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January 4, 2021

GENERAL MEETING

An Examination of the Effects of Surface Data Acquisition Methods on Well Performance Evaluations and Completion Optimization
Darryl Tompkins P. Eng. Chief Technology Officer, Revo Testing Technologies.

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 Wednesday, January 20th, 2021, 11:50 PM – 1:00 PM

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Abstract:

It is common to develop unconventional wells changing completion designs to determine which technique works best in each area. A Rate Transient Analysis ("RTA") of the flowback / early production data is often used to evaluate how well performance is affected by changes in the completion design. Many analysts faced with performing RTA struggle to have confidence in the analysis results due to low-quality production data. This presentation will show how different surface data acquisition methods affect well-performance evaluation using standard RTA techniques. Additionally, we will recommend preferred data acquisition methods and demonstrate how these methods produce less ambiguous results. Examples of early production data are shown that were acquired from a variety of familiar sources found in production operations. Practical measurement QA/QC methods are used to evaluate data quality, and RTA is used to demonstrate the effect data quality has on performance evaluations. Comparisons of results will illustrate the impact that good and poor quality data can have on evaluating the relative difference in well performance due to changes in completion designs. Superior data quality should be a top priority if a well's performance and completion design need to be evaluated quickly and accurately with the RTA of the early production period. Some data acquisition methods shown in this paper are not adequate for collecting the quality of data needed to produce reliable analysis results. Frequently, the changes from one completion design to the next are relatively small. With low-quality data, it can be impossible to quantify the effect of these changes. Examples presented in this paper show how low data quality can be misleading when



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 - [Volunteering Opportunity](#)
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performing well evaluations. Examples of data acquisition from some of the best quality sources illustrate how straight-lines used on specialized diagnostic plots can match the data very closely. This gives the analyst much more confidence in the magnitude of the difference in well performance due to the completion design changes.

Iterative completion optimization can be a waste of time and money if the difference in a well's performance due to the completion design changes cannot be evaluated quickly and accurately.

Suppose those responsible for unconventional well performance optimization will continue to rely on the insights provided by RTA. In that case, it seems only logical that the data going into the analysis needs to be of the highest quality possible.

Reservoir and production engineers need high-quality data to evaluate a well's performance to provide feedback to the completions engineers on which changes in the completion design have the most considerable impact on the well's performance. None of this can be done correctly if the production team does not receive the best quality data available. The production team must have the right people and equipment in place to consistently collect high-quality data. This often seems to be an overlooked component of the overall value chain.

Biography:



Darryl has spent his career working in reservoir, completions, and operations engineering in mature fields, gas storage, and unconvensionals. He is currently the Chief Technology Officer of Revo Testing Technologies based in Houston, TX, where he works on developing technologies for unconventional well performance evaluations and production optimization. He

is a registered Professional Engineer in the Province of Ontario, and he holds a B.Sc. in Mechanical Engineering from the University of Windsor, Canada.

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