(8) Porosity and Permeability of Sediments Penetrated

Foot by foot porosity estimates for the interval from 8001 to 10,553 feet (K.B.) are listed in the computer processed interpretation (Enclosure 3). Appendices 3 and 4 contain visual porosity estimates and core analysis results (Cores 1 and 2) respectively.

The only potential reservoir rocks of interest in Aroo-1 are the sandstone bodies of the Eastern View Coal Measures. These fall into three broad groupings; those in the upper part of the formation (P. asperopolus to N. asperus palynological zones) above 8100 , those lying between 8100 and 10,327 feet (lower L. balmei to M. diversus zones) and those below 10,327 feet (undated) which are interbedded with volcanics.

Above 8100 feet, although GR/SP development is poor, the Eastern View Coal Measures contain 0.5 net sand. The individual bodies are thick and very fine to medium grained and their average (corrected) ϕ_D is within the range 0.15 to 0.17. In a few places maximum ϕ_D (uncorrected reaches 0.27. Minimum ϕ_D is 0 on dolomite streaks within sands near the top of the upper sand sequence.

Between 8100 feet and the top of the volcanics (10,327 feet K.B.) there is 550 feet of sandstone (0.25 net sand) with maximum ϕ_D (corrected) of 0.26 minimum ϕ_D 0.04 and weighted average ϕ_D (corrected) 0.15. The best sand in this interval is from 9514 to 9546 feet. It has an average ϕ_D (corrected) of 0.16 and maximum and minimum ϕ_D (corrected) of 0.20 and 0.08 respectively. Cores 1 and 2 were cut in this interval and core plugs from 9516 and 9530 feet showed porosities of 0.176 and 0.208 respectively. Corresponding permeabilities for the two samples were 0.89 md and 113 md. FIT No. 1 at 9530 feet recovered 1.4 cubic feet of gas and 1900 cc's of water. The pressure data and recoveries for this test were achieved only after a shape charge has been fired into the formation indicating the extremely low permeability of the formation at this point in the well. FIT 2 at 9133 feet in a 6 feet thick sand with average ϕ_D (corrected) of 0.10 (0.14 at 9133 feet) also indicated very tight formation.

Within the volcanic sequence from 10,327 to total depth (12,112 feet) are interbedded sediments including an interpreted thickness of 148 feet of sandstone. Only sidewall cores were obtained from these units and lithology determination in this section is difficult and log derived porosities even more unreliable due to lack of knowledge of the mineralogy, clay choking, borehole enlargement and other factors. Porosity of