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SHOWS: Pelican 5 recorded a similar distribution of gas shows and shows of fluorescence through the lower and middle M. diversus zones to that encountered in Pelican 1, 2 and 4. Below the top of the Palaeocene the gas and fluorescence shows continued to total depth in the Late Cretaceous. Increased concentrations of the heavy hydrocarbons (Butane to Pentane) are observed on the gas chromatograph with increased depth.

RESERVOIR: The lower to middle M. diversus sequence contained similar quality reservoirs to those encountered in the earlier Pelican wells. In the Palaeocene and Late Cretaceous sequence similar deltaic and fluvial sandstone reservoirs were encountered to those in the lower to middle M. diversus zones. Log analysis by the operator prior to testing indicated the potential for 62m of net pay using cut off of SW <50%, Vsh <50% and porosity >10%. Despite these promising results production testing failed to meet the initial enthusiasm and many of the apparent pay zones proved to be tight with low permeability. Only two zones flowed hydrocarbons, at the top of the Palaeocene, a sandstone between 3142 - 3163m flowed gas at 0.75 MMCFD, and a test of a sand in the "E" unit of the middle M. diversus zone flowed at a more encouraging rate of 5.6 MMCFD with 302-441 BCPD and 662-705 BWPD. The water in the second test is interpreted to be from a deeper interval via communication behind casing as there was no water recovery during an earlier flow period.

MATURITY: Pelican 5 provides the most complete maturity profile for the central part of the Pelican half graben. The profile down to the top L. balmei zone matches that recorded in other Pelican wells. Peak oil maturity (vitrinite reflectance 1.1%) is reached at a depth of approximately 3,600m and the wet gas window (vitrinite reflectance 1.3%) starts at approximately 3800m. The maximum mean vitrinite reflectance of 1.67% was measured in the deepest sample near to total depth.

SOURCE ROCK: The primary source rock interval in T91-2 is the Eastern View Coal Measures. The source potential of the Otway Group has not been tested in the permit and is unknown. Analysis of samples from the Eastern View Coal Measures has identified samples with good to very good gas richness ($C_1-C_4=10,000 - 180,000$ ppm) throughout the Eocene and Palaeocene intervals. Wet gas (C_5+) yields in excess of 1000 ppm occur at two levels which produced hydrocarbons on test. Total organic carbon values are high because of the presence of abundant coal seams. TOC values range between 1.10-79.2% in the Eocene, 0.96 - 47.0% in the Palaeocene and 0.82 - 13.7% in the Late Cretaceous. Potential hydrocarbon yields (oil and gas) are very high in the Eocene and Palaeocene ($S_1+S_2 > 6-366$ kg hydrocarbons/tonne). However, much of this genetic potential is likely to be for gas and condensate. Cuttings from the Late Cretaceous were contaminated by cavings. One carbonaceous claystone at 3846m gave a S_1+S_2 ratio of 24 kg hydrocarbons/tonne, whilst sidewall core data indicated poor source richness from the Late Cretaceous section ($S_1+S_2 < 2$ kg hydrocarbon/tonne).

In the Eocene coal in the dominantly carbonaceous lithofacies, two main types of organic matter were identified, a good quality oil and gas-prone type II-III kerogen and a poor quality dry gas-prone type IV kerogen. The major kerogens are vitrinite (45-85%) and exinite (10-40%). The exinites include resinite and subertinite which are potentially generative at low maturities (vitrinite reflectance, 0.45% for oil generation).

In the Palaeocene the source rock consists of more mature oil and gas-prone type II-III kerogen. Coal is less abundant, and the major exinite is sporinite.

In the Late Cretaceous source rocks shale appears to be the most common organic-rich rock type. Many shales are very rich in exinite (up to 85% of DOM). The oil deadline for this exinite which is dominantly bituminite is a vitrinite reflectance of 0.9% and therefore most of these shales are now post-mature for oil. Earlier in their history they were probably prolific sources of liquid hydrocarbons.