



CSPG ROCK ANALYSIS WORKSHOP

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State of the art geomechanical triaxial tests at the millimetre core scale to examine scale influence of hydro- and multiphase properties changes of shales

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Summary

The geomechanical response of tight formations (i.e. tight Montney siltstones, shales) during stimulation and production are influenced by their complex structures and compositional heterogeneities. Optimizing hydrocarbon recovery from these unconventional reservoirs requires improved understanding of how petrophysical, hydraulic and geomechanical properties are impacted by these multiscale (pore to reservoir) heterogeneities. Unconfined Compression Strength testing and correlated methods (micro indentation, scratch tests, etc) are insufficient to capture complex Thermal-Hydro-Mechanical (THM) behavior of unconventional tight formations during fracturing and production. The small multi-scale THM testing on unconventional tight formations will provide significant understanding on the impacts of scale and inform requirements for reservoir completion design. Using our unique, custom designed small triaxial system (STC), the effects of confining stresses and fluid saturation (spontaneous imbibition) on the constitutive behavior of unconventional tight formations will be studied. Multiple 5mm to 25mm diameter specimens will be tested under consolidated drained and undrained triaxial conditions with permeability measurements at ambient and reservoir temperatures (<150°C) as well as detailed petrophysical characterization (e.g. SEM, XRD, etc.). Experimental results will form the basis of a scale dependent constitutive behavior for this class of materials.