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better, faster decisions

IDENTIFYING COMPLETION BEST PRACTICES.

Read About How Drillinginfo Analysis Tools and Engineering Data Help E&P Companies Drill Better Wells

Case Study

Using the engineering data and analysis tools in the Drillinginfo web app, engineers can easily rank the top operators in an area of interest, group wells by completion techniques, and forcast Estimated Ultimate Recovery (EUR) for each group.

The Challenge

An engineer faces many big decisions when making recommendations for a new well. Even small changes in completion parameters can make a big difference. One way engineers can make better recommendations is through understanding how the top operators in an area of interest complete their wells. The problem is finding that information in a fast and easy way.

In this example, we will follow an engineer at an E&P company that recently acquired acreage in the Midland Basin. The engineer needs to recommend completion parameters for the soon-to-be-drilled wells in the Wolfcamp formation. To do this, she would first like to research completion best practices in the area. Specifically, she would like to find out who the best operators are in the Midland Basin and the proppant concentrations and lateral lengths they used to complete their wells.

The Solution

With Drillinginfo and the Drillinginfo web app, the engineer can follow a simple workflow to find this information. Using the Drillinginfo technical well dataset, she begins by filtering only horizontal wells drilled since 2014 in the Permian. From there, she can easily draw a polygon around the Midland Basin, then narrow in even further to only wells drilled in the Wolfcamp by selecting wells with a first perforation of at least 8,000 feet deep.

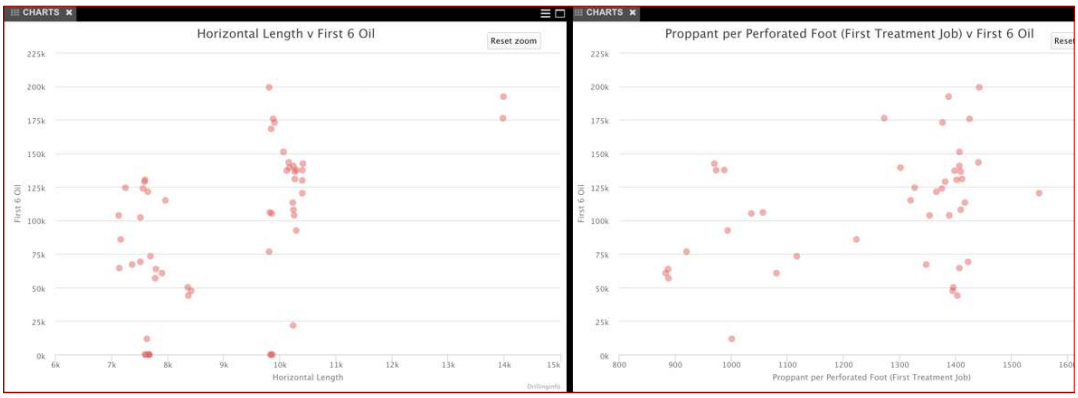
After filtering wells that are most similar to those her company will be drilling, the engineer can identify the top operators. She styles the wells by operator and cumulative oil production within the first six months, then launches a group chart to rank the operators in terms of six-month production. She decides to select the operator with the highest producing wells and then draws a polygon around only that operator's wells closest to her company's new acreage.

The engineer can easily identify which operators are operating the highest producing wells in her area of interest using layer symbology on the map view and a group bar chart .

Her dataset is narrowed to 55 wells on which she can perform further analysis. First, the engineer wants to get a general sense for the different ways this

operator is completing their wells. Are there groups of wells she can compare that have clear distinctions in completion parameters?

Using a scatterplot that compares horizontal length with first-month oil production, she identifies three clear groups. One group of wells uses shorter lateral lengths, between 6,500 and 7,500 feet long. Another group has lateral lengths of around 10,000 feet long and a third group has ultra-long laterals that are over 12,000 feet long. Next, she modifies the scatterplot to compare proppant per foot with production. Again, clear groups emerge. She identifies one group that uses around 900 to 1,100 pounds of proppant per foot and another group that uses 1,300 to 1,500 pounds per foot.



The engineer can see clear groups emerge on the scatterplots comparing horizontal length and proppant per perforated foot with first six-month oil

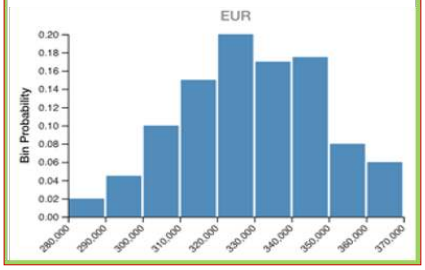
The engineer now has four key groups of wells whose production she wants to compare: Group A, which uses shorter laterals and around 1,000 pounds per foot of proppant (5 wells in analysis); Group B, which uses longer laterals, but the same amount of proppant as Group A (7 wells in analysis); Group C, which also uses longer laterals, but uses more proppant at 1,400 pounds per foot (16 wells in analysis); and Group D, which uses ultra-long laterals and 1,400 pounds per foot of proppant (1 well in analysis).

The engineer now launches the Drillinginfo probabilistic decline curve analysis (DCA) tool to estimate EURs for each group of wells. The analysis produces the following results: Group A wells are expected to produce 177,000 barrels of oil in the first five years; Group B wells are expected to produce 330,000 barrels; Group C is expected to produce 360,000 barrels, but with a wider range of variance than the other groups; and Group D wells are expected to produce 511,000 barrels.

Group A

Short Lateral
Version 1.0 Completion

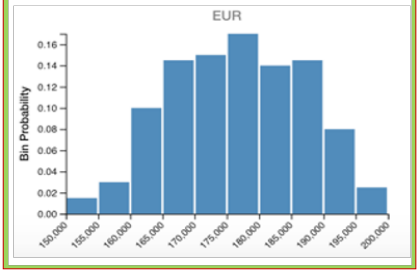
- 5 Wells
- Worst Well: 144K bbls
- Type Curve: 177K bbls
- Best Well: 183K bbls



Group B

Long Lateral
Version 1.0 Completion

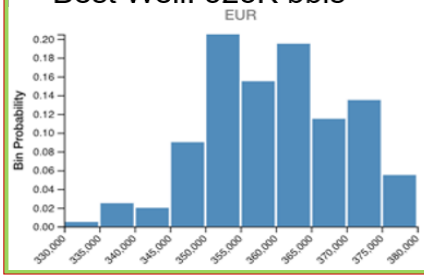
- 7 Wells
- Worst Well: 223K bbls
- Type Curve: 329K bbls
- Best Well: 425K bbls



Group C

Long Lateral
Version 2.0 Completion

- 16 Wells
- Worst Well: 171K bbls
- Type Curve: 360K bbls
- Best Well: 525K bbls



Group D

Extra Long Lateral
Version 2.0 Completion

- 1 Well
- Worst Well: 511K bbls
- Type Curve: 511K bbls
- Best Well: 511K bbls

Based on these results, the engineer can conclude there is strong evidence wells in this area with longer laterals produce significantly higher EURs, but she needs more data to determine whether more proppant results in a production boost high enough to justify the cost.

Using the Drillinginfo web app, the engineer was able to perform a simple, yet powerful, workflow helping her do her job in just minutes. She was able to quickly rank major operators in her company's area of interest, identify groups of wells that use different completion techniques, and estimate EURs for these different groups. This data enabled her to make a confident recommendation to her team.

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