# Macedon Member Reservoirs of the Lower Barrow Group, Western Exmouth Sub-Basin, Offshore Northwestern Australia: Integrated Results from Core Logging and 3-D Seismic Data Analysis

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Several commercial hydrocarbon accumulations are hosted within the Macedon Member reservoir sandstones of the Late Jurassic – Early Cretaceous Lower Barrow Group, a syn-rift succession found within the Exmouth Sub-basin, offshore northwestern Australia. The study aims to improve: (1) correlations between petroleum fields in the area; (2) understanding of the origin and evolution of the Macedon Member; and (3) understanding of similar sandstones. The Macedon Member has been previously interpreted as having lowstand affinity and deposited during a brief (~2 myr) time interval characterized by active extension. Results are presented from a preliminary study of the Macedon reservoirs within the western part of the Exmouth Sub-basin, part of a larger study being undertaken over the southern area of the Northern Carnarvon Basin. The results have both economic and academic significance, furthering knowledge of the Exmouth Sub-basin petroleum geology and sedimentary processes in Mesozoic rift basins globally.

The Macedon reservoir intervals in the Laverda, Enfield and Stybarrow fields are dominated by fine-grained poorly cemented quartz sandstones with a range of fabrics and sedimentary structures. Diverse sandstone lithofacies are recognized in cores, some of which can be resolved at the seismic data scale and correlated regionally. Utilising the techniques of core logging and analysis of 3-D seismic data and incorporating existing biostratigraphic and well log data it is possible to identify similar facies associations occurring within fields situated tens of kilometres apart.