AAPG Annual Convention
Salt Lake City, Utah
May 11-14, 2003

J.L. Coleman, D.M. Stone, and D.H. Phillips, BP America, Houston, TX

Assessment of Deep Gas Potential of the Eastern Green River Basin, Southern Wyoming

The potential for deep gas production from the eastern Green River Basin (EGRB) has been a subject of debate for the past 30 years. The EGRB is a Paleogene basin with a Cambrian to Quaternary sedimentary section. Production from Mesozoic and Paleozoic reservoirs on high angle, reverse and normally faulted anticlines was established on the basin margins between 1946 and 1973. Non-economic gas was found on smaller structures within the basin in 1973 and 1989. An additional number of undrilled, reverse faulted anticlines have been mapped for future drilling. Basin-centered gas production was established in 1958, but not effectively realized until the early 1970's.

Establishment of high rate gas production by UPR (now Anadarko) from the Frontier Formation NE of Table Rock Field, via horizontal drilling technology, led to a flurry of excitement in the 1999. Difficulties in extending this high rate production beyond the discovery well have dampened some of the enthusiasm and defused the fervor associated with deep basin gas drilling, completion, and production in the EGRB.

Managing the uncertainties and economic viability of deep basin gas, will require further advances in horizontal drilling, image logging, and high temperature — high pressure mud systems. Continual improvement in 3-D seismic fracture detection will be needed to reduce risk of failure in finding effective reservoir pore structure. Understanding the origin, controls, and distribution of overpressure will be central to managing the subsurface reservoir environment. If these crucial elements can be effectively addressed, then the estimated ultimate recoverable gas may be realized.