iPZIG At-Bit Imaging Service Optimizes Geosteering, Achieves 98% Well Placement Accuracy

At-bit imaging and well placement service enables accurate placement of wellbore within target coal seam in coalbed methane formation

CHALLENGE
Accurately drill to position the casing point and maintain wellbore placement within targeted coalbed methane (CBM) formation throughout the lateral sections of horizontal wells.

SOLUTION
Use directional drilling, MLWD, and PayZone Steering* well placement services that leverage iPZIG* at-bit inclination, gamma ray, and imaging service with a customized drilling assembly to quickly interpret formation bed boundaries and accurately position the wellbore within the target coal seam.

RESULTS
Successfully drilled more than 55,413 ft of lateral in multiple wells while mitigating directional drilling risks and maintaining wellbore placement in the targeted coal seam with 98% accuracy.

CASE STUDY
Drilling

Increasing production in CBM formations
An operator was drilling in CBM formations that typically ranged from 10 ft to 30 ft thick, with lateral extensions up to 5,000 ft. To increase methane production rates, the operator needed an efficient and reliable geosteering method for drilling and positioning the lateral sections of the wellbores. After collaborating with Schlumberger, the operator selected the MWD survey and total natural gamma ray, and the iPZIG service to provide real-time at-bit 8-sector gamma ray image and dynamic inclination measurements. They combined these services with PayZone Steering well placement services at the wellsite.

Accurate geosteering through at-bit measurements
The iPZIG service positions the image gamma ray and dynamic inclination measurements directly behind the bit to reduce the reaction time for making critical geosteering decisions and maintaining the wellbore in the targeted interval. The coal seam targets were identified based on offset well logging data, and the gamma ray character was evaluated. The PayZone Steering service earth model was generated from offset well data and used to provide real-time geosteering interpretation for landing the curve. Gamma ray measurements were used to position the wellbore within the coal seam. The earth model provided a responsive platform to interpret the iPZIG service measurements for the lateral sections.

While drilling and placing the wellbore, the PayZone Steering service model was continuously updated with iPZIG service inclination and natural gamma ray image measurements. The iPZIG service’s image gamma ray location was just 2 ft behind the bit, enabling the drilling team to make quick steering decisions and adjust the well path to maintain the wellbore in the target coal seam.
**CASE STUDY:** At-bit imaging enables accurate placement of wellbore within target coal seam in CBM formation

A dynamic borehole pressure measurement (DPM* dynamic pressure module) included in the drilling assembly assisted in evaluating the borehole condition to ensure borehole cleaning and integrity.

**Placing wellbores with 98% accuracy**

Real-time data from measurements taken at bit enabled quick steering decisions and time-critical well path adjustments, which allowed the safe navigation of the wellbore within the target interval. Since the introduction of the iPZIG service to the CBM drilling program, the wells have been drilled successfully with an industry-leading accuracy, maintaining 98% of the lateral within the target coal seam. Accurate placement of the laterals is expected to result in significant increases in methane production rates.