

## **Successfully Searching for Spraberry Reservoirs by Integrating Old and New Exploration Techniques, Dawson County, Texas**

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Traditional exploration techniques for stratigraphic traps including; regional play concepts, subsurface well control, 2-D seismic and early 3-D seismic surveys, often yield marginal results. Integration of these older methods and implementation of newer and different techniques may reduce risk and improve success rates. Remaining exploration targets in the Permian Basin comprise mostly stratigraphic traps, which if discovered, often get over-drilled and become uneconomic. The Spraberry Trend of the Midland Basin, although a significant widespread play (10 billion bbl OOIP), poses significant challenges in extracting known reserves. Poor recovery factors are due to low permeable, mud-rich, distal fan deposits, basinward of the Horseshoe Atoll. Proximal fan deposits in the northern half of the Midland Basin often contain better reservoir properties, but are much more discontinuous and difficult to delineate

In 2004 Fasken Oil and Ranch drilled an industry generated prospect in Dawson County, Texas that was developed from subsurface well control. Fasken owned two early 1980's vintage seismic lines near the well site. It was thought that this seismic data demonstrated a geophysical anomaly associated with the reservoir target. After drilling a dry hole on this prospect, the Exploration Department initiated a series of steps to determine if it was feasible to actively explore for Spraberry targets in this part of the Midland Basin, since most Spraberry Fields in the area have been discovered by serendipity on the way to deeper targets.

Field Studies were completed over several producing fields that contained multiple Spraberry zones. Fasken reprocessed and mapped its widespread database of 2-D seismic data and acquired and reprocessed old 3-D data sets. During late 2006, Fasken acquired a high effort 3-D survey over the area. Other technologies applied were surface geochemical analysis by Gore<sup>TM</sup> Survey for Exploration and Geotrace's RockRes seismic processing techniques. The integration of data from these exploration techniques resulted in Fasken successfully finding 7 of 8 economic wells and the prediction of several dry or uneconomic wells drilled by competitors in the area.