Adjusting Amendment Delivery Vertically and Horizontally Based on Targeted Compounds: Translating Assumptions to Field Implementation

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Background/Objectives. Most critical to a successful in situ remediation design is interpreting and integrating the known geochemical characteristics and the groundwater sampling data into an implementation program. Together with a thorough understanding of the capabilities and limitations of individual delivery tooling, equipment, pumps, mixers, hoses and direct-push rigs, a mix of chemistry, biology, art and science merge together into a coherent and reliable remediation solution.

Approach/Activities. The historical data available from two distinctly different chloroethene impacted sites are contrasted when applying partitioning characteristics of the hydrophilic nature of the mother and daughter products in conjunction with the heterogeneous nature of the vertical soil matrix. Various organic hydrogen donors, zero-valent irons and enhancement amendments are integrated into an implementation program that is optimized based on the capabilities of injection equipment.

Results/Lessons Learned. The vertical and horizontal loading of remediation amendments based on the variability between the impacted saturated soil horizons at each site provides economic benefits as seen by the comparison of stochiometric dosing to product vendor pore volume dosing. Finally, translating the theoretical amendment dosages of individual remediation components into a remedial plan that utilizes the vertical and horizontal heterogeneity presents a compelling argument for adjusting the individual components.