

Direct Hydrocarbon Indicators (DHIs) Derived from Analysis of Simultaneous Seismic Inversion Significantly Reduces Exploration Risk

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The Early Cretaceous Flag Sandstone has proven to be a prolific oil and gas producer within the Barrow Sub-Basin to the east of Barrow Island. The main trapping mechanism is four-way dip closed anticlines formed by drape compaction. The large structures have now been drilled and remaining prospects require the integration of data through the use of inversion technology. The variations in extracted seismic amplitudes at the Flag reservoir level are primarily related to variations in porosity or gas, and are therefore not seen as reliable indicators of oil charged reservoirs. Simultaneous inversion of three angle seismic stacks was applied to a 500 sq km area and a direct hydrocarbon indicator (DHI) attribute, fluid index, was derived as an exploration tool to minimize risk.

This presentation shows how the fluid index attribute was derived using a combination of well and seismic inversion data and summarizes the results of using fluid index (DHI) as a predictive tool based on the 2005/6 well results. The application of DHI technology to this mature hydrocarbon producing area has aided Apache and its joint venture partners in their assessment of remaining assets within their exploration permits.