

Tartan MultiFrac Systems Successfully Stimulated 18 Months Post-Install

OBJECTIVE

An operator working in the Denver-Julesburg (D-J) Basin acquired two wells completed in September 2015 with Tartan cemented MultiFrac™ systems. Targeting the Niobrara formation chinks in the Wattenberg Field (Fig. 1), the wells had not been stimulated by the previous company due to the uneconomic conditions. The wellbores were left containing untreated water and the operator planned to stimulate the wells in April 2017 – almost 18 months post-install.

The uncertainty with leaving any multistage completion system in the wellbore for extended periods of time is whether the tools will still function as designed. In this case, the Tartan MultiFrac sleeves and Cemented Initiation Subs (CIS) were used to complete the toe stages of each well to enable enhanced operational efficiency.

SOLUTION

The patented MultiFrac™ sleeve enables limited entry stimulation through multiple sleeves actuated with a single ball. After the ball shifts all the sleeves within a stimulation stage, the liner is pressured up to open the patent-pending BurstPoint™ ports.

During installation and cementing operations, the BurstPoint ports remain completely closed preventing cement from entering the system to ensure reliable ball-drop stimulation operations.

The MultiFrac systems run in the Niobrara wells had three sleeves per treatment stage up to 10 stages (30 tools) with 1/12-in. ball seat increments between stages.

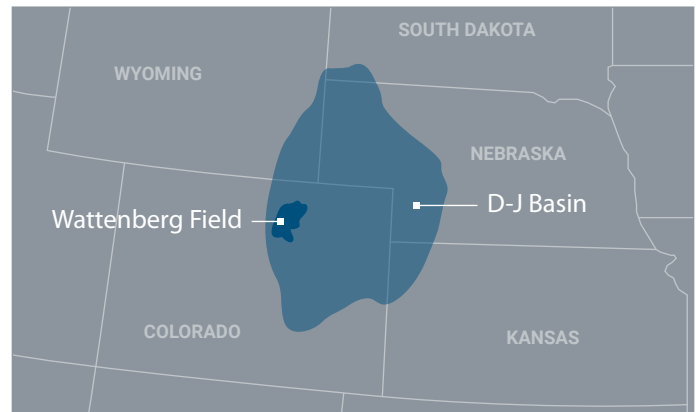


Fig. 1—Location of the Wattenberg Field in the D-J Basin.

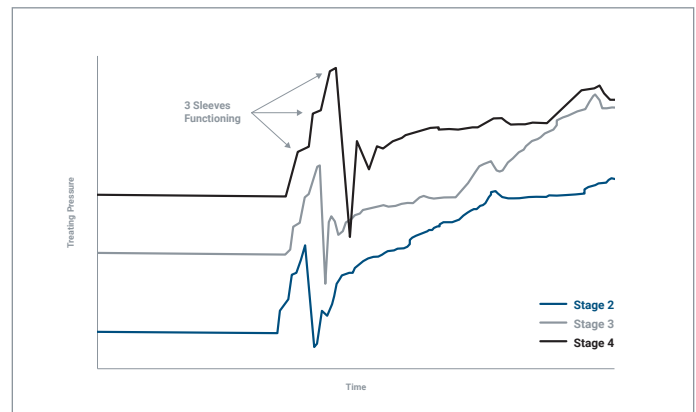


Fig. 2—Pressure charts showing signature of MultiFrac sleeves shifting.

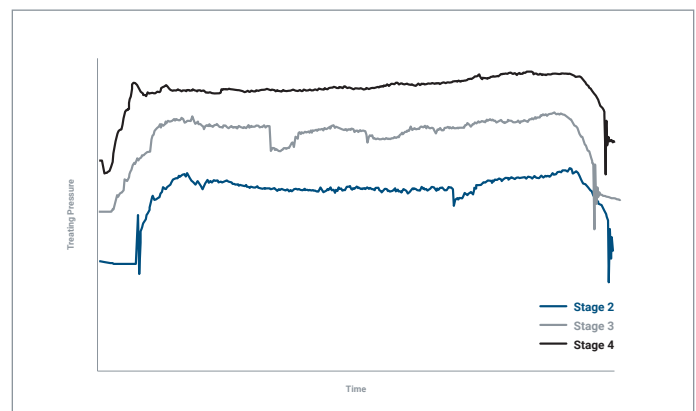


Fig. 3—Pressure charts showing constant treating pressures achieved through BurstPoint ports.

RESULTS

The wells were initially pressure tested for integrity to 9,000 psi (62 MPa). Simulation operations on both wells were then successfully initiated through the CIS, which enables full fracture treatment of the toe stage through the BurstPoint ports.

Dissolvable metallic actuation balls were used to shift the three MultiFrac sleeves per stage, with positive pressure indications at surface (Fig. 2). An average 200,000 lb of proppant per stage was placed at 5 ppg slurry concentration in crosslinked gel frac fluid with rates reaching 53 bpm and maximum pressures of 8,800 psi (see job summary). The pressure charts also showed no evidence of port erosion during the treatments due to the hardened steel inserts of the BurstPoint ports.

Overall, the Tartan downhole tools performed as expected, even after sitting 18 months in untreated water at 195°F and 3,600 psi formation conditions. While these may be extreme circumstances, the successful stimulation through the tools demonstrates their durability and reliability.

Because of these successful wells, the operator sees the MultiFrac system as an excellent fit for completing the toe of their extended-reach laterals that are drilled to a measured depth of between 2 and 3 miles to enable exploitation of reserves under areas with surface access restrictions, such as populated areas.

Job Summary		
Formation	Niobrara Pressure: 3,600 psi (24.8 MPa) Temperature: 195°F (90°C)	
Install Date	September, 2015	
Frac Date	April, 2017	
Liner	4.5 in. (114.3 mm) 13.5 lb/ft (20.09 kg/m) P-110 BTC	
	Well 1	Well 2
Stages	Total = 50 <u>MultiFrac</u> 10 stages 30 sleeves <u>Plug-and perf</u> 40 stages	Total = 50 <u>MultiFrac</u> 2 stages 6 sleeves <u>Plug-and perf</u> 48 stages
MD ft (m)	14,895 (4,540)	14,985 (4,570)
TVD ft (m)	6,885 (2,100)	6,860 (2,090)
Proppant/Stage lb (kg)	200,000 (90,720)	
Proppant Conc. ppg (kg/m ³)	5 (600)	
Max. Frac Rate bbl (m ³)	53 (8.4)	
Max. Frac Pressure psi (MPa)	8,800 (60.7)	

ABOUT TARTAN COMPLETIONS

Tartan Completions is a multifaceted energy services company that engineers and manufactures innovative, customized multistage stimulation solutions and provides completions milling services globally. For over 20 years, Tartan has followed the philosophy of engineering our products with simplicity, reliability, flexibility and performance in mind, providing outstanding field service and value to our customers. From design to installation, we continue to meet the high expectations of our customers.

Please contact Tartan Completions for any of your downhole completion system and milling requirements.

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