**OVERVIEW**

When drilling through multiple formations, changes in the lithology and in the dip and direction of the structures create directional drilling challenges that could result in missing downhole targets or zones in the reservoir.

The 9-1/2-inch ALD™ azimuthal lithodensity logging-while-drilling (LWD) service from Halliburton is the industry’s first and only service capable of delivering azimuthal density and ultrasonic caliper measurements in real time in deepwater boreholes ranging from 14-1/2 inches to 17-1/2 inches. The ALD service meets U.S. Bureau of Safety and Environmental Enforcement (BSEE) regulations, and helps operators reduce well costs by minimizing post-drilling formation evaluation runs.

**MAXIMIZING ASSET VALUE**

**Drill to Produce by Keeping Well on Target**

The 9-1/2-inch ALD service provides azimuthal density images, along with conventional log curves (top, bottom, left, and right quadrants). The images are used to determine the dip and direction of bedding planes intersected by the wellbore. The information provided is especially important when drilling through the base of a salt layer, where seismic data is often unclear, leading to geological uncertainty. The 9-1/2-inch ALD service provides real-time logs and images of geological features to keep your well on target, maximizing your asset value.

**Enhance Reservoir Understanding with LWD Density Data**

In addition to borehole imaging, the 9-1/2-inch ALD service also provides high-quality measurements of formation density for petrophysical analysis, enabling the evaluation of potential hydrocarbon-bearing zones, even in very large boreholes. This can be critical when evaluating shallow gas hazards that could pose a threat to the integrity of the well. The built-in acoustic standoff measurement also provides an indication of borehole size and shape, highlighting intervals of spiral hole, washout stress-related breakout.

Used with the QBAT™ multipole LWD sonic service or XBAT™ azimuthal sonic and ultrasonic LWD service.

The azimuthally oriented density, Pe, and acoustic standoff data are acquired in eight or 16 azimuthally oriented sectors or bins referenced to either the high side of the borehole or the magnetic north as the tool rotates. The 9-1/2-inch ALD service can provide real-time formation imaging in oil-based and water-based mud systems and is compatible with bi-center bits.

**ALD™ sensor data from the North Sea. A 16-bin real-time image is shown to the right of the 16-bin recorded image.**
BENEFITS

Drill to Produce
» Optimize wellbore placement through real-time geosteering responses
» Produce quality wellbore measurements with real-time and recorded data

Enhance Reservoir Understanding
» Reduce geological uncertainty and refine the earth models by measuring structural dip and direction in real time
» View azimuthal data as conventional log curves and as borehole images

Reduce Well Time
» Eliminate post-drilling formation evaluation for stratigraphic dip analysis

For more information, contact your local Halliburton representative, visit us on the web at www.halliburton.com, or email sperry@halliburton.com

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