

## **Resource Potential of the Woodford Shale in New Mexico**

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Shale resource plays are either shale-gas or shale-oil. Better evaluation procedures considering more number of parameters are needed to estimated resource potential. Successful shale-gas and shale-oil plays in the United States are variable in geological age, depositional sequence, organic richness, thermal maturity, kerogen type, and mineralogy among a few key parameters.

The Upper Devonian Woodford Shale ranges from a thickness of 0 ft to 300 ft and is found at depths of 7,000 ft to 18,000 ft in the Delaware Basin. The Woodford is thermally mature over its entire extent in New Mexico: In the deeper parts of the Delaware Basin, it is in the thermogenic gas and condensate window; on the Northwest Shelf and where present on the Central Basin Platform, it is in the oil window (Broadhead 2010). Southeastern New Mexico is subdivided into Regions I, II and III based on the intensity of the fracture networks, thermal maturity and Total Organic Carbon (TOC) (Comer 2005). Each of the regions (Regions I, II and III) were ranked for the prospects of shale Bas using Miller's (2010) ranking scorecard and assigned a score of 68, 66 and 48 respectively. The results showed that Region I and II have better chances of finding shale Bas. Finally an assessment was made to quantify the volumes of oil and Bas in-place using Comer's (2005) Hydrogen mass balance method. The estimated volumes were 36 billion barrels of original oil in-place and 44.5 trillion cubic feet of original Bas in-place in comparison to 119 billion barrels of original oil in-place and 230 trillion cubic feet of Bas in-place in the Woodford for the entire Permian Basin (Texas & New Mexico). The assessment confirms that Woodford shale is a major unconventional source of both oil & Bas in New Mexico.

The work described in this paper was performed in conjunction with a contract from the U.S, Bureau of Land Management, Pecos District to help estimate oil and gas development in southeastern New Mexico for the, next 20 years.