Petrographic Analysis of Tuscaloosa Marine Shale (Upper Cretaceous) Core Recovered from the Eads Poitevent #1 Well in Lacombe Bayou Field, St. Tammany Parish, Louisiana

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EXTENDED ABSTRACT

The Upper Cretaceous Tuscaloosa Marine Shale (TMS) is estimated to extend downdip 30 mi north-south, 275 mi east-west, and can be found at a maximum depth 15,000 ft across south-central Louisiana and south-central Mississippi. The Tuscaloosa Group comprises a complete second-order depositional sequence, and the TMS corresponds to the inundated phase of the sequence. There is still considerable debate as to whether the Tuscaloosa Marine Shale is an extension of the time-equivalent Eagle Ford Formation of Texas (Lowery et al., 2017). The Cretaceous (145–66 Ma) has experienced several periods of anoxia, or decreased dissolved oxygen, in large parts of the Gulf of Mexico and is known to have endured many relative sea-level changes. Oceanic anoxic events are preserved in the sedimentologic record by the deposition of organic-rich black shales. The importance of the widespread marine anoxic events and its consequential deposition of black shale is apparent in the TMS section.

A detailed petrographic analysis of core from the Eads Poitevent #1 well recovered from St. Tammany Parish in Lacombe Bayou Field will be completed. Then, based on the core description, we will be able to constrain stacking patterns, the sequence stratigraphy, the depositional environment. Results from core description will be paired with thin sections and applied to sequence stratigraphy in order to complete a compete stratigraphic characterization of the TMS at Lacombe Bayou Parish Field. An in-depth knowledge of ichnology and sedimentary structures will act as a support to our petrographic observations. Sequence stratigraphy and the environment of deposition of the TMS as preserved in the Eads Poitevent #1 core will be determined. The presence of black shale can be observed in the core; shown as small-scaled bedding reiterations of sand, shale, and silt throughout the 135 ft section. The cyclic sedimentary beds also seem to be a result of storm deposits which occurred during sediment deposition.

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