

## **THIN BED RESOLUTION AND THE DETERMINATION OF FLUSHED ZONE RESISTIVITY IN OIL BASED MUD**

JOSEPH F. GOETZ, ROLAND CHEMALI & DOUGLAS SEIFERT  
HALLIBURTON LOGGING SERVICES, U. S. A.

In the detailed description of reservoirs, thin bed resolution by wireline techniques is a vital factor. While common microresistivity devices may suffice in water based muds, special techniques must be devised for oil based drilling fluids. Rather than running an exclusively designed tool, a cost saving could be effected if the desired information could be derived from a logging tool routinely run for other purposes. The Six Arm Dipmeter has been extraordinarily successful in producing dips in oil based muds. The raw data can also be used for discrimination of sand-shale laminae down to thicknesses of one inch. A reliable measurement of net sand thickness is thus provided as well as the volume fraction of shale in laminated form,  $V_{lam}$ , for input into laminated shaly sand saturation equations.

In addition, the same measurement provides data for the value of the flushed zone resistivity,  $R_{xo}$ , in oil based muds, information which can be used to further refine saturation computations. This is possible because the Six Arm Dipmeter generates resistivity curves absolutely calibrated in ohm-m. Furthermore, there is scope to study the depth of invasion of specific oil based muds, and because measurements are made on six sides of the hole, to recognize and bypass pad contact problems.

These applications of the Six Arm Dipmeter are approached from both computer modeling and field examples.