

Reservoir Engineering

Fracture modeling + well testing = better reservoir understanding

FEATURES

- Production data and well test analysis.
- Reservoir stimulation studies.
- Formation damage evaluation.
- Integrated development studies.

The independent application of hydraulic fracture modeling and well testing to understand fracture performance is common practice. Today, StrataGen integrates these two very valuable tools to better understand fracture performance.

Well testing and fracture modeling each require the acquisition of specific data sets. When sufficient data are available, the integration of well test data and fracture models can lead to significant economic benefits through improved treatment designs.

The ability to successfully optimize fracture treatments relies on the accuracy of our fracture geometry predictions and our knowledge of basic reservoir properties. In many cases basic reservoir parameters are unknown, and fracture treatment designs are based on gross “estimates” of reservoir permeability and pressure. Also, detailed fracture modeling of actual treatment data is often performed to estimate fracture geometry and evaluate the relative success (or failure) of treatments without verifying data to support that the model at least approximates the actual fracture geometry.

Although fracture modeling is an essential component in the quest to understand fracture performance, one cannot validate these models without baseline reservoir data. StrataGen recognizes that it is usually impractical to routinely obtain pre- and post-fracture pressure buildup data (especially in tight formations), but it is often essential to gather some well test data to provide the basis to make key economic decisions concerning fracture designs.

Detailed reservoir assessment

The process of designing and optimizing hydraulic fractures starts with an assessment of the reservoir. StrataGen engineers review existing reservoir and geological data with our clients. If necessary we then recommend additional testing (for example, pressure transient tests) to better quantify reservoir properties such as permeability and pressure.

StrataGen has state-of-the-art well testing software and experienced engineers to both design and analyze well tests. Post-frac well tests and detailed well production analyses are routinely recommended and performed to evaluate fracture performance. This process provides the necessary feedback and “quality control” needed to improve and optimize future fracture designs and field development strategies.

StrataGen’s experience and innovative ideas in fracture and reservoir engineering of tight reservoirs make us the ideal choice to provide expert support for:

- Infill drilling studies.
- New field development strategies.
- Expert witness testimony.

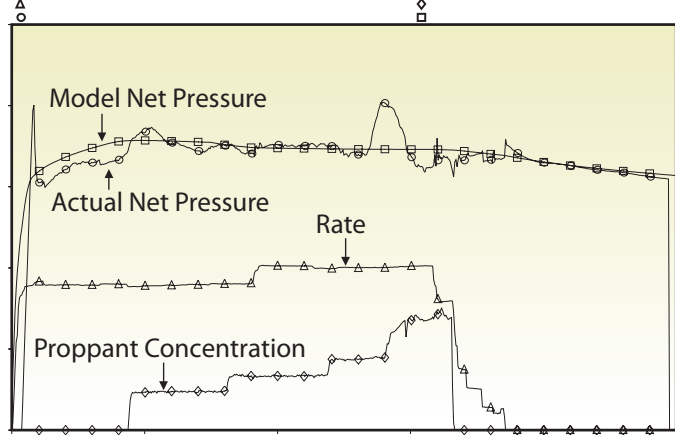
StrataGen’s proven combination of fracture engineering, diagnostic measurements and reservoir engineering provides clients with tangible results in maximizing economic return.



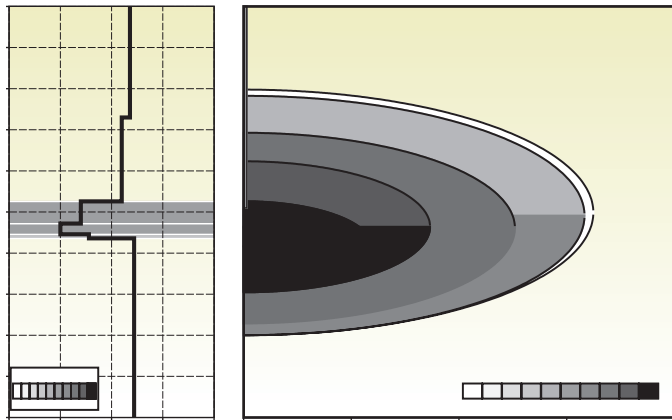
Problem

What proppant type and pad size results in maximum economic benefits?

Net Pressure History Match Moxa Arch: MA-1



Net pressure matching yields reservoir values that aid in understanding stress and reservoir permeability.

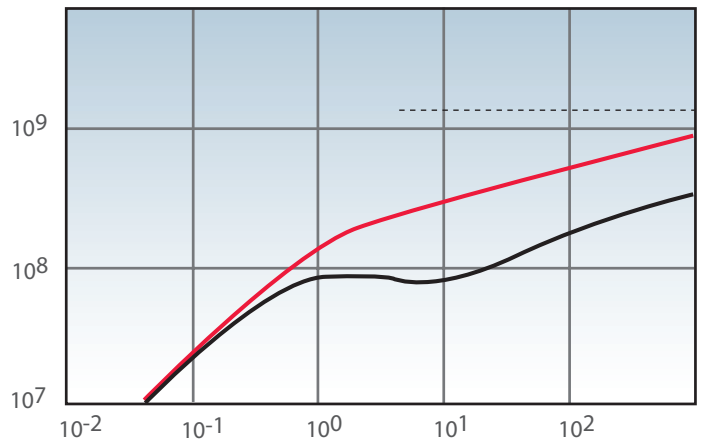


These diagnostics yield fracture conductivity optimization.

Solution

Integrate net pressure history matching, production data analysis and well testing to better understand fracture performance.

Well MA-1 k=0.024 mD Lp=670 ft FCD=16



dm(P) [psi2/cp] versus dPst [hr]

Reservoir tests help quantify reservoir quality.

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