

Craig W. Adams, ADEXCO Production Company, Fort Worth, Texas
Barnett Shale: A Significant Gas Resource in the Fort Worth Basin

ABSTRACT

The Mississippian Barnett Shale of the Fort Worth basin is an organic-rich shale that is the reservoir, source, trap and seal for a very large unconventional gas accumulation. The play has rapidly spread over a multi-county area.

The Barnett Shale is a spent oil-prone source rock. Porosity and permeability is developed upon thermal transformation from liquid to gas with resulting maturation-induced micro fractures. Gas is stored in these micro fractures, as well as being adsorbed in the solid organic matter (kerogen). The exploration fairway is defined by Barnett Shale isopachs, subcrop maps, source rock richness data (Total Organic Carbon), thermal maturity defined by vitrinite reflectance and the presence of reservoir quality Barnett Shale.

The Barnett Shale is one of the most active drilling targets of the past decade. Newark East Field is now the second largest gas producing field in Texas. Drilling depths are less than 8,000 ft, and per well reserves in the expanding Newark East Field are 1-3 BCF. Gas-in-place is 52 BCF per square mile. The Barnett Play is estimated to have 10 TCF recoverable reserves (USGS, 1998).

Low proppant hydraulic fracturing technology ("water-fracs") has greatly improved play economics. This new technology has reduced total well cost by more than 20 percent and has resulted in much improved rate and reserve profiles. Barnett Shale wells are typically re-fraced after several years resulting in producing rates superior to initial production rates.