Regional Facies and Rheological Controls on Future Austin Chalk Exploration

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ABSTRACT

The Upper Cretaceous Austin Chalk formation was deposited in a shallow marine environment and consists of three main members: Chalk-Marl-Chalk. Similar to the Eagle Ford, the Austin Chalk is self-sourced from amorphous, sapropelic kerogen. Additional hydrocarbon production from the Austin Chalk can be derived from natural fractures that connect to the Eagle Ford. The occurrence, abundance and distribution of the main production drivers of the Austin Chalk (organic content and fractures) are controlled by depositional facies variations and their control on fracture development related to rheological properties.

Historic exploration and production has primarily been conducted by vertical well drilling, aimed at producing in areas of increased fracture densities and/or fault disconnected fault blocks. With the advent of unconventional lateral well drilling and completion practices, the Austin Chalk Play has once again become an area of exploration and production for E&P companies.

Our study utilized approximately 1000 wells across the Austin Chalk play within Texas and Louisiana to construct a regional stratigraphic correlation and allowed for petrophysical evaluation to provide lithological information within each well.

This information, coupled with CGG's paleogeology database, was utilized to generate Gross Depositional Environment (GDE) maps of the Austin Chalk play. Linking these observations with regional structural trends, production data and current producing fields, this study provides an insight to the key production drivers of the Austin Chalk related to facies and their reservoir potential.

Spence, G., 2019, Regional facies and rheological controls on future Austin Chalk exploration: GeoGulf Transactions, v. 69, p. 631.