

7. Porosity and Permeability of Section Penetrated

Porosity and permeability measurements made by Core Laboratories are included in Appendix 4 of this report and electric log analysis porosities are in Appendix 3. Sands developed in the Oligocene and in the Deltaic Complex are potential reservoir rocks.

Measured core porosities range to 34% and permeabilities to 190 millidarcies in this deltaic sequence. No core analysis was done on the sands in the Oligocene series. A certain amount of matrix plugging by clay matrix and some dolomitization locally impedes the permeability of these rocks. The skeletal calcarenite and quartzose sandstone in the Middle Miocene and younger section is of no economic interest as it is probably unsealed.

8. Contributions to Geological Concepts Resulting from Drilling

The most significant fact resulting from the drilling of this well is that relatively rapid facies changes occur laterally within the Tertiary section of the northeastern part of the basin.

These facies changes are particularly noteworthy regarding the basal parts of the Oligocene and Miocene series and within the deltaic complex.

Other Pertinent Facts

- (i) With the exception of the Eocene, the formation tops in the well were essentially as predicted from the seismic data, indicating that there is little velocity variation laterally in this part of the basin.
- (ii) The Eocene top being higher does not affect closure on this horizon. The error in prognosis is due to a "mistie" of the seismic data between Esso Bass-1 and Esso Bass-2.
- (iii) The basal Tertiary "deltaic complex" represents a relatively rapid infilling of a continually subsiding basin dividing Paleocene-Eocene and possibly Upper Cretaceous time.

It is also evident that basement blocks, such as the one upon which Esso Bass-2 is located, have had a strong local influence on the sedimentation during the deposition of this interval. The Esso Bass-2 feature was apparently positive during Paleocene-Eocene deposition and the bulk of sediment was deposited around the flanks of the feature. Dipmeter and seismic data indicate a large northwest-southeast trending trough to the north and east of the Esso Bass-2 location.

- (iv) The marine Tertiary sequence in the Bass Basin is strikingly similar to that in the Anglesea sub basin. Taylor (1965) suggests that from Upper Eocene time the two basins have been joined.
- (v) The 'volcanic' interval (5,511-5,767) in Esso Bass-2 is petrologically unlike any extrusives seen either in Tasmania or Victoria and its age is unknown.
- (vi) The well bottomed in an altered 'quartzitic mudstone' and 'bedded tuff' (Apthorpe 1966) of indeterminate age (from 5,767-5,910). This interval may well be associated with the overlying 'volcanic' sequence.