

StackFRAC technology outperforms conventional “plug-and-perf”

[United States, Barnett Shale](#)
[StackFRAC HD System](#)

Background

The Barnett Shale in northeast Texas was discovered in the mid-1950s, but the commercial exploitation of this formation began in 2001 when horizontal drilling and multi-stage fracturing were introduced. With porosity from 3 to 5% and permeability from 0.07 to 0.5 microdarcy, various completions strategies were tested as operators attempted to determine the best way to unlock the Barnett Shale.



Challenge

An operator working in the Newark Field in Denton and Tarrant County, Texas had used the conventional cemented liner, “plug-and-perf” method to multi-stage fracture their horizontal wells. Due to the numerous operations and equipment required for the plug-and-perf method, the operator sought a more efficient multi-stage fracturing solution. The challenge was to not only save time and reduce costs, but to also maintain or increase production and improve the operator’s overall return on investment.

Solution

The operator chose to use 7-stage Packers Plus StackFRAC® systems to complete multiple horizontal wells in the Barnett. This system creates isolated stimulation intervals using dual-element, hydraulic-set, mechanical RockSEAL® II packers and ball-activated FracPORT™ sleeves, which are located between the packers. This configuration enables a single, continuous pumping operation, allowing the operator to complete all fracture treatments within hours instead of days, as is the case with the plug-and-perf method.

In addition, the StackFRAC system eliminates all downhole work after the drilling rig has reached total depth: cementing of the lateral casing, coiled tubing or tubing-conveyed perforating, and setting multiple bridge plugs. After the fracture treatment, the long process of drilling out bridge plugs set between stages is also eliminated. Therefore, the efficiency of the StackFRAC system provides significant time and cost savings. This efficiency increases safety, simplifies the completion process, and decreases standby time during fracture treatments.

Results

Production results from two wells completed with the StackFRAC system were compared to

two direct offset plug-and-perf wells. The wells were stimulated almost identically, using a similar fluid volume, proppant quantity, and rate. In both cases, the StackFRAC system outperformed the conventional plug- and-perf method. At each measured interval of production, 6, 12, 24, and 36 months, the StackFRAC system out-produced the cemented liner, plug-and-perf methodology (Figure 1). Cumulative production values were on average two-fold higher for the StackFRAC completed wells versus the offset plug-and-perf wells.

The StackFRAC completed wells were also stimulated more efficiently, each requiring less than a day compared to 2 to 3 days for the plug-and-perf wells. This allowed the wells to be put on production sooner and the fracture crew to move onto the next well. According to 2005 pricing, this increase in efficiency compared to the plug-and-perf method resulted in a cost savings of \$300,000 to \$400,000 per well.

