Paper 11

Malaysia's new frontier — the Sabah Trough

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Murphy Sabah Oil Co., Ltd. signed the Production Sharing Contract for Block K on 27th January 1999. The block covers an area of 16,496 sq km and it is located approximately 130 km offshore Kota Kinabalu (Fig. 1). It located within the Sabah Trough which is a major northeast to southwest trending bathymetric low with water depths ranging from 1,500 m to almost 3,000 m.

A series of NE-SW trending folds and associated thrusts are present on the continental slope within the block. The folds define the eastern margin of the Sabah Trough with some of the thrust anticlines forming a toe thrust zone. The western margin of the trough is formed by the downfaulted southeastern margin of the Sabah Platform, an area of shallower water depths which extends northwards towards the Dangerous Grounds (Fig. 2).

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To the east of the Block K is the Sabah continental shelf which comprises a thick sequence of Neogene clastics which are up to 12 km thick within the Baram Delta. The self has been divided into an Inboard and Outboard Belt. The Inboard Belt is bordered to the east by the outer belt of the Rajang Group Fold and Thrust Belt, comprising a series of imbricated deep water flysch sediments which developed as an accretionary wedge complex during the Palaeogene and earliest Neogene.

Stratigraphy for Block K can be divided into four stages. Stage I (Eocene to Cretaceous Basement), Stage II (Oligocene), Stage III (Lower Miocene) and Stage IV (Middle Miocene to Recent)

Block K is located in a proven petroleum system in the emerging deepwater sector of Borneo, as demonstrated by recent deepwater wells in Sabah and Brunei. One of the significant reservoir potential within the block comprised of Basin Floor Fan turbidite sequences. Thick highstand shale and hemipelagic muds provide an excellent top seal. Migration can occur either cross-strata or via fault deep seated. Structural traps are very obvious on block K that is a key element to prospect definition.

Source rocks can be either from reworked terrestrial sediment or from lacustrine source in the underlying half-grabens. There are few trapping styles within the block, Pop-Up structures formed by movement along back-thrusts due to compression, sub-thrust where sediment traps underneath the thrust and large toe-thrust anticlines.

The seismic database for block K comprised 6,000 line km of 2D seismic lines. This year, Murphy is acquiring more than 3,400 sq km 3D seismic and with onboard processing we believe we can start the drilling program by second quarter 2002.