

There are several component sequences within the two megasequence between 80 Ma to Recent: the Eastern View and Torquay Megasequences, respectively (Encl 1). A Late Cretaceous (66 Ma), Top of Palaeocene (55 Ma), Base of Demons Bluff (39 Ma) and Top of Demons Bluff (38 Ma) sequence boundary is mapped.

All these sequence boundaries converge on, and merge with, the Durroon Megasequence Boundary at the margins of the basin. The last, the Demons Bluff sequence, also demarcated the transition of non-marine to marine deposition within the basin.

## 6.1 Structural Style

The extensional regime at the end of the Durroon Megasequence continued to act upon the basin. The rollover structures along the southern bounding listric fault to the Boobyalla Sub-Basin were accentuated by continued differential movements along the fault; uplift of the Anderson and Bark Sub-Basins, the Bassian Rise, Tasmania, and King Island High, was continuous; major faults were active throughout the Cretaceous and early Tertiary.

## 7.0 SOURCE

Morgan (Bridge Oil report, 1991) reported that algal cysts within the Durroon Mudstone contain excellent oil source material, if present in sufficient quantity. They occur in two intervals that might indicate times of maximum algal productivity in large lakes during sea level highstands.

Smith (1985) concluded that the geothermal gradient in the Bass Basin ranged from 40°C/Km on the southwest and northeastern margins of the Bass Basin, to 30°C/Km along the NW-SE basin axis. Goldstein (Bridge Oil, 1991) measured a geothermal gradient of between 29°C/Km to 31°C/Km at Durroon-1, and suggested that the Durroon Mudstones would become mature at a depth of burial of approximately 3,000 m. Mature Durroon Mudstones underlies a large part of the Boobyalla Sub-Basin. Since the cover of post-rift sediments increases to the west, the depth of burial of the Durroon Mudstones also increases in the direction. Mature rocks would exist in both the Anderson and Bark Sub-Basins.

## 8.0 TRAPS

### 8.1 The Lachlan Structure

Petroleum accumulations are most frequently found on the upthrown side of extensional blocks. Most production has been found in the highest parts of tilted blocks.

The highest closure mapped along the updip culmination of the Otway Megasequence of the Anderson tilted block is the Lachlan Structure (Fig 1; Encl 4). The structure formed at the onset of spreading in the Tasman Sea (80 Ma). A cover of Cenomanian and Turonian sediments is in trap position, juxtaposed against downfaulted sediments of the Durroon Megasequence of the Boobyalla Sub-Basin. The Turonian mudstones would provide a seal to underlying clastic sediments of Cenomanian age.

This structure measures 14 km x 1.5km. It could be sourced from deeply buried Turonian mudstones on the downthrown side of the fault, or from Turonian mudstones within the Anderson depocentre.