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Pushing the limits of the Montney at Gold Greek – from seismic to stimulation

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Part 1 - Summary

Hydraulic fracturing of unconventional resource plays has become the norm across the western Canadian sedimentary basin. Advances in engineering technology has resulted in longer laterals, higher tonnage and closer spacing as companies attempt to maximize recoverable hydrocarbons. Correspondingly, the role of seismic data for optimizing unconventional resources has become increasingly technically demanding. In addition to the specialized geophysical processes, integration with other data sets becomes critical to asset optimization. Like most datasets, seismic in isolation is limited in its interpretation power. However, combining various sources of seismic, geologic and engineering data can establish a geologic model with production relevance addressing fracture geometries and flow performance.

In part 1, a workflow for the extraction of viable seismic attributes is developed. Pre-stack seismic data and inversion is utilized to solve for P-Impedance and S-Impedance that can be reformulated into these moduli and make mineral estimates through rock physics templates. To be confident in the seismic data predictions the input must be sufficiently AVO friendly for inversion. The inversion must also be constrained such that the output values are representative of what is expected for the given formation. Outlined is a workflow displaying the iterative process to ensure amplitude preservation and the quality control steps to achieve an optimal inversion result and determine its reliability.

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