Correlation of Sand Reservoirs of the Lower Tuscaloosa Formation in the Smithdale and East Fork Fields in Amite County, Mississippi

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ABSTRACT

The Upper Cretaceous Lower Tuscaloosa Formation has been a major hydrocarbon producer in southwest Mississippi since the 1940s, with discovered oil reserves in the billions of barrels. The mid-Cenomanian unconformity underlying the Lower Tuscaloosa created an extensive network of incised valleys. The transgressive sequences that occurred during the deposition of the Massive and Stringer Sand members filled the incised valleys with sediments, due to the low accommodation space, and this created a series of stacked channel sand deposits.

The Smithdale and East Fork oil fields located in Amite County, Mississippi, produce from the Stringer Sand Member of the Lower Tuscaloosa. The goal of this research was to determine if the two fields were producing out of the same channel sand based on petrophysical log signatures and isopach maps. Petrophysical logs were correlated in each field and used to determine sand thickness. An isopach map of the first sand was created to illustrate the channel pattern in each field.

Based on the results, the Smithdale Field appears to have characteristics of a braided and meandering channel, with multiple thick depocenters inside the main channel and prominent meander loops. The East Fork Field appears to be characteristic of a thinner meandering stream system. Different log signatures and sand patterns indicate there is little correlation between the two fields and that they are likely producing out of two different channel sands.

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