ROCK MECHANICS AND GEOMECHANICAL STRATIGRAPHY

Trican Geological Solutions, formerly CBM Solutions Ltd., is a geological analysis and services company specializing in the evaluation of unconventional and conventional resources worldwide. Using state-of-the-art equipment and software, our experienced geoscientists provide customers with the information they need to understand and analyze key reservoir parameters, including:

- Formation stresses
- Borehole stability
- Cap rock integrity
- Hydraulic fracture behavior

Our team is dedicated to providing our customers with high quality, meaningful and timely analyses to evaluate formation properties, characterize reservoir rock and optimize completion programs. We offer a comprehensive range of services that can be combined and customized to meet the specific goals and scope of each individual project. Our services include:

**Triaxial Compression Testing**

- Sample sizes ranging from small gauge plugs to full diameter core
- High force and low force systems
- High pressure and high temperature testing
- Anisotropic static property measurements
- Time-dependent (creep strain) deformation measurement
- Permeability measurement and evolution under stress
- Drained and undrained properties
- Biot's and other poroelastic coefficients for stress, permeability, etc.
- Multi-stage compression testing
- Acoustic emission monitoring of failure
- Tensile, shear and non-linear failure criteria development
Acoustic Velocity Measurements

- Compressional (P) and shear (S) waves acquired at various stress levels
- Velocity measurements for calibrating sonic log data
- Multi-azimuth acoustics to quantify all elastic parameters of the VTI stiffness tensor with the use of a single sample

Direct Shear Testing

- Using a variety of sample sizes and shapes from 1 in. plugs to full diameter or irregular core
- Direct measurement of shear strength and modulus as a function of normal stress; useful in the determination of failure envelopes
- Elevated temperature testing
- Quantification of sliding friction along bedding planes under varying applications of normal load

Mechanical Profiling

- High resolution, non-destructive quantification of mechanical properties along a core or core plug
- High resolution scratch testing with acoustic velocity profiling
- Mechanical testing of drill cuttings
- Preliminary determination of mechanical heterogeneity; correlation to petrophysical logs and other mechanical tests

Proppant Embedment, Fracture Conductivity and Fluid Treatment Effects

- Measurement of:
  - Proppant embedment and/or crushing with formation fines generation analysis
  - Evolution of fluid conductivity under reservoir stresses and temperatures
  - Chemo-mechanical effects of drilling/completion fluids on fracture surfaces and proppants
- Customizable testing programs to assess specific proppants and/or treatment/completion fluids

Modelling and Analysis

- 1D to 3D, single well to multi-well geomechanical model construction and analysis
- Integration of core and log data
- Coupled numerical models for complex problems
- Analysis of wellbore and perforation strategies to improve hydraulic fracture placement
- Analysis of near-wellbore fracture behavior, stress shadowing, etc.
- Analysis of problem wells and/or fields

For more information, please contact Trican Geological Solutions.