Case study: Illinois, United States

CENetic certified water pumping system solved municipal water district reliability issues

A municipal water district in Illinois used an electrical submersible pump (ESP) system in a water well to deliver fresh drinking water to area residents. The water well was drilled into a sandstone formation, which meant sand fines were produced along with the water. The sand was produced through the pump and filtered out on the surface prior to final treatment.

Two traditional water well pumping systems initially deployed in the well experienced premature failures due to erosion from the sand fines. The 14-in. bolted-bowl pumps constructed of cast iron and operated at 1,800 RPM failed in less than 14 months. Typical water well systems are expected to run for 10 or more years, and the premature failures due to sand erosion risked service disruptions and drove up costs for the municipality.

The city contacted Baker Hughes for a solution that would at least double the run life of the water pumping systems in these challenging conditions. The applications the engineering team determined as the best option for the well was a **CENetic™ certified water pumping system** featuring an 8.62-in. bolted-bowl pump constructed of nickel aluminum bronze with tungsten carbide bearings. Baker Hughes also recommended a sand screen be installed below the motor to capture some of the sand before it could enter the pump and to reduce the fluid velocity at the pump intake.

In the first three months of operation, the smaller diameter 8.62-in. nickel aluminum bronze pump was delivering the same water production rate and was already exhibiting more stable operating conditions—even at nearly twice the RPM speed as the previous equipment. The water district operator was extremely happy with the initial results.

Challenges

- Municipal water well producing from a sandstone formation
- Premature failures due to sand fines entrained in the fluid causing severe erosion in the pump

Results

- Nickel aluminum bronze pump stage metallurgy and tungsten carbide bearings extended pump run life
- Sand screen installed below the motor minimized sand volumes in the pump and reduced the fluid velocity at the pump intake, further enhancing system reliability