Gas-Lift System With Capillary Injection Strings Produces 4,500 bbl/d, Reduces Salt Buildup and Interventions

Objectives

- Identify the most economical method of artificial lift that has a small surface-setup footprint to increase total production fieldwide while reducing salt buildup and well interventions.

Our Approach

- Weatherford installed gas-lift systems on 30 newly drilled and existing wells, some of which were not flowing. The systems included a string of retrievable gas-lift valves, side pocket mandrels, and a packer. The design of the gas-lift system enabled use of slickline valves for a more optimized design as a well depletes. A compressor was centrally located to provide lift gas to multiple wells.
- Weatherford capillary injection strings were run on the outside of production tubing to protect the tubulars from salt buildup. The capillary injection string carried fresh water to desolidify produced fluids.
- As soon as the gas-lift wells were kicked off, they began producing at a higher rate than their initial production. As the liquid level fell, loaded-up wells began to produce; production increased in both older loaded-up wells and in newly drilled wells.

Value to Client

- The added production resulting from implementation of the Weatherford gas-lift systems made this artificial lift method economical. Per-well production was more than 4,500 bbl/d on initial startup.
- The use of the Weatherford capillary injection strings eliminated the salt buildup in the tubulars that obstructs well production, resulting in fewer well interventions and allowing the gas-lift systems to function as designed.
- The gas-lift systems combined with the centralized compressor minimized the surface facilities footprint.
- Based on the success of the first 30 wells, the client requested that an additional 30 wells be completed with Weatherford gas-lift and capillary string systems during the next 6 months.

Gas lift is designed for maximum production in sandy conditions and deviated wellbores.

LOCATION
North Dakota USA

FORMATION
Bakken

WELL TYPE
Onshore, natural drift, shale

AVERAGE DEPTH
10,500 ft (3,200 m)

AVERAGE DOG LEG SEVERITY (DLS)
Horizontal wells completed with gas-lift mandrels in the vertical section

PRODUCTS/SERVICES
- Gas-lift system
- Retrievable gas-lift valves
- Side pocket gas-lift mandrels
- Packer completion
- Capillary injection strings

Weatherford®