

**DETERMINATION OF THE SOURCE OF CHLORIDE IMPACT TO GROUNDWATER
USING THE HYDRAULIC PROFILING TOOL**

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Chloride contamination in groundwater has been noted for a number of years in an area downgradient of two natural gas liquids (NGL) storage facilities located in south-central Kansas along the margin a major regional freshwater aquifer. The facilities operate brine storage ponds that contain brine used for movement of product. The question of the source of chloride contamination has been a major concern to the state regulatory community and local groundwater management district.

Numerous phases of investigation and sampling had not determined the source of the elevated chloride concentrations in groundwater. Subsequent investigations were performed using alternative approaches and have provided a better understanding of the geologic characteristics, migration pathways, and potential source of the chloride impacts to this portion of the aquifer.

In order to better characterize the site conditions, determine the extent of the impacts, and potential preferential pathways for migration, a Hydraulic Profiling Tool (HPT) was used in combination with conventional technologies to investigate the area of interest. 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.

An analysis of the investigation data, in particular the HPT and groundwater results, identified a point source related to a release or leak from an old brine pipeline that ran from a brine well to the brine storage ponds that was located remote from the facilities. This finding contradicted the previous belief that the source of the chloride contamination in the area of interest was the results of a past catastrophic failure of the brine ponds.

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