

MVP Frac™ - Enhanced Production from Slick Water Fracture Treatments

Business Needs

In tight oil and gas formations, it is common to use low-viscosity water-based fluid and proppant combinations pumped at a high rate. These slick water treatments are effective, but do present some challenges. The lack of viscosity can result in poor proppant transport, leading to increased settling or duning, and less effective proppant placement. Our customer came to us wanting to improve proppant transportation, and maximize proppant placement and production on their four-well Cardium pad. To meet these objectives, Trican used multiple stimulation techniques, analyzing and comparing the results from each well to identify the most effective method.

Trican Solution

Trican's MVP Frac™ (Maximum Volume Placement) process is a two-part slick water frac system comprised of both a non-energized component (Trican's Flowrider™ additive) and an energized component. MVP Frac imparts a hydrophobic coating onto the proppant surface creating an attraction to gaseous phases, making proppant more buoyant without increasing fluid viscosity. This fluidized proppant enhances transportation, allowing for greater propped fracture height and length, and greater overall conductivity.

Each well was stimulated with 19 hydraulic fractures along a horizontal multistage liner with open hole packer isolation. One well was stimulated with Trican's MVP Frac fluid system, another using a combination slick water and linear gel system, and the remaining two with conventional slick water systems.

Production data for all four natural gas and oil producing wells was compared and analyzed using barrels of oil equivalent (BOE). Production data was compared using equivalent months of production.

Results

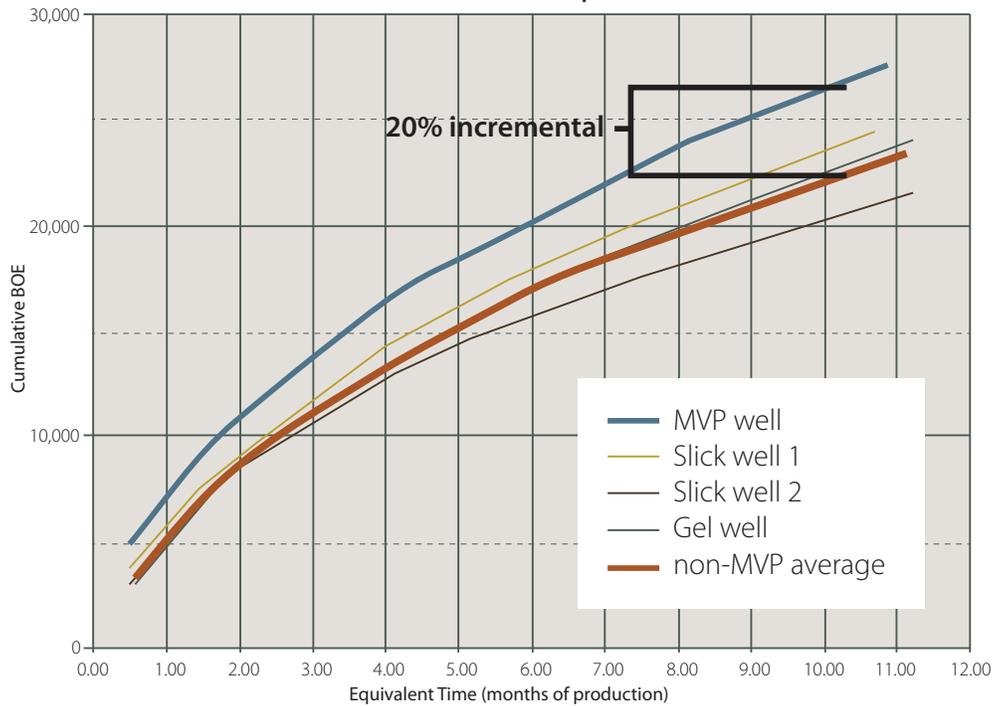
Results analyzed and compared from the first 12 months show that of the four, the MVP Frac well returned the highest production. Compared to the non-MVP well average, the MVP well yielded an incremental production increase of 20%.



43g of settled proppant, following agitation. Conventional slick water slurry (left) and MVP Frac slurry (right).

	MVP well	Gel well	Slick well 1	Slick well 2	non-MVP average
BOE at 10 equiv. month	26,600	22,650	23,550	20,400	22,200
MVP incremental		17%	13%	30%	20%

MVP Frac Comparison



	MVP well	Gel well	Slick well 1	Slick well 2
Frac Fluid	Slick Water MVP	Linear Gelled Water	Slick Water	Slick Water
Stages (Frac intervals)	19	19	19	19
True Vertical Depth m (ft)	1,995 (6,545)	2,000 (6,562)	2,021 (6,631)	2,021 (6,631)
Total Measured Depth m (ft)	3,570 (11,713)	3,604 (11,825)	3,425 (11,237)	3,687 (12,097)
Water m ³ (gallons)	3,285 (867,900)	3,420 (903,600)	3,176 (839,100)	3,197 (844,600)
N ₂ scm (mscf)	76,554 (2,704)	117,682 (4,156)	76,443 (2,471)	97,629 (3,448)
Rate ave. m ³ /min (bpm)	8.7 (55)	9.4 (59)	9.4 (59)	9.3 (58)
Max conc ave. kg/m ³ (ppg)	308 (2.57)	466 (3.88)	303 (2.53)	303 (2.53)
Tonnage per frac (t) natural 30/50 sand (lb)	24 (53,000)	27 (59,500)	24 (53,000)	24 (53,000)

Case Study Snapshot

Date: 2012/2013

Project Area: Four-well pad in the Cardium Formation, Alberta, Canada

Challenges:

- Less effective proppant placement in slick water fracture treatment due to proppant settling/duning

Trican Solution:

- Stimulation using Trican's MVP Frac technology

Results:

- Successful production; highest from MVP Frac well
- Compared with the non-MVP well average, the MVP well yielded an incremental production increase of 20%



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