

HABITAT AND C-14 AGE DATING OF LIGNITIC TERRACE SANDS – IMPLICATIONS FOR UPLIFT ON THE BORNEO COASTLINE DURING THE HOLOCENE

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Quaternary terrace deposits are very common along the Borneo coastline (H.D. Tjia 1983), often in conjunction with mangrove swamp environments, and these have been preserved on land, where terraces saw uplift in respect to the sea-level (Liechti et al., 1960; Hutchison, 2005). The terrace deposits lie above a marked angular unconformity that may have originated as an intra-tidal abrasion surface (Kessler, 2005).

The young terrace deposits lacing the Miri coastline from Miri to Bekenu (Figure 1) are formed by lignitic sands (Figure 2), fossil wood, and conglomeratic beds that contain reworked quartz pebbles derived from the older Tukau Fm below. The only fossils, other than wood, are Callianassa-style burrows (Figure 3), and are indicative for an inter-tidal to estuarine environment.

Field observations (in the context of stratigraphy, buried wood and compaction) suggested that the sediments might be young, and possibly younger than 50,000 years, which would bring the sediment into the window of C-14 analysis. Accordingly, ten (10) lignitic sand and fossil wood samples in

ten coastal profiles were sent for C-14-based age determination; with the results indicate an age range from Late Pleistocene to Early Holocene of 28,570 to 8,170 years.

The presence of Quaternary tectonism is particular interesting from the angle of petroleum geology. Significant Quaternary tectonism would have considerable impact on the trapping of hydrocarbons (breach and spill); hence it is an important question to be resolved. Given the terraces are block-faulted; implication is that the Miri Hill, in its present form, emerged during the Holocene. So-far, with the Holocene tectonics being confirmed for the Miri Hill, the question remains how much the oilfield below Miri City and undrilled prospects further east of the Miri Hill have been affected by these young movements.

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Figure 1: Elevation and profiles of the terraces in the surroundings of Miri.



Figure 2: Cross-bedded lignitic sands, with quartz pebble conglomerates.



Figure 3: Laminated lignitic sandstones containing Callianassa-type burrows.