You Have to Spend Money to Save Money: The Business Case for Pre-Remedial Assessment

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Background/Objectives. Traditional investigation and remediation approaches have typically included two phases: assessment followed by remediation. More questions are often generated during the assessment phase than answers and depending on the complexity of the site, the assessment phase can seem endless. Once the assessment phase is "closed" (i.e., the Remedial Investigation is approved), sites may transition quickly into remediation in order to make more rapid "progress" at the Site. Spending money on remediation rather than assessment can be perceived as more beneficial to stakeholders as there is a tangible path towards closure during this phase of the project lifecycle. However, in spite of the warm feeling of progress when remediation measures are first implemented, proceeding with a remedy without continuing to gather and assess data can lead to remedy failure.

Approach/Activities. Costs associated with additional investigation/assessment as part of the remedial design may seem to provide less value than money spent on remediation activities. Pre-design assessment, however, can result in significant savings in both the time and money required to meet the end goal of closure. Examples of pre-design activities that can contribute to better certainty in remedy application/optimization include high resolution site characterization for source delineation, mass flux assessments to focus remedial applications, and groundwater models to support remedy selection or optimization. This presentation will include case studies from three sites where pre-design assessment activities resulted in an overall decrease in remediation cost and/or time to closure.

Results/Lessons Learned. The first case study involves a chlorinated solvent plume where in situ chemical oxidation (ISCO) injections were performed. ISCO injections effectively reduced contaminant mass in some portions of the site, however chronic rebound initially attributed to matrix was observed in other portions of the treatment area. Additional site investigation activities confirmed the presence of several secondary source areas upgradient of the treatment area, resulting in optimization of the injection strategy to sustainably reduce contaminant concentrations throughout the entire treatment area.

The second case study includes a chlorinated solvent site where a bifurcated plume extended from the facility and discharged into two different surface water bodies. Assessment activities were conducted to evaluate potential preferential flow paths from the groundwater to the surface water and through this was determined that no treatment was required for surface water protection on the west side of the facility. In addition, it was found that the plume had migrated into bedrock on the east side of the facility resulting in a change in the proposed remedy as the originally proposed permeable reactive barrier would have had limited effectiveness in reducing the overall risk associated with the site.

The last case study involves use of a numerical model to optimize a 30-year old pump and treat system. The model was constructed to compare different pumping scenarios with focus on source control and increasing mass removal as key performance metrics.