Conductor™ Fracturing Service
Advanced Pillar Fracturing Technology Provides Improved Long-Term Production from Specially Selected Formations

Conductor™ Service Helps Improve Pillar-Type Fracturing Results
Operators are finding that conventional pillar or channel fracturing techniques provide good initial production from some formations but the production often declines more rapidly than expected. The production rate can be maintained longer by careful consideration of several design and execution factors including the following:

- Proper candidate selection
- Installing stable pillars to prevent fracture closure

Conductor™ Service Helps Improve Pillar-Type Fracturing Results
Conductor™ service addresses these factors and provides a high-performance fracturing technique, especially important for wells producing oil and gas liquids.

The following aspects of Conductor service can result in more productive wells:

- Rigorous candidate selection process. In-depth basin and formation understanding, and specially developed software enable the selection of appropriate candidate wells.
- Modeling capability. Enhanced modeling capability enables improved job design.
- Stabilized pillars. Consolidated, stable pillars resulting from proppant coated on the fly with liquid resin (SandWedge® enhancer) help sustain improved production. Conductor service pillars can withstand the dynamics of well operations and keep fractures and flow channels open.
- Proven pumping and pulsing capability. The necessary equipment and processes have been extensively tested and field operations proven to provide dependable performance.

Performance Enhancement Options Available with Conductor Service
- PermStim™ fracturing fluid. Near-zero-residue fracturing fluid can be used to improve production by reducing formation damage that can occur with guar-based fluid systems.
- AccessFrac™ service. Fully degradable diverter system can be used to help assure every zone is treated and to enhance fracture connectivity and density. In addition, this service can reduce or even eliminate the need for plugs in multi-stage fracturing treatments.
- RockPerm™ service. Process for developing stimulation fluid additive formulation using a unique comprehensive evaluation process. The process results in a fluid formulation customized to enhance productivity of the reservoir. RockPerm service can include the selection of an optimized OilPerm Formation Fluid Mobility Modifier (FMM). The FMM enables improved fluid recovery and liquids production.

Conductor™ fracturing service provides infinite acting conductivity for improved production of liquids. The left portion of the image above is output from Halliburton’s Conductor service model. The right portion is a photograph from a laboratory slot model demonstrating the effects of pulsing while pumping. Proppant is deposited in random pillars within the fracture and stabilized by coating the proppant on the fly with liquid SandWedge® ABC enhancer, which makes the proppant remain sticky, consolidating the pillars.
Candidate Selection

Conductor Service design workflow analyzes the physical & mineralogical properties of the formation, as well as production practices and treatment schedule to create the optimal fracture design for enabling infinite acting conductivity. Conductor service involves determining and understanding the impact of many parameters including the following:

- Physical Properties
  - Young’s modulus, Poisson’s ratio
- Mineralogy
  - Clay content, Laminations
  - Embedment, Friability
- Stress Environment
- Production Practices
  - Production initiation and Shut-ins
  - Choke management, Production ramp-up
- Water Production

Case History

Conductor Service Pays Off for Operator in Egypt

A major independent operator needed to achieve high fracture conductivity to improve the production of oil and condensate. The operator worked with Halliburton to pilot test the Conductor service process ability to enhance the value of their asset.

The proposed well to be treated was vertical in a sandstone formation. First, the formation characteristics were evaluated to determine if the well was a good candidate for Conductor service. Then, the treatment was modeled and included a mini-frac using the WaterFrac™ G fluid system followed by the main treatment using the Sirocco™ fluid system. The treatment was pulsed with alternating stages of proppant-laden and clean fluid.

Results: the operator achieved a measured dimensionless fracture conductivity (Fcd) of 45 and negative 5.6 skin factor, which indicates much more stimulation than normally achieved. The stimulation effect is unusually high considering the transmissibility (kh/µ) of the formation. In addition, the Halliburton process and equipment worked seamlessly.

Treatment plot from the pilot test of Conductor service implemented in Egypt. Note the regularity of the pulses leading to very good pillar formation resulting in exceptional fracture stimulation of the formation.

For more information about how ConductorSM service can help you achieve longer lasting production improvement, contact your local Halliburton representative or email stimulation@halliburton.com.

© 2013 Halliburton. All rights reserved. Sales of Halliburton products and services will be in accord solely with the terms and conditions contained in the contract between Halliburton and the customer that is applicable to the sale.

www.halliburton.com