

Role of Stratigraphic Models to Refine Site Assessments

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Background/Objectives. One of the most critical factors to account for in a site assessment is the media that transport and store groundwater. An incomplete understanding of geologic heterogeneity can impair remediation efforts which is often overlooked during characterization and remedial design in sedimentary deposits. Defining geology by the depositional environment will organize the subsurface framework which is the plumbing that dictates constituent movement. The objectives of this work are to discuss two case studies where a stratigraphic review was completed either before (Washington, DC) or after (Altus, OK) remedial design implementation which provided cost-saving opportunities or identified current design data gaps, respectively.

Approach/Activities. A site assessment utilizing a stratigraphic approach can be incorporated by review and analysis of historic site data and regional publications. These methods have been used by the oil and gas industry for decades to refine the geologic understanding by organizing deposits by regional controls and depositional processes that explain lateral and vertical subsurface heterogeneities. Application of these methods to remedial design can target field activities saving time while generating a geologically-defensible stratigraphic understanding of the subsurface.

Results/Lessons Learned. Performing a stratigraphic review prior to installation of a biowall at a site in Washington, DC resulted in reducing an initial discharge window estimate by approximately 50% (~1,500 feet). The stratigraphic review also guided 3-D modeling (i.e., EVS) estimates by constraining geologic pathway geometry and extent. Completing a stratigraphic review of existing biowalls at a site in Altus, OK resulted in identifying primary hydrogeologic pathways and where the current design was and was not effectively addressing groundwater mass discharge.