

Maximizing Giant Gas Resources in the Appalachian Super Basin: Marcellus, Utica and More!

The Appalachian “Super” basin is a historically important U.S. basin with production from Cambrian- to Mississippian-age sediments starting back in the 1800s. “Super” unconventional targets include the Ordovician-age Utica-Point Pleasant formation and the Devonian-age Marcellus formation. Huge volumes of commercial hydrocarbons are contained within the states of Pennsylvania, West Virginia and Ohio with gas production of approximately 34 billion cubic feet per day (November 2020). A 2019 U.S. Geological Survey report estimates undiscovered, technically recoverable mean resources of approximately 214 trillion cubic feet of gas and 1.8 billion barrels of oil for these combined formations within the Appalachian basin. Horizontal Marcellus producing zones are extremely organic rich with original total organic carbon (TOC) estimates from 4 to 20% (weight %) spanning across condensate to dry gas thermal maturity windows. Productive fields are located within structurally complex to minimally deformed areas of varying thicknesses across the foreland basin. Rock quality and reservoir pressure gradient are key productivity drivers. Natural gas and natural gas liquids (NGLs) from the Appalachian basin feed into local, national and international markets. Operators in the basin include multi-basin integrated companies, single basin “pure players” and smaller privately-held companies. Commercial success hinges upon efficiently finding and exploiting large quantities of hydrocarbons in concert with implementing effective marketing/transportation solutions. The “super stars” in this basin will be the companies that successfully navigate geologic, commercial and environmental challenges.