

1) *Pelican 5 Vitrinite Reflectance Profile*

The vitrinite reflectance versus depth profile for Pelican 5 (Figure 10.3) indicates that the Eocene section of the EVCN above 1750 metres is thermally immature ($VR < 0.5\%$). However, generation of light oil from sediments of such low rank may occur where the DOM is rich in resinite (Snowden and Powell 1982, Powell 1985), as appears the case at Pelican 5 (Watson 1986). Whilst generation may have occurred it is probable that significant expulsion of this hydrocarbon has not occurred.

Eocene sediments within the interval 1750-2500m depth are marginally mature (0.5-0.7% R_o). The presence of exsudatinite in coals, and oil in sandstones and siltstones from this part of the section (Watson op.cit.) suggests that mobilisation of liquid hydrocarbons has commenced.

The top of the main oil window ($R_o = 0.7\%$) in Pelican 5 is located at approximately 2500 metres depth in the Eocene section of the EVCN. The base of the oil window ($R_o = 1.25\%$) occurs at about 3750 metres depth in the Cretaceous portion of the EVCN. Sediments below 3750m depth are presently mature for gas generation.

2) *Flinders 1 Vitrinite Reflectance Profile*

The Flinders 1 vitrinite reflectance versus depth profile (Figure 10.4) shows a significant zone of elevated rank immediately adjacent to the igneous intrusion. Apart from these localised 'over mature' values, the Eocene, Palaeocene and Cretaceous sediments fit along a similar trend to the Pelican 5 data (Figure 10.2 and 10.3).

The vitrinite reflectance profile indicates that the sedimentary section penetrated by Flinders 1 is sufficiently mature for the generation of early light oil from resinite-rich dispersed organic matter (DOM) below 2300 metres depth ($VR \approx 0.7\%$). The section is not sufficiently mature to reach the peak to late mature oil threshold ($VR \geq 1.0\%$).