Remedial Design Characterization Using Electrical Hydrogeology

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Background/Objectives. Remedial technologies facilitate cleanup of impacted sites using a range of physical, chemical, and/or biological mechanisms. All too frequently, remediation failures are primarily due to the lack of sufficient data density for subsurface properties. This lack of data density leads to an incorrect or incomplete conceptual site model (CSM), and subsequently to an inadequate remedial design.

Approach/Activities. Surface deployed and non-invasive electrical scanning of the subsurface during remedial design characterization (RDC) provides continuous data dense imagery. These images allow point data from wells and borings to be correlated and develop a robust, 3D visualized CSM with hydrogeology, bioactivity, and contaminant distribution. The subsequent remedial design, based on the data rich 3D CSM, provides a guide for the technology(ies) to be successfully deployed in the correct subsurface spatial locations, saving both time and money.

Results/Lessons Learned. Datasets from two LNAPL-impacted sites will be used to illustrate how the investment in RDC allows decision making to exist with much greater certainty and attain site cleanup goals. Both sites were long term recalcitrant sites in similar complex geology. Robust RDC work discovered undegraded free product caught in the vadose zone at the first site, and answered significant questions regarding remaining free product from multiple sources at the second site.