



PREDICT-K “TIP OF THE MONTH”

Water Production

One of the many factors that Predict-K accounts for in its proppant conductivity correlations is relative permeability effects in the proppant pack. Based on the fractions of hydrocarbon and water flow, Predict-K will determine water saturation within the proppant pack and calculate relative permeability factors for both phases. However, since Predict-K is not a full reservoir simulator, the software has to be told how to calculate the water rate. There are three options for how to determine this rate in Predict-K. The preferred option can be chosen using the water rate type in the well properties section of the well information tab shown below.

Reservoir Properties	
Well Properties	
Depth - TVD (ft)	10000
Wellbore radius (ft)	0.3
Tube inner diameter (in)	2.4
Measured depth (ft)	10000
Absolute pipe roughness	0.0018
Horiz. skin	0.5
Well temp. (F)	65
Bottomhole temp. (F)	215
Oilwell GOR (SCF/bbl)	0
Water rate type	Const ratio
Water production (fraction)	Const ratio
Lateral length (ft)	Const rate
Lateral vertical position	Production rate
Untreated contrib. lateral (frac.)	1

The constant ratio take the simulated oil production rate and multiplies that rate by the input factor to determine the water rate. For example a ratio of 1.0 results in a 50% water cut. Using this option will essentially result in a constant water cut over the entire production period. This can be a very effective option for creating realistic production projections for much of the well's lifetime assuming that the water cut does not dramatically change over time.

Constant rate uses the same input water rate regardless of the drawdown or current hydrocarbon production rate. This option can be especially useful for wells that produce very little water or a very large amount of water. Some caution is required for this option if the well will be shut in intermittently. If the water rate is high enough, Predict-K may continue to calculate a very low relative permeability to hydrocarbon after drawdown is increased resulting in low simulated production after the shut in for extended periods of time.

The production rate option uses the water production information that is input into the production data tab and works just like the production flow control options. Using this option requires more well data, but may give better results for a smoothly changing water rate over the well life. One important consideration is that Predict-K is using this information to determine saturation within the fracture itself. If water rate at the surface and downhole are not well connected, e.g. under liquid loading conditions, the production rate option will not be the proper choice.

With a proper understanding of well production trends for your wells, the appropriate water production control can be easily chosen inside of Predict-K. This proper selection will create a more robust Predict-K simulation resulting in better predictions and improved well optimization.

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2. [Predict-K Main Screen](#)
3. [Quick Entry](#)
4. [Predict-K General Structure](#)
5. [Creating a New Proppant Manager Database](#)
6. [Running the Proppant Manager Correlations](#)
7. [Exporting Proppant Manager Results to Predict-K](#)
8. [Baseline Conductivity](#) [Demonstration Base Project for Videos 8 - 10](#)

9. [Dynamic Conductivity](#)
10. [Production Analysis Overview](#)
11. [Adding Production Data to Predict-K Demonstration Base Project for Video 11 Simulated Production Data Excel File](#)
12. [Matching Production Data](#)
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