

Operator Saves 21 Hours on Two Extended-Reach Horizontals in the Bakken Field

SPECTRUM® ENABLES OPERATOR TO MILL AND THEN COMPLETE A FRAC EFFICIENCY PROFILE FOR COMPLETION OPTIMIZATION

BAKKEN FIELD, UNITED STATES

CHALLENGES

- » Mill out plugs from the wellbore of two extended-reach horizontal wells following stimulation
- » Evaluate current frac method to optimize future completions and lower costs
- » Safely reach final depth to perform full wellbore monitoring in real time

SOLUTIONS

- » SPECTRUM® Real-Time Services to gather data with fiber-optic DAS and DTS diagnostics
- » Use downhole milling tools to remove plugs
- » Conduct cluster efficiency analysis to measure production profile

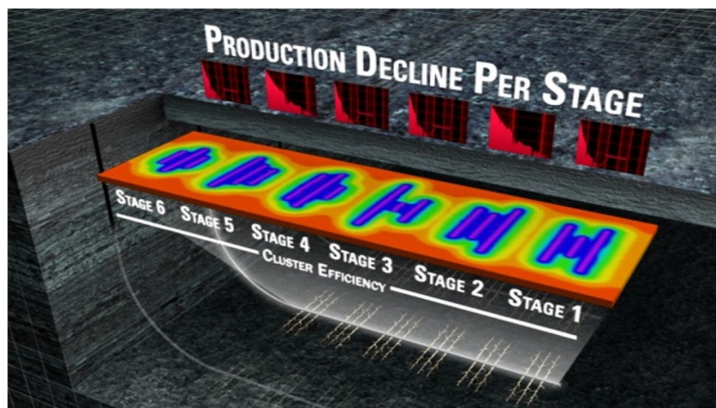
RESULTS

- » Saved an overall 21 hours of operational time
- » Cut costs by reducing coiled tubing running length by 20,000 feet (6,096 meters), and lowering the amount of completion brine and associated additives by approximately 4,400 bbl
- » Cluster analysis enabled completion optimization of the next wells in the field

OVERVIEW

Two extended-reach horizontal wells were successfully milled and monitored to save 21 hours of overall operational time, 20,000 feet (6,096 meters) of coil, and approximately 4,400 bbl of completion brine and associated additives. After removing the frac plugs, each well was evaluated for production efficiency, in just one downhole trip per well, by combining milling tools with distributed acoustic sensing (DAS) and distributed temperature sensing (DTS) technologies.

Due to a tight completion budget and logistical constraints, the operator sought to improve upon its current fracking method. Therefore, a perforation cluster efficiency analysis was performed using fiber-optic data acquisition to gain insight for application to the next wells in the Bakken field development plan.



Representation of cluster efficiency data obtained from SPECTRUM® Diagnostic Services.

HALLIBURTON COMBINES SPECTRUM DIAGNOSTIC SERVICES WITH MILLING TOOLS

The combined approach enabled safe removal of plugs via milling tools and, once at full depth, SPECTRUM® Diagnostic Services were used to perform fiber-optic DAS and DTS profiles to monitor the entire wellbore in real time while the DTS/DAS is performed with the coil held stationary pulling out of hole.

This project delivered on both objectives – milling out frac plugs and providing more reservoir understanding – while also reducing operational time and costs related to completions.

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