Short Note

Bulungan Delta Clastic Wedges

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Most of the gas and oil fields within the greater N.E Kalimantan basin are discovered in Tarakan subbasin (Fig. 1). The Tarakan subbasin, the most productive subbasin, developed significantly during Middle Miocene to Pliocene when accommodation space for an increased volume of deltaic sediments was created due to a combination of basin subsidence and gravity induced listric faulting. However, the uplift of the western basin margin that had begun after Late Early Oligocene and continued into Miocene created shallower depositional conditions in the northern part of the basin (Tidung and Tarakan subbasins). The newly emergent area to the west formed constructive deltas that prograded from west to the east. Nevertheless, in the southern area (Berau and Muara subbasins) the deposition was under stable condition whereby platform carbonates and deeper marine sediments filled the region.

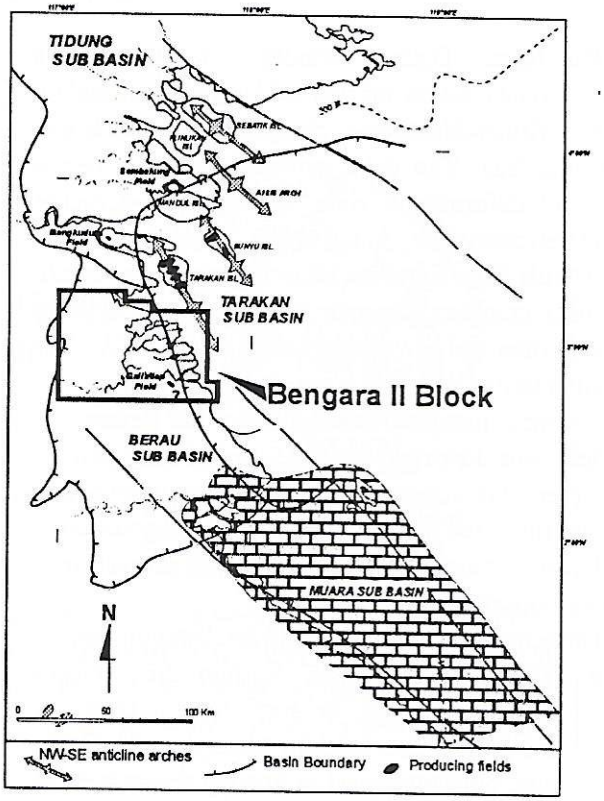


Fig. 1. Location map of the Bengara II Block.

Western part of the Tarakan subbasin had undergone several uplifts since its formation. The uplifting processes reached the peak at the end of Early Miocene and that time, the depositional environment changed completely from shallow marine to a deltaic-transitional environments. The Late Plio-Pleistocene tectonic activity affecting this area was compressive in nature, producing strike-slip faults, and locally inverted normal faults become reverse faults.

There are five transgressive-regressive depositional cycles recognized within Tarakan subbasin. Of those five cycles, only two cycles are proven as productive hydrocarbon producers. The first one is Middle to Late Miocene (16.5 to 6.6 Ma) regressive deltaic sequences composed of Meliat, Tabul, and Santul Formations, while the second one is Pliocene (6.6 – 2.8 Ma) Tarakan sandstone regressive cycle. Some sandstone portions of those four formations bear hydrocarbon, while known source rocks are only the shales of Meliat and Tabul Formations. Another potential reservoir is sandstone of the Sujau Formation of Late Eocene to Early Oligocene age.

Some seismic lines in the north central portion of the Bengara II block (Fig. 1), located on the southern part of the Tarakan basin, show the presence of clastic wedge features (Fig. 2) that can be time limited to the Middle Miocene Meliat and Naintupo Formations. These phenomena are closely related to the past tectonic and sedimentation events mentioned above. If it is attributed to the gas discoveries of Muara Makapan-1 well and Galiadap oil wells to the south boundary of the block, these wedges could offer potential traps within this area.

