

Reconstructing Deposition Environment Using Energy Regime Assessment of Stacked Sequences from Gamma Ray Log and 3D Seismic Data

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Abstract

Depositional sequence unbundling was done to understand the depositional environment from six wells through the analysis of gamma-ray logs using shale volume, and a 3D post-stack seismic. Identified hydrocarbon reservoir formations were laterally tracked to assess horizon continuity and spatial draping of the units. Horizon surfaces were built post-correlation to examine the bounded zones and reconcile sequences. Gamma-ray log motifs for the deposits indicate the presence of progradational, retrogradational, and aggradational sequence patterns that typifies prevalent energies at the time deposition, characteristic of deltaic environment. On the seismic sections, aggradational reflectors dominate over the other two. Although current well placements do not conform to structural attitude, petrophysical analysis done over the horizons indicate a significant increase in porosity and hydrocarbon saturation basin-ward (South-west), in the direction of the frontier prospect to site more wells.