

# **Analytics of Production Decline for Multistage Hydraulically Fractured Horizontal Wells (MHFHW) in Unconventional Reservoir Development**

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## ***Abstract***

*Production decline analysis for multistage hydraulically fractured horizontal wells (MHFHW) has been increasingly playing an important role in tight formation unconventional resources such as Bakken tight oil in Williston basin as a greater number of MHFHW are drilled each year. Production in a complex well-reservoir system, with a horizontal wellbore and multiple fractures under a very complicated reservoir environment that is routinely encountered in exploiting tight oil, shale gas or even conventional oil/gas, requires solid technical capacity to enable petroleum engineers to understand, analyze well behavior and to predict well performance as well as to evaluate reservoir characteristics. Great achievement in understanding the production decline behavior of MHFHW has been accomplished recently due to our work of quality analytical computing and comprehensive inclusion of physics in modelling. Based on our research outcomes, the production behaviors of MHFHW can be analyzed in a systematic manner in which reservoir properties and well-reservoir-system geometry information are integrated systematically to generate a set of newly modified type curves. For reservoir properties, the properties are the commonly known porosity, permeability, fluid viscosity, fluid compressibility, etc. For well-reservoir-system, it is dependent on the information of relative fracture and reservoir geometry, wellbore length, number of hydraulic fractures, etc. The newly developed modified type curves, in a sense of having unified MHFHW and reservoir information, will definitely empower our reservoir engineers when applied for MHFHW production decline analysis practice. This proposed presentation is going to focus on disseminating our new understandings.*

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