

## **INTERPRETATION OF A PERMIAN CONJUGATE BASIN MARGIN PRESERVED ON THE OUTER NORTHWEST SHELF OF AUSTRALIA**

*Christopher Paschke<sup>1\*</sup>, Gerard O'Halloran<sup>2</sup>, Craig Dempsey<sup>3</sup>, Christopher Hurren<sup>4</sup>  
BHP Billiton Petroleum, Houston, TX, USA, Chris.Paschke@bhpbilliton.com<sup>1</sup>,  
BHP Billiton Petroleum, Perth, WA, Australia, Gerard.OHallorane@bhpbilliton.com<sup>2</sup>, BHP  
Billiton Petroleum, Perth, WA Australia, Craig.Dempsey@bhpbilliton.com<sup>3</sup>, BHP Billiton  
Petroleum, Houston, TX, USA, Chris.Hurren@bhpbilliton.com<sup>4</sup>*

The Northwest Shelf (NWS) of Australia is characterized as a series of northeast-southwest trending Mesozoic offshore depocentres which both juxtapose and partially overprint a series of onshore, northwest-southeast trending Paleozoic basins. An integrated interpretation of well bore data, regional seismic data and plate tectonic models suggests that the Paleozoic section is also present below the Mesozoic depocentres. Referred to as the East Gondwana Interior Rift, the primary rift axis is oriented in a (present day) NE-SW direction, below the Mesozoic section, with orthogonal marginal rift basins such as the onshore Canning and Southern Carnarvon basins.

While precise age dating for the initial formation of the axial rift is speculative, our integrated interpretation suggests that a significant portion of the pre-existing rift was modified by a Mid-Permian extensional event, forming the Northern Carnarvon basin. Interpretation of recent acquired 3D reflection seismic data suggests that the conjugate basin margin from this Permian rifting event is preserved, and is visible below the Mesozoic section. A series of back-stepping, Late Permian carbonate ramps and banks is interpreted to form on a thermally subsiding rift flank. Our interpretation of these carbonate banks is based primarily on seismic geometries, and is supported by area well control and regional paleogeographic models.

This interpretation suggests that deep marine intra-continental basin bisected the NWS in the Late Permian. Then shallow marine conditions persisted across the conjugate margin through the Triassic and into the Jurassic. Only after Late Jurassic rifting associated with Gondwanan break-up, did the region subside into deep water.