3 INTERPRETATION

3.1 Data Quality and Phase

Extensive deconvolution trials and demultiple tests were conducted to select the final parameters used during the processing sequence. These were aimed at producing zero-phase data and reducing short period multiples. To check this, both minimum-phase and zero-phase synthetics were constructed for Yolla 1, and then compared to the data. The zero-phase synthetic was selected as having the best tie to the chosen designature, and the final data set is therefore assumed to be near zero phase. Post-migration Trace Equalisation was performed on overlapping 1000 millisecond gates, being large enough to preserve true relative amplitudes, but also aid significantly in the interpretation by the presentation of a better looking data set.

The 3D-migration process produced clean sharp fault cuts superior to those shown by the previous 2D data, and justified the decision on in-line shooting direction. However, the presence of multiples remains a problem in the EVCM, particularly below the Middle M.diversus coal dominated sequence.

3.1.1 Well Tie

A synthetic seismogram was created for the Yolla 1 well using LOGM software, and is shown here in Enclosure 1. The check shot data was input to correct the sonic, and both sonic and density logs were used to calculate the reflection co-efficient series. The normal polarity convention used here, is that an increasing velocity interface will produce a negative trough on the seismic data. The LOGM software considers this as "Reversed Polarity".

At Miocene levels, approximately 1 second two-way time, the seismic frequency content is 40-50 Hertz. At the deeper Palaeocene levels (2 seconds twt), this is reduced considerably to 20-25 Hertz. The two synthetics presented in Enclosure 1, reflect the data frequency content by using two zero-phase Ricker wavelets at 25 and 45 Hertz. Table 2 lists the mapped events in time and depth, for the Yolla 1 well on seismic in-line 530 cdp 1010.

3.1.2 Tuning Thickness

It is generally accepted that the stratigraphic tuning thickness of individual beds is one quarter the seismic wavelength, ($\lambda/4$).

Below this the seismic reflections no longer coincide with the stratigraphic interfaces, but to a composite response of many overlapping wavelets. Additionally, the amplitude of a particular composite event starts changing at half the wavelength ($\lambda/2$), increasing to a peak at $\lambda/4$ and then decreasing as beds became thinner than $\lambda/4$ (for more detail refer to AR Brown 1991, AAPG Memoir 42 "Interpretation of 3D seismic data"). At Miocene levels the frequency is 40-50 Hz, which at an interval velocity of 2500 metres/second gives wavelengths of 63-50 metres, and hence tuning thickness of $\lambda/4$ = 16-12.5 metres. At the deeper Palaeocene level, frequencies of 20-25 Hz give rise to λ = 185-148 metres at a velocity of 3700 metres/second, and a subsequent tuning thickness of $\lambda/4$ = 46-37 metres.