Evaluation of Production Log Data from Horizontal Wells Drilled in Organic Shales

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Production logs from more than 100 horizontal shale wells in multiple basins have been acquired and interpreted. An evaluation of this data set confirms that production is highly variable along the length of the wellbores. In some basins, two-thirds of gas production is coming from only one third of the perforation clusters. Furthermore, when looking at all basins, approximately one third of all perforation clusters are not contributing to production. This highlights a significant opportunity to improve overall completion effectiveness and economics in these high profile projects.

Observations of near-wellbore reservoir quality and completion efficiency can be attained from the analysis of this data. Rock properties such as mineralogy, natural fracture density, and closure stress in the near wellbore region impact reservoir quality and hydraulic fracture conductivity. Completion parameters such as the number of perforation clusters per frac stage, number of perforations per cluster, and perforation cluster spacing can all impact the productivity of an individual perforation cluster. Correlations between productivity and key geologic, petrophysical and completion parameters can be made. The result is a better understanding of the parameters that are controlling completion effectiveness, and corresponding productivity in horizontal organic shale wells.