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Pushing the limits of the Montney at Gold Creek – From seismic to simulation

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Part 2 - 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 iterpretation power. However, combining various sources of seismic, geologic and engineering data can establish a geologic model with production relevance addresssing fracture geometries and flow performance.

In part 2, the transformation of seismic attribute to geoengineering parameter is investigated. The reservoir characterization workflow that includes seismic data can be an integral part of play development. Such data integration can only occur once processed seismic data, ranging from depth structure maps to estimates of P and S impedance, is transformed into a format that is compatible with geologic or engineering data. This means taking seismic attributes and relating them to reservoir properties. A means to accomplish the transformation is shown specifically for the Montney where 3D seismic data is used to map porosity, lithology and pertinent structural features. A combination of emprical and rock physics trends are used to establish reservoir property estimates. Furthermore, exploiting seismic anisotropy helps visualize subtle faulting. This data is complemented with microseismic data to establish stimulation and reservoir property correlations.

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