Wells with OilPerm™ surfactants and formation fluid mobility modifiers (FMMs) performed 300% better than similar wells on 30-day cumulative oil production

Location: Woodford Shale, Oklahoma

Overview
The Woodford shale play covers a large portion of Oklahoma. In Carter and Payne counties, an operator’s wells were experiencing severe post-stimulation declines in hydrocarbon production. Long-term production numbers were lower than expected and desired. The operator turned to Halliburton for assistance in increasing production.

As part of its RockPerm™ service, Halliburton recommended the use of OilPerm surfactants and OilPerm™ formation fluid mobility modifiers (FMMs), which are designed to increase treatment fluid recovery and enhance mobility of formation fluids for increased hydrocarbon production following fracture stimulation treatments.

After Halliburton’s recommendations were followed, a study was conducted in four different areas across Oklahoma to compare the effectiveness of OilPerm surfactants against conventionally used surfactants or wells without surfactant. All of the wells in the study were in the Woodford formation and were completed around the same time frame. Results were even better than anticipated. Data showed 69% to 340% increases in initial oil production due to faster and more efficient treatment fluid recovery. After 30 days, the wells treated with OilPerm surfactants had 309% to 559% more oil production due to increased mobility of formation fluids.

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<th>CHALLENGES</th>
<th>SOLUTIONS</th>
<th>RESULTS</th>
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<tr>
<td>Decrease emulsions in produced fluids</td>
<td>Recommended RockPerm service to screen for emulsion tendencies</td>
<td>Reduced emulsion tendency to lower cost per barrel of oil equivalent (BOE)</td>
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<td>Improve recovery of treatment fluid</td>
<td>Used RockPerm service’s OilPerm products to enable quick recovery of treatment fluid</td>
<td>Improved initial oil production compared to conventional surfactants</td>
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<tr>
<td>Increase production of hydrocarbons</td>
<td>With RockPerm service, selected optimum products to mobilize formation fluids</td>
<td>Increased cumulative production 300% higher than nearby wells using conventional surfactants or wells without surfactant</td>
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Better fluids make better wells

All wells are different. Even wells in the same reservoir can vary greatly in formation characteristics. Halliburton’s RockPerm service provides prestimulation scientific testing of actual well cuttings and well fluid samples to determine the most effective chemistry. Then, we recommend the best surfactant package for each and every well.

Customized chemistry is the key

RockPerm service is a laboratory testing process performed by specially trained technicians in local-area labs. This process selects the optimized surfactant package using Halliburton’s suite of unconventional-focused technologies. Extensive testing has shown that Halliburton’s OilPerm surfactants and OilPerm formation FMMs can maximize water recovery and hydrocarbon production from fracture-stimulated shale. The objective is better performance from every well every time.

The emulsion break test helps ensure that surfactant additives selected for column flow testing will not cause an emulsion.

RockPerm service provides optimization of additive formulations tailored to the needs of individual wells. Each column contains actual formation material, proppant, broken fracturing fluid, and reservoir oil.

CASE STUDY: How custom chemistry increases production over the life of wells

INITIAL OIL PRODUCTION INCREASES WITH OILPERM

340%

69%

309%

559%

HIGHER PRODUCTION from OILPERM-TREATED WELLS

after 30 DAYS
**RockPerm™ Service**

Surfactant additive selection to enhance formation fluid mobility

Maximizes water recovery and hydrocarbon production from unconventional wells. Results in better well performance and lower costs per BOE.