

AGE, DEPOSITIONAL ENVIRONMENT, AND ORGANIC METAMORPHISM OF THE WOODBINE (CRETACEOUS) OF POLK COUNTY, TEXAS

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ABSTRACT

Cores and cuttings from six wells in Polk County, Texas were studied to determine the age, depositional environment, and organic maturation history of the Woodbine hydrocarbon producing interval and superjacent Rapides Shale.

Palynologic analysis of the Woodbine core samples indicates a Cenomanian age for the section. Palynomorphs recovered from the Rapides Shale samples indicate a much younger age than the Woodbine with the unconformity representing possibly as much as full stage.

The depositional environment of the Woodbine section is interpreted from palynologic, sedimentary structure, petrographic, and seismic data to have been on a prodelta continental shelf seaward to a topographic break in the shelf formed by an earlier (Lower Cretaceous) carbonate buildup.

Organic maturation studies of the Woodbine samples indicate vitrinite reflectance (R_0) values ranging from 1.1 to 1.4 with thermal alteration index (TAI) values of 2.3 to 3.2. The organic matter distribution consists of abundant vitrinite and inertinite with mixed matter assemblages less common. Two samples are from intervals that have produced hydrocarbons. These samples had R_0 values varying from 1.1 to 1.2 with mixed matter organic distributions. Theoretical studies indicate that such samples should be the source of wet gas. Wet gas is precisely what these sample intervals have produced.

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