A high velocity igneous intrusive was also modelled and compared to the original data. A velocity of 8060 m/sec and a density of 2.56 g/cc were used in the model. These values are taken from a dolerite sill that was encountered in the Yolla 1 well between 2584-2651 metres.

RESULTS

The synthetic time section was generated using a 30 Hz minimum phase wavelet and is shown on Enclosure 1. The top of the water-sand corresponds to the beginning of a white trough on the synthetic section, while the gas sand is associated with a high amplitude black peak. Comparison between the real and the synthetic data results in the following observations:

1. Similar high amplitude "bright-spots" occur on both real and synthetic data.

2. Similar phase changes occur at the base of the anomaly on both data.

3. A second peak, associated with the base of the gas sand, is seen only on the synthetic section. This results from the simple geometry of the depth model. Inspection of the real data suggest the presence of an unconformity beneath the anomaly, which would not have the same seismic signature as a series of conformable velocity boundaries.

In an attempt to approximate the data more realistically, a number of changes to the initial depth model were introduced. Firstly, the real section appears to lose reflection strength and continuity within the Pelican Zone interval in a direction towards the Pipipa fault. To account for this the velocity of the coals of the depth model were increased towards the flank to reduce the acoustic contrasts within the section. Generally, this produced the desired result in the synthetic time section. Secondly, the initial depth model included an abrupt hydrocarbon/water contact producing a sharp horizontal velocity boundary between the hydrocarbon and water saturated components of the sand. As seen in Figure 2, a strong flat spot was produced at the base of the anomaly. However, as this affect could not be seen on the original section TNK4-79, the velocities were smoothed through a Transition Zone, and the flat spot was effectively removed from the synthetic section.

The depth model containing a 50-60 m thick high-velocity intrusive produced the synthetic time section of Figure 3. A seismic amplitude anomaly is associated with the intrusive, while the amplitudes of all other events have been suppressed artificially by a normalisation factor built into the model software. While there are similarities to the real data in terms of amplitude, there is no phase change at the base of the anomaly and there are diffraction events produced by the model at the edge of the intrusive not seen on the real data.