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Timothy M. Demko¹, Penny E. Patterson², Howard R. Feldman², Christian J. Strohmenger³, John C. Mitchell⁴, Patrick J. Lehmann⁴, Ghaida Alshahlan⁵ Hamdah Al-Enezi⁵, Menahi S. Al-Anzi⁵ (1) ExxonMobil Upstream Research Company (currently at University of Minnesota, Duluth), Duluth, MN (2) ExxonMobil Upstream Research Company, Houston, TX (3) ExxonMobil Exploration Company (currently with Abu Dhabi Company for Onshore Oil Operations), Abu Dhabi City, United Arab Emirates (4) ExxonMobil Exploration Company, Houston, (5) Kuwait Oil Company

Sequence Stratigraphy and Reservoir Architecture of the Burgan and Mauddud Formations (Lower Cretaceous), Kuwait

An integrated, sequence-stratigraphic and biostratigraphic study of the Lower Cretaceous Burgan and Mauddud Formations, Kuwait, reveals a predictable distribution of reservoir facies and seal at both the field scale and regional scale. The Burgan and Mauddud formations form two second-order composite sequences, the oldest of which constitutes the lowstand, transgressive and highstand sequence sets of the Burgan. This lower composite sequence is subdivided into fifteen high-frequency depositional sequences, which are characterized by tide-influenced, marginal-marine deposits in northeast Kuwait that grade into more fluvial-dominated, continental deposits to the southwest. The second, younger composite sequence consists of the lowstand sequence set of the uppermost Burgan Formation and the transgressive and highstand sequence set of the overlying Mauddud Formation. These composite sequence deposits are sand-and mud-prone in south-southwest Kuwait and are carbonate-prone in north-northeast Kuwait. A major, second-order marine flooding surface at the top of the Burgan Formation in Kuwait is a regional chronostratigraphic boundary and can be correlated throughout the country.

The Mauddud composite sequence is subdivided into seven high-frequency depositional sequences. The lower Mauddud transgressive sequence set displays a lateral change in lithology from limestone in north Kuwait to siliciclastic deposits in the south. The traditional lithostratigraphic Burgan-Mauddud contact is time-transgressive. The upper Mauddud highstand sequence set is carbonate-prone and thins southward due to depositional thinning and significant post-depositional erosion at the contact with the Wara Shale.