Sedimentology, Environment of Deposition, and Rock Mechanics of the Montney Formation: Outcrop Study in the Kananaskis area, SW Alberta

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ABSTRACT

The Lower Triassic Montney Formation is a reservoir unit of high interest to the modern Canadian petroleum industry. In north-eastern British Coloumbia and western Alberta, it contains estimated marketable resources of 449 trillion cubic feet of natural gas, 14.5 billion barrels of natural gas liquids, and over 1 billion barrels of oil. Understanding the sedimentology, stratigraphy, and depositional environments is key to understanding and predicting the distribution of quality oil and gas reservoir within the Montney Formation. Additionally, understanding how observed fracture networks relate to various lithologies is highly important for advanced recovery techniques such as hydraulic fracturing. My research will utilize outcrop in the Kananaskis area to better understand the depositional aspects of the Montney Formation, and how this relates to the observed natural fracture networks. Fieldwork will involve sedimentological description of measured sections, creation of depositional cross sections, and 3D modeling of outcrops using drone photography. My main objectives are to differentiate and describe the subtly different offshore environments and observe how these affect the natural fracture networks of the formation. This project will further the understanding of fine grained sediment transport and deposition in ancient offshore environments, which is currently an area of active academic research and debate. It will also contribute greatly to the understanding of the Montney Formation as a hydrocarbon reservoir unit. A better understanding of the environments of deposition, meter-scale variability, and rock mechanics of the various lithologies will contribute greatly to exploration and production of resources within the Montney.