

Minimizing losses of water channeled into “thief zones”

Client: Exploration and Production Company

Location: Caddo County, Oklahoma

Objective: Optimize waterflood patterns and evaluate infill potential through geological modeling and reservoir simulation

The Client engaged Knowledge Reservoir to update an Eclipse simulation of the Hoxbar Sand Unit in their Caddo County Field. The scope of the study was initiated with a detailed review of the geological and petrophysical model of the field, followed by simulation using Petrel and Eclipse, including:

- Performing a material balance and updating the reservoir model.
- Conducting production and injection history matching and forecasting.
- Reviewing the field for injection modifications, additional waterflood potential, and further infill and development drilling

The simulation and field data revealed that some of the historically injected water volumes were most likely being channeled into “thief zones”. History matching suggested that water injection operations should be studied before any further development programs were conducted. Determining the extent of the water losses channeled into the “thief zones” helped optimize the waterflood patterns. Efforts to minimize losses not only increased the efficiency of oil sweep, but reduced operating costs. Knowledge Reservoir also recommended infill drilling locations based on the results of the evaluations.

