

## **The Stratigraphic Framework of the Haynesville Shale in Northwest Louisiana and Northeast Texas**

**Bo Henk, Steve Sinclair, Andy Juett, Justin Bagley, David Nicklin, and Scott King**

*Matador Resources, Dallas, Texas*

The Late Jurassic Kimmeridgian Haynesville shale member in a 9 county- parish area of Northeast Texas and Northwest Louisiana has been found to be a highly prolific gas bearing shale producing from depths ranging from 10,000 feet in the north at the Pine Island uplift to 12,800 feet to the south in Red River Parish. In Texas, numerous operators refer to the Haynesville as the Lower Bossier shale. This organic rich Haynesville shale represents a transgressive flooding event in a restricted shelfal basin following the deposition of the Smackover formation. Laterally this shale grades into Haynesville, or Cotton Valley limestone build-ups along the margins of the basin. Thicknesses approaching 300 feet are common in the northern area and 130 to 150 feet is common in the south. Above the Haynesville, the Bossier shale is present with less organic facies preserved and represents shallower more oxygenated shelfal conditions.

Matador's Hall 5 conventional core (310') was the central data point for much of our interpretation and well logs and other core information from other operators have enabled us to correlate across the basin and establish a stratigraphic framework. We have defined the physical stratigraphy as being composed of three units: a more organic rich lower interval, a mid-level siltier and muddier member, and an upper interval with an organic-rich base and calcareous upper facies. Internally there are several marker beds we use to define separate packages across the basin and these low gamma ray high density markers are defined as marine cement grounds with crystalline dolomite.

In a sequence – stratigraphic framework we have identified several transgressive to maximum flood events, marked by organic carbon preservation, several high stand events and the cement grounds may cap the parasequences as marine firm to cement grounds. Bioturbation is present in the highstands along the northern margin of the basin and organic rich laminated pyritic shales mark the maximum flood events.