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David C. Jennette¹, Khaled Fouad¹, Francisco Grimaldo², Rafael Munoz², Carlos Williams², David Barrera² (1) Bureau of Economic Geology, University of Texas, Austin, TX (2) PEMEX

Stratigraphic Traps in Miocene Turbidite Reservoirs, Veracruz Basin, Mexico: New Plays for the Gulf Coast Basin

The Miocene gas reservoirs in the reemerging Veracruz Basin may provide a striking contrast to the conventional exploration targets from the northern Gulf of Mexico. Attractive drilling opportunities for oil and gas reserves in conventional deepwater sandstone plays from the northern part of the basin have been successfully identified from a combination of bright amplitudes and favorable structural position. Seismic geometries commonly indicate stratal onlap onto salt flanks or mud diapirs, giving rise to lateral pinch-out traps. These Miocene through Pleistocene reservoirs are a mixture of sandy turbidite sheets/lobes and sand-rich, variably amalgamated channel complexes as well as classic leveed channel complexes, and most of the gas-bearing sandstones are low impedance.

The Miocene deepwater play of the Veracruz Basin has several important differences from its northern cousin. Veracruz was fronted on the landward side by high-gradient mountains, which shed sand and conglomeratic material into a tectonically structured deep marine basin. These deposits are found today as high-impedance reservoir bodies confined within erosional canyons or by shale-rich levees. At least one gas field is the result of lateral and updip pinch-out of conglomerates into shale. The lower and middle Miocene clastic feeder systems transitioned into classic sand-rich fans that contain clear channel elements that have trapped gas in meander bends draped over noses and anticlines. As progradational clinofolds filled the basin's remaining accommodation space during late Miocene and lower Pliocene time, narrow sinuous turbidite channels and associated small distributary complexes formed. These channels contain stratigraphically trapped gas and represent a new low-risk play that PEMEX is exploiting with the use of recently acquired 3-D surveys. On balance, the turbidite systems from the Veracruz have greater similarities to turbidite reservoirs currently being encountered along the West Africa Atlantic margin (Angola, Nigeria) than those occurring in the northern Gulf basin