

Case study: Oklahoma, North America

Baker Hughes VAS detected ideal pay zones in the STACK play and reduced costs

A customer in Oklahoma wanted to boost return-on-investment (ROI) in the Anadarko Basin’s STACK play. They needed to quickly identify the highest-potential hydrocarbon production zones and avoid conventional logging the 1- to 2-mile-long laterals to reduce operational costs and risks.

The **Volatiles Analysis Service (VAS) reservoir characterization** from Baker Hughes was proposed for formation evaluation. An initial mile-long lateral was planned, to be followed up by analyzing 25 more laterals and additional pilot vertical wells.

The VAS provides a cost-effective, non-invasive formation evaluation log generated from drill cuttings or core plugs. The fast turnaround, high-quality log identifies pay intervals and characterizes hydrocarbon zones with no additional rig time. It helps improve well evaluation by:

- Identifying recoverable oil and gas in laterals that would otherwise be completed blind, or without evaluation
- Estimating levels of compartmentalization
- Quantifying rock mechanical strength to optimize stage placement and fracture intensity of laterals
- Pinpointing filling reservoir migration conduits (faults) and organic acids

Valuable results were obtained with the first VAS-analyzed lateral. The precision of data interpretation, recommendations, and economic results increased with the analysis of each additional lateral completed. Unique information about additional recoverable oil was identified by the VAS—beyond what was indicated by conventional logs. The comparable interpretation time was shortened to less than two weeks, which ultimately led to a more efficient completion strategy and reduced the time to begin production.

The VAS identified the most profitable pay zones for this customer, as well as individual stages to drain zones with similar properties. This enabled the design of fracturing stages that did not cross boundaries between chemical and mechanical compartments, which typically meet at faults.

The pay zone stages identified by the VAS were fractured with less intensity, draining the resource without fracturing into nearby gas- or water-bearing zones.

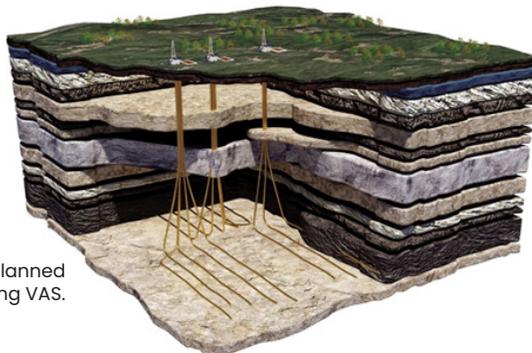
The customer planned to use the information from the Volatiles Analysis Service to locate additional high-productivity zones in the reservoir.

Challenges

- Conventional logging in 1- to 2-mile-long laterals
- Identification of highest-potential hydrocarbon zones
- Reducing costs and risks

Results

- The VAS detected the optimal hydrocarbon zones in the play
- More than 200 high-quality samples were obtained for each 1-mile lateral
- Interpretation time was shortened to less than two weeks, reducing costs and time to production
- Analyses were scalable to the entire development so that additional laterals would be more productive



Lateral diagram: this operator planned for 25 additional laterals using VAS.