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Petroleum exploration and stratigraphy of the Lower Cretaceous James Limestone (Aptian) and Andrew Formation (Albian): Main Pass, Viosca Knoll, and Mobile areas, northeastern Gulf of Mexico

Abstract

Hydrocarbon exploration of Lower Cretaceous carbonates on the outer continental shelf began in 1968, with the Andrew Formation and James Limestone as targets. Seven fields were discovered in this carbonate trend: the Andrew Formation's Main Pass 253 and Main Pass 221 (relinquished); the James Limestone's Mobile 991, Viosca Knoll 69, Viosca Knoll Block 114, Viosca Knoll 252, and Viosca Knoll 256 (terminated). In 1986 Tenneco's Viosca Knoll Block 117 well No. 1 initially encountered James Limestone gas while drilling to a deeper Jurassic target. Lower Cretaceous hydrocarbon potential remains in relatively unexplored regions of the the southern platform in the Desoto Canyon/Florida Middle Ground areas, Tampa Basin, Sarasota Arch, and the South Florida Basin adjacent to the Lower Cretaceous shelf-edge reef trend.

Stratigraphically positioned between the Dantzler and Paluxy formations, the Andrew Formation is composed of an upper Washita and two Fredericksburg age carbonate platforms separated by shelf mudstones. The James Limestone, comprising upper and lower members, dominates thin shale members of the Pearsall Formation. Six facies compose the Lower Cretaceous carbonates where grainstone detritus zones, adjacent to reef/patch reef boundstones, were redistributed by wave action over the interior platform. Shelf lagoonal micrites nearest the paleoshoreline occur in the central and eastern portions of the Mobile and northern Viosca Knoll areas. Shelf-edge reef boundstones interfinger with oolitic grainstones on the shelf and forereef mudstones off the shelf.

Biographical sketch

Andrew J. Petty has worked 20 years for the Minerals Management Service in New Orleans, Louisiana, in the Rate Control Section and as Corpus Christi district geologist. He is currently in the Basin Analysis Unit where he has authored several papers on biostratigraphy in the Eastern Gulf of Mexico. Andy holds a BS from Stephen F. Austin State University (1973) and an MS from the University of Texas at El Paso, (1975). □

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