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Evaluate Fracture Design and Well Placement

Case study: StimMAP diagnostics reveal actual Fayetteville shale fracture geometry

Challenge

Understand complex fracture propagation in the Fayetteville shale and use the data to refine and improve future stage and perforation cluster placement.

Solution

The StimMAP* hydraulic fracture diagnostics service, which maps hydraulic fracture systems in 3D as they are created.

Results

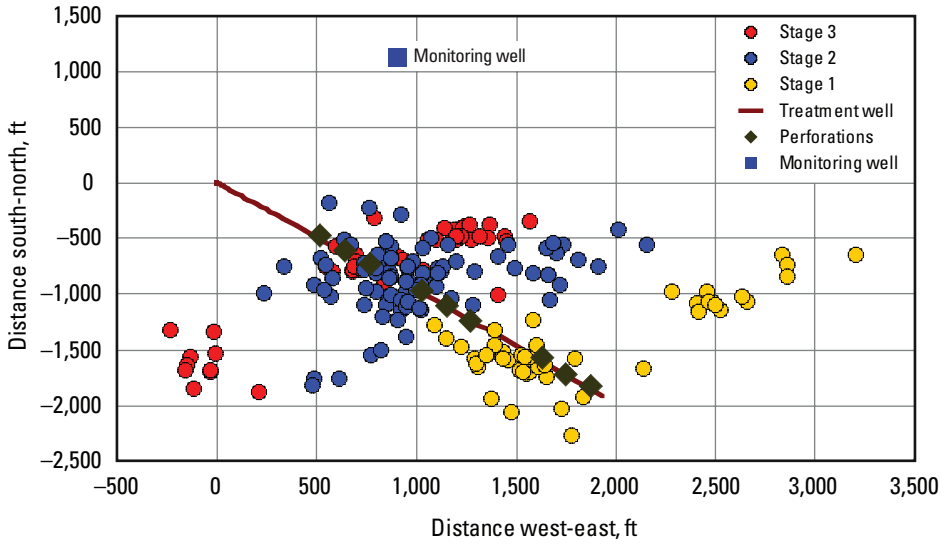
Acquired a better understanding of reservoir response to fracturing, permitting continuous improvement in future fracturing design and overall reservoir management.

Analyze reservoir fracturing

An operator working in the Fayetteville shale needed to better understand the fracturing of the reservoir to optimize production. The operator determined that fracture monitoring could optimize fracturing operations.

Apply innovative solution

The operator selected the StimMAP hydraulic fracture stimulation diagnostics service. In an era of demand for technical resources, the Schlumberger integrated solution offers industry-leading experience and expertise. StimMAP diagnostics map hydraulic fracture systems in 3D as they are created. These measurements can be used to ensure optimal hydraulic fracture placement and improve reservoir development. Information collected is processed on site to refine the fracturing design for the next stage. The service can also be used to evaluate the influence of treatment communication with offset wells.



Map view of microseismic events from a three-stage slickwater ClearFRAC LT low-temperature polymer-free stimulation treatment.*

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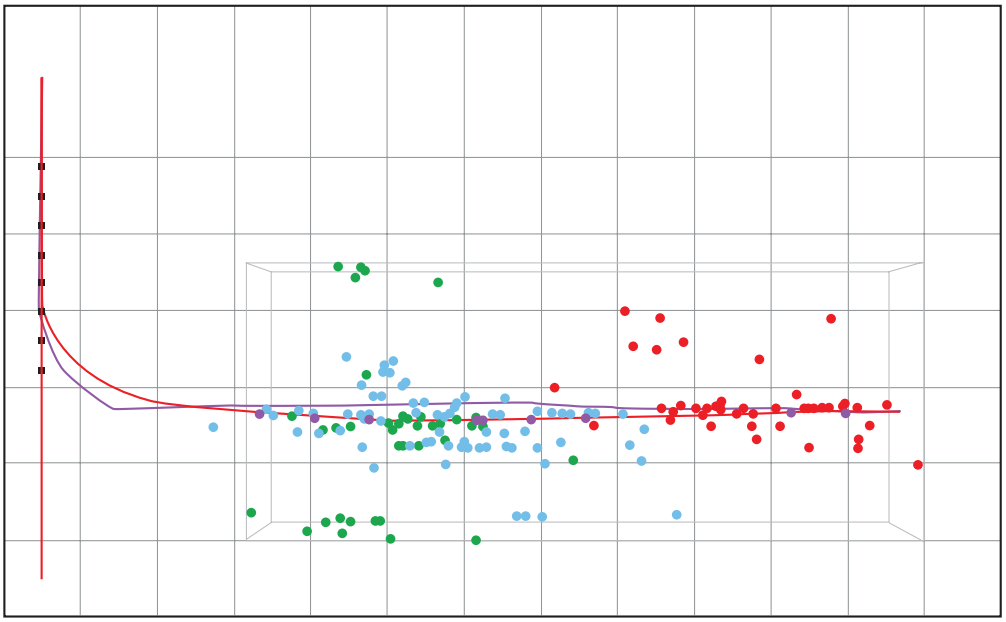

Transverse view of microseismic locations from a three-stage slickwater ClearFRAC LT stimulation treatment orthogonal to the preferred fracture orientation. Color-coding indicates which of the three seismic events is responsible for each location.

StimMAP results enabled better understanding of reservoir response for continuous improvement in fracturing and overall reservoir management. The operator was entirely satisfied with the StimMAP service and now uses it for more than 20% of all wells in the field.

Refine treatment design

StimMAP diagnostics determined that the fracture system was relatively contained within the Fayetteville shale formation. Primary characteristic geometry reflected a complex fracture fairway in all stages and a wider fracture fairway coverage. Overlapping was observed between Stages 2 and 3, and communication was observed in offset wells.

Schlumberger made a number of recommendations for future operations, including evaluation of infill well placement to prevent overlap and possible inefficient drainage; evaluation of the production contribution of each stage to provide confirmation of the treatment design; and the construction of a reservoir model to determine the effective fracture length and drainage area.

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www.slb.com/stimmap

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