Late Jurassic Deepwater Depositional Systems of the Dampier Sub-Basin, Northwest Shelf, Western Australia

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The Dampier Sub-Basin lies at the northern end of the Carnarvon Basin on the North West Shelf of Australia. In terms of the amount and quality of data available the Dampier Sub-Basin is perhaps one of the best examples of a failed intra-continent rift within the Asia-Pacific region. Almost the entire rift and a significant proportion of its margins are covered by 3-D seismic data and over 300 exploration, appraisal and development wells have been drilled within the rift and its immediate surrounds. It provides an excellent natural laboratory within which to study aspects of the structural and depositional evolution of a rift system. This paper uses regional 3-D seismic interpretation and visualisation to illustrate the structural development of the Jurassic rift system and the effect of the evolving rift topography on the geometries of deepwater depositional systems during this time.

Within the Dampier Sub-Basin the rift climax occurred during the Callovian-Oxfordian. The resultant rift basin fill is dominantly comprised of deep marine clastic sediments which attain thicknesses of over 2000 metres in the depocentres. This paper integrates observations from well data with an evolving structural template defined by regional isopachs of key sequences in order to illustrate depositional models for the main deep marine sand fairways within the Late Jurassic rift.