

Devono-Mississippian Petroleum Systems of North America: What Makes the Stack- Merge Play in Oklahoma So Special

Andrew Cullen¹

¹Warwick Energy, Senior VP of Geology

ABSTRACT

Devono-Mississippian unconventional plays and reservoirs of the greater Midcontinent encompass the full range of unconventional tight reservoirs and play types. From shelf to basin, the Miss Lime, STACK, Merge, SCOOP, and Barnett Shale plays comprise a petroleum megasystem that records a change in source rock depositional environments. Devonian siliceous mudrocks of the Woodford Formation were deposited on locally incised shallow marine platforms whereas Early Mississippian (Lower Carboniferous) siliceous source rocks were deposited in a foreland basin created by continental collision of Gondwana with Laurentia during closure of the southern Iapetus Ocean. This talk explores the question of why the Meramec siltstones and correlative lithofacies in the STACK, Merge, and SCOOP are so prolific relative to other Devono-Mississippian basins and embayments of southern Laurentia that share lithostatigraphic characteristics: Rancheria Formation (New Mexico), Barnett shale (Permian Basin), Moorefield shale (Arkansas), and Borden Siltstone (Illinois Basin).