

**An Alternative Approach at a Hydrogeologically Complex Site
Contaminated with Chlorinated Compounds**

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A fractured carbonate aquifer in Pennsylvania has been impacted by past surface releases of chlorinated solvents. Initial characterization efforts focused on the top 100 feet of the aquifer, and subsequent remediation efforts (soil removals, chemical oxidation) focused on this depth interval with limited success. Post-remediation monitoring has determined that impacts extend into deeper portions of the aquifer. Additional characterization work was performed, including drilling, packer sampling, deep well installations, rock matrix sampling, and a long term water level study. Results show impacts extending to depths of at least 350 feet, despite extremely tight fracturing at depth. Diffusion of contaminants from groundwater in fractures into the rock matrix has also been observed. Lateral migration is limited, especially in the deeper portion of the bedrock aquifer, and biodegradation appears to be active to varying degrees. A Technical Impracticability evaluation is underway, with the goal of obtaining a TI Waiver for deep groundwater.