EHC® Liquid Application to Treat CVOCs Under a Building at an Industrial Site in Denver, CO

Summary

The objective of the project was to demonstrate the efficacy of EHC® Liquid Injections for treatment of residual TCA and DCE contamination beneath the building and to reduce contaminant mass in the deeper saturated zone (20-25 ft bgs).

Given limited access to contamination under the building due to ongoing operations, the gravel-filled former source area excavation west of the building was used as a large storage or reaction vessel. Pumping wells were installed east of the building to enhance groundwater movement under the building and promote reductive dechlorination of the remaining contaminants.

Solution

From June 11 through June 14, 2012, approximately 5,000 lbs of EHC ISCR reagent and 7,114 lbs of lecithin-based EHC® Liquid reagent were injected into the gravel-backfilled former source area excavation along the west-side of the building. Groundwater extraction was conducted at E-4, E-15, E-16, and TPW-2 following the injection of EHC ISCR reagent in an attempt to create anaerobic conditions in groundwater in the area beneath the building.

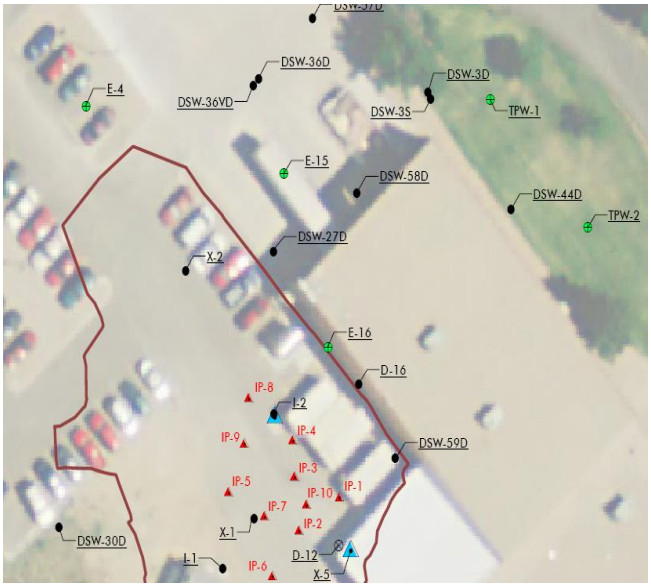

Figure 1 indicates the layout of direct push injection points depicted in red, EHC Liquid amendment injection wells depicted in blue, and the down gradient extraction wells in green.

Results

Figures 2 and 3 show the molar concentrations of CVOCs in wells D-16 and X-2 pre and post injection indicating that the delivery method successfully created anaerobic conditions down gradient of the area injected in the wells along the west side of the building.

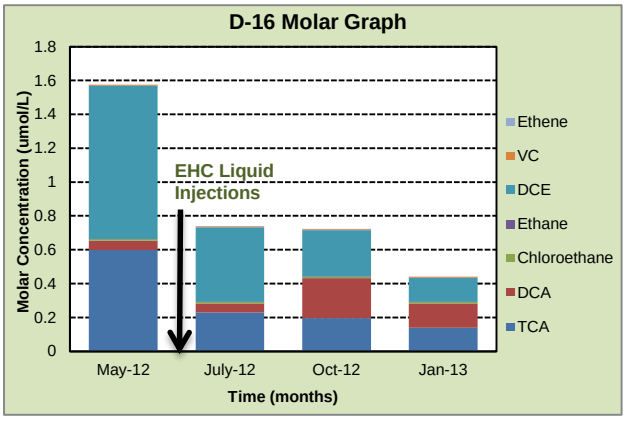

Figure 2

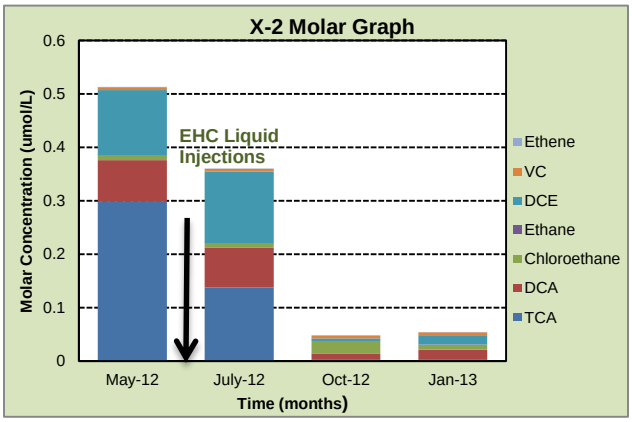

Figure 3

Discussion and Future Scope of Work

- The amendments were successful at establishing long-lasting, highly-reducing conditions conducive to chemical and biological reduction of cVOCs.
- Monitoring results at D-16 and X-2 will be used in determining whether additional EHC Liquid is necessary to maintain ISCR conditions.
- Multiple lines of evidence that anaerobic conditions have been generated have not been observed at DSW-44D, but the increasing trend in methane concentrations and the decreasing trend in nitrate concentrations are positive indications that anaerobic conditions may be observed in the upcoming year along the east side of the building.
- Sampling will continue on a quarterly basis till the end of 2013 followed by additional investigation/delineation of contamination under the building to identify multiple residual sources (if any).