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Hale Area Seismic Survey, OP75, by Geophysical Associates Pty Ltd for Flamingo Petroleum Pty Ltd 1964

Onshore

SUMMARY

HALE AREA SEISMIC SURVEY
OIL PERMIT 75
NORTHERN TERRITORY OF AUSTRALIA
FLAMINGO PETROLEUM PTY. LTD.

ABSTRACT

A reflection seismic survey was conducted in the Hale Area, Oil Permit 75, of the Associates Pty. Ltd. for Flamingo Petroleum Pty. Ltd. The survey commenced on 27 October, 1964 and was completed on 8 December, 1964.

Programme was assigned to provide qualitative and quantitative information on the depth and distribution of sediments in the Permit, and to investigate anomalies indicated by previous seismic and aeromagnetic surveys.

Completion of the reconnaissance work has indicated that future operations using conventional shooting methods will require at least three shot hole drills and four water trucks in order to obtain optimum seismic results. The seismic lines would be most advantageously placed running approximately north-south, parallel to the sand dunes. East-west tie lines (traversing the sand dunes) should be kept to a minimum.

The survey has shown considerable variation in near-surface velocities and velocities at depth. These velocity variations have made it necessary to compute several move-out curves for dynamic corrections for playback sections.

The record sections indicate regional southeast dip, generally conformable with the increase in depth of sediments indicated aeromagnetic surveys. Numerous faults, with relatively small vertical displacement, are indicated on the record sections. Unconformities are indicated below the Cretaceous-(Jurassic ?) and (Triassic ?) - Permian levels in the east part of the Permit. An area approximately six miles long on the East-West traverse (Line 1) could possibly contain major structural development and should be included in future detail programming.

CONCLUSTONS.

To increase the efficiency of the seismic field operations the crew should be enlarged to include at least three drilling units and four water trucks. It is believed that this will permit shooting the desired number of pattern holes at the optimum recording depth. Seismic lines should be programmed, wherever possible, to run parallel to the sand dunes with the tie lines traversing the dunes kept to a minimum.

Considerable difficulty was experienced with changes in normal move-out times and this phenomenon should be closely inspected in subsequent work. It might be expected, however, that as the programme progresses south towards the Great Artesian Basin both the near and sub-surface velocities may become more consistent.

The record sections reveal a regional dip toward the southeast with Mesozoic sediments also increasing in thickness in that direction. Basically, this confirms the magnetic basement interpretation of a basinal area of up to 15,000 ft of section developing in the southeast corner of the permit.

Unconformities are evident which are probably Cretaceous - (Jurassic ?) and (Triassic ?) - Permian in age. Lower Palaeozoic sediments may be forming part of the thicker section found on the south end of Line 3 although the delta T analysis failed to yield any velocities correlating to formations of this age.

No structures of sufficient interest to warrant a deep test were found on the reconnaissance lines. However, an anomalous area of possible major significance between SPs 138 and 163 on Line 1 is considered worthy of additional detail surveying. Future programming is also recommended for the south-east corner of the permit which probably contains the greatest thickness of prospective sedimentary section.

GEOPHYSICAL ASSOCIATES PTY. LTD.

J.H.B. Campbell