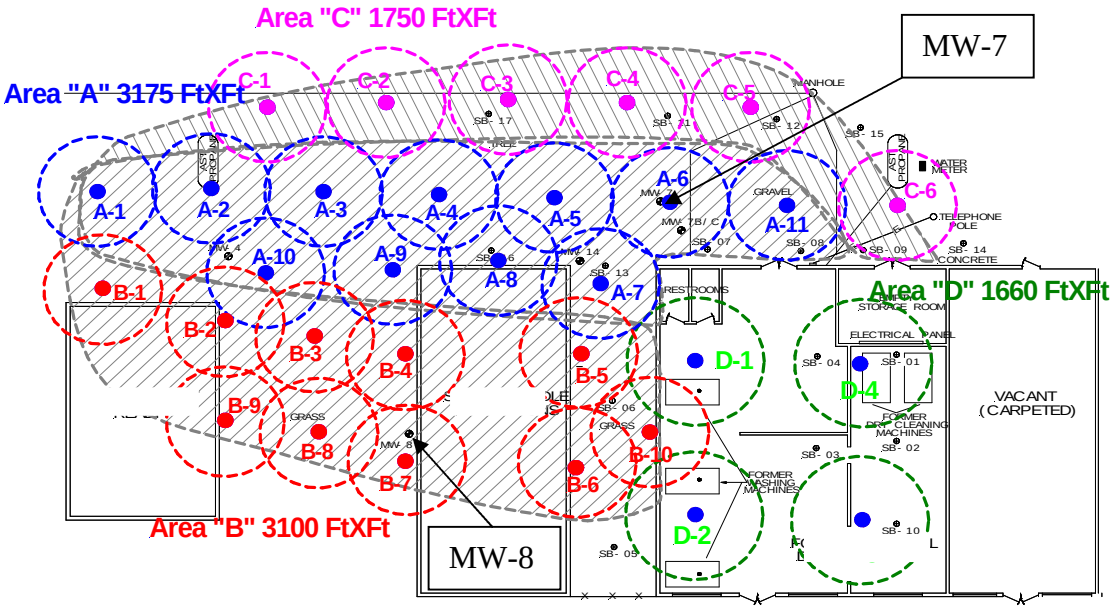
Project Summary

The subject site is a Coastal Cleaners located in Swansboro, NC. The site has historically had soil and groundwater impacted by the use of dry cleaning agents, tetrachloroethene (PCE) and its corresponding daughter products: trichloroethene (TCE), cis-1,2-dichloroethene (DCE) and vinyl chloride (VC). The in-situ injection program targeted these compounds and the anaerobic daughter products. A total of 31 injection points were made in September 2010 over 4 days utilizing direct push points advanced utilizing a Geoprobe 6620. The injections were made at 15-26 feet below ground surface (bgs), targeting four separate two foot intervals. The injection point locations can be viewed below.

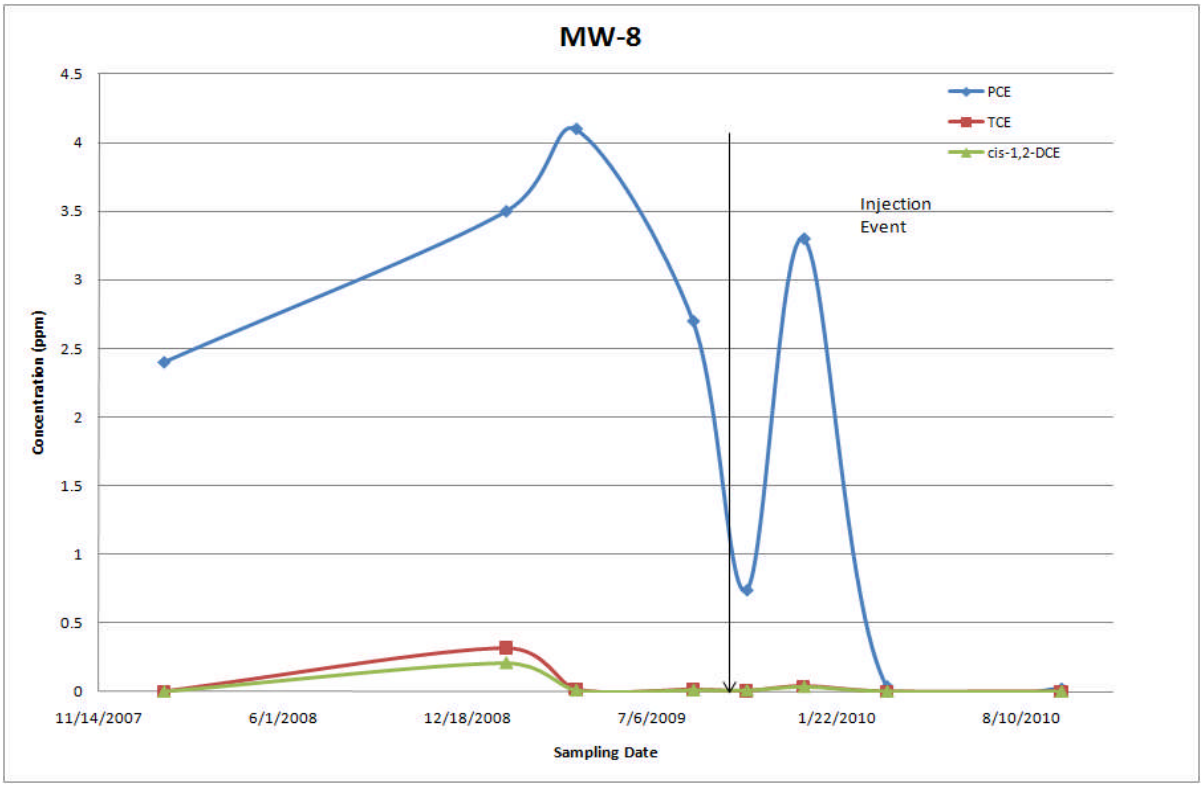


Remediation Plan

The injection program utilized direct-push technology to apply a mixture of vitamins, nutrients, sodium sulfite (an oxygen scavenger), calcium propionate, zero valent iron, HRC®, and EHC®. The designed remediation plans purpose was to reduce source area concentrations and limit plume migration, as well as promote anaerobic conditions in the groundwater favorable to anaerobic bacteria that degrade CVOCs. This was done through the use of several different areas (A-D) to tailor a more accurate remediation plan for the site based on groundwater concentrations, site conditions, etc. The resulting emplacement treats dissolved phase chloroethenes and provides soluble organic hydrogen donors which will enhance attenuation down gradient of the PRB. The stimulus of these indigenous bacteria in the subsurface, in conjunction with the ZVI component, is utilized to effect the rapid and measurable removal of the targeted compounds in the groundwater and saturated soils.

Results

Based on the analytical and field parameter data presented so far indicate that the remedial event was successful in promoting reductive dechlorination and contracting the PCE plume. Concentrations of CVOCs are greatly reduced in many of the monitoring wells sampled, for example, MW-7 PCE concentrations decreased 56% from the August 2009 baseline sampling event (0.37 mg/L→0.16 mg/L) and 97% from the April 2009 sampling event (5.4 mg/L→0.16 mg/L); the concentration of PCE in MW-8 decreased 99.2% from the August 2009 baseline sampling event (2.7 mg/L→0.022 mg/L). The fluctuation of PCE concentration prior to the injection event can be attributed to the changes in groundwater elevation in the vicinity of MW-8 that most likely altered the sorbed material in the smear zone and saturated zone concentrations. The rebound in PCE concentration in MW-8 is expected following the injection event because the sorbed material is liberated from the soil particles. The subsequent drop in concentration to 0.022 mg/L of PCE from 3.3 mg/L shows the effectiveness of the dechlorination process on the liberated material.



The injection event conducted in September 2009 appears to have affected the geochemistry in the subsurface and stimulated biotic reductive dechlorination. The remedial program appears to be dominated by the biological phase of the remedial program and should continue to reductively dechlorinate the CVOCs present in the groundwater.