

PROJECT SUMMARY

Product Name

3-1/8 inch SandIQ™
FracIQ™ 35 (EC2-33A2071)

Region

Williston Basin - USA

Well Type

Unconventional horizontal oil
producer

Formation

Bakken / Three Forks

Stages

31 stages
2, 3, 5, 8, & 13 shots per cluster

Depth

10,500 ftVD

Casing

4-1/2 inch 13.5 lb/ft, P-110



Williston Basin

CASE STUDY

Operator Achieves Target Pump Rates in Bakken When Using SandIQ™ System

New angled perforating system with FracIQ™ consistent entry hole shaped charges permits higher injection rates

THE CHALLENGE

Conventional shaped charge perforation entrance hole diameter varies circumferentially. This variation affects the radial distribution of the stimulation since the perforation friction through each hole will be different, depending on the orientation. This is particularly true in limited entry perforating operations where entrance hole variation can have significant impact on stimulation perforation efficiency. Furthermore, traditional perpendicular tunnel configurations may provide a less than effective flow path due to the abrupt angle fluids and proppant must travel – this tortuous path may limit pump rates and reduce stimulation effectiveness.

THE SOLUTION

The SandIQ™ perforating system generates a consistent entrance hole diameter and penetration at all phase orientations and the perforation tunnel is angled downward in the direction of fracturing fluid flow. Angling provides a more efficient flow path than the traditional perpendicular configuration as demonstrated by a higher discharge coefficient identified from step rate test analysis. With higher pumping efficiencies, higher pump rates can be achieved at the same stimulation pressure resulting in the placement of more proppant and more effective fracture development and placement.

THE RESULTS

An operator was targeting a pump rate of 85 bpm during the stimulation program. With conventional perforating systems the maximum rate obtainable was 60 bpm. When a consistent entrance hole perforating charge was used the rate was increased to 70 bpm, at the same pumping pressure. The operation then transitioned to the SandIQ™ angled perforating system and rates exceeding 85 bpm were achieved. The operator has now standardized to a SandIQ™ / FracIQ™ systems for all future wells.

