

## BAKKEN FORMATION

|                     |              |
|---------------------|--------------|
| Location            | Bakken Shale |
| Well 1: Temperature | 180 degF     |
| Pump setting depth  | 8,680 ft     |
| Well 2: Temperature | 190 degF     |
| Pump setting depth  | 8,630 ft     |
| Well 3: Temperature | 182 degF     |
| Pump setting depth  | 8,611 ft     |
| Well 4: Temperature | 180 degF     |
| Pump setting depth  | 8,432 ft     |

## Background

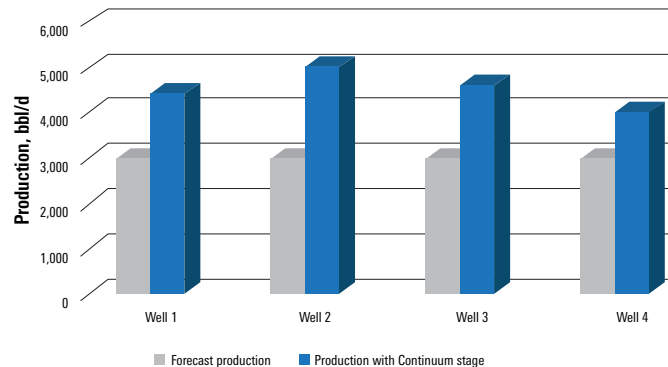
Four wells in the Bakken Shale were initially expected to produce 3,000 bbl/d. Although most ESPs are available with stages for this flow rate, the steep production decline, solids and gas production, and initial high flow rate made it a challenging environment for conventional ESPs.

## Technologies

- REDA Maximus\* electric submersible pump system
- REDA\* Continuum\* unconventional extended-life ESP stage
- Phoenix xt150\* high-temperature ESP monitoring system
- Vortex\* gas separator

## REDA Maximus Systems with REDA Continuum Stages Increase Production by 70% in the Bakken Shale

Customer increases production while avoiding ESP replacement and related costs



*Due to their wide operating envelope and ability to handle production decline, Continuum stages were used in the all-weather Maximus systems. The rest of the completions included the motor and protector, a gas handler, Vortex gas separator, and a Phoenix xt150 system multisensor gauge. The systems were configured for immediate installation at the wellsite, eliminating the risk of motor contamination and human error during equipment assembly.*

*Production increased 36%–70% compared with the initial forecast, and the Maximus systems with Continuum stages enabled more than 70% pressure drawdown. They continued operating beyond their recommended flow range, saving rig time while handling high solids and increasing gas/liquid ratio.*