Natural Gas Reservoirs in the Tertiary Basins of Mexico

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ABSTRACT

The largest Mexican natural gas fields in Tertiary siliciclastics, based on their cumulative production, are the Jose Colomo Field (2.6 TCF) in the Macuspana basin and the Reynosa Field (2.4 TCF) in the Burgos Basin. These fields represent the main basis for general knowledge of the natural behavior of Tertiary gas sand deposits.

In Mexican Tertiary clastic basins, the more productive sedimentary systems are identified in Oligocene and Eocene sands of the Burgos Basin, in Pliocene-Miocene sand deposits of the Veracruz Basin, the lower Miocene-Pliocene in the Gulf of Mexico's Continental Shelf and in the lower Miocene-Pliocene of the southeastern basins.

All the Tertiary gas reservoirs in Mexico known at the present day have a direct genetic relationship with the sedimentary and structural evolution of the western margin of the Gulf of Mexico. The Burgos Basin structures were created in an extensional regime, with extensional fold bend folds with associated growth strata. The Veracruz Basin contains hybrid structures created by compression affected with delayed extensional faulting. The Macuspana Basin displays deformation associated with the Miocene transpressive tectonics, to the Chiapas Mountain front compression and to the Neogene thermal subsidence of the Gulf of Mexico's depocenter.

The natural gas reservoirs in Tertiary clastic rocks in the Mexican basins vary in physical and flow characteristics based on their depositional environment, mineralogical composition and permeability, but they have in common that the energy mechanism is driven by rock-fluid expansion. Confinement conditions usually dominate the pressure spectrum that occurs in this type of reservoir, according mostly to the depth, however they do not always determine the magnitude of initial flow rates and productivity.

A comparative analysis of basic rock properties, static and dynamic characteristics and volumetric magnitude is approached for these reservoirs. Their importance as analogs for guiding the assessment of new gas fields is emphasized.