

Chlorinated Solvent Concentrations Reduced >100x within Six Months

Enhanced Reductive Dechlorination Used to Treat Former Dry Cleaner in South Carolina Coastal Plain

Project Highlights

- Small groundwater recovery system in place to provide hydraulic control.
- Enhanced Reductive Dechlorination (ERD) treatment selected to achieve site closure more quickly.
- High PCE concentrations reduced by more than 100x within 6 months and remain <5 ug/L two years post-injection.
- Follow-up treatments enhanced initial injection and contributed to continued dechlorination.



3-D Microemulsion was applied on-site to treat high PCE concentrations.

Project Summary

The site, located in the Coastal Plain of South Carolina, was impacted from former dry cleaning operations. A small groundwater recovery system had historically been used to provide hydraulic control, but the site owner wanted to move the site toward closure more quickly. Enhanced Reductive Dechlorination (ERD) with 3-D Microemulsion® was selected based on cost, ease-of-use and expected remediation performance. After the initial injection, PCE concentrations decreased by more than 100x within 6 months of application and remain below 5 ug/L two years after the initial injection.

Remediation Approach

The core of the plume was characterized by concentrations of 14-18 mg/L PCE at baseline plus the full suite of chlorinated ethene daughter products. An initial application of 3-D Microemulsion occurred in June 2011 over a 7,750-square-foot area in the surficial aquifer from 3-25 feet below ground surface. The injections were completed using direct-push equipment into temporary borings on 13-20 foot centers. Based on the success of the initial injection, a follow-up injection was completed in September 2013 over a much smaller footprint (2,200 square feet) to fill in treatment gaps near the upgradient edge of the initial treatment area and to supplement the 3-D Microemulsion in the core of the plume. The follow-up treatment has built on the initial treatment and is contributing to continued depletion of the chlorinated solvents.

Technology Description

3-D Microemulsion is an engineered electron donor material that offers a novel 3-stage electron donor release profile, pH neutral chemistry and is delivered on-site as a factory-emulsified product.

Site Type: Former Dry Cleaner, Current Office Building

Contaminant of Concern: PCE

Concentration: >18 mg/L

Remediation Approach:
Enhanced Anaerobic Biodegradation

Soil Type: Silty Sand

Treatment Area: 7,750 sq. ft.

Technology Used: 3-D Microemulsion