

DIAGENESIS OF THE ARBUCKLE GROUP IN EASTERN AND CENTRAL OKLAHOMA, U.S.A

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ABSTRACT

Arbuckle Group carbonates provide a wide variety of petroleum, natural gas, mineral, and freshwater resources in Oklahoma and throughout the southern Mid-Continent. For decades, the 'Arbuckle' has been a preferred petroleum wastewater disposal target for the petroleum industry and regulatory bodies alike. The connection of this practice to increased seismicity on the Mid-Continent has increased the need for better understanding the reservoir properties of the Arbuckle. I propose to conduct a petrographic and geochemical study of Arbuckle Group carbonates in eastern and central Oklahoma. This study will test the hypothesis that reservoir properties of the Arbuckle Group were modified by both early (seawater derived) fluids as well as late diagenetic basinal fluids. The findings from this study will be used to compare the petrology, geochemistry, and diagenetic history to the better known Ozark region. A series of Arbuckle cores will be studied and placed into a stratigraphic section using corresponding wireline logs. The lithologies of these cores will be described and sampled for thin section and other petrographic and geochemical analysis. Thin sections will be examined using standard and cathodoluminescence petrographic techniques. Additionally, diagenetic fluids will be studied using fluid inclusion microthermometry and selected petrographic textures will be further analyzed using carbon, oxygen, and strontium isotope geochemistry.

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