

Developing a Regional Stratigraphic Framework for the Late Miocene to Middle Pleistocene, NCMA, Trinidad & Tobago

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Abstract

The Late Miocene – Pleistocene basin-fill of the North Coast Marine Area (NCMA), offshore Northern Trinidad and west of Tobago, comprises a predominantly mud-prone succession interspersed with a series of sand-prone clastic wedges. Not only do these form the reservoirs in the producing dry gas fields of the BG-operated NCMA-1 licence block but they also represent the focus of on-going exploration prospectivity across the region. There are also a number of gas discoveries located to the north of this area, within the Block 22 and NCMA-4 Licences operated by Centrica. Currently, this shelfal to deep marine succession is poorly constrained in terms of formal, published lithostratigraphy, with the reservoir sand units being informally-named as “M series sands”.

Recent, detailed biostratigraphy from across the NCMA now provides a high resolution stratigraphic framework for this offshore region. Through the integration of seismic and sedimentological data, a regional stratigraphic framework is presented. This framework describes a series of chronostratigraphic time slices, referred to as the North Coast Unit (NC) scheme, which recognises seismically constrained units calibrated to biostratigraphy and palaeoenvironment. Well-based biofacies interpretations provide a basis to understand both vertical (stratigraphic) and lateral (time-correlative) variations in depositional setting and palaeodepth. The scheme therefore provides a basis within which individual sandstone reservoirs can be recognised and defined. A proposal is put forward to adapt this scheme towards a lithostratigraphic hierarchy for the post Middle Miocene stratigraphy.

Although the Late Miocene – Pleistocene basin-fill succession across the NCMA can be mapped in great detail based on the integration of wireline log, conventional core and high quality 3D seismic data, the only outcrops of comparable age belong to the The Rockly Bay Formation which comprises small, scattered exposures on the southwestern tip of the island of Tobago. This paper will also investigate the stratigraphic relationship between the proposed NC Unit scheme and the Rockly Bay Formation exposures which have only previously been addressed informally based on broad age calibration.