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Geology and Exploration Potential of the Offshore SW Bintuni Basin, Semai-Gorong Area, Eastern Indonesia

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The hydrocarbon potential of the offshore part of the Bintuni Basin in the Semai-Gorong area has been sporadically investigated for many years. No wells have been drilled in the area due to the lack of sufficient seismic data coverage. In 2006, 5300 line kilometres of 2D non-exclusive seismic was acquired covering the offshore part of the SW Bintuni Basin, and as a result of subsequent interpretation, a number of large structures capable of holding significant hydrocarbon volumes have been identified at a variety of stratigraphic levels.

Despite the offshore SW Bintuni Basin's current location within a complex region of four plate interactions: the Australian, Eurasian, Philippines, and Pacific Plates, a thick Paleozoic to Mesozoic section has been mapped displaying a strong strati-structural affinity with the Australian Plate evolution. As the Australian and SE Asian regions approached each other during the Tertiary, the overlying section began to reflect an increasing influence of eastern Indonesia. Since the 5.5 million year collision, the offshore SW Bintuni Basin shows a similar dispositional history to the hydrocarbon-rich Bintuni-Salawati region.

The offshore SW Bintuni Basin covers three distinct structural provinces; the Seram Thrust Belt in the west, the deep water Seram Trough in the centre and the moderate to shallow water Seram Fold Belt in the east.

The area is underlain by an older extensional regime related to Gondwanian plate tectonics, which is overprinted by the uppermost Upper Miocene to recent series of compressional pulses progressively younging to the northeast. The western part of the area is severely compressed showing a complex of imbricate thrusts. Alternatively, the eastern area displays a series of gentle folds that propagate into shallow water and possibly onshore.

A number of stratigraphically distinct mature source rocks are interpreted to be present in the region. These are: Permian paralic carbonaceous claystones and coals, Middle to Upper Triassic restricted marine claystones, and Lower to Middle Jurassic paralic coals and claystones.

The new seismic data indicate the following Paleozoic to Recent plays, some of which contain multiple reservoir–seal pairs sourced by multiple non-marine to marine source rocks:

- Extensional Paleozoic rift fault blocks
- Triassic limestone build-ups
- Triassic to Middle Jurassic rift fault blocks
- Callovian to Oxfordian fractured limestone
- Upper Cretaceous to Lower Tertiary sandstones associated with the Middle Palaeocene Coral Sea rifting
- Miocene biohermal build-ups (the Kais Formation equivalent)
- Imbricate thrusts in the Seram Thrust Belt in the west
- Gentle folds in the Seram Fold Belt in the east