

StackFRAC system doubles oil production from deep, tight zones

[International](#), [Saudi Arabia](#)
[StackFRAC HD System](#)

Background

Packers Plus provides several key technologies for the international market. In particular, the carbonate reservoirs of the Middle East are a prime target to benefit from Packers Plus multi-stage fracturing systems and services.

One of the target reservoirs in the Middle East is an oil-bearing, carbonate reservoir located in the Eastern Province of Saudi Arabia. This structure extends over an estimated area of 500 square kilometers and contains vast light crude reserves often with high sulfur content.



Challenge

The Operator had implemented bullhead acid treatment using coiled tubing (CT) to complete their extended-reach, open hole horizontal wells in this field. These wells were drilled on a slight incline to target a number of zones that differed in permeability. This method was not able to effectively stimulate these wells for a number of reasons. First, due to the wellbore trajectory, the CT was not able to reach total depth leaving the lower zones unstimulated. Second, the variation in zone permeability resulted in preferential stimulation of the highest permeability zone at the heel of the well. Third, the CT was limited in terms of the pumping rate allowing for only a limited amount of acid per foot of open hole.

Solution

To effectively open up the deeper, tighter zones in this field, the Operator chose to complete a 5,000 ft, 6 1/8-in. open hole lateral with a StackFRAC® system to isolate the eight zones into individual stimulation stages. The higher permeability zone at the heel was left untreated in order to determine how much production was available from the tighter zones between 17,000 and 22,000 ft. Starting at the toe, each stage was successively acid stimulated by dropping an actuation ball of increasing size to shift the FracPORT™ sleeve open. All seven stages were performed in a single, continuous pumping treatment with different treating pressures observed for each stage indicating that the RockSEAL® II open hole packers were providing a positive seal.

Results

The well was immediately flowed back after treatment keeping the higher permeability zone closed. Compared to an offset well stimulated with CT and producing from all eight zones, the

StackFRAC treated well had three times the Productivity Index (BOPD/psi/ft). After six months, the StackFRAC well had twice the production of the offset well.

Three years later, the Operator had not opened the higher permeability zone because the production from the StackFRAC-stimulated, tight zones remained at 95% the initial production.

