# CERAMAH TEKNIK TECHNICAL TALK

## Deep marine, channel-to-lobe transition deposits of the Oligocene – Miocene Tajau Sandstone Member, Kudat Formation, Sabah

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The above talk was delivered by Dr Hafzan Eva Mansor (UMK) on 22nd June, 2023 via Zoom. Some 80 members participated. An abstract of the talk is given below:

**Abstract:** Channel-lobe transition zones (CLTZs) are identified in many modern deep-water systems, but few exhumed examples have been identified. Exposures of the Oligocene-Miocene Tajau Sandstone Member (TSM), Kudat Formation, northern Sabah, Malaysia, provides the opportunity to document a CLTZ from an active basin margin. This work provides the first detailed field-based sedimentological logging to produce a quantitative database on facies, sedimentary structures, bed type, and statistical analysis. This is particularly important to produce a robust stratigraphic framework of the TSM. Sedimentary facies support interpretation of subaqueous sediment density flows, and key features, including scour-fills, antidunes, and dune-scale bedforms, suggest changes in gradient and/or flow confinement and the development of hydraulic jumps. Eight bed types are recognized including: (a) tripartite beds with a debrite (BT1), interpreted as hybrid event beds recording downslope flow transformation between turbulent and laminar states; (b) beds with a mixture of depositional, erosional, and bypass features (BT2, BT4, BT5), interpreted as recording the transitions between supercritical and subcritical flow conditions triggered by hydraulic jumps; (c) bipartite beds with a basal massive sandstone overlain by fine-grained facies (BT3), interpreted as hyperconcentrated flow deposits with evidence of downcurrent flow transformation; (d) bipartite beds with a basal high-density turbidite sharply overlain by a low-density turbidite (BT6), interpreted as turbidites with evidence of sediment bypass; (e) basal tractive structures capped by fine-grained facies as the product of reworking of very coarse- to coarse-grained sediments caused by lateral spreading of turbulent flows; and (f) Bouma Tbcde sequences (BT8) interpreted as high-to-low-density turbidites. Our depositional model for the TSM comprises: (a) an aggradational channel-lobe transition zone (CLTZs/BTA 1 and BTA 2) which was dominated by hydraulic jumps and sediment bypass; and (b) stacked lobe (i.e., lobe-axis/BTA 3a, lobe-off axis/BTA 3b, frontal lobe fringe/BTA 3c, and distal lobe fringe/BTA 3d) located in the northern and southern parts of the study area, which is dominated by tabular, sheet-like elements bioturbated with the Nereites ichnofacies. The aggradational stacking of CLTZs deposits observed in the TSM may be explained by high subsidence rates combined with high sediment supply rates associated with a tectonically active margin setting.

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