

Non-Detect Levels Reached with Application of PlumeStop® at Former Dry Cleaning Site

Project Highlights

- Rapid reduction in groundwater solvent concentrations to non-detect within 19 days
- Post-treatment shows PCE and daughter products remain at non-detect post-application
- Multiple lines of evidence for post-sorption solvent degradation

Project Summary

A former dry cleaning site in Northern California was treated with PlumeStop® for chlorinated solvent groundwater contamination. PlumeStop was applied in conjunction with the slow-release electron donor, Hydrogen Release Compound (HRC®) and the microbial bioaugmentation dechlorinator inoculum, BioDechlor INOCULUM Plus® (BDI® Plus) for the treatment of residual PCE (550 µg/L). The application was conducted around a single well. Conditions prior to the test were aerobic (ORP +254 mV; DO 4.4 mg/L). Multiple parameters were monitored from groundwater samples, to explore lines or evidence of solvent fate/degradation. Post-treatment solvent concentrations in groundwater were reduced by over 99% to non-detect (<5µg/L) by the first sampling round at nineteen days post-application. Microbial quantitative array data revealed marked increases in reductive dechlorinator species from baseline conditions in the months following reagent application.

In addition, functional enzymes for dechlorination of PCE through to ethene similarly increased over the same period. Throughout, groundwater concentrations of PCE and daughter products remained below detection limits. Electron donor status and redox potential post-application quickly stabilized at near-optimal conditions (150mV +/- 30 mV), with rapid decreases in competing electron acceptors observed within the first sampling intervals.

Technology Description

PlumeStop Liquid Activated Carbon™ (LAC) is an innovative groundwater remediation technology designed to address the challenges of excessive time and end-point uncertainty in groundwater remediation.

HRC is an engineered, hydrogen release compound designed specifically for enhanced, in situ anaerobic bioremediation of chlorinated compounds in groundwater or highly saturated soils.

BDI Plus is designed for use at sites where chlorinated contaminants are present and unable to be completely biodegraded via the existing microbial communities.

Results

The use of Plumestop in combination with HRC and BDI Plus, quickly and effectively reduced contaminant levels to non-detect in days. The use of LAC produced results beyond what is typically seen in traditional remediation solutions and points to the future for cost-effective and efficient bioremediation solutions.



Site Details

Site Type: Former Dry Cleaner

Contaminant of Concern: PCE

Concentration: 550 ppb

Remediation Approach: Enhanced Anaerobic Bioremediation, *In Situ* Chemical Oxidation (ISCO), Combined Remedy

Soil Type: Silt clay

Technology Used:



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