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Exploration Potential and High-Resolution Sequence Stratigraphy of Shelf-Sand Reservoirs, Miocene, South Mississippi

Following late Oligocene delta progradation in south Mississippi, a 2nd-order rise of sea-level (early Miocene) resulted in the deposition of a series of higher-frequency sequences that include a newly discovered gas reservoir at Mariner field. The quartz sand reservoir occurs within the lower Miocene *Amphistegina* sand in southern Hancock County. Core analyses indicate ~33-36% porosity and 0.5-8.0 darcies of permeability. The sand is interbedded with shallow marine shale and marly limestone. Thin-section examination shows *Amphistegina*, nummulitids, other shallow marine fauna and glauconite.

Regional 2-D seismic lines illustrate rather discontinuous to continuous bright reflections in the reservoir interval above several southward-progradational delta systems belonging to the Midway, Wilcox-Sabine, Claiborne, Jackson and Vicksburg Stages (Baum and Vail, 1988) with clinoform geometry. Similar progradational delta geometry is also evident within the Jackson-Vicksburg interval in regional well-log cross sections. Analysis of well-log stacking patterns and well-log correlations suggest that producing *Amphistegina* sands comprise isolated shelf-sand ridges of a transgressive systems tract and that they overlie incised valley-fill deposits of a lowstand-transgressive systems tract. A maximum flooding surface forms the topsealing upper boundary to the reservoir, and the sealing beds are downlapped by clinoforms of highstand deltas. In some areas, delta progradation was terminated by base-level fall and probable valley-floor incision.