

(8) Porosity and Permeability of Sediments Penetrated

Several thin sands in the basal Torquay Group showed fair to good SP and gamma ray development and uncorrected ϕ_D values ranging up to 0.30 but these units are of minor importance and will not be discussed further here.

The computer processed log interpretation (Enclosure 3) contains porosity data for all sands in the Eastern View Coal Measures. Visual porosity estimates on cores and sidewall cores are included in Appendix 2, and Appendix 3 contains porosity and permeability determinations of Core 1.

Sand development in the Eastern View Coal Measures is similar to that observed elsewhere in the basin, in that the thickest most continuous sand section is at the top of the formation. In Nangkero, the upper 330 feet of the Eastern View Coal Measures, above the highest coal at 6500 feet, contains 260 feet (80%) of sand with good SP and fair to good gamma ray development. The computer log interpreted average porosity for the Upper Eastern View sands is from 0.15 to 0.20 with a range from 0.07 to 0.31. The low values correspond with dolomitic streaks. Sidewall cores and the computer log interpretation indicate that these sands have a higher clay content than those below 6500 feet.

From 6500 to 8000 feet net sand is only 470 feet (30%) and average thickness 16 feet. SP and gamma ray development are fair to good and log derived porosity is comparable with that of the upper units but actual porosity is probably better due to a general lack of clay choking. Several sandstone bodies in this interval have a characteristic "christmas tree" shape on the gamma ray log due to a progressive upwards increase in clay content. Log interpreted porosity is in the range 0.25 to 0.30 for the cleaner sands and 0.10 to 0.20 for clay choked and dolomitic sands. The best sand in the well (7322-7404 feet) has an average log interpreted porosity of close to 0.22 and core analysis indicates a porosity range from 0.11 to 0.20. Corresponding permeabilities range from less than 0.1 to 21 md. The core is from the base of the sand where porosity is believed to be higher.

Below 8000 feet to total depth (9440 feet) net sand (40%) is comparable with the 6500 to 8000 interval but individual sand bodies average only 10 feet in thickness. Average porosity is slightly lower than 0.20 and porosity ranges from 0.05 to 0.25. Several of these sands, in contrast to those of the intermediate interval, show downwards increasing clay content.