

Depositional Model and Distribution of Marginal Marine Sands in the Chase Group, Hugoton Gas Field, Southwest Kansas and Oklahoma Panhandle.

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Since the 1930's, the Hugoton Gas Field of southwest Kansas and the Oklahoma panhandle has produced approximately 29 TCF from the Wolfcampian (Lower Permian) Chase Group. The rocks of the Lower Permian Chase Group were deposited on the broad shallow shelf of the Hugoton Embayment of the Anadarko Basin. Important reservoir lithofacies are dolomitized grainstone, carbonate packstone and grainstone, and marginal marine sandstone. In the Hugoton Field, marginal marine sandstone lithofacies comprise a significant portion of the reservoir volume, but are not well characterized. In many of these very fine grained sandstones, porosities range from 15-25% and have permeability in the 10-100 millidarcies range, making them excellent storage and flow units. The sandstones of the Herrington, Winfield, and Towanda Limestones and the Holmesville Shale are at the top and base of the marine portion of glacio-eustatic driven, marine-nonmarine cycles. Based on sedimentary structures, stratigraphic context (position within the marine-nonmarine cycles) and depositional geometry (broad, relatively thin sheets), these sandstones are interpreted as deposits of tidal flats to shallow subtidal environments of the upper shelf.