

Late Triassic-Early Jurassic Non-Marine to Marginal Marine Sequence Stratigraphy and Palaeogeography of the Rankin Trend and Surrounds, Northwest Shelf, Australia

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The Greater Rankin Trend area is unique on the Northwest Shelf in that there appears to be a continuous stratigraphic record from the Upper Triassic I unit to the top of the Lower Jurassic C unit that has been penetrated by the drill bit [upper Mungaroo Fm-North Rankin Fm]. This produces a composite stratigraphic section of over 2000 m of nonmarine–nearshore marine strata of which much of the upper 600 m has been continuously cored. A major problem in trying to reconstruct this stratigraphic section for the Dampier Sub-basin is that when the older part of the section is penetrated, the younger sequences are often truncated by a major Oxfordian unconformity termed the MU event. When the younger sequences are preserved, the older ones are not drilled. The older Triassic sections that are deeply eroded and capped by the MU event are often difficult to place stratigraphically because of poor biostratigraphic control in the predominantly nonmarine settings. Despite these problems, the extensive drilling in the Greater Rankin Trend provides what appears to be a complete composite stratigraphic section within a confined area.

A revised sequence stratigraphic model is proposed for the region based on detailed well coverage on the Rankin Trend and a regional grid of key wells covering much of the Dampier Sub-basin. This covers events ranging from regional 2nd – 3rd order surfaces to 4th order or higher, reservoir specific cycles on the Rankin Trend. These surfaces are then used to slice the stratigraphy in a time related context to produce a set of semi-regional paleogeographic maps illustrating sediment source direction and potential sand distribution.