

Seismic Stratigraphy and Geomorphology of the Bibiyana Gas Field, Bangladesh: How the Recognition of Sequence Boundaries Impacts the Understanding of Reservoir Architecture and Distribution

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Abstract

A sequence stratigraphic model constructed for the Chevron-operated Bibiyana gas field in Bangladesh shows how the recognition of sequence boundaries impacts the understanding of reservoir architecture and distribution. The stratigraphic model integrates 3D seismic reflection volumes with well data and was used to define and delineate geobodies that were incorporated into static and dynamic reservoir models. Using seismic stratigraphic/geomorphologic workflows, the architecture and distribution of the reservoirs at Bibiyana field are now better understood. The reservoir at Bibiyana gas field is divided into sequence stratigraphic units, each recognized by seismically defined sequence boundaries at both the base and at the top of the units. The reservoir sands are divided into two general categories: 1) erosional remnants of shallow-marine, tidal sands below sequence boundaries, and 2) channel sands at the base of incised canyons above sequence boundaries. The main reservoir, the BB60, is an erosional remnant below a major sequence boundary (SB60) sealed by the thick canyon fill shale. Locally, at the base of the canyon, “deepwater” turbidite-dominated sandstones are present and have reservoir properties that contrast with the underlying and adjacent shallow-water, tidal-dominated sandstones of the BB60

reservoir. Reservoir pressures are directly related to the position relative to the sequence boundaries. The pressure barriers are the transgressive shale units that fill the canyons above sequence boundaries. Review of the pressure data from the wells helped refine the final sequence stratigraphic correlation. The recognition that unconformities with overlying canyon-fill shales seal many of the reservoirs at Bibiyana is critical in understanding and modelling the reservoir architecture and performance over time. The sequence stratigraphic model of the Bibiyana field provides the cornerstone to both the static and dynamic reservoir models, currently being developed for the field.