

AN INITIAL ASSESSMENT OF THE HYDROCARBON POTENTIAL OF THE KHARAN BASIN, WESTERN BALOCHISTAN, PAKISTAN

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The Kharan Basin is located in a remote western part of the Balochistan Province of Pakistan and is entirely obscured by superficial deposits of the Kharan Desert. The areally extensive basin is bounded to the north by volcanic arc complexes of Late Cretaceous-Recent age whilst to the south a series of hills are the most northerly surface expression of a Tertiary flysch belt that forms part of the large Makran Accretionary Prism. The subsurface nature of the Kharan Basin is entirely unproven but it is generally regarded as a Tertiary forearc basin within a trench-arc system that developed as the Neo-Tethys Ocean was subducted northwards beneath the continental Afghan Block.

During 1998-99 Murphy Pakistan Oil Company (MPOC) undertook reconnaissance work to assess the hydrocarbon potential of the Kharan Basin. Plate reconstructions, remote-sensing imagery, published geological maps and reports together with fieldwork provided regional context. A new airborne magnetic and gravity survey was acquired over the southern half of the basin. Integration of these data suggests that the Kharan Basin contains up to 7 km of highly deformed Tertiary flysch that is partly underlain by oceanic crust.

The area surrounding the basin is thermally overmature and no hydrocarbon seepages or potential source rocks have been identified. The widespread multi-storey clastic turbidites of the Miocene Panjgur Formation appear encouraging for reservoir development, but at outcrop they are tightly folded, cleaved lithic arenites with negligible porosity and permeability. Eocene turbiditic limestones are of limited areal extent and would rely on fracture porosity to be effective reservoirs. It seems reasonable to anticipate that the interbedded shales in the Panjgur Formation would form effective seals to a variety of compressional structural traps but only seismic data and drilling will confirm whether these play elements combine to form a productive hydrocarbon system.