GEOLOGY PAPER 21

LABUAN OUTCROP REVISITED: NEW FINDINGS ON BELAIT FORMATION FACIES EVOLUTION

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The sedimentary successions of the Belait formation exposed across the northern side of the Labuan Island has been studied by various workers such as Hazebroek, 1993; Levell, 1983, 1987; Tate, 1994. Based on his work, Mazlan Madon (1994, 1997) concluded that the basal Belait Formation was deposited in fluvial system developed over an eroded Temburong landscape in an overall transgressive regime. Facies development in the basal Belait reflects a quick change transition from fluvial systems (braided to meandering) to shallow marine successions represented by coarsening-upward offshore shales to shoreface sandstones.

The presence of two (2) new outcrops provide the opportunity to further study the lateral continuity and vertical facies succession within the Belait Formation. A total of nine (9) outcrop sites including two (2) new locations were studied and logged and 142 samples were taken and analysed for biostratigraphic information.

Results showed that the fluvial succession within the Belait Formation is not presence above the Temburong Formation at the new outcrop and replaced by coastal plain, fresh/brackish water estuarine successions. The fluvial succession thickened away from the new outcrop in the direction of Layang-layangan in the west and Tg. Kubong to the east. Furthermore, the fluvial succession in Tg. Kubong is also thinner than previously reported (Mazlan, 1994). Rapid change form fluvial to estuarine environment was observed based on biostratigraphic data. Interms of vertical facies development, we proposed that there are two (2) incised valleys developed where the fluvial succession was deposited and rapidly overlain by brackish water fluvial-estuarine deposits. The new outcrop area is interpreted as an interfluve and appears to be where the center of the anticline is located. The relatively thin fluvial to shallow marine transition above the sequence boundary, implying rapid deepening due to the steepening depositional surface, coupled with rising sea level and uplifting in the new outcrop area. This finding will help us in understanding the relationship between sea level, tectonic activity and vertical/laterar\l facies development.

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