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Unveiling Permian Upper Gharif Stratigraphic Traps in North Oman: A Geological Basis for Growth in Mature Basintitle

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Abstract

Recent exploration success across North Oman has highlighted the untapped potential of stratigraphic traps within the Permian Upper Member of the Gharif Formation. These discoveries underline the value of integrating advanced seismic technologies, legacy well data, and introduction of innovative geological concepts. The Upper Gharif stratigraphic traps have emerged as highly recoverable, low-UTC portfolio. Their geometries vary depending on geological and structural contexts—ranging from channels draped over structural noses to pinch-outs and fault-bounded traps where reservoir sands terminate against impermeable facies.

This presentation demonstrates how a forensic geological understanding of these trap styles can drive growth in mature basin, reduce exploration risk, and increase the probability of success. Despite the challenges associated with reservoir prediction and appraisal—where primary targets may occasionally be missed—contingent sidetracks offer viable alternatives for resource capture. Crucially, the application of spectral Wide Band Spectral Decomposition (WBSD) is a game changer in seismic interpretation by enhancing the imaging of channel and channel-belt systems, clarifying flow directions and reservoir geometries.

The stratigraphic trap potential of Upper Gharif in North Oman was relatively underexplored and had recently been the focus for exploration activities supporting the exploration growth initiatives. This work highlights how geological insight, integrated with advance geophysical tools, forms the foundation of a resilient exploration drilling strategy in complex stratigraphic settings.