

best seal in the basin, to fluvial and alluvial sandstones at Durroon-1.

Mapping at the Base of the Torquay Group shows gentle topography, but no structures of any significance were noted.

4.0 HYDROCARBON POTENTIAL

4.1 SOURCE AND RESERVOIR ROCKS

Sedimentary rocks in which organic material can be transformed under heat, pressure, and time, into liquid or gaseous hydrocarbons must exist within the permit area. Sedimentation within the Bass Basin is predominantly non-marine. The single dinoflagellate recorded from the Durroon mudstone may tell of one or more marine incursions during the Turonian highstand, but will not detract from the probability that source rocks will be mostly from a lacustrine or swamp environment.

The relative sea level highstand periods in Cenomanian and Turonian times and the paleogeography that existed during these periods of deposition, will have encouraged the formation of lakes and swamp areas in the sub-basins. Cenomanian lakes will have been restricted to the subsiding areas within each sub-basin. The Turonian lake in which the Durroon mudstone was deposited, transgressed the boundaries of these basins. Since the evidence is of a rapid subsidence in all sub-basins during the Cenomanian and Turonian, the likelihood of organic matter being preserved for subsequent maturation is excellent.

Proximal sources of siliclastics have surrounded the sub-basins throughout Cenomanian and Turonian deposition. Reservoir rocks will dominate the periods of rising and falling sea levels. These sands will show a preference for stream beds, deltas, the margins of lakes, and the structural hinge lines of subsiding troughs.

4.2 SEALS

Smith (1986) wrote: "The best regional seal in the Bass Basin is the Demons Bluff Formation. This thick mudstone unit totally blankets the Eastern View Group, except on the southern margins where the transgressive mudstones did not reach (e.g. Durroon-1). Within the Eastern View Group thick widespread interformational seals are common, especially in the Lower Eastern View Group, and these are capable of forming good seals, as at Pelican. The Durroon Formation, if correctly interpreted from the seismic sections, should provide another good regional seal, in this case to the top of the Otway Group".

The Durroon Formation will also provide a seal to the Lower Turonian reservoir rocks below it. Interformational seals will also be present within the Cenomanian.

4.3 MATURITY

Goldstien in his report "Source Rocks Scenarios for Prospects in the Boobyalla Sub-Basin" has concluded, from evidence at Durroon-1, that mature source rocks exist if sufficiently deeply buried. This depth is calculated as occurring at a seismic time below 2.5 seconds, or at a depth of approximately 3.5km (Line BB88-306). The Depth versus Age Plot (Fig.5) indicates that a considerable thickness of mature source rock of Cenomanian and Turonian age may exist in the Boobyalla Sub-Basin.