

Case History

REPack[™] Open-Hole Packer System

Adaptable REPack application achieves cost savings, evolves new materials, and attains performance record.

Problem

An independent operator sought to increase overall production while reducing construction/completion costs. The operator selected an eight-stage compartmentalized frac job. However, because effectiveness of frac stimulation is often diminished when laterals exceed 5,000 ft, running an eight-stage frac job at more than 5,000 ft. involved many unknowns.

Solution

- Baker Oil Tools REPackers were selected to perform an eight-stage compartmentalized frac job
- The job originally was planned to be run in brine water with an estimated 28 to 36 hours to trip the tools to total depth, but due to bottomhole pressure, the brine had to be swapped over to oil-based mud (OBM)
- To mitigate premature swelling, the OBM was immediately tested. Test results showed that the OBM would successfully swell the REPack, but to successfully deploy the system, an effective retardant had to be found
- Baker Hughes coordinated an effort that extrapolated swell rate at various depths and temperatures, giving the operator a matrix to show swell rate over trip time
- Through rapid and efficient collaboration, a new retardant was discovered and tested in less than one week. Its application allowed the openhole packers and openhole frac sleeves to be deployed successfully

Results

- The final completion, using standard liner top equipment, frac sleeves and packers, allowed the customer to minimize risks and costs associated with cementing and perforating
- The fracture treatment was pumped approximately one month after the completion was run. All balls seated and all sleeves shifted as expected
- Pre-job planning and mobilization in shop resulted in savings of six hours of trip/rig time
- REPack and frac sleeves achieved a new horizontal extended-reach performance record of 7,740 ft
- The ability to frac the entire interval in 12 hours resulted in significant operator savings. Using conventional perforating guns and composite plugs during winter months could have taken more than four days
- The new retardant is now available for similar contingencies
- Based upon this performance, Baker Hughes was awarded a new 35-well package

Project Details

Location: Middle Bakken formation, Sanish field, Williston Basin, North Dakota

Setting Depth: 7,740 ft (2359 m)

Openhole ID: 6.125 in.

Total Vertical Depth (TVD): 10,176 ft

Bottomhole Temperature at TVD: 210°F

Drilling Fluid: Oil-based mud

REPackers: 4.5-in. x 5.75-in.; water-reactive element (if applicable)

Other Baker Oil Tools Equipment: Liner top equipment, frac sleeves and packers

