

Minima Composite Frac Plugs Reduce Mill-Up Time in Bakken Multizone Plug-and-Perf Completion

Objectives

- Install composite frac plugs in a horizontal well to efficiently stimulate a multizone plug-and-perf completion.
- Deliver a plug-and-perf completion that reliably holds frac pressure for each stage.
- Minimize cuttings and debris following drillout to quickly bring the oil well onto production.

Our Approach

- Following a thorough pre-job analysis, a Weatherford completions team recommended the 4 1/2-in. diameter Minima composite frac plug to hold against the frac pressures imposed downhole, and mill out cleanly to open the production casing for subsequent operations.
- A Weatherford completions team deployed to the wellsite with 23 Minima frac plugs to set across the pay interval.
- Upon completing frac operations, the operator quickly drilled out the plugs using a five-blade concave mill run on coiled tubing. Swarf and cuttings from the frac plugs were flowed to surface to clean out the wellbore.

Value to Customer

- The Weatherford Minima frac plug milled out quickly, and enabled the operator to achieve an average millout time of 4 minutes per plug.
- Because the 14.5-in. length of the Minima frac plug is nearly 35% shorter than other plugs, it produced significantly less debris and broke down into manageable pieces to enhance the efficiency of the clean out operation.



The 14.5-in. long Minima composite frac plug (left) breaks down into small, manageable cuttings (right) that pump to the surface for easy removal from the wellbore.

LOCATION

North Dakota, USA

WELL TYPE

Onshore oil producer

FORMATION

Bakken

HOLE SIZE AND ANGLE

6 in., 90°

LINER SIZE AND TYPE

4 1/2-in., 11.6 lb/ft

TEMPERATURE

200°F (93°C)

TOTAL DEPTH

~20,200 ft (6,157 m) measured depth
~9,800 ft (2,987 m) true vertical depth

MILLING BOTTOMHOLE ASSEMBLY

3 3/4-in. 5-blade concave mill, run on
2 3/8-in. coiled tubing

CIRCULATING PRESSURE

3 bbl/min through coiled tubing at
4,800 psi (33.1 MPa)

PRODUCTS/SERVICES

4 1/2-in., 11.6 – 13.5 lb/ft Minima top ball

