

Depositional Facies, High Resolution Sequence Stratigraphy, Reservoir Characterization of Early Oligocene Carbonates (Mukta Formation) Of North & Northwest of Heera, Mumbai Offshore

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Abstract : The study aims to determine the depositional facies, high-resolution sequence stratigraphy, and diagenetic processes of Early Oligocene carbonates in N & N-W of Heera, Mumbai Offshore. Foraminiferal assemblage and microfacies from cores of Well A, B, C, D and E are indicative of facies association related to four depositional environments, i.e., restricted inner lagoons-tidal flats, shallow open lagoons, high energy carbonate bars-shoal complex and deeper mid-ramps of a westerly dipping homoclinal carbonate ramp. Two high-frequency (4th Order) depositional sequences bounded by sequence boundary, DS1 and DS2, displaying hierarchical stacking patterns, are identified and correlated across wells. Vadose zone diagenesis effect during short diastem/ subaerial exposure has rendered good porosity due to dissolution in HST carbonates and occasionally affected underlying TST sediments (Well D, C and E). On mapping and correlating the sequences, the presence of thin carbonate bars that can be potential reservoirs are envisaged along NW-SE direction, towards north and south of Wells E, D and C. A more pronounced development of these bars in the same orientation can be anticipated towards the west of the study area.

Keywords : sequence stratigraphy, depositional facies, diagenesis petrography, early Oligocene, Mumbai offshore

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