

by Michel Puzio,
Mayne & Mertz, Inc.
Houston, Texas

A re-evaluation of the Hackberry — new life for a comatose trend

The Hackberry trend of southeast Texas and southwest Louisiana has posed one of the Gulf Coast's most perplexing targets for petroleum exploration. Thick pay with outstanding reservoir quality at moderate drilling depths has lured many explorationists to try to unlock its potential. However, reservoir extent has, in the past, been unpredictable, at least in part as a result of multiple unconformities and poor structural and stratigraphic resolution. Economic success was elusive, and the play was all but abandoned during the late 1980s and early 1990s.

A regional re-evaluation of the geologic model arose from the assimilation of well log correlations, dipmeter use and evaluation, interpretation of paleo reports, and the combination of quality 2-D seismic data throughout Jefferson and Orange Counties, Texas, and Calcasieu Parish, Louisiana. From this work it became very apparent that the majority of the trend should be interpreted as a subunconformity/slump block play and not a deep-marine, basin-floor/turbidite sequence. The new model predicted reservoir extent and thickness concisely and logically, not as an artistic contouring exercise.

The history of the basin is one of prograding shallow-marine deposition rising out of the lower Frio Formation through the *Nodosaria blaspiedi* and *Nonion struma* zones, followed by thick shallow-water deposition of up to 500 feet of strand plain sands in the upper Frio Formation. Basin collapse, resulting from regional salt withdrawal and development of salt domes caused over-steepening of the sea floor, resulting in slumping within the soft sediments from the Vicksburg Formation through the early strand plain deposits. Wave-base erosion removed the majority of the youngest sand section. It was followed by marine shale deposition containing a diagnostic Hackberry faunal

assemblage. As subsidence ceased and the basin finally filled with shale, shallow-marine strand plain deposition continued through deposition of the upper Frio section.

Armed with this geologic model, a group of industry partners partook to gather regional 3D seismic coverage in order to take advantage of greater than 500 undrilled square miles that still existed in the trend. Eventually the effort resulted in 24 successful wells out of 29 attempts. Additional information from over 520 square miles of 3D seismic data and our drilling shows that the model developed earlier has been highly accurate and very helpful in predicting reservoir age and extent and production performance of individual wells. This work has renewed the interest in exploration throughout this play and resulted in more than 900 square miles of 3D data acquisition and an additional 40 wells being drilled by other oil and gas companies.



Biographical Sketch

Michel Puzio is the geologist at Mayne & Mertz, Inc., Houston, Texas. He received his Bachelor of Science degree in geology and attended graduate school at Michigan State University in East Lansing, Michigan.

Mr. Puzio's career started at Amoco in 1980, where he worked on the Lobo trend of the Wilcox and the Vicksburg of the middle Texas coast. From 1984 until 1992 he worked for Bartell Exploration in Houston, where he began his work in the Hackberry trend. He joined Mayne & Mertz when they opened an exploration office in Houston. □