

# INTERPRETATION OF THE STRATIGRAPHY, STRUCTURE AND HYDROCARBON POTENTIAL OF THE VLAMING SUB-BASIN

The Vlaming Sub-basin occupies the region beneath the shelf and upper slope offshore from Perth and it forms the major depocentre of the offshore South Perth Basin. The sub-basin covers an area of some 10,000 km<sup>2</sup> between latitudes 31° 30' and 33° 30' S. It is about 100 km wide at its widest point, off Perth, Western Australia.

Some 3,000 km of multichannel and high-resolution seismic reflection profiles, plus an extensive suite of geological samples, were acquired by the AGSO's research vessel *Rig Seismic* from the Vlaming Sub-basin in the latter part of 1988.

Offshore petroleum exploration in the Perth Basin began in 1965. Twenty two wells have been drilled so far in the offshore part of the basin, fourteen of which are located in the present area of interest. In addition to the fourteen exploration wells, some 6,000 km of seismic reflection

profiles have been acquired in the offshore region of the South Perth Basin prior to 1990. Since 1990, reprocessing of existing lines and acquisition of new seismic data have been undertaken by some major oil companies.

The overall impression of the previous structural interpretation and mapping is the disjointed nature of the major faults throughout the Vlaming Sub-basin. This haphazard arrangement is seen as a result of not taking into account large horizontal offsets between faults, which are related to primary basement structures that are too deep to be imaged by conventional seismic surveys. The structural interpretation in this report is based on the premise that the faults within the sub-basin form a linked system, commonly with large offsets on individual fault traces. These offsets are, in general, related to pre-existing structures, most of which are transfer faults. These transfer faults have resulted

in the compartmentalisation of many structures within the basin.

There appear to be three main types of structural plays within the Vlaming Sub-basin. The most common structural plays are the arches that have been developed mainly along the eastern part of the sub-basin. These arches are interpreted as flower structures that have been produced by wrenching during the Early Cretaceous phase of structuring of the basin. These structures tend to be large and heavily faulted, and possibly they lack closure within individual fault blocks. However, there is potential for trapping at the Neocomian unconformity or possibly deeper within the axis of the arch. Other potential structural traps are closures associated with the upthrown blocks along faults.

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