

Seismic and Well-log Based Sequence Stratigraphy of The Early Cretaceous, Lower Goru “C” Sand of The Sawan Gas Field, Middle Indus Platform, Pakistan

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The additional hydrocarbon potential of the Early Cretaceous “C” sand of the Lower Goru Member is highlighted in the Sawan Field through overhauling its sequence stratigraphy using 3D seismic and inversion, spectral decomposition, well-logs and core sedimentology data. It is observed that the “C” sand, which was deposited at the shelf margin during a 3rd order LST, is resolvable into 6 distinct seismic events or progrades. Detailed mapping of these prograding clinoforms (TWT, amplitude, minimum acoustic impedance, isochrone and isopach) has been carried out over the whole Sawan Field to understand its genetic packages and their distribution within the basin. It is concluded that the sediments of the 6 seismic events were fed through multiple feeders showing switching of channel axes until filling of the available accommodation space. This resulted in partially overlapping delta lobes and hence controlled the distribution of reservoir quality sands. An erosional unconformity separates the Sawan “C” sand LST from the FSST (older progrades of the C-interval). The 6 seismic events are proposed to grouped into two subsequences (4th order). Sequence-I may consists of LST, TST and HST deposited mainly confined within the central Sawan compartment where relatively high rate of sediment supply is inferred based upon seismic geometries and well-logs signatures showing progradation associated with aggradation. Sequence-II started with the deposition of a LST from the Sawan South area followed by a TST deposited identified mainly in Sawan North, whereas HST deposits were again formed in the Sawan South area. Subsequently, these sediments were flooded by a 3rd order TST that provided a seal for the reservoir sands. The robust seismic based depositional model is updated using corebased sedimentology for integrated high resolution sequence stratigraphic analysis. All available data are integrated to prepare facies maps which help to locate and characterize new drilling targets. For future exploitation two areas in Sawan South and one in central Sawan are delineated within the lowstand system tracts of sequence-I and sequence-II.