

## Groundwater Remediation

Haskell County, Southwest Kansas

### Client

Pioneer Natural Resources USA, Inc.

### Highlights

- ◆ Used groundwater recovery to extract brine-impacted groundwater within the Ogallala aquifer
- ◆ Injected the recovered groundwater into a lower saltwater formation
- ◆ Groundwater capture zone modeling
- ◆ Conducted long-term monitoring to demonstrate effectiveness of the remediation to regulatory entity

DBS&A was requested by Pioneer Natural Resources USA, Inc. (Pioneer) to review an ongoing groundwater remediation project in southwest Kansas. This project involved oil-field brine contamination in the freshwater Ogallala aquifer. Depth to groundwater was approximately 320 feet below ground surface and maximum chloride concentrations were 6,020 mg/L in an extraction well. The technology utilized was groundwater recovery to extract the brine-impacted groundwater within the Ogallala aquifer. The recovered groundwater was then injected into a lower saltwater formation for a water flood project.

DBS&A proposed several tasks, including a comprehensive file/regulatory review, groundwater sampling, an aquifer test, and a geophysical survey. These tasks were performed to identify the current state of the saltwater plume and to identify gaps in the subsurface geologic and hydrogeologic data. Recommendations included the design of the system upgrade, groundwater pump and piping specification, and the installation of four extraction wells and three monitoring wells.

DBS&A was the prime contractor on the system upgrade and managed subcontractors for well installation, trenching, piping/plumbing installation, and electrical requirements. In addition, groundwater modeling was performed at this site to evaluate the operation of the irrigation well with respect to the impact from the oil-field brine within the Ogallala aquifer.

The extraction wells are sampled on a quarterly basis and the monitoring wells are sampled on a semi-annual basis. Technical reports documenting system performance and monitoring results are submitted on a semi-annual basis. DBS&A assisted with the development of a sampling approach and methodology to move the site toward regulatory closure.



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