

Beagle Deep Non-Exclusive Seismic Survey 1998 : Stimulating Australian Deep Water Exploration

by

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POSTER ABSTRACT

The 10,000 km Beagle Deep 2D Seismic Survey acquired by TGS-NOPEC Geophysical Company is Australia's largest non-exclusive seismic survey. It covers the deepwater portion (water depths generally within the range 500 to 2,000 metres) of the northern Carnarvon Basin and its immediate environs (outer Beagle Sub-basin, eastern margin of the Exmouth Plateau and western sector of the Rowley Sub-basin) in waters adjacent to the major North West Shelf gas/condensate fields. The area was included by the Australian Government in the 1998 Offshore Acreage Release.

The survey provides a 10 km regional grid of modern high quality seismic data in the south-western part of the survey area and a 20 km grid in the northeastern sector allowing explorers to better evaluate the petroleum systems in this little-known frontier region.

The data was acquired from November 1997 to November 1998 by *M/V Odin Explorer* using a Syntron digital streamer, HGS sleeve guns and the following acquisition parameters: 6,000 m streamer, 12.5 m group interval, 25 m shot interval, 2 ms sample interval, 8 second record length. Processing was carried out by Western Geophysical in Perth.

The Beagle Sub-basin represents the northernmost extension of the Carnarvon Basin, Australia's premier hydrocarbon province. The sub-basin is part of a series of Palaeozoic extensional and Mesozoic passive margin rift basins collectively known as the "North West Shelf".

Basin formation was initiated in Late Carboniferous to Early Permian times as part of a large scale extensional event along the entire North West Shelf (at that time a large intracratonic basin). Basin-wide inversion occurred during the Late Triassic and a later major structural event occurred during the Early and Middle Jurassic, when a series of horst and graben developed during rifting associated with the initial breakup of the Gondwana super-continent – tectonism largely involved reactivation of Triassic and older faults which were originally developed along the margin of the older intracratonic basin.

The major tectonic elements are the primary control on the distribution of source, reservoir and sealing successions developed throughout the region. The new survey shows unequivocal evidence of at least one active petroleum system and will facilitate construction of a regional stratigraphic and structural framework within which the occurrence and distribution of potential seal and reservoir facies may be analysed and predicted.

About the Author

Peter Baillie

PETER BAILLIE is a graduate of the University of Tasmania (B.Sc., 1970) and Macquarie University in (M.Sc. Hons., 1988). He was employed at the Tasmanian Department of Mines from 1970 until 1993 and held various positions in the regional geological mapping and petroleum exploration sections. In 1993 he moved to Department of Minerals and Energy in Western Australia as Manager of Petroleum Exploration and Production. He joined TGS-Nowpec Geophysical Company in 1997 and is Chief Geologist, working on non-exclusive programmes in Australia, Indonesia and Far East Russia. He is a Fellow of the Geological Society of Australia and is also a member of AAPG and SPWLA.