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Determination of dynamic deliverability equation for fractured horizontal well in tight gas reservoir

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The deliverability equation of gas well is important for productivity evaluation and performance forecasting. For fractured horizontal well in stress-sensitive tight gas reservoir, due to the pressure-dependencies of gas properties, reservoir/ fracture permeability and high-velocity non-Darcy flow, the deliverability equation would not be constant but is also dynamic. Traditionally, the relationship between reservoir/fracture permeability is commonly be obtained by laboratory experiments, which is expensive and time-cost. Besides, the predecessor's studies which neglect the pressure-dependence of high velocity non-Darcy flow would also lead inaccuracy. Therefore, this paper presented a new method to quantify pressure-dependence of reservoir/fracture permeability as well as obtain dynamic deliverability equation for multi-fractured horizontal well in tight gas reservoir considering non-constant non-Darcy flow. This method is validated by an actual well in Sulige tight gas field in Ordos Basin, China. The result shows that this method is accurate and can contribute to the effective development of stress-sensitive tight gas reservoir.

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