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Characterization of Jurassic and Cretaceous Carbonate Reservoirs in UAE Through Advanced Seismic Conditioning and High Resolution Seismic Inversion

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ABSTRACT

The Lower Cretaceous Thamama Group and upper Jurassic Oolites are one of the most productive group of formations in the Middle East, containing large hydrocarbon accumulations. Thamama Group deposited along a gently sloping carbonate platform, is a thick sequence of limestone and dolomite with minor shales, with alternating reservoir and tight zones. The Oolites represent a large-scale eastward- prograding intrashelf basinal depositional system.

The reservoir characterization study encompassed classification of Thamama A-H zones and the upper Jurassic Oolites. The rock physics model predicted porosities with high confidence, using acoustic impedance and Vp/Vs. As most of the reservoirs were beyond seismic resolution, Pre-stack High- Resolution Geostatistical inversion (Stochastic inversion) was performed after the deterministic AVO Pre-stack Inversion, in order to improve the understanding of heterogeneities and vertical/lateral correlation of reservoir properties (e.g. Porosity) in areas of interest under sub-seismic scales.