

ANALYZING TRENDS AND OPPORTUNITIES IN THE MIDLAND BASIN

Learn how to track well evolution, compare operator metrics, and forecast reserves in the Midland Basin with Drillinginfo and DI Asset Analysis



Case Study

Within just 30 minutes and using a single platform, the E&P company's business development team conducts rapid and accurate studies of the production, performance, completion parameters, field development, and operator comparisons for wells within the Wolfcamp reservoir.



The Challenge—Doing a Deal in the Midland Basin

One of the biggest challenges for exploration teams at E&P companies is evaluating and benchmarking operators, reservoirs, and wells both quickly and thoroughly. However, this work is extremely important in establishing the most profitable areas for future growth and beating competitors to the best deals.

Unfortunately, for many companies tracking down datasets located across multiple sources, transforming raw data into workable datasets, and adding up-to-date information is a time-consuming, expensive, and not always accurate process.

In this example, we follow an E&P company analyzing the possibility of a deal in the Midland Basin. Such a deal could be done through the purchasing of existing production assets, the buying of an equity interest or partnering

with an existing operator, or the purchasing of new leases. In this situation, the company wants to assess horizontal black oil wells in the Wolfcamp reservoir of the Midland Basin.

The Vice President of Business Development asked his team to find as much information as possible on this area of interest (AOI) with a view to a future deal.

Questions to be answered included: How is activity trending in the AOI and what is affecting production? Who are the main operators and how do they compare? What is the Gas Oil Ratio (GOR)? Are there any suitable fields for production enhancement? And what are the future production prediction estimates?



The Solution

Rather than collecting public filings and cross referencing and integrating data from multiple sources, the business development team used DI Asset Analysis from Drillinginfo.

DI Asset Analysis' analytics-grade datasets and user-friendly tools to help companies track the evolution of wells in an AOI, understand production and completion trends, follow field development over time, compare metrics across operators and counties, run decline curve analysis, and more.



Focusing on the Detail

The team starts by customizing the datasets to focus on the details most relevant to them using the DI Asset Analysis dashboard, which allows users to visualize maps, charts, and graphs. They are easily able to hone in on only black oil horizontal wells in the Wolfcamp reservoirs in the counties they are interested in: Midland, Glasscock, Martin, and Howard. This level of granularity on specific reservoirs is rarely available from state sources. Luckily, the team can rely on

the Drillinginfo internal geology team carefully picking these zones rather than spending time and manual effort doing it themselves.

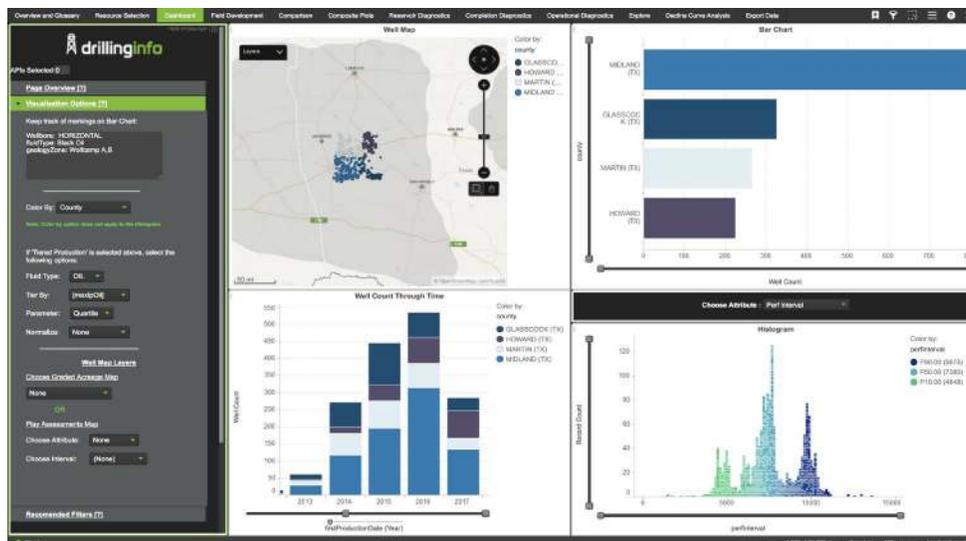


Figure 1: The dashboard highlights horizontal, black oil wells in the Wolfcamp reservoir in Midland, Glasscock, Martin, and Howard counties. Note histogram and well count through time.



Comparing Operator Metrics

The team can easily see the four top E&P companies operating in their AOI. They decide to further focus on these four companies - how they operate, areas they are focused on, and other production variables relating to their wells.

From here, the team can analyze field development in more detail including the directions in which the wells were drilled. By layering a Drillinginfo Graded Acreage map, they can also assess the impact of geology on the wells and whether well trajectory or acreage quality was most responsible for the production results (see **Figure 2**).

In order to limit geological variation over a large area, the team focuses on wells within a seven-mile radius, using the radius tool. This allows for more meaningful comparisons across operators. Now, they can see average production trends (well

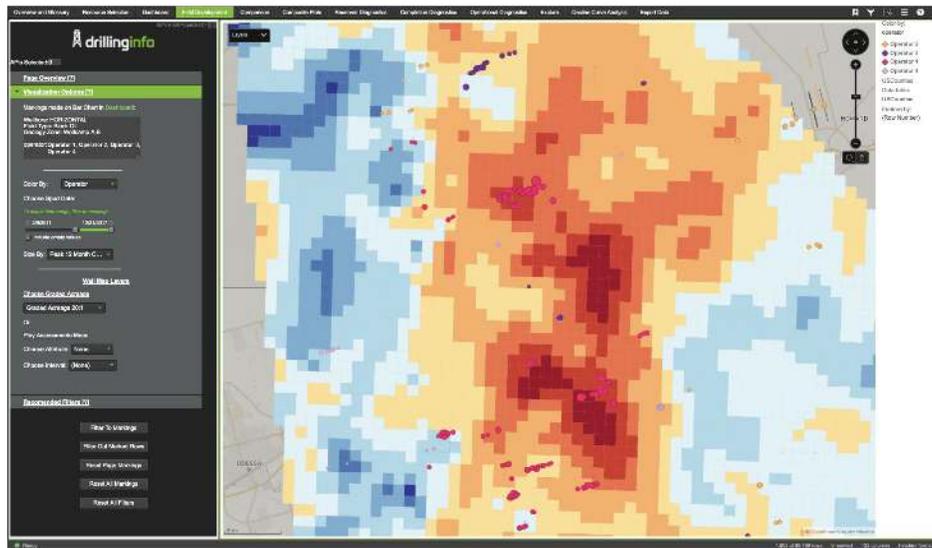


Figure 2: Graded Acreage Map for the Wolfcamp reservoir. The warmer the colors, the higher the grade and potential productivity. The colored dots represent wells by operator. The pink dots are Operator 1 wells, which are largely located in the warmer areas.

count, oil (Bbl/day), gas (Mcf/day)) among all three operators over a normalized timescale.

A composite plot view also enables the team to look at oil production, gas production, cumulative production, and GOR/Water Oil Ratio (WOR) normalized over time.

GOR has recently become a key issue for investors and operators - especially in the Permian - with rising GORs hinting at higher oil depletion rates and more engineering complexities (possibly affecting the cost base).

Therefore, information that GOR is more volatile for Operator 2's wells (as opposed to the other operators where GOR is more stable) is highly valuable information for the team in regard to future deals in the area (see **Figure 3**).

With the reservoir diagnostics tool, the team can also size maps by average GOR to better understand how the operators compare (see **Figure 4**) and where the gaseous areas are – again, very useful information.

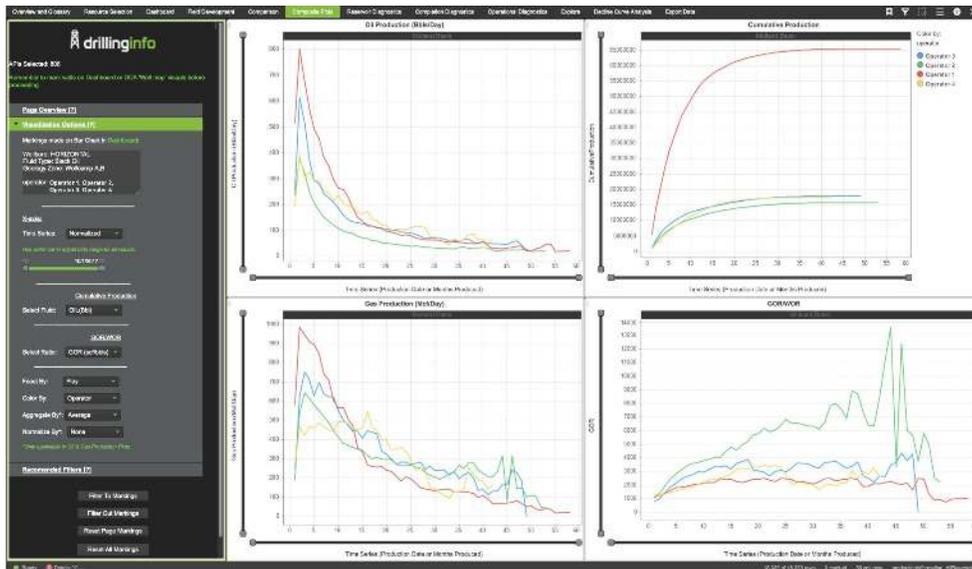


Figure 3: A composite plot comparing the four operators. Note the large jumps in GOR for Operator 2 that currently trends downward.

Reservoir & Completion Diagnostics

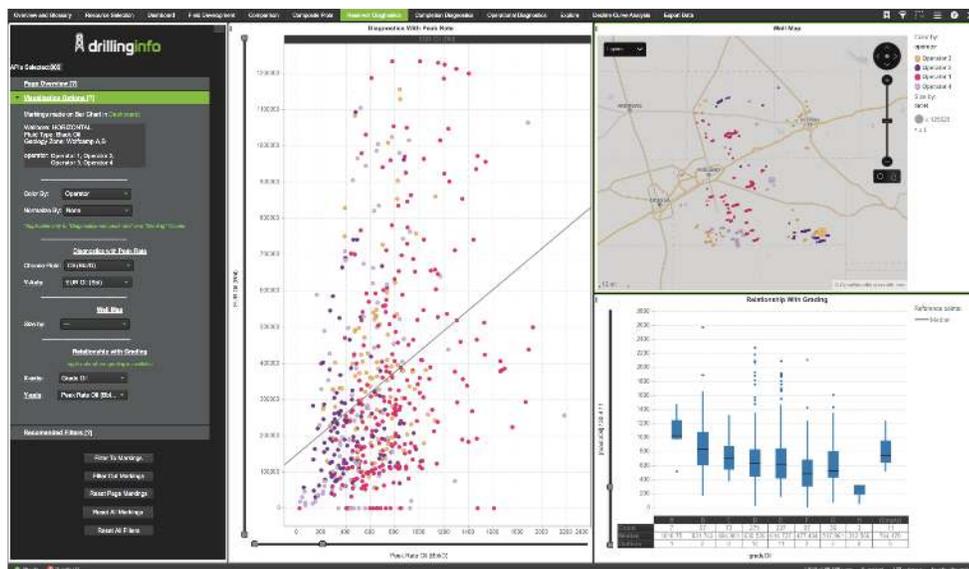


Figure 4: Cross plot comparing peak rates with EUR. Note the top right map where wells can be sized according to GOR. The bottom right plot compares peak rates with the grades assigned for each well as part of the Grade Acreage Map.



Next, the team wants to explore reservoir production trends and completion techniques and variables, such as proppant and fluid. The reservoir diagnostics tool in DI Asset Analysis permits them to see how peak rates correlate with pre-calculated estimated ultimate recovery (EUR) values for each individual well. When comparing operator wells as in figure 4, the team notes that several Operator 1 wells are posting significant numbers.

The team can also visualize proppant in time alongside peak rate. Of note is that the peak rate goes up and down based on the proppant (see **Figure 5**). When the operators are compared, it is Operator 1 with large amounts of proppant, although it is the wells with less proppant that deliver higher cumulative values to date.

The operational diagnostics tab identifies to the team which wells have been pad

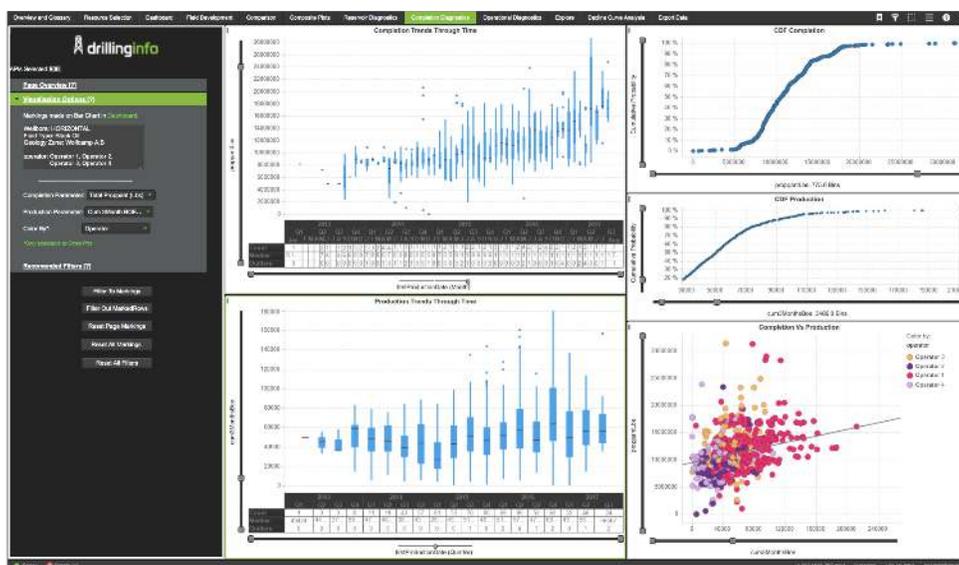


Figure 5: Proppant in time (top left) alongside peak rate (bottom left). Note the correlations. The Bottom right panel shows proppant by operator with Operator 1 pumping a significant amount.

drilled, with Operator 1 again leading the way. This is also of interest because pad drill wells perform differently compared to offset stand-alone wells.



Building Decline Curves

Finally, the team needs to build a decline curve as this is a vital tool for predicting future production and identifying suitable wells for production enhancements. Data sourced would be integral to any future acquisitions, partnerships, or new licenses.

To this end, the team calculates average curves for operator wells and fits a decline curve. Inputs can also be adjusted, such as initial rates, b-factors, decline rates, economic limits to the type curve, and time over which EURs can be calculated.

Figure 6 shows a curve for Operator 1 normalized to a 5,000 foot lateral well which includes a number of inputs and provides a strong match between the curves. From these, the team can compare EURs between the operators.

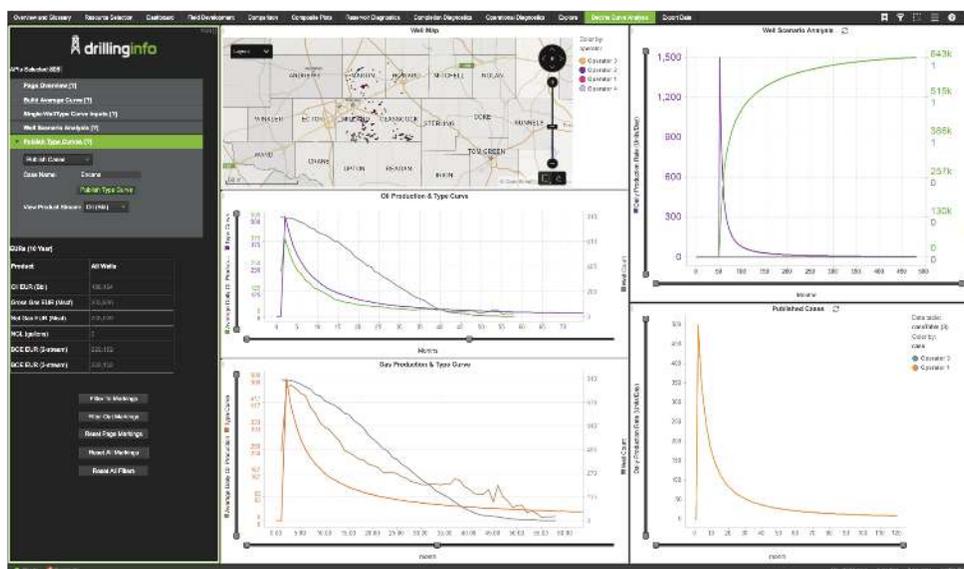


Figure 6: Oil production and type curve for Operator 1 normalized to a 5,000 foot lateral well. Green shows average curve for all the wells selected and purple the type curve. Note that EURs are calculated in the left side panel. The curves can be repeated for all operators with the bottom right panel showing both Operator 1 and Operator 3 curves.



Accurate Information, Better Deals

Within just 30 minutes and using a single platform, the E&P company's business development team conducts rapid and accurate studies of the production, performance, completion parameters, field development, and operator comparisons for wells within the Wolfcamp reservoir.

The up-to-date information can be delivered to the Vice President of Business Development - all within easy-to-read charts, graphs, and maps with customizable views and filters – and will provide vital input in preparing the groundwork for future deals.

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