GROUND TRUTH BREAKTHROUGH

Innovating Rock Data Insights

THINK CUTTINGS!

GeoTechnical Rock Lab specializes in subsurface analysis with its flagship product, Integrated Drill Cuttings™, transforming drill cuttings into actionable geoscientific insights.

DEPTH CORRECTION

Mixed cuttings leads to misleading results. Our proprietary sorting process extracts valuable and complete insights.

DATA INTEGRATION

See the whole picture and maximize data value with interdisciplinary interpretation.

www.georocklab.com

Petrophysics

Petrophysics focuses on quantifying a rock's ability to store and transmit fluids. Key properties and methods include:

- **Porosity** – Measures fluid storage capacity.
- **Fluid Saturation** – Indicates the proportion of each fluid (oil, gas, water) in pore space.
- **Permeability** – Assesses fluid flow potential through connected pores.
- **Cuttings** – Properties must be estimated using a combination of analytical techniques

- **Analytical Techniques**:
  - XRD, XRF, TOC
  - Micro-CT, NMR, Helium Porosimetry
  - Karl Fischer Titration, Pyrolysis, Rock-Eval
  - External Bulk Density, Unsteady-State Permeametry
  - Inversion Modeling for derived estimates

Log Analysis

- **Logs** – Continuous borehole measurements to evaluate subsurface formations and its surroundings.
- **Hydrocarbon Identification** – Detects presence, mobility, and storage potential.
- **Lithology & Rock Typing** – Determines mineralogy and rock classification.
- **Porosity & Saturation** – Assesses reservoir quality.
- **Permeability** – Supports flow potential evaluation.
- **Anisotropic Geomechanics** – Estimates elastic parameters, stress, and pore pressure using volumetric models.
- **Model Validation** – Refined using lab or *in-situ* measurements when available.
- **Operational Guidance** – Informs perforation, sampling, wellbore stability, and development planning.

Geochemistry

This discipline uses analytical techniques to study the composition, formation, and distribution of geological materials—both solids and fluids—under varying pressure, temperature, and time. Key methods include:

- **RockEval/TOC and Vitrinite Reflectance**: Assess hydrocarbon generation potential and type.
- **XRF/EDX and XRD** – Determine elemental and mineralogical composition; when paired with TOC and bulk density, enables porosity estimation.
- **Raman and Infrared Spectroscopy** – Aid in distinguishing mineral polymorphs and kerogen texture.
- **Gas Chromatography and ICP** – Provide detailed analysis of volatiles and trace elements.
- **Fluid-Rock Sensitivity** – Evaluating for minerals that are sensitive to acid, fresh water, and fluids of various compositions.

Research and Development – Characterizing expected behavior of fluids based on various existing datasets.

Geomechanics

Landing Zone Selection and Rock Mechanics

- **Landing Zone** – Rock mechanical properties are fundamental to determining the optimal landing zone.
- **Nano-indentation** – Properties are assessed from nano-indentation measurements on drill cuttings.
- **Sample Selection** – Measurements from select intervals calibrate the log-scale volumetric geomechanics model, providing insights into the target reservoir and surrounding facies.
- **Rock Mechanical Properties** – Used to estimate fracture width and minimum horizontal stress.
- **Advanced Analysis** – Fracture width, minimum horizontal stress, cuttings deformation index, cuttings size distribution, and lamination count.