

NORTH AMERICAN EXPLORATIONISTS

Development Drilling and Assessment in a 40-year Old Oil Field: New Opportunities Through the Integration of Depositional System and Sequence Stratigraphic Analyses with Cumulative Production Histories

by Daniel B. Schafer and Henry W. Posamentier

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Social Period, 5:30 p.m., Dinner and Meeting, 6:30 p.m.
H.E.S.S. 3121 Buffalo Speedway

Grand Isle 43 is an oil and gas field in the Gulf of Mexico that was discovered in 1955. This field is currently being re-evaluated in the context of depositional system and sequence stratigraphic analyses. These analyses, which are largely well log and, to a lesser extent core based, have been integrated with cumulative production histories and have led to the identification of bypassed or underexploited reservoir compartments, and consequently additional drilling locations.

This study focuses on the Middle Miocene JR sandstone, one of 93 pay sands in Grand Isle 43. Reservoir compartments in this field are delineated primarily by

flooding surfaces overlain by fine-grained transgressive deposits, and maximum flooding surfaces, lying within fine grained transgressive to highstand deposits. At initial discovery, a common oil/water contact was observed in the JR sand. Recent drilling, however, has shown there to be multiple oil/water contacts as some compartments have been drained and others not.

The depositional model suggests that the producing sandstones are part of a shingled, offlapping shelf-edge lowstand systems tract progradational shoreface/deltaic succession. Several orders of permeability barriers have been identified.

These include first order barriers comprising shales deposited as part of the transgressive to highstand systems tract. Second order barriers are shales deposited in response to lobe switching and minor depocenter shifts within a given lowstand. Third order barriers comprise shales deposited within a given progradational event and are associated with a shingling architecture. Careful analysis of production history and perforation strategy, combined with analysis of recent drilling results within a tightly constrained sequence stratigraphic framework has revealed that significant bypassed pay remains in this 40-year old field.

DANIEL SCHAFER –

Biographical Sketch-



Daniel Schafer is currently a Senior Geologist with Vastar Resources, Inc. in

Houston. Daniel has worked his previous 18 years with the Atlantic Richfield Co. in many varied assignments. His initial assignment with ARCO was in their Research Lab where he was active in applied research related to district operations with emphasis on sedimentology, petrology, and geochemistry. Additional assignments took Daniel to Alaska where he worked in a development mode on the Sag River, Shublik, and Sadlerochit Fms. within the Prudhoe Bay Field. This work culminated in the final solution of the Prudhoe Bay Equity Determination which was based on a best technical answer related to rock properties and fluid saturations. Recently Daniel has been working in Houston on Exploration

and Exploitation in the Offshore Gulf of Mexico. However, his primary emphasis is on development opportunities in the producing fields of the Grand Isle/West Delta complex. His involvement in this development assignment has brought new drilling to some once thought depleted oil and gas fields.

Mr. Schafer received a B.S. (1977) in Geology, and a M.S. (1979) in Geology from the University of Texas at Arlington. He is an active member of the AAPG and the HGS and has presented papers on Low Resistivity Pays, Sequence Stratigraphic Principles, and Development Opportunities in Old Oil and Gas Fields.