USE OF HYDRAULIC PROFILING TOOL TO IDENTIFY PREFERENTIAL PATHWAYS FOR CHLORIDE IMPACTED GROUNDWATER MIGRATION

BINDER, Jeffrey L., Burns & McDonnell Engineering Company, 9400 Ward Parkway, Kansas City, MO 64114,
jbinder@burnsmcd.com

A natural gas liquids (NGL) storage facility located in south-central Kansas operates brine storage ponds that were previously unlined and released chloride impacted water into the subsurface. As a result, groundwater impacted with chloride has migrated downgradient of the source.

Complicating geologic and hydrogeologic factors exist at the site relative to the containment and remediation of the chloride plume. The stratigraphic and geologic conditions, limited radius of influence for capture, and low groundwater yield to existing wells were the primary concerns in reference to characterization and determination of viable remedial options for the site.

In order to better characterize the site conditions and potential preferential pathways for migration, a Hydraulic Profiling Tool (HPT) developed by Geoprobe® was used in combination with conventional technologies to select the most effective location for construction of a hydraulic containment system at the site. The HPT is a direct push technology that utilizes electrical conductivity (EC) logging and water injection pressure to identify lithologies and zones of relative permeability that may represent potential migration pathways for impacted groundwater.

Although the subsurface at the site had elevated chloride levels in the soil and groundwater due to the past release, a comparison to background conditions and data from offset geologic borings proved to be key components in the correlation of the HPT data. Zones of elevated chloride concentrations and high relative permeabilities based on hydraulic pressure response data for the formation were identified in the central portion of the plume.

Data from this HPT investigation was an integral part in the determination of the optimal remedial alternative location for a hydraulic containment system at the site. The final remedial alternative will be the installation of a one-pass collection trench to maximize hydraulic containment and control of the migration of chloride impacted groundwater at the site.