Environmental Solutions

EHC® Liquid
Case Study

EHC® Liquid Pilot Application to Treat CVOCs at a Former Industrial Site, Holmdel, NJ

Summary

Groundwater at a site in Holmdel, NJ is impacted with chlorinated solvents (primarily PCE, TCE and 1,2-DCE). A pilot test was first conducted in Nov 2011 by injecting EHC® Liquid reagent into the shallow aquifer. EHC Liquid is composed primarily of ELS™ Microemulsion, a controlled-release organic carbon substrate and EHC Liquid mix, an organo-ferrous compound. The injected amendments were successful at establishing long-lasting, highly-reducing conditions conducive to chemical and biological reduction of cVOCs.

Remedial Strategy

The geology is primarily silty sand in the top 30 ft of the aquifer, vertical impacts span from 7 ft to 21 ft bgs. The upgradient source area was formerly excavated where EHC reagent was applied at the bottom of the excavation to treat residual contamination in saturated soil. The downgradient portion of the area of interest was to be addressed with EHC Liquid, an *in situ* chemical substrate to promoting biotic and abiotic reduction of CVOCs with a possible addition of a buffer to raise the pH of the acidic aquifer.

Solution

Figure 1 shows the site map with the layout of pilot test injection and monitoring wells. A total of 5,110 gallons of solution was injected containing 10,920 pounds of ELS Microemulsion, 639 lbs of EHC Liquid Mix (organo-iron compound), 3,670 lbs of magnesium hydroxide buffering agent and 24 L of dehalococcoides (*Dhc*) containing solution. Nineteen injection points targeted a vertical zone from 7-21 ft bgs.

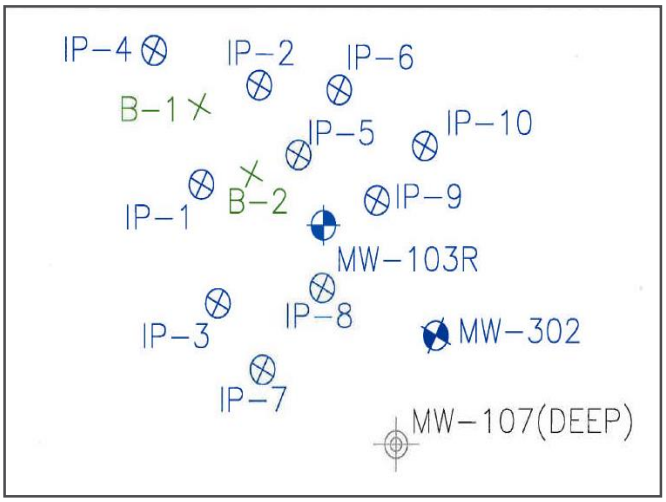
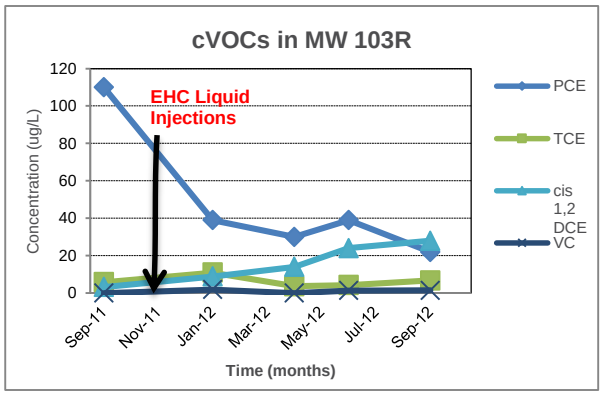


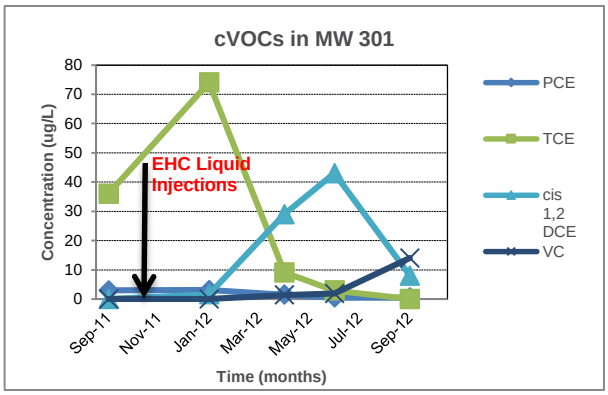
Figure 1 – Pilot test injection locations

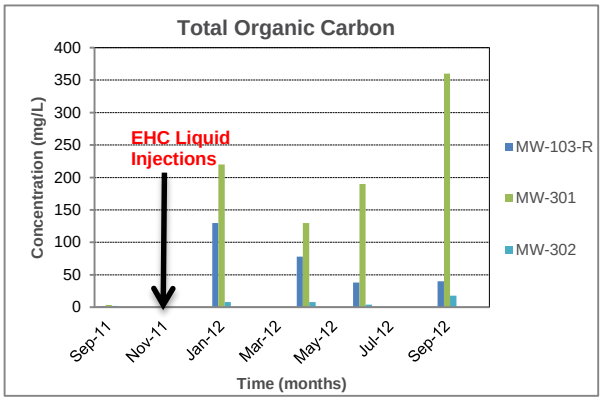
Results

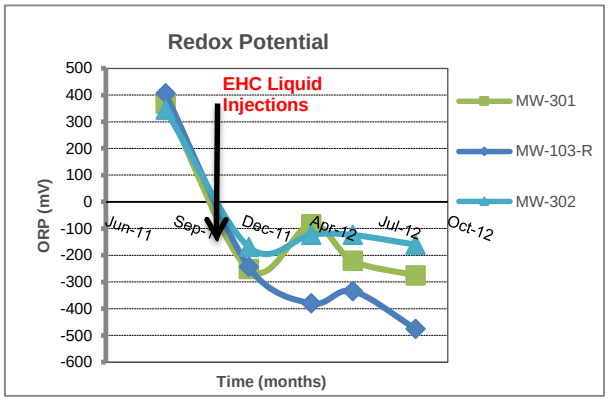
Figure 2 shows the concentrations of CVOCs, Total Organic Carbon and ORP in performance monitoring wells within the treatment area. PCE and TCE concentrations were reduced to concentrations below the GWQS within 9 months following the pilot-scale treatment.

Figure 2 – cVOCs, Total Organic Carbon, Redox Potential data baseline and post injection









Future Scope of Work

The quantity of magnesium hydroxide (alkaline buffer) injected during the pilot test was excessive, resulting in high pH conditions restricting the proliferation of microbial community. Full-scale remedy will be designed to address shortcomings identified during the pilot test, which included proper pH dosing and introduction of a sufficient population of bacteria capable of dechlorinating VC and 1,2-DCE.