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Seismic Stratigraphy and Facies Architecture of the Middle/Late Miocene Sequence Offshore Eastern Nile Delta (Egypt)

Deep offshore potential of the Miocene Sequence in the Mediterranean (Egypt) is still fully unexploited. Technical challenges and high explorative risks make this task extremely challenging. Middle and Late Miocene turbiditic sandstones represent the main reservoir levels of the more than 4 TCF of gas reserves existing in the NW/SE structural trend formed by Akhen, Temsah, Port Fouad and Wakar Fields.

Detailed Seismic stratigraphic and facies analysis, supported by regional sedimentologic and sequence stratigraphic framework, have been applied to build a predictive reservoir distribution model over undrilled sectors of the Eastern Nile Delta Province. 3rd and 4th Order Depositional sequences have been interpreted over a wide area and chronostratigraphically tied to Temsah/Akhen wells.

Above 15.5 m.y sb, after the Qantara Fm marly interlude, the northward sediments supply of the prograding delta filled mainly the closer depocenter of the basin and gradually onlap the structural highs.

Starting at 12.5 my enhanced clastic discharge prompt widespread reservoir occurrence. Depositional scenario is dominated by cross-cuttings channels with limited extent terminal lobes. Poorly evolved sand flows are mainly encountered. Rapid lateral facies changes, paleo-topography and accommodation rate differences complicate the latest Serravallian basin architecture.

Above 10.5 my Tortonian depositional sequences are encountered in areas not affected by the deep Messinian erosion. Entry points location act as a main critical factor for the Tortonian reservoir location.

Depositional sequences recognition and geometry definition provide a powerful tool to minimize reservoir distribution risk in the near future exploration of the potential deep offshore sector.