Malay Basin Upper Pliocene shallow, low pressure gas potential: Its implication towards onshore Peninsular Malaysia deltas hydrocarbon prospectivity

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Abstract: The offshore Malay Basin is best known for its expensive Tapis crude blend production since late 1970s. The south Malay Basin Duyong gas field started production in 1984 for domestic use, followed by Jerneh-Lawit fields, landing gas in Kerteh, Terengganu. These early oil and gas fields development were based on market prices of around US$40-50 per bbl oil, and below US$1 per 1000 scf gas. In contrast, small and marginal subsurface gas volumes were considered uneconomical. Previously these simple structures were found using 2D seismic data. Since 1984 the advent of 3D seismic technology has allowed better subsurface resolution of these major fields. Some fields 3D data still suffered wipe-out effects from shallow gas diffraction across the structural crest. However, most other fields show pockets of bright anomalies which were interpreted as shallow hazards. The seismic anomalies have been variously penetrated above the Groups B/D Unconformity as low pressure gas in silty sandstones. Since early 2000 many of these shallow gas have been successfully mapped and drilled through safer site investigation and shallow section drilling technology. The current higher gas prices allow them as fuel alternative to support platform operations. Expanding this idea beyond Malay Basin, would there be a similar subsurface model of shallow gas trapped in the onshore Plio-Pleistocene deltas of east coast Peninsular Malaysia. The lower coastal plain of Kelantan River Delta has about 4,000 sq km area, while the Pahang River Delta has some 5,000 sq km area respectively. Effective future onshore seismic and non-seismic data acquisition may assist in uncovering prospective hydrocarbon resource. Any substantial gas pockets present in stratigraphically trapped sand bodies can be quickly developed to power small turbines for domestic electricity or industrial needs.

Keywords: Malay Basin, seismic anomaly, Pliocene, delta