A Barnett Shale asset at risk of abandonment gets profitable new lease on life via Halliburton’s CYPHER\textsuperscript{SM} Seismic-to-Stimulation Service.

**OVERVIEW**

The operator’s asset was located in the Barnett Shale in the Fort Worth Basin in Texas. Although it was just outside the historically core area of the Barnett Shale, it was considered to be in an area that had the potential to produce liquid hydrocarbons. However, only 3 of the 11 drilled and completed wells, were considered successes. Poor production and high inconsistency had the asset under consideration for abandonment when Halliburton was invited to collaborate with the operator to implement technologies that would help reduce costs and improve surface efficiency.

Realizing the potential that could still be gleaned from the asset, Halliburton suggested that the operator consider improved production over cost reduction via the CYPHER\textsuperscript{SM} Seismic-to-Stimulation Service that utilizes multiple Halliburton service lines. The operator agreed, and work began.

Halliburton and the operator developed a comprehensive earth model. Investigative logging tools provided a better idea of the formation, and incorporating this information into the model delivered additional subsurface insight, which led to focusing on a new sweet spot. After the “where to drill” model was developed, Halliburton also provided insight on “how to drill” with geosteering to best follow the plan and place the well in the proper zone. Then, collaboration began on a completions design strategy to determine “where to frac” and “how to frac.” Utilization of Halliburton’s industry leading CYPHER\textsuperscript{SM} Software Suite and complex frac model uncovered frac design changes that could optimize induced fractures. Several changes were made in a systematic approach to leverage existing natural fractures and improve wellbore connectivity to the fracture system. The overall result—a more than 50% increase in production and cost savings through rate and horsepower reduction enabled by the new frac design.

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<th>CHALLENGES</th>
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<td>- Location outside productive core</td>
<td>- CYPHER\textsuperscript{SM} Seismic-to-Stimulation Service</td>
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<td>- Inconsistent well performance</td>
<td>- Superior subsurface insight</td>
<td>- Over 50% production increase</td>
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<td>- Less than desired results</td>
<td>- Where-To- and How-To-Drill planning</td>
<td>- More consistent well-to-well performance</td>
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<td>- Where-To- and How-To-Frac recommendations</td>
<td>- Less overall economic risk</td>
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<td>- Cost per BOE significantly reduced</td>
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To maximize unconventional resources, divide the workload, but multiply the brainpower.

CYPHER™ Seismic-to-Stimulation Service is the way to help assure maximization of your unconventional asset’s Net Present Value (NPV). This service provides a comprehensive earth model that identifies key reservoir attributes to enable drilling and stimulating the best wells first. Trial and error are significantly reduced. Learning curve times are slashed. This service a more predictable, productive, and smarter way to optimize unconventional resource plays.

With the tailored approach of the CYPHER™ Seismic-to-Stimulation Service, Halliburton collaborates with operators to integrate all available resource data and geoscience modeling into a refined earth model that is continuously updated and validated. This ongoing collaboration has led to enhanced profitability and synergistic efficiencies that have not previously been achieved in the industry.

CYPHER™ Seismic-to-Stimulation Service helped lower cost per BOE.

CYPHER™ Seismic-to-Stimulation Service helped nearly double production.

CYPHER™ Seismic-to-Stimulation Service identified the sweet spot and the best way to drill it.

CYPHER™ Seismic-to-Stimulation Service used software with an Unconventional Reservoir Simulator to maximize fracture surface area.

SPE 168583

“What New Processes and Tools for Design and Execution to Optimize Hydraulic Fracturing Treatments in Shale Reservoirs,” Ron Dusterhoft, Amit Kumar, Shameem Siddiqui, Geoff Spade, Nick Schischka, and Bill Johnson, Halliburton; Jeff Dahl and John Spaid, Devon Energy Corporation

What’s your unconventional challenge?
For solutions, visit Halliburton.com/CYPHERservice

www.halliburton.com
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