

To assist in the identification of mud filtrate obtained during formation testing, sodium nitrate was run in the mud in the 216mm section. Relatively consistent levels of 250 ppm were obtained which required treatment approximately every two days. Detectable levels were recovered in SFT 1 and 2 but not in Sample 3. Owing to the lack of stability and colourimetric inaccuracies inherent in field techniques, only qualitative assessments of SFT fluid recoveries were made and the absence of NO₃ in Sample 3 does not imply an absence of filtrate.

The mud data can be found in the Drilling Record, Section 5.5 while the SFT data can be referred to in Appendix 3.

3.12 Porosity and Permeability

Within the Torquay Group the only sandstone encountered was between 1046m and 1050m. From cuttings the observed porosity was good in a clean but fair to poorly sorted sand. The sonic log indicated excellent porosity with an uncorrected value of 40%. Resistivity separation indicates some permeability. The bioclastic calcarenites of the Torquay Group exhibited poor to good, with predominantly fair intraparticle visual porosity. Sonic log porosities range from 13% to 30% and are predominantly excellent. The resistivity profile indicates some permeability.

Porosity data for the EVCM falls into two sets, the lower values corresponding with sands less than 2-3m thick and the upper values with sands in excess of 3m. The lower porosity set are generally silt to very fine grained or poorly sorted sands ranging from 23% to 9% porosity decreasing with depth.

In contrast the porosities of the higher set range from 32% to 22% at depth. These sands are generally fine to medium and locally coarse with moderate to good sorting becoming predominantly very fine to fine and well sorted with depth.

Core porosities closely match log derived porosities although they are marginally more optimistic.

Comparison of the visual cuttings porosity with the log porosities shows that the visual estimates were generally low. This is both a function of the unconsolidated nature of the sands and the dispersive nature of the claystones as seen at surface, with porosity estimates being influenced by the amount of clay matrix assigned to the sandstone.

Permeability within the EVCM is generally good and frequently excellent. Almost all of the SFT pretest pressures were obtained within a few minutes with stable final pressures building up in less than 120 seconds. The excellent permeability was considered the major cause of the problems that were encountered in trying to obtain segregated formation fluid samples.

Permeability results from core plugs gave values from 0.7 to 1253 md. Most values are in excess of 300 md and confirm the inferred good values from other sources eg the induction log, SP, caliper and microlog.