

3.2.2 Pelican Trough

The mapped area comprises most of the eastern portion of T/25P and covers a large portion of the central Pelican Trough. The trough is of Early Cretaceous to Eocene age with basement probably consisting of Cambrian metasediments. Data quality below the Eocene strata are poor but an approximate basement pick is possible and has been presented in the July 1994 Permit Assessment Report. The Pelican Field, which sits on the floor of the Pelican Trough, is located centrally in the study area and is now seen to be, essentially, a dome cut by NW-SE faulting (Figure 3.5). The structure sits on the culmination of a monoclinial feature which is perpendicular to the trough grain. The monocline is cut by Palaeocene to Upper M.*diversus* aged faulting and it is the combination of these two grains that sets up the closure on structures such as Tourville, Eddystone, Grindstone and the Pelican Field. The monocline is an early feature of the Pelican Trough manifesting itself as a Lower M.*diversus* thin (Figure 3.6). Interestingly all the Pelican wells are located on the western margin of this thin. The terrace which sets up the Tourville and Actaeon highs was also active during Lower M.*diversus* deposition and is represented by a thin on the interval map. Deep troughs were present after the Palaeocene, are located near Narimba 1 and the other southeast of the central monocline. Another monocline trend may be present in the eastern part of the Pelican Trough but interpretation difficulties in this sparsely covered and poor data quality area prevent any conclusions at this stage. Broad trough areas were present southwest of the Pelican Trough deeps and it is possible they may have focussed tributary channels at Lower M.*diversus* time feeding the probable Pelican Trough main stream axis which is likely to have been restricted to immediately east of the Eddystone Fault.

The Top Lower M.*diversus* time structure map (Figure 3.7) shows most features of the Palaeocene map but with less relief, as would be expected. The Middle to Lower M.*diversus* time interval map (Figure 3.8) reflects this, however the erosional event at the top of the interval will contribute to the map's appearance as well. The Pelican Trough channel axis was much broader during Middle M.*diversus* time extending from the foot of the Grindstone Fault to the Tourville Fault. Once again the Tourville and Actaeon terrace would have been an interfluvial environment although possible receiving alluvial fan deposits from the pronounced Pelican 3 high. Encouragingly the channel focus would have been over the prospective Eddystone structure in Middle M.*diversus* time giving this area a better chance of stacked cleaner sandstone deposits. The Middle M.*diversus* time structure map (Figure 3.9) shows lower structural maturity again with further reduction in relief. The Upper to Middle M.*diversus* time interval (Figure 3.10) shows a broad basin west of the Pelican 3 high and an indication that a slower subsidence post-rift basin phase had commenced at this time (Figure 3.11). The slow subsidence rate lead to broadening of the stream belt and a much higher density of channel deposits being preserved at Upper M.*diversus* time. Slow subsidence was also conducive to coal formation and hence a greater number of coal seams are observed on the logs. Some growth faulting was still present at the top of the Middle M.*diversus* (Figure 3.12) although some faults would have been mildly reactivated during a compressional event which lead to basin edge uplift and subcrop at basal N.*asperus* time. This event is manifested by a slight enhancement of structural relief on several culminations. Grindstone, Eddystone, Tourville, Actaeon and Warrego have been enhanced in this way which can be most clearly seen as thinning of the Top EVCM to Upper M.*diversus* time interval (Figure 3.13).

The Pelican Trough has no expression at the Top EVCM (Figure 3.14) which owes its structural relief to Early and Late Miocene events. The first of these events was associated with volcanism and emplacement of intrusives. The Flinders and Hunter Top EVCM culminations result from sill emplacement and the associated section