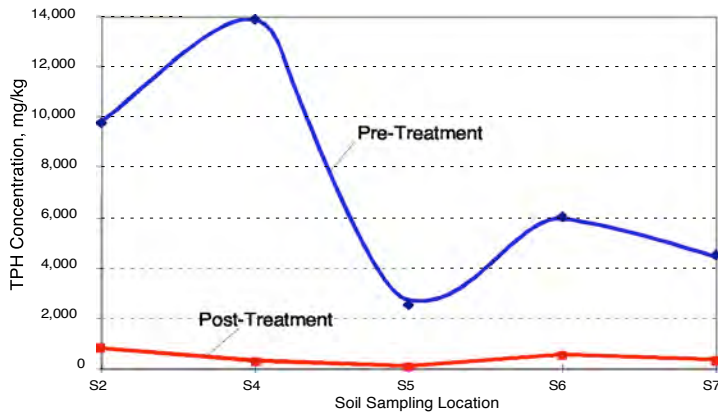


Figure 1: Soil TPH Concentrations reduced from 91 to over 99% Following HC-2000 BioVenting.

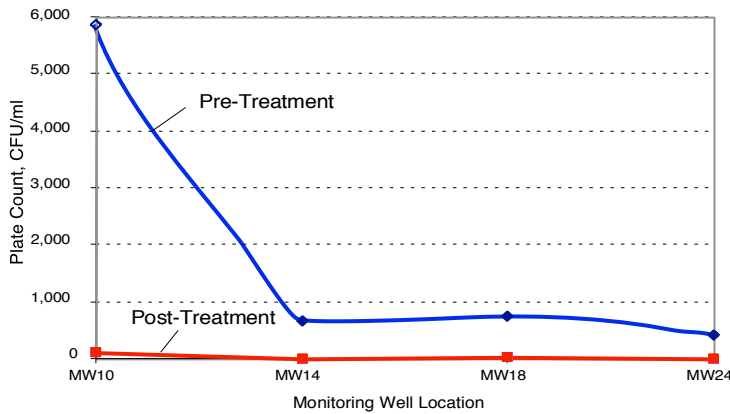


Figure 2: Groundwater TPH Concentrations reduced by over 94% Following HC-2000 BioSparging.

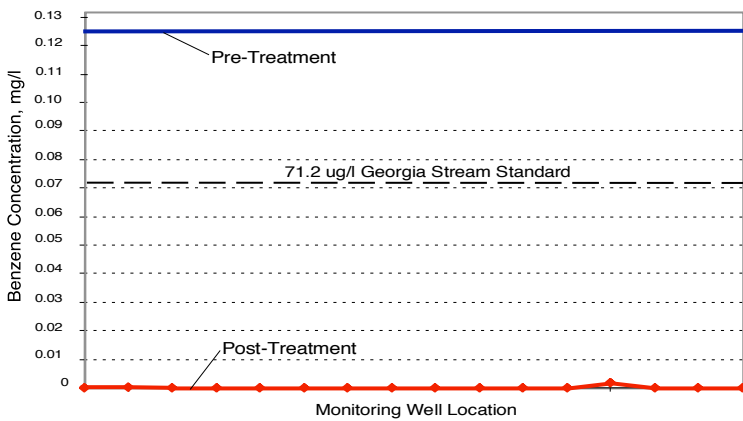


Figure 3: Groundwater Benzene Concentrations Reduced to Below Detection Limits at Monitoring Wells Following BioSparging

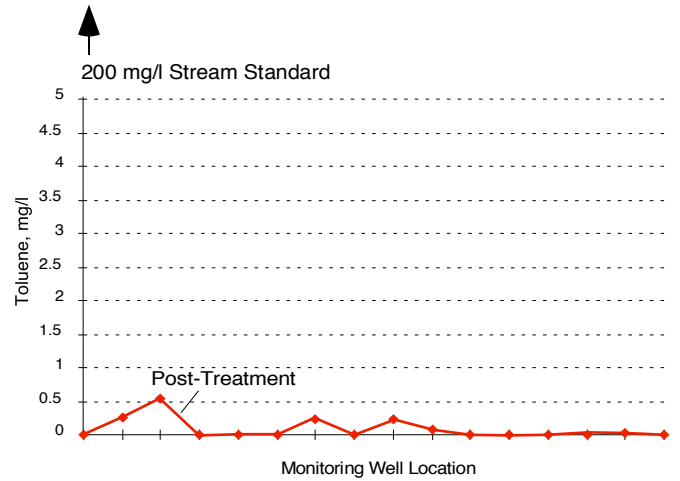


Figure 4: Groundwater Toluene Concentrations Reduced to Below Georgia Stream Standards in Monitoring Wells Following BioSparging

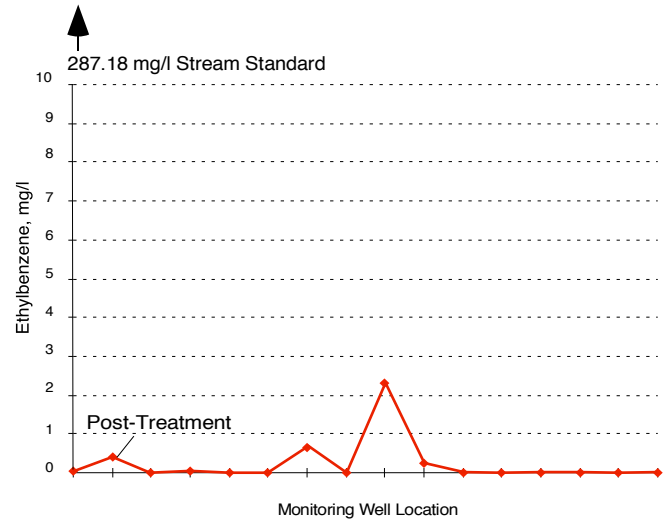


Figure 5: Groundwater Ethylbenzene Concentrations Reduced Below Stream Standards Following BioSparging



Bio-Foam