



Day: Wednesday 26 April
Time: 4:10pm

Session: 4

TIMOR GAP's Onshore Block: A Preliminary Assessment of Prospectivity in Onshore Timor-Leste

Tim Charlton*, Dino Gandara & Norberta da Costa Noronha
TIMOR GAP, E.P., Dili, Timor-Leste

TIMOR GAP, E.P., the national oil company of Timor-Leste, was awarded exclusive exploration rights to an Onshore Block in the SW part of the country in December 2015. Subsequently this block has been subdivided into three sub-blocks (A, B & C), each with an area of approximately 1000 sq km. These are currently being gazetted as full PSC licence areas.

Timor Oil Limited drilled 18 exploration wells in the current Onshore Block by between 1960 and 1973: 10 of these encountered hydrocarbons, with 2 (Matai-1/-1A and Cota Taçi-1) testing oil in subcommercial quantities. At least 37 natural and drilling-induced surface hydrocarbon seeps (14 oil, 23 gas) have been identified across the Onshore Block. More than 500km of seismic lines were acquired in three onshore surveys (1968, 1969/70 and 1994). Existing land survey gravity data is currently being supplemented by an airborne gravity-magnetic survey of the entire country undertaken by the Government of Timor-Leste. Reconnaissance field mapping has been carried out over the most prospective parts of the Onshore Block, and this will be enhanced by an extensive programme of detailed field mapping through 2017.

Oil seeps across Timor-Leste appear to derive from a Triassic restricted marine shale source. Potential reservoir successions occur in the Permo-Mesozoic (Triassic-Jurassic clastic successions comparable to reservoir targets on the Australian North West Shelf; and Triassic-Early Jurassic limestones comparable to the Manusela Limestone reservoirs of Seram island). A further important potential reservoir succession is the synorogenic (Plio-Pleistocene) Viqueque Formation which has measured porosities of up to 25-30%. Sealing shales are abundant within the Mesozoic succession, and occur interbedded with the sandstones of the Viqueque Formation.

The primary exploration targets in onshore Timor-Leste are currently considered to be late-stage inversion structures, both at a deeper Permo-Mesozoic level, and in more gentle late-stage folding of the synorogenic (Viqueque) succession. Initial focus by TIMOR GAP has been on the Matai Anticline near the town of Suai (Block A), which was also the first structure within the present Onshore Block targeted by Timor Oil. At Matai we provisionally identify pinchout and anticlinal traps within the synorogenic Viqueque Formation, and deeper inversion at the Mesozoic level. In the Betano area (Block C) comparable inversion structures are identified in the Permo-Mesozoic succession, and the possibility of prospectivity within fractured basement and the overlying Eocene Dartollu Limestone is also being considered. Further inland (Block B) large, structurally simple surface anticlines (Bazol and Aituto Anticlines) are associated with numerous surface gas seeps (and one oil seep), and the potential for hydrocarbons in the Permian cores of these anticlines is being investigated.

Speaker Biography

Tim Charlton received a Bachelor's degree in Geological Sciences from University College London in 1982, and a PhD from Royal Holloway College, University of London, in 1987 for a study on the structural evolution of southern West Timor. Between 1987-1989 he undertook postdoctoral research in the London University Southeast Asia research group, investigating the geology of the Tanimbar and Kei islands in the eastern Banda Arc; and as a member of the Sorong Fault Zone research project, carrying out fieldwork in Waigeo, Halmahera, Bacan, Obi and the Sula islands of northeast Indonesia. Since 1990 he has been an independent researcher and consultant on the geology and hydrocarbon potential of eastern Indonesia, and from 2000 focussing particularly on the geology and prospectivity of Timor-Leste. Since July 2016 he has been employed as Geoscience Advisor to TIMOR GAP's onshore exploration programme.