Unraveling the Secrets of the "Eaglebine": Sequence Stratigraphy Versus Lithostratigraphy

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Abstract

In the southern portions of the East Texas Basin, between the Buda Formation and Austin Group, a vertical succession of facies, which changes from the bottom up from: (1) organic-poor, low-resistivity, argillaceous mudstones; (2) high–TOC and high-resistivity, calcareous mudstones; (3) moderate–TOC and moderate-resistivity calcareous mudstones; (4) low– TOC and low–resistivity argillaceous mudstones grading into sandstones, can be determined from well logs, cores, and cuttings. Traditionally, all of these facies were included within the Woodbine Group, due to the presence of the sandstone-prone strata near the top of this succession. More recently, however, the term "Eaglebine" has been used to convey these strata, since many researchers realized that part of this facies succession was likely coeval to middle Cenomanian to late Turonian Eagle Ford Group, within the outcrop belt along the west flank of the East Texas Basin.

In order to better understand the relationship between the unconformity- bounded Woodbine and Eagle Ford groups, as defined along the outcrop belt, and their coeval equivalents in the southern portions of the East Texas Basin, a detailed sequence stratigraphic study, which tied shallow research boreholes along the outcrop belt, with a grid of well-log cross sections to the deeper subsurface, was conducted. As the Woodbine and Eagle Ford groups are defined along the outcrop belt, this study revealed that only the organic-poor, low-resistivity mudstones at the base of the succession is equivalent to the early Cenomanian Woodbine Group, and that the overlying facies succession is in fact coeval to the middle Cenomanian to late Turonian Eagle Ford Group. Furthermore, these correlations also revealed that the organic- and carbonate-rich facies within this succession are equivalent to the Lower Eagle Ford Formation, and that these facies are not coeval to the Woodbine Group, or represent a time-transgressive, organic-rich facies, as some recently published research has suggested.