

**Petrophysics**

**Summary**

From shows, log response and fluid samples it is interpreted that >60 feet of hydrocarbons were discovered by the Macondo well, the majority occurring in the M56D (22') and M56E (54.8') sands. Porosity averages 22%, Sw averages 10 - 17% and permeability averages in the range of 250 - 500 md (arithmetic, log derived). Permeability was calculated using a porosity-permeability transform based on Macondo well rotary side wall core data analysis.

Three MDT multiphase fluid samples were collected. MDT sample analysis and PYT analysis confirm low OBM contamination level (0-1.2%). The samples were characterized as volatile oil with GOR >1000 scf/stb, API 35 degrees, and viscosity of 0.2 cp.

No hydrocarbon-water contacts were penetrated and no significant aquifer sandstone was observed.

Rotary side wall core data were used to calibrate log derived porosity and permeability at net confining stress. Log porosity was calculated from density log calibrated to side wall core porosity data measured at net confining stress. Permeability data was calculated from log porosity calculated using a porosity-permeability transform based on Macondo well rotary side wall core data analysis. Water saturation was calculated from log derived porosity and resistivity data. Log porosity had to core porosity wt, log derived permeability had reasonable match. There is no core calibration for water saturation yet.

Based on core measurement (lower porosity and permeability values and finer grain size analysis) M56D is probably slightly different rock type and more heterogeneous than M56E.

analysis) M56D is probably slightly different rock type and more heterogeneous than M56E. Nuclear-magnetic resonance (CMR) and RT Scanner logs response also show higher rock anisotropy of M56D lobe (See Figure 33).

Electrical properties, capillary pressure data and thin section analysis will be incorporated into the interpretation when available.

**Data base**

All Logging While Drilling (LWD), Wireline, Mud logging, Pressure and Core data were loaded into Geolog where formation evaluation was completed.

**LWD**

Halliburton was the LWD vendor. GR, Resistivity, Sonic and PWD tools were in the BHA, while drilling plus Geotap formation pressure in the target section.

In the section of the hole logged with wireline tools, LWD was depth shifted to TOCOMO Gamma Ray. In cased hole section, where wireline Sonic in casing was run, LWD was shifted to it to match sonic response on LWD and wireline. From mudline to top of sonic in casing (~11,700' md) the depth shift was distributed.

Version 1

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