

## **A New Method to Estimate the Horizontal Well Landing Point to Optimize the Production**

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### **ABSTRACT**

The current paper presents a new methodological approach in log analysis to examine the field data based on the average of permeability porosity to determine the most profitable zone in a horizontal well. During the log interpretation, we analyzed the most important parameters to detect the higher original oil in place (OOIPstb). Furthermore, in this analysis, we plot the permeability porosity ratio at a specific range of feet to decide for horizontal well landing point based on the average of OOIPstb and geo-mechanics parameters. A full well-log suite was given for analysis from a horizontal well drilled in the Permian Wolfcamp located in the Midland and Delaware Basins of West Texas and New Mexico. The raw data was used to calculate the total organic carbon (TOC), the effective porosity, permeability, OOIPstb and geo-mechanics parameters (list them). All these calculations were based on 3, 8 and 25 foot running averages and CMR T2 cutoffs of 3ms, 10ms and 100ms porosities. In addition, the OOIPstb was calculated by using two different methods, (1) the bitumen corrected porosity and (2) combinable magnetic resonance(CMR) log data with different cutoffs. Thus, based on OOIPstb and permeability porosity ratio for 25 feet average and 100 ms, the horizontal well was placed on the higher oil on place and most movable hydrocarbon. The well contains 92,000 bbl of potential production based on the calculation made with finite conductivity for 30 stages, 250 fracturing spacing and the optimum half-length is between 650 feet to 700 feet to match the company the total production. As a result, the horizontal well placement has matched the company decision and calculated productions ranged from 91,500 to 98,500 bbl based on the optimum fracture length. More importantly, the OOIPstb and geo-mechanics parameters were the main components to distinguish and determine the best landing point for the horizontal well placement as well as to estimate the pay thickness that help for the future fracturing project. This should help to minimize risk and maximize economic benefits in a horizontal well. Keyword: Permeability porosity ratio, total organic carbon, original oil in place, Geo-mechanics, bitumen and CMR.