

Contacting New Reservoir in Hunton Dolomite in Nearly Depleted Unger Field, Marion County, Kansas Using a Lateral with Azimuthal Gamma Ray Sensor and Drillpipe Conveyed Wireline Logs

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Unger Field, discovered in 1955, has produced 8.6 million barrels of oil from a thinly (several ft) bedded, locally cherty dolomite containing vuggy and intercrystalline porosity. Today, the Siluro-Devonian Hunton Group reservoir contains 17 of the original 76 wells that produce at an average rate of 2.6 BOPD. Water cut is high, indicative of a strong water drive, but as wells are pumped off, oil production can increase, suggesting that bypassed oil remains. The Hunton Group subcrops and locally thins from 25 ft to 11 ft along a NW-trending anticline with a structural closure is 30 feet. The original oil column is approximately 40 feet and the reservoir is overlain and underlain by thick shales. In an attempt to intercept bypassed oil an azimuthal gamma ray was used to “soft land” the lateral in the thin Hunton reservoir and geosteer the well for 1137 feet along the upper 5-10 feet of the carbonate. The lateral parallels the east flank of the NW-trending anticline encountering a strong show of oil. Drillpipe-conveyed triple combo and microimaging logs identified a 180-foot long interval of oil-saturated sucrosic dolomite with minor fracturing. A slotted liner has used to isolate the interval of pay and avoid open fractures that trend E-NE, parallel to maximum horizontal compressive stress. Apparently, discrete fracture systems in the reservoir contributed to the anisotropic drainage from existing wells. Based on results of the initial well completion, this RPSEA-supported project demonstrates that old fields can be revitalized with precise drilling of laterals.