ADAPTIVE LONG-TERM MONITORING AT ENVIRONMENTAL RESTORATION SITES

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The objective of this project is to demonstrate and validate the use of the recently developed
Summit monitoring tools for reducing costs and improving effectiveness of long-term monitoring (LTM) through adaptive assessment while achieving remediation goals. These tools will allow performance assessment relative to site-wide remediation targets (e.g., assessing plume stability), reduce redundancy in LTM data, and identify where and when additional data may be most beneficial to reducing uncertainties regarding performance. A secondary objective is to compare the results with the Monitoring and Remediation Optimization Software (MAROS), which is currently available for monitoring optimization.

This ESTCP project (ER-0629) was started by Naval Facilities Engineering Service Center and partners in FY 06. The project includes Dem/Val at three DoD sites. The first dem/val is at the Camp Allen Landfill, Norfolk Naval Base, and the findings are presented in this poster session.

There are three components that comprise the Summit monitoring tools. The first, Model Builder, creates geostatistical or statistical models of spatial and temporal data. The second, Sampling Optimizer, identifies redundant sampling locations and frequencies in historical data, and also highlights areas of significant data uncertainty that may benefit from additional sampling. The third, Data Tracker, enables users to create time-dependent site-wide remediation targets (e.g., reductions in mass) or well-specific targets (e.g., concentration trends) and evaluate new data relative to those targets, providing automated alerts of unexpected deviations.

At the Camp Allen Landfill, two aquifer systems are impacted by contamination: the shallow aquifer and the underlying deep aquifer. The optimization for selection of sampling locations and/or frequency was performed simultaneously for three COCs (cis-1,2-DCE, TCE, and VC). The optimization results are in the form of “tradeoff curves” associated with two competing objectives: (1) minimize the number of sampling locations; and (2) minimize the maximum concentrations errors at the “plume boundary sampling points” that result from removing specific sampling locations. Constraints limit the maximum error in the core portion of plume. For comparison purpose, MAROS was also applied at Camp Allen Landfill, to compare results where such comparisons can be made, and to establish where comparison of results is not possible because of differences in the software applicability or functionality.