The Compartmentalization and Biomarker Analysis of the Spivey-Grabs-Basil Oil Field, South-Central Kansas

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The Spivey-Grabs-Basil oil field of south-central Kansas has long been suspected of having section-sized, inter-well compartments. The field produces out of the Mississippian Pineville Tripolite facies, bordering the Central Kansas Uplift (CKU) trending with other fields flanking the CKU with Pineville production. In this study, biomarker analysis of oils from 10 wells in sections 24, 25, 35, 36 of T29S R7W and section 2 of T30S R7W area, in conjunction with logs, was used to locate compartment barriers. Biomarker values denote this area has the same source rock, a carbonate-rich shale in the peak oil window. Slight differences in oil maturities indicate a complex filling history of the field and apparent separation of oils. The Voran 1-35, Krehbiel B1, Maple E2, Bruch 1 and Spring Acres 1 wells all have similarities in thermal maturity, but are less mature than the Maple F1 & F2, Bruch 2, Sullivan 2 and Pound 1 wells. The Sullivan 2 and Pound 1 wells are both thermally mature separated from less mature wells located northeast and southwest of their locations by formation thins. The Maple F1 & F2, and Bruch 2 wells all are of similar thermal maturity, but are surrounded by less mature wells having no known lithological barrier between them. Overall, this field has a very complex history as evident from the biomarkers. Possible tectonic influences may have created different filling times based upon the oil maturities and may have segregated the oils due to generation of formation barriers.