

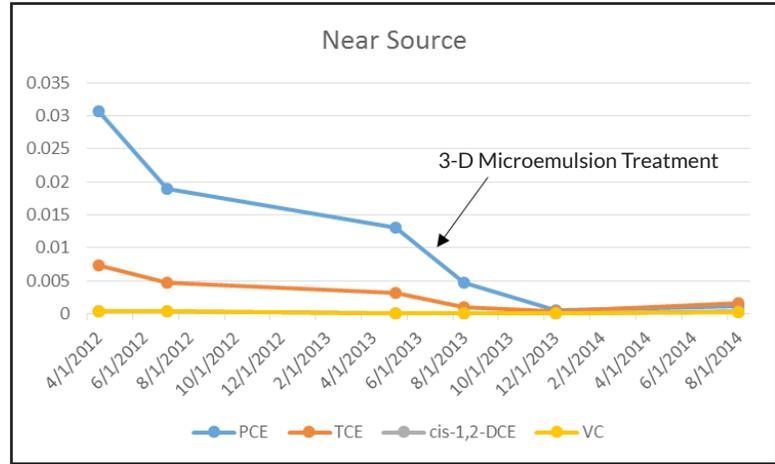
# Cost-Effective Remediation Plan Implemented at Active Texas Dry Cleaner

*3-D Microemulsion® Reduces Chlorinated Solvent Contamination to Clean-Up Standards*

## Project Highlights

- Dual-phase extraction used to treat high level PCE in the source area.
- Enhanced Anaerobic Bioremediation selected as a cost-effective approach to treating migrating contamination.
- Majority of contamination reduced to clean-up standards; two low-level VC areas remain above desired limits.

## Groundwater Contaminant Concentration Trends



## Project Summary

Dry cleaning operations resulted in a PCE release at a Texas dry cleaner. PCE concentrations at high at 95 mg/L were observed on-site. Aggressive clean-up measures were used in the form of dual-phase extraction of DNAPL and solvents in the source area. This resulted in nearly a two order-of-magnitude reduction in PCE concentrations in certain source wells. The second clean-up phase included expanding the system to treat contamination that had migrated out of the source area into the periphery of the groundwater plume.

## Remediation Approach

Due to a limited budget for remediation, a cost-effective anaerobic bioremediation approach was selected due to the desire for a long-lasting solution that could also achieve low concentrations. 3-D Microemulsion and HRC Primer were injected along the migration centerline of the plume extending from just outside the source area to the toe of the plume. A second smaller treatment event was conducted in the vicinity of the former source area.

One year post-injection all solvent concentrations have dropped below clean-up standards with the exception of two low-level contamination areas. Recent treatment of the source area is starting to result in similar trends although there is not enough data yet to track remediation progress of the second injection event.

However, biostimulation alone through the addition of 3-D Microemulsion and HRC Primer appears to be very effective. Ongoing monitoring will occur followed by initiation of closure monitoring once all critical wells reach target levels.

## 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.

HRC Primer is a less viscous version of the standard Hydrogen Release Compound (HRC) product. It is a thinner, water-like compound that is typically injected into an aquifer where it releases lactic acid at a rate faster than standard HRC (several weeks), but at a slower, more controlled rate than dispersing aqueous simple sugar solutions or straight lactic acid (several days).

**Site Type:** Dry Cleaner

**Contaminant of Concern:** Chlorinated Solvents

**Remediation Approach:** Enhanced Aerobic Biodegradation

**Soil Type:** Silty Sand

**Technology Used:** 3-D Microemulsion, HRC Primer