

Michigan's Antrim Shale Play—A Two-Decade Template for Successful Devonian Gas Shale Development, Wayne R. Goodman, Northern Lights Energy, Gaylord MI 49734-0218, wrgnle@alphacomm.net; and Timothy R. Maness, Maness Petroleum Corporation, Mount Pleasant, MI 48804-0313, tim@manesspetr.com

Although key wells drilled by early visionaries from the 1940's to 1960's proved play viability, it was not until the late 1980's that Michigan's Devonian Antrim Shale play established a strong economic foothold. The combination of improved completion technology, regional pipeline capacity seeking new gas in the twilight of the Niagaran pinnacle play, and non-conventional gas tax incentives led to a dramatic burst in Antrim development roughly 20 years ago. Today, over 9,000 completed wells in 700+ discrete projects across a 12-county northern Lower Michigan fairway bear testimony to a successful play that defines one of the 10 largest gas fields in the United States. Earlier in 2007, Antrim gas sales exceeded the 2.5 TCF mark.

The Antrim, while producing from the same Upper Devonian sequence that defines many North American non-conventional gas plays, has some fundamental differences from most of the others. Antrim gas pays are shallow (500–2,000 feet); the gas is chiefly biogenic, with Antrim thermal maturities generally below levels required for methanogenesis. Significant associated water is produced, particularly early in a well's history, resulting in a typical project design where multiple wells feed a central production facility for dehydration and compression.

While essentially all play fairway wells with a preserved Antrim section result in economic completions, areas of enhanced recovery are identifiable through geological and engineering studies. The ultimate performance level of Antrim wells and projects is defined by combining the innate regional geology and reservoir characteristics with surface topography, flowline mechanics, and operational astuteness.