



# Weatherford®

## REAL RESULTS

### Rotaflex® Long-Stroke Pumping Unit Increased Oil Production by 126% in High Water-Cut Areas

#### Objectives

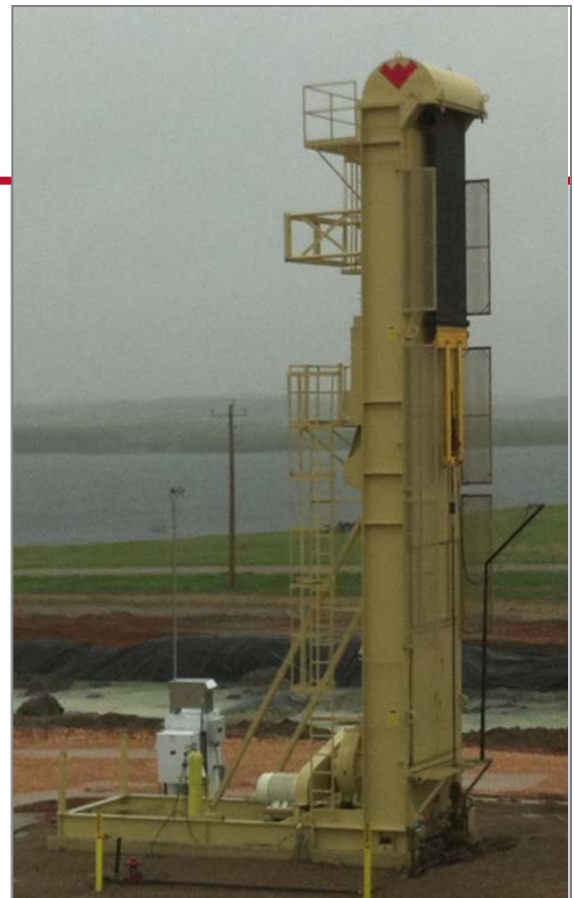
- Identify and design optimal rod lift for area with high water cut of from 27% to 68%.
- Conventional-geometry pumping units are the standard for the area.

#### Our Approach

- Weatherford first installed conventional pumping units with taper rod strings, guided K sinker bars, and an AJAX single-cylinder gas-engine prime mover for 7 wells. These wells were evaluated over time with the use of dynamometer analysis and inflow performance relationships. The average oil recovery per well was 43,699 bbl after 6 months, 72,404 bbl after 12 months, and 93,220 bbl after 18 months. A total of 10 rod lift failures occurred with an average of 0.391 failures per well each year.
- When co-op electricity and natural gas generators later became available, Weatherford installed Rotaflex® long-stroke pumping units with 100-hp electric prime movers with variable-speed drives (VSDs) and rod-pump controllers for 27 wells. The average oil recovery per well was 59,163 bbl after 6 months, 97,670 bbl after 12 months, and 127,950 bbl after 18 months. A total of 9 rod lift failures occurred with an average of 0.125 failures per well each year.
- Analysis of the two tested forms of rod lift proved that the Rotaflex long-stroke pumping unit provided higher oil recovery than the conventional pumping units: 35.4% more after 6 months, 34.9% after 12 months, and 37.3% more after 18 months.
- Compared to the average oil recovery of other wells in the area using the conventional-geometry pumping units, the wells equipped with the Rotaflex units produced 126% more oil and 68% more fluid over 2 years.

#### Value to Client

- The use of Weatherford Rotaflex long-stroke pumping units increased run times, reduced workover expenses, and increased oil production. The optimal rod lift design allowed the client to continue production in these high water cut areas that otherwise would have been uneconomical.
- With the success of the first 32 wells, the client plans to expand the use of the Rotaflex units to 271 additional wells in the area.



The Rotaflex long-stroke pumping unit increased oil production in historically costly, high water-cut environments.

**Location**  
North Dakota

**Well Type**  
Onshore oil

**Number of Wells**  
34

**Water-Cut Range**  
27% to 68%

**True Vertical Depth**  
7,800 to 8,800 ft (2,377 to 2,682 m)

**Products/Services**

- Conventional pumping units
- Rotaflex long-stroke pumping units
- Prime movers
- VSDs and rod pump controllers

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