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Horizontal Core for Fracture Description in the Naturally Fractured Spraberry Trend Area

The Spraberry Trend Area in west Texas still contains some 10 billion barrels of oil locked up in tight matrix rock. The reservoir is extensively fractured so most of the permeability is a result of natural fractures. The assumption has always been that a regional set of fractures oriented approximately N50E have been responsible for fluid movement in Spraberry. However, over the years, unusual behavior has been noted that does not always conform to the presumed characteristics of the fracture system.

For the first time in over 50 years of production, a horizontal core has been retrieved. Over 100 natural fractures were intersected out of approximately 300 feet of core. The average fracture spacing of 2.86 feet corroborated simulation studies that have always relied on a value of approximately 3 feet for fracture spacing in order to best match production data. Hoewever, the startling result that there are three natural fracture sets was also discovered from the horizontal core. The presence of multiple fracture sets explains some of the mysterious behavior cited in Spraberrry literature. The existence of three distinct natural fracture sets would probably never have been deduced from vertical core or exisitng information.