MicroScope Service Guides Placement of Lateral Within Target Formation in Niobrara Shale

High-quality images provide in-depth understanding of faulted reservoir in complex shale play

**CHALLENGE**
Maximize production from highly faulted reservoir.

**SOLUTION**
Use MicroScope* resistivity- and imaging-while-drilling service to steer lateral section and improve reservoir characterization.

**RESULTS**
- Placed horizontal lateral within target formation with no sidetrack.
- Maximized reservoir exposure.
- Revealed complex structure and identified fractures and faults.

The horizontal lateral was successfully placed within the target formation, with no sidetracks, using real-time MicroScope data and borehole images to guide steering decisions.

**Enhance production from highly faulted reservoir**
An operator in the western US was drilling a well targeting a highly faulted reservoir in the Niobrara formation, which is composed of chalk benches with intervening marls. Because both permeability and porosity in the Niobrara chalk are relatively low, production can be enhanced by placing the well to intersect natural fractures and developing a stimulation strategy based on the distribution and orientation of fractures and faults.

The operator chose MicroScope service to get a better understanding of the reservoir structure and improve reservoir characterization. Real-time MicroScope images were used to steer the well's lateral section. Advanced interpretation of recorded MicroScope images guided stimulation strategy development.

**Use real-time images to steer well**
A Schlumberger high-speed telemetry system continuously transmitted MicroScope data to the surface in real time while drilling. The data—a gamma ray (GR) curve, four multidepth laterolog resistivity measurements, and borehole images—were correlated with offset well data, enabling the operator to adjust the well trajectory to stay within the selected target interval.

Real-time MicroScope data and borehole images were used to steer the well's lateral section.
Interpretation of the real-time MicroScope borehole images such as structural dips and faults provided crucial information for well placement. The images confirmed the presence and orientation of faults, identified numerous fractures along the lateral, and provided the basis for well placement decisions.

Advanced interpretation of recorded MicroScope borehole images showed structural dips and revealed the presence of local structural deformation. Fracture orientation and characterization were important inputs for stimulation strategy decision making.

**Develop effective stimulation strategy**
The horizontal lateral was successfully placed within the target formation with no sidetracks, using real-time MicroScope data and borehole images to guide steering decisions. Interpreted fracture orientation and characterization aided development of an effective stimulation strategy with the understanding of the complex reservoir structure and location of fractures and faults along the lateral.

Contact your local Schlumberger representative to learn more.