

Case study: Permian basin

# Baker Hughes VAS accurately predicted production in Permian Basin laterals

A customer in the Permian Basin had drilled a pilot hole in the Wolfcamp field and needed to complete an analysis to determine the locations to land two 2-mile (3219 m) laterals. The company required the laterals to land in the optimum pay zones for oil and gas production. There was only a 24-hour window to complete the evaluation project before drilling commenced.

The **Volatile Analysis Service (VAS) lateral characterization** from Baker Hughes was determined to have the best opportunity for success. The Volatiles Analysis Service provides a low-cost well log generated from drill cuttings or core plugs used to identify pay intervals and to characterize hydrocarbon zones. Using the "sealed-at-the-well" shale cuttings, the VAS would be able to assess the estimated ultimate recovery (EUR) of oil in the field.

Estimates of EUR and mechanical strength were needed for the entire Wolfcamp formation on a sampling density of 10 ft (3 m). Samples of VAS cuttings had to be obtained and shipped directly from Midland, Texas to Tulsa, Oklahoma and analyzed the same day. Within 4 hours of project approval, a VAS-trained team from

Baker Hughes was dispatched to the rig with necessary equipment and supplies. The required 200 cuttings samples were carefully captured from the flow line discharge into the shaker box or "possum belly," gently rinsed, and immediately sealed in VAS tubes for delivery to the lab same day via commercial airlines. Using this process, the analyses and interpretation were completed and recommendations delivered within 24 hours of reaching total depth (TD).

The 2-mile (3219 m) laterals were landed in the Wolfcamp zone A, which the VAS determined as optimal due to the best mechanical strength, best permeability, and highest oil content. The VAS cuttings analysis predicted each of the laterals estimated ultimate recovery (EUR) at 800,000 barrels (127,190 m<sup>3</sup>) before the laterals were completed and fractured. The total production rate from both laterals was 3,000 barrels per day (477 m<sup>3</sup>), with an customer-revised EUR of 1 million barrels (based on the collected data). The EUR expectation from the VAS closely resembled the estimate made by the customer based on the production data.

## Challenges

- Two 2-mile (3219 m) laterals required in optimal pay zone
- Completion of evaluation within 24 hours

## Results

- 200 cuttings samples were achieved, which helped determine the optimal lateral landings
- Daily samples were obtained and analyzed within the 24 hour period
- The EUR prediction from the VAS closely resembled the revised EUR from the customer post production