NANGKERO STRUCTURAL RE-INTERPRETATION

Following the drilling of the well, and in view of the absence of hydrocarbons the structural interpretation was reviewed.

No changes could reasonably be made in the times picked for the "Red Horizon", but it was apparent that there was relatively little velocity control in the critical closure direction to the northeast, all velocity information in this area being extrapolated from the Flinders Seismic Survey lines, HB73A-135, HB73A-137, HB73A-138, HB73A-125. As there was thought to be some possibility of velocity variation in the area, which could remove the critical closure, velocity analyses (G.S.I. 700 pkg.) were run on parts of lines B70A-3A, B71A-41, B71A-44, B71A-54, B72A-104.

These were interpreted and combined with the Flinders Survey velocity analyses were used to convert the reflection times to depth. To do this a smoothed velocity was calculated for every shotpoint mapped by using the difference in velocity from a standard time velocity curve, this being smoothed by averaging all points within 3 km. weighted approximately inversely to the square of distance from the shotpoint.

The smoothed velocity was then converted to average velocity using Dix's method, and used to convert times to depth.

The use of these velocities has significantly changed the map on the "Red Horizon". The major difference is the 8200 ft. low northeast of Nangkero-1, which replaces the northern lobe of the structure as previously mapped. This low is entirely due to a high velocity anomaly except to the extent that it overlaps the previously mapped saddle which marks the northern flank of the structure.

This raises the question as to what causes the velocity anomaly, and as can be seen on the section of line B71A-44, this is fairly evident. Below about 1.2 seconds there is a band of disturbed reflections, which has been identified in the wells (e.g. Bass-1) as volcanic material. The outline of the area of this material is shown on the map, and is very nearly coincident with the velocity related structural low. It is therefore quite clear that the velocity variation is directly related to the presence of the layer of volcanics.

A separate problem is the one of whether the velocity variation is real or is an effect of the volcanics on the velocity analysis method, but not a real increase in velocity. Examples of scattergrams are shown with and without the volcanics and it is obvious that the difference in velocity is not merely one of interpretation. However, the moveout velocity measured by the velocity analysis may show a higher velocity than the actual RMS velocity because the travel paths making up the common depth point gather do not all travel through the same velocity layers. This