

## CASE STUDY

# MICROGUIDE VALIDATES ESP PLACEMENT AND PROVES VIABILITY OF DEEPER SET DEPTH IF REQUIRED

### ▶ TECHNOLOGY

- MicroGuide™ wellbore tortuosity logs

### ▶ APPLICATION

- Artificial lift
- Production optimization
- ESP placement

### ▶ LOCATION

- Permian Basin, Reeves County

### INDUSTRY CHALLENGE + OBJECTIVE

An operator in the Permian Basin drilled a well and determined a possible placement for their ESP as the method of production. The operator and ESP company wanted to place the pump at a shallower depth—potentially sacrificing production—due to their inability to determine a deeper placement with standard MWD data. To help the operator understand true downhole conditions and place the pump where production would be optimized, we performed our MicroGuide wellbore tortuosity analysis.

## TECHNOLOGY + SERVICE SOLUTION

- With only a conventional MWD survey available, we recommended performing a comprehensive MicroGuide logging analysis to provide true insight into tortuosity over the entire depth of the well.
- Taking measurements in 1-ft increments versus stand-length intervals provides a detailed picture of true downhole conditions and issues that might be causing problems with artificial lift equipment.

## RESULTS + VALUE DELIVERED

- The MicroGuide analysis showed that the first 5,000 ft of the well were without tortuosity, but immediately thereafter there were several bends of approximately 1.7°.
- The analysis showed that the operator's originally planned ESP set depth of 6,958 ft was in a location where tortuosity and sideloading force would not be of concern (**Fig. 1**), though based on completion design, this depth would not achieve the highest possible production level.
- We recommended a deeper set depth at 7,650 ft (**Fig. 2**) to achieve optimized production.
  - We noted two areas of significant tortuosity at 7,135 and 7,535 ft that would make traversing the pump to the proposed depth challenging. In addition, an area at 7,557 ft had a 4° bend that would necessitate cable clamps to successfully pass the pump through.
  - This would not have been clear with typical dogleg severity information and MWD data; had the operator proceeded as normal, it would have led to significant equipment damage when attempting to place the pump.

3D representation of transversal displacement. Color temperature is proportional to the maximum diameter of device in inches. At a Measured Depth of 6958.0 ft, the maximum diameter of a device is 6.14 inches, at a device bend of 0.896 degrees / 100 ft. A device of diameter 5.38 inches will undergo a uniform bend of 0.239 degrees / 100 ft. Patent Pending, Gyrodata Inc

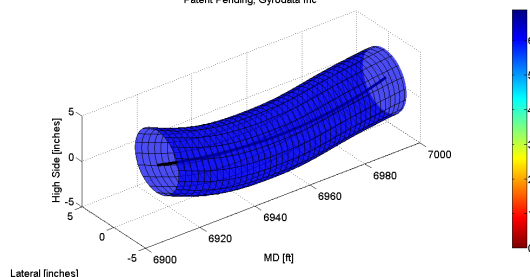


Fig. 1—The original ESP placement as determined by the operator.

3D representation of transversal displacement. Color temperature is proportional to the maximum diameter of device in inches. At a Measured Depth of 7650.0 ft, the maximum diameter of a device is 6.40 inches, at a device bend of 0.249 degrees / 100 ft. A device of diameter 5.38 inches will undergo a uniform bend of 0.000 degrees / 100 ft. Patent Pending, Gyrodata Inc

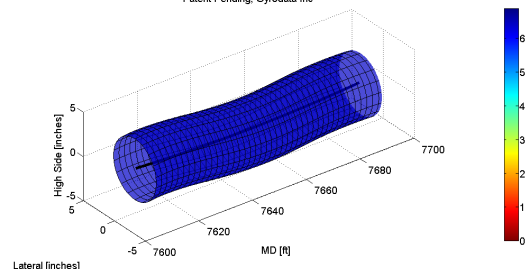


Fig. 2—Our recommended ESP placement if a deeper set depth would enable optimized production.