

The Value of a Full Petrophysical Analysis for Stimulation Design

Tim Leshchyshyn, P.Eng.

Dorian Holgate, P.Geol.

E.R. (Ross) Crain, P.Eng.

Dr. Ted Leshchyshyn, PhD, P.Eng.

Summary

Petrophysical analysis provides key inputs used for stimulation design and fracture optimization. To reduce error propagation issues, reconstructed or synthetic logs are an essential input to stimulation design software packages.

A case study will be presented to quantify the differences in predicted hydraulic fracture geometry using three different sets of geomechanical inputs: the first input set will use raw logs to calculate rock properties directly in the fracture design software; the second set will be based on using reconstructed sonic and density logs to calculate mechanical rock properties with petrophysical software; and the final set of inputs will be based on using published rock property tables to assign mechanical properties based on manual log layering. Each input set will be run in modern fracture design software to quantify the differences in predicted hydraulic fracture geometry in terms of height and half-length.

Findings from the case study will be reviewed and related to impacts to Directive 083 and Industry Recommended Practice (IRP) 24.