INTERPRETATION REPORT:
MARINE GEOPHYSICAL SURVEY OFFSHORE SOUTHERN AUSTRALIA
CONDUCTED WITH M.V. PETREL
from 19 December 1972 to 18 April 1973

I. GENERAL INTRODUCTION

This report represents an evaluation by Shell's deep water exploration team of data collected during the 1972-3 survey by the M.V. Petrel in southern Australia. The survey covered the continental slope area from Perth in western Australia to Cape Howe in Victoria, and was laid out in the form of a zig-zag grid. The distance between the end points of the zig-zag varied but was normally of the order of 150 kms (Fig. 1). The lines involved comprise numbers N 314 (1)-N 325, N 330-N 333, N 400-N 417 and N 427-N 438. A total of 10,904 kms was surveyed.

A report of the operational aspects of the survey has already been submitted (Report EP-44811 of June 1973).

The seismic sections were obtained using a 1090 cubic inch airgun array with a working pressure of 2000 psi. Shipboard sections were displayed on a VAX near-trace playout, together with continuous magnetic and gravity profiles.

The interpretation was carried out by a team of geophysicists and geologists in the special deep-water evaluation team of SIPM under the direction of P. Lehner. Seismic sections were interpreted by A.D. Ingles and P. Allenbach of EP/13 and magnetic basement depths were computed by J. Adriaanse of EP/12. The geological interpretation was carried out by H. Doust of EP/13.

For the purposes of constructing depth maps and depth sections in the offshore area where there was little well or velocity control, the following velocity functions were employed throughout

water : 1500 m/sec
sediment : (1650 + 0.75 z) m/sec

The latter (the so-called Houbolt function) has been computed as an average for deeper water sediments by J. Houbolt of the Shell research laboratory, KSEPL at Rijswijk. It is thought that for levels deeper than 4 or 5 kms of sediment in parts of south Australia it may be rather fast, resulting in exaggerated thicknesses.