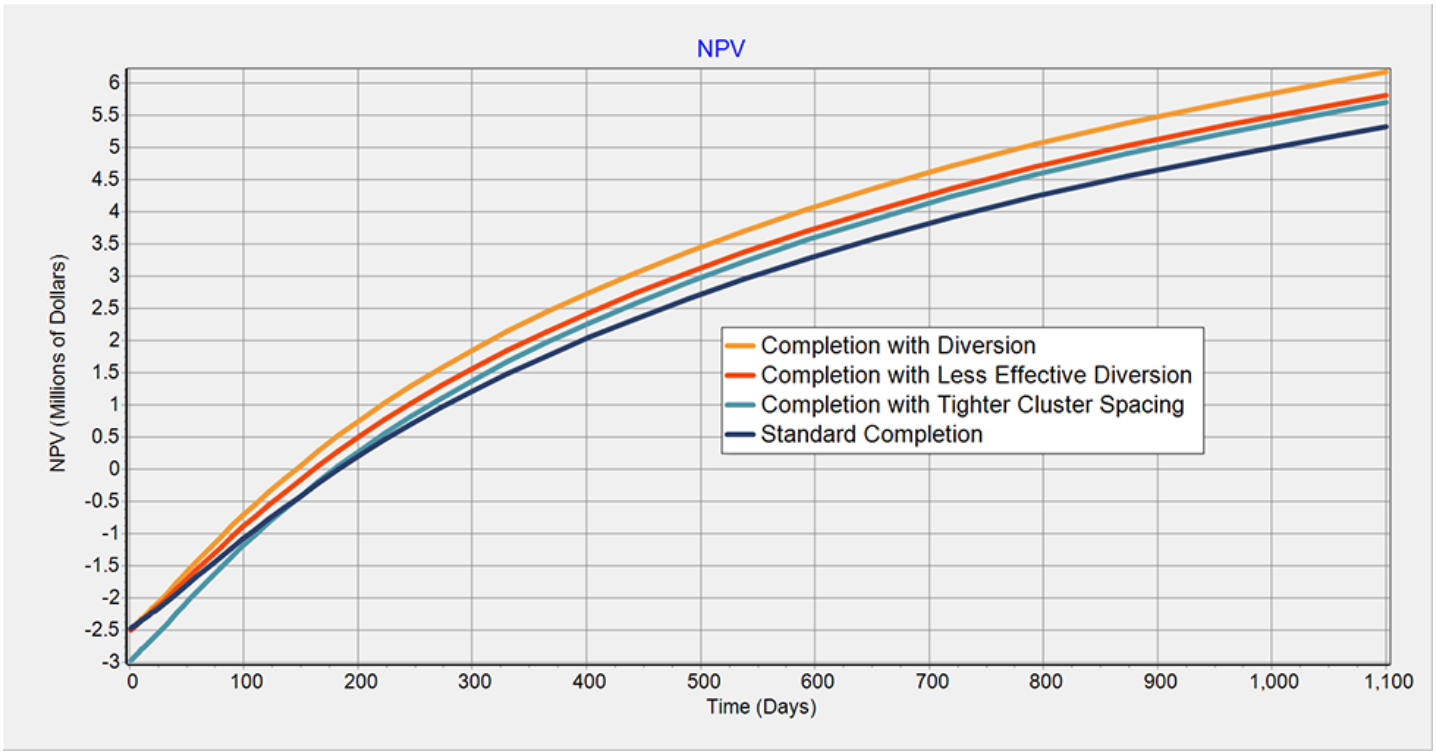
PREDICT-K "TIP OF THE MONTH"

Evaluating the Value of Cluster Efficiency

One of the critical topics in our industry today is the use of diversion and other methods to increase the cluster efficiency on horizontal wells. There remains uncertainty about how many of the multiple clusters per stage are actually stimulated and contributing production, but the general consensus is that at least some cluster are not helping. In fact, efficiencies as low as 50% are considered to be perfectly reasonable and have been confirmed through production logs and tracer diagnostics. Predict-K's production simulator can be used to evaluate different methods for increasing the number of clusters based on net present value and production uplift.

The plot below shows the net present value for a few completion options on an 8,000 ft lateral. The standard completion involves 25 stages with 4 clusters per stage and an assumed 50% cluster efficiency. The other three simulations represent competing options to create more producing fractures with a target of 70 fractures. The tighter cluster spacing simulation achieves this goal by simply increasing the number of clusters while assuming the same cluster efficiency. Cost for this 40% increase in the number of cluster was assumed as an additional 20% of the $2.5 million dollar completion cost. The two diversion simulations represent the use of a diversion treatment at a cost of $25,000. The goal was to increase the cluster efficiency to 70%, but another simulation was included to assess the risk if the improvement was only to 60%.



As can be seen, the diversion treatment is clearly the most economical option as would be expected based on the minimal cost assumed. However, net present value if the treatment does not work as planned (60% efficiency) is only marginally better than a simple increase in the number of clusters ($110,000). A slightly different cost structure could change the preferred option very easily. The Predict-K results illustrate the importance of including more extensive diagnostics in the evaluation of the completion procedure to confirm all of the assumptions and can help determine where the risk of a poor assumption is highest.

To view the Predict-K Tip of the Month archive please go to: http://www.corelab.com/stimlab/predictk-tip-of-the-month

To view our Predict-K training videos main page please go to: http://www.corelab.com/stimlab/training-videos

Predict-K Training Videos (opens in YouTube):

1. How to obtain your license for Predict-K and Proppant Manager
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

13. Changing Default Units

14. Treatment Options