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DEEPWATER EXPLORATION IN THE KUTEI BASIN, EAST KALIMANTAN

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ABSTRACT

A new, high potential exploration play is now emerging in the offshore Kutei Basin. Unocal has recently made two significant, deepwater discoveries in the East Kalimantan and Makassar Strait PSCs (Figure 1). Unocal is the operator for both PSCs with 100% working interest in the East Kalimantan PSC and 50% working interest in the Makassar Strait PSC (Mobil Oil holds the other 50% working interest).

The oil and gas fields discovered in the shallow offshore area (shelf) of East Kalimantan occur largely in Miocene sediments related to the ancestral Mahakam delta. Source for the hydrocarbons has been identified as delta-derived plant material. The Mahakam delta prograded across the shelf reaching its maximum seaward extent in the late Miocene and then episodically retreated shoreward to its present position.

As exploration proceeded further out on the shelf, it was recognized that good quality reservoir sandstones and hydrocarbon presence were trending into deeper water (Figure 2). It made no intuitive sense to believe that the working petroleum systems should be constrained to the shelf. Identification of trap as the primary remaining prospect risk factor led to the decision to acquire exploration 3D surveys over a large area of the present-day shelf margin and slope

environments (Figure 3). 3D seismic provided excellent imaging of potential reservoirs and direct hydrocarbon indicators in this emerging exploration play. Adoption of the SX (saturation exploration) drilling philosophy by Unocal beginning in 1996 allowed low cost, rapid exploration of the deeper water shelf areas. Through the use of 3D seismic and the results of the early SX drilling program, a model of deepwater sedimentation and the associated petroleum system emerged.

Drilling in the deepwater Kutei Basin has progressed out to 3700 foot water depths. Targets have been Pliocene and Miocene slope channels and base-of-slope fans, and Miocene shelf-edge reefs (Figure 4). The Merah Besar-1 well (November 1996) was the first potentially commercial deepwater discovery in East Kalimantan, confirming gas pay in Pliocene deepwater sandstones. Subsequent drilling (Merah Besar-8 in April 1997) discovered gas and oil pay in Miocene deepwater sandstones. Unocal's exploration program is moving into ever deeper water depths pursuing hydrocarbon accumulations in turbidite sandstones of submarine fan deposits. The recent (August 1998) significant Miocene oil discovery at Seno Prospect (West Seno-2), which tested >10,000 BOPD, is further confirmation of the validity and potential of this emerging exploration play. Utilization of exploration 3D seismic and Unocal's 'SX' philosophy has resulted in rapid, cost-effective evaluation and commercialization of deepwater Kutei Basin acreage.

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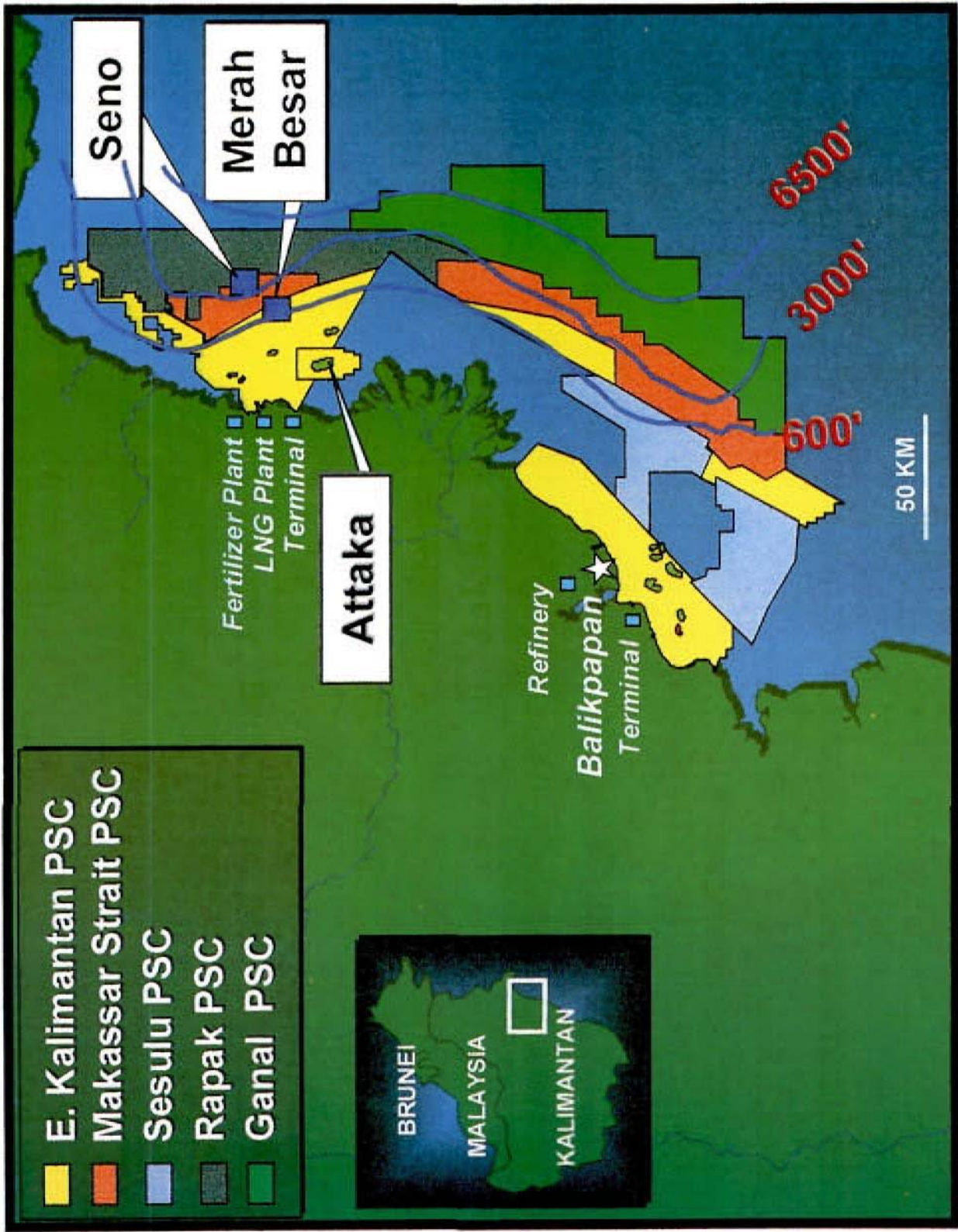


FIGURE 1 : Location Map Showing Deepwater Discoveries at Seno and Merah Besar, Offshore East Kalimantan.

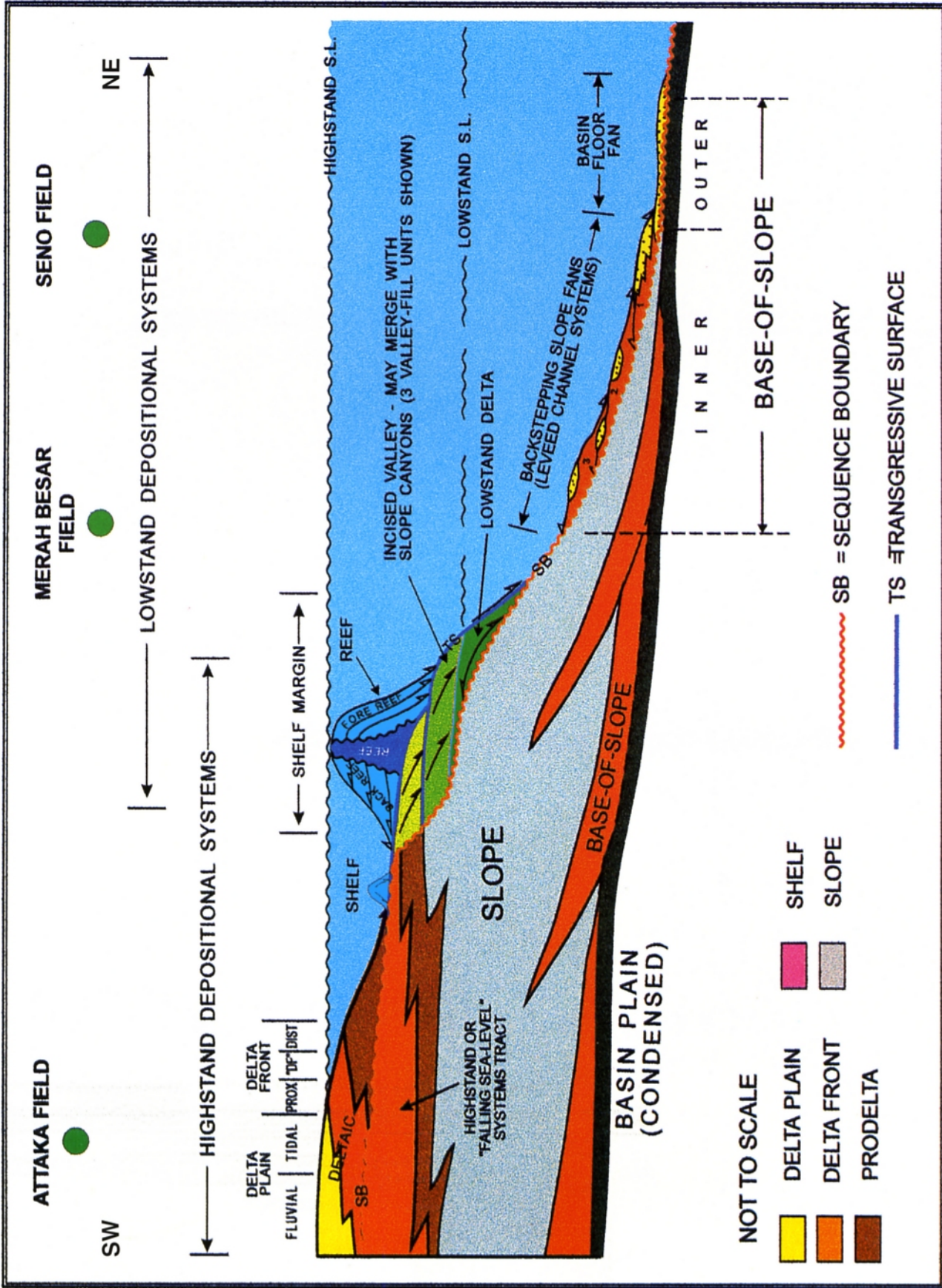
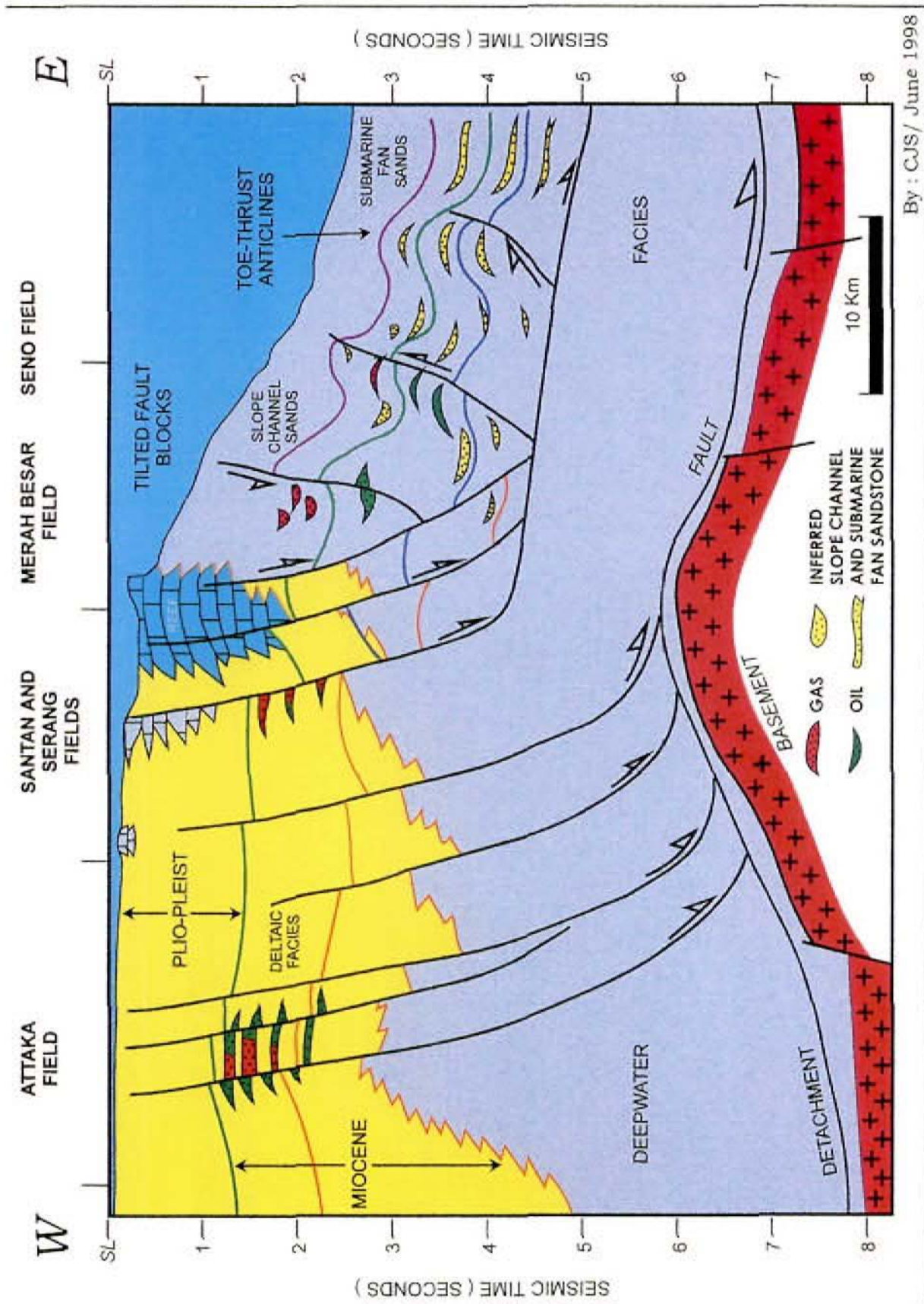


FIGURE 2 : Diagrammatic Cross Section showing Regional Distribution of Sedimentary Facies.



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FIGURE 3 : Schematic Regional Cross Section showing Major Depositional Systems and Syndepositional Structural Development.

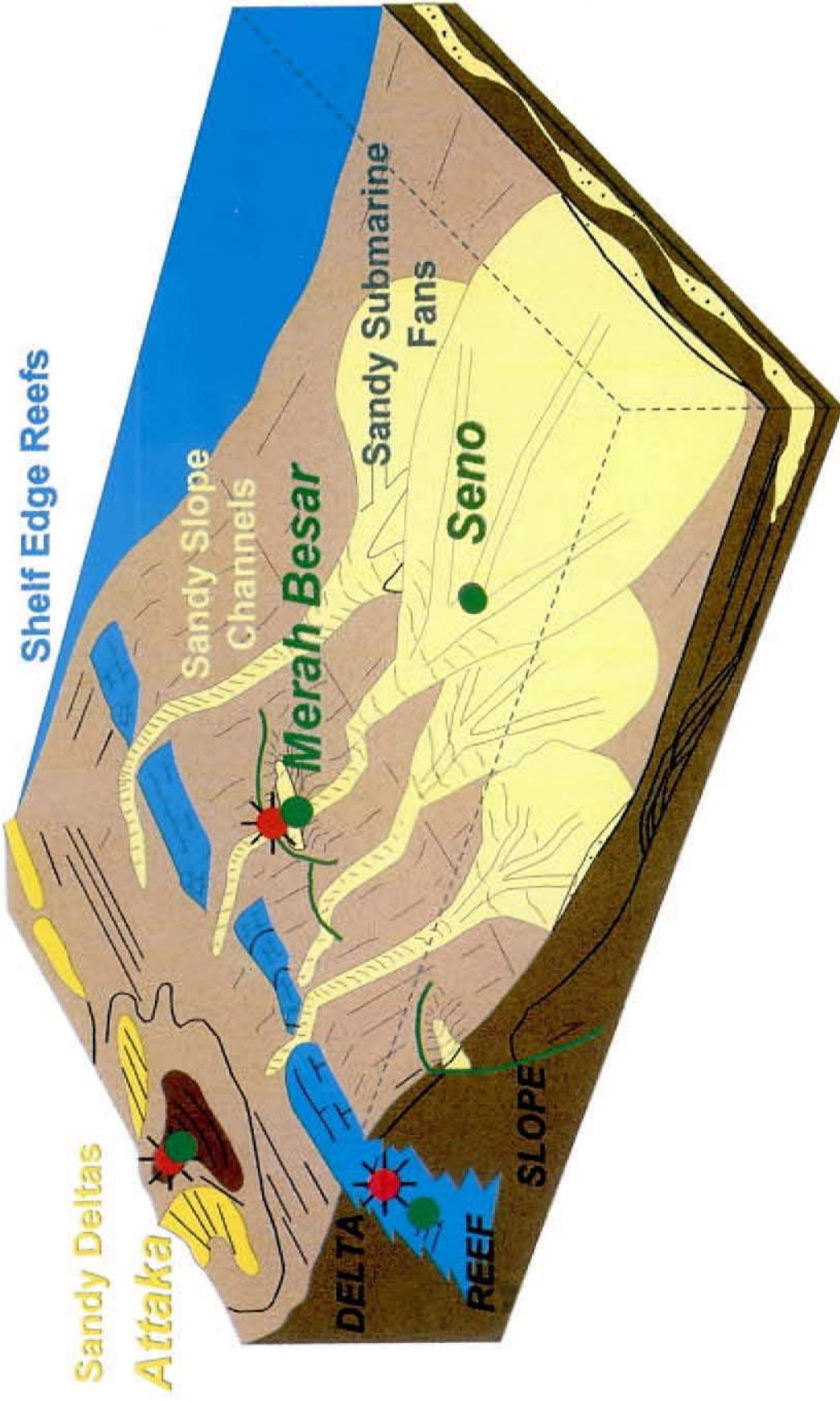


FIGURE 4 : Depositional Model for Deepwater Systems, Offshore East Kalimantan, Showing Relative Positions of Attaka, Merah Besar and Seno Oil and Gas Fields.