

The Possible Significances of Coals Encountered in Cored Sections from the Central Malay Basin: Implications for Sequence Stratigraphic Interpretation and Basin Character*

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Abstract

Cores from E Group sections (Miocene) from the central Malay Basin have been the subject of studies to provide the basis for improved understanding of reservoir sequences. These studies included detailed core description and dense sampling for combined micropalaeontological and palynological analysis.

Reservoir sandstones in the cored sections were most probably deposited within river dominated shallow water deltas or sub-deltas in a lacustrine setting. Possible present day analogues may be found in the Catatumbo River delta in Lake Maracaibo, or alternatively in the Volga and Ural deltas prograding into the shallow waters of the Caspian Sea.

The coals studied have been shown to be of both freshwater and brackish origin, based on the palynological and micropalaeontological content. In all cases they represent phases of drying out of much of the basin, some being correlatable regionally. They are usually underlain by variably well-developed seat earths which show high levels of bioturbation/pedoturbation and also often contain marine to brackish water microfaunas. As such these seat earths often represent the most saline/marine sediments in a given genetic sequence. The coals are generally rootleted and the seat earths are pale grey in colour, indicative of soil zone leaching. Peat accumulation is invariably terminated by a flooding event. This may be freshwater or brackish, indicated by the palaeontology and bioturbation index.

The conclusion drawn from these observations is that at various stages of the fill of the Malay Basin, much of the area was prone to regular drying out, with the establishment of widespread coal forming peat. River channels formed at the same time as the peat and dissected the area, which is thought to have been low relief, but occasionally flood events breached the channel margins and killing the peat mires, at

least locally. Peat accumulation was brought to a close by flooding of the basin, either with fresh or brackish water. This suggests there to have been a barrier to the basin, preventing or restricting the ingress of saline water. The presence of brackish water coals may approximately locate the paleo-coastal belt for a given cycle and the upward change in coal character indicates increasingly freshwater conditions. This in turn suggests that peat facies belts may have been migrating basin-wards during phases of falling sea levels, resulting in the establishment of more widespread peat swamps.