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Treatment of a Chlorinated Ethene Plume Using Different Biological Amendment Mixtures to Reach Site Closure

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Background/Objectives. A site at the former Kelly Air Force Base in San Antonio, Texas is contaminated with PCE and TCE at concentrations well above the groundwater protection standards (GWPS). Historically, PCE as high as 1,500 µg/L has been detected at the site. The site is located off-base in the vicinity of a company selling aircraft spare parts. To prevent migration of the plume contractors previously installed a permeable reactive barrier (PRB). Contaminant concentrations continue to remain above GWPS upgradient of the PRB. CB&I has conducted multiple injections using different amendment mixtures at this site to attain unrestricted site closure. Different amendment mixtures included; 1) EVO, SDC-9 and nutrients; 2) EVO with ferrous gluconate, SDC-9 and nutrients; 3) PlumeStop®, Hydrogen Release Compound (HRC) and SDC-9.

Approach/Activities. The first round of injections involved the use of EVO using temporary injection points. To create longer lasting reducing groundwater conditions and maintain favorable groundwater geochemistry, an iron source (ferrous gluconate) was mixed with EVO for a second and third round of injections. In order to achieve the goals of site closure for the site within the period of performance, additional injections were conducted in the upgradient area using PlumeStop® and HRC. The latter injection events were smaller and more focused than the first and were conducted using 2-inch injection wells.

Results/Lessons Learned. After the first round of injections using EVO, PCE, TCE and daughter product rebounded at the site. Additional injections using EVO mixed with ferrous gluconate created favorable groundwater conditions and complete reduction has been observed in several wells. Currently, TCE and cis-1,2-DCE and VC have been reduced to below the GWPS at many of the monitoring wells. The injection of PlumeStop® in the upgradient areas has also successfully reduced concentrations to below the GWPS. The presentation will discuss the implementation of the project, field challenges, and results of performance monitoring events in detail.