NOVOMET

CASE STUDY

SlimLine ESPs Enabled Production in 4.5-in. Casing, Saved over $428,000 USD on Two Wells

CHALLENGE

Enable production in two underperforming wells and increase runtime.

SOLUTION

Install 3.19-in. SlimLine ESPs to reduce the pressure drop across the motor and protector to enable production.

RESULTS

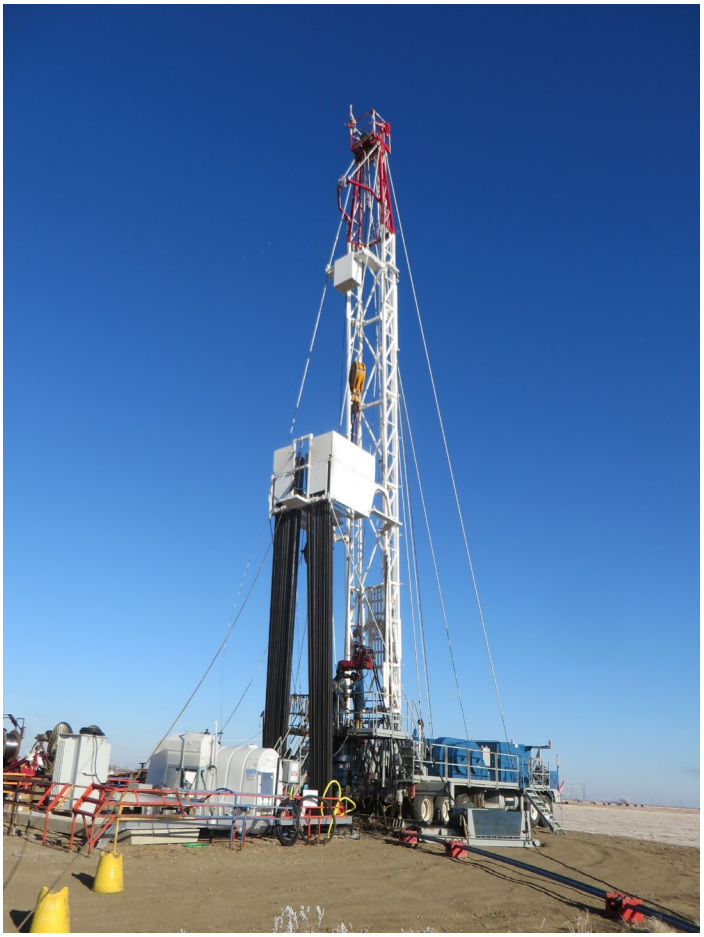
- Initially increased production by more than 50%
- Saved the operator an estimated $350,000 USD in workover costs
- Reduced power consumption and costs by 35%
- Delivered 1080-day (and counting) and 826-day runlife

Alberta, Canada

Low Production in 4.5-in. Casing

An operator in Southern Alberta, Canada had two 4.5-in. (114-mm) wells that were experiencing production problems. Based on sensor pressure readings below the motor, the operator expected production to be somewhere between 2,990 and 3,775 BPD (475 and 600 m^3/d). On startup, the wells initially produced between 2,670 and 2,990 BPD (425 and 475 m^3/d), and then quickly declined to just 1,570–2,045 BPD (250–325 m^3/d).

The electrical submersible pumping (ESP) systems initially installed by two different competitors in the wells were experiencing cavitation and gas lock, causing the systems to fail prematurely. When one of the ESPs failed in the first 3 months, the operator knew they had to find a better solution.



Reducing the motor OD increased production rates and stopped ESP cycling.

Identifying the Problem

After examining the wells and the ESPs, the operator realized that the ESP systems the competitors had installed were too big for the casing. While the outside diameter (OD) of the casing was 4.5 in. (144 mm), the inside diameter (ID) was just 4.09 in. (104 mm). The motors had a 3.75-in. (95-mm) OD, leaving an annular flow clearance of only 0.170 in. (4.32 mm) for fluid to move past the motor. This small clearance created a very high pressure drop.

Because the sensor was below the motor in the well, it recorded adequate reservoir pressure for the expected production rates. But the limited volume around the motor caused a pressure drop between the sensor and the intake. The fluid simply could not get around the ESP motors fast enough to enter the pumps.

Decrease the Diameter, Increase the Flow

The Novomet team installed **SlimLine ESP Systems**, which have an OD of 3.19 in. (81 mm), in both wells. The smaller OD almost tripled the annular flow clearance of the competing ESPs, leaving 0.450 in. (11.43 mm) for the fluid to move around the motors.

When the systems were put on production, they immediately outperformed the previous ESPs, producing between 2,990 and 3,365 BPD (475 and 535 m^3/d). Initial production rates were more than 50% higher than the previously installed systems, and have fallen slightly over time as reservoir pressure has decreased.

Because SlimLine ESP systems use technology developed for our **PowerSave High-Efficiency Pumps** and **Permanent Magnet Motors**, they delivered the added benefit of saving the operator 35% on their monthly ESP power bill.

Well #1 was still in operation at the time this case study was published at 1080 days and counting. Well #2 ran until April 2019, delivering 834 days of continuous operation.

Delivering Results—By the Numbers

Value	Well #1	Well #2
Run time	1,080 days	834 days
Electricity savings	$37,987 USD	$40,906 USD
Workover savings	$200,000 USD (four at $50,000 each)	$150,000 USD (three at $50,000 each)
Total:	**$428,893 USD**	

Novomet SlimLine ESPs saved the operator time and money while increasing production and uptime.