The Mississippian Lime: Kinematics of a Plays

Shane Matson[1]

[1]Geologist, Spyglass Energy Group, LLC

Abstract

The Mississippian section of the Mid-Continent has been an exploration target for the oil and gas industry for 90 years. Hydrocarbons have been economically produced from thousands of vertical wells targeting multiple productive facies with log porosity values ranging from 2% to 48%. In 2003, Tulsa based Ceja Corporation initiated drilling program utilizing horizontal drilling to exploit seismically identified high porosity (>35%) Mississippian tripolite. Through 2009 more than 20 horizontal wells were successfully drilled and completed which set in motion the hugely extensive Mississippi Lime Play of the Mid-Continent. In 2009 Spyglass Energy Group drilled the Shaw 1A—8H, one of the earliest horizontal well east of the Nemaha Ridge targeting the low porosity (2-6%) the results of which set in motion the assembling of one of the largest acreage positions in the play. Spyglass Energy Group, led by explorationists Charles Wickstrom, has been at the forefront in pioneering the play taking it from arm waving to visualization to exploration to full exploitation.

The Mississippi Lime Play is unique in the spectrum of newly defined “Unconventional Reservoirs” in that it encompasses multiple reservoirs of highly varying petrophysical parameters which are often stacked or laterally adjacent to one another. This leads to many misunderstandings of the section. The variability of the section coupled with the high fluid volume production has led to yet another paradigm shift in how the industry interprets reservoir objectives in horizontal carbonate plays. Geologists utilizing fresh eyes on new data while rediscovering the monumental works published throughout the 1900’s are on the cusp of cracking the many codes held tight in this dynamic geological section.