Tertiary Deep Water Systems in the Southern Gulf of Mexico

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ABSTRACT

Offshore exploration in the Tertiary terrigenous rocks in the Holok area, southern Gulf of Mexico, began in 2005. The sedimentary facies and depositional systems were established by well core studies and seismic attributes analyses.

The Eocene reservoirs are made up of carbonate turbidities which were deposited in the western portion of the area. Within the Oligocene succession, the reservoirs are found mainly in the north and west area, and are related to a deep water system that was rich in mud.

The Early Miocene deep water depositional systems can be classified as sand-rich submarine fans (at the base) and sand-rich ramp (at the top). These sediments are composed of feldspathic litharenites that were fed by southwesternward sediment influx. The gross thickness of these rocks can be up to 5500 ft (1700 m), with 20-25% porosity and maximum permeability of 100 mD.

The sedimentary processes were strongly influenced by the main compressive event in the Middle Miocene. During the Late Miocene and Early Pliocene, the turbidites were confined; these deposits, rich in mud, filled piggy back basins and salt mini-basins. From the Middle Pliocene to Pleistocene, the platform limit as well as a sedimentary progradation were depositional influences.

Based on this interpretation, seven plays have been established. The Early Miocene plays have the lowest geologic risk and widest areal extent.

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