BAKER HUGHES
a GE company

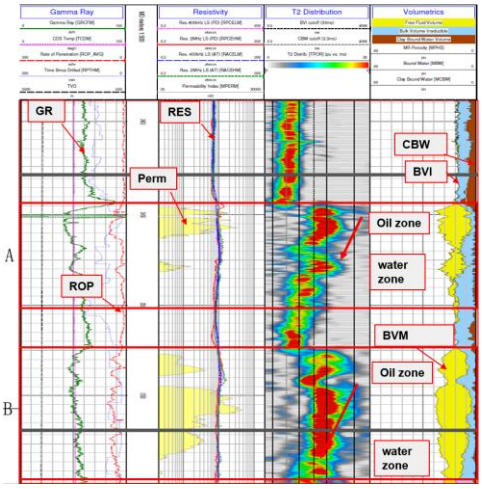
MagTrak confirmed oil zone in low-resistivity reservoir

An offshore operator in China's Bohai Bay wanted to identify a viable oil zone in a shaly sand reservoir. The company was drilling a pilot well with a 12 ¼-in. borehole and needed to determine the optimum landing depth for production.

Measuring Gamma Ray and resistivity curves indicated little difference between the reservoir and non-reservoir areas of the formation, making it difficult to differentiate the oil zone from water zone. Baker Hughes, a GE company (BHGE), used its **MagTrak™ logging-while-drilling (LWD) magnetic resonance service** to pinpoint the location of producible fluids. Its real-time nuclear magnetic resonance transversal relaxation (NMR T2) spectrum identified potential oil zones in the pilot hole by measuring porosity. However, it was difficult to determine the next step by resistivity curves alone due to the low-resistivity contrast between oil (10+ Ohm.m) and water zones (9- Ohm.m).

The BHGE **AziTrak™ deep azimuthal resistivity measurement tool** was used to enable real-time distance-to-bed boundary and apparent-dip calculations with deep azimuthal resistivity data and gamma-ray images. This additional information identified the light oil zone and helped with well decisions.

After confirming the oil zone, the operator was able to drill two successful horizontal wells that increased oil production 1,400 BPOD for each well.



Light oil was identified in the reservoir by noting the much later NMR T2 distribution peak than that of the water.

Challenges

- Horizontal well with varying lithology uncertainties
- Difficult differentiation between oil and water zones

Results

- Identified optimum well landing depth
- Confirmed viable oil zones in the pilot hole
- Operator drilled two successful horizontal wells in the oil zone

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