SCAL, Inc.
Services & Capabilities
About Us

30+ years of service

2019 marks the 30th year in operation for Midland-based Special Core Analysis Laboratories, Inc. (SCAL, Inc.). We're proud to celebrate this anniversary by acknowledging the people that enable our success - you, our clients.
Our Services

Conventional Core Analysis
Porosity, Klinkenberg permeabilities and fluid saturations at reservoir stress for drilled sidewall, plug and full diameter core samples. Full range of sample preparation techniques for sensitive minerals and a large in-house core storage facility.

Complete Shale Analysis
NANO GAS MEASUREMENT: cost-effective, automated, real-time (24-48 hr) measurements to identify SHALE OIL "sweet zones" using Quick-Desorption™ Analysis - our industry-changing innovation.

Special Core Analysis
Wettability, relative permeability (water-oil, gas-oil, gas-water), capillary pressure, rock-fluid compatibility, electrical resistivity measurements, acoustic velocities, dynamic rock mechanics, and other specialized services.

PVT Laboratory Services
Our state-of-the-art PVT Laboratory is available to perform black oil, volatile oil, retrograde condensate and gas studies. NEW: PVT for Shale Liquid Systems

Enhanced Oil Recovery
Reservoir fluid recombination, MMP determination, miscible and miscible flooding services, CO2 flooding and other EOR-related services.

Geological Services
Core description, photography, thin-section preparation, petrography, x-ray diffraction mineral and clays identification, scanning electron microscopy w/ energy dispersive spectroscopy, reservoir rock petrology, diagenesis & other geological services.
Conventional Core Analysis

ROUTINE CORE ANALYSIS SERVICES

Research grade, automated equipment is available for routine core properties measurements (porosity, air permeability, grain density and fluid saturations).

Capable of analyzing 15/16", 1", 1.5", 2" diameter plug samples as well as full diameter core samples from 2" to 4.25" diameter up to 36" length.

Numerous cleaning, drying and sample handling procedures are available.
Conventional Core Analysis

- Drilled Sidewall Analysis
- Plug Core Analysis
- Full Diameter Core Analysis
- Well Site Services
Shale Analysis

Nano Gas Measurement & Sweet Zone Identification
Extended Gas Analysis

Gas chromatography is used to analyze the sample for permanent gas components (helium, oxygen, nitrogen, hydrogen sulfide, and carbon dioxide) and hydrocarbon components (methane, ethane, propane, i- and n-butane, i- and n-pentane, hexanes, heptanes, and the octanes plus fraction).

Containers used to collect samples at high or low pressure.
Integrated Gas Analysis and QDSE Results

The results of the extended gas analysis are plotted on a log versus depth for easy visualization of the data. Helium is of particular interest, because it can be used as an indicator of the presence of natural fracture networks.
Shale Fractions & Associated Testing

1. Desorption Isotherms (i)
2. Matrix Permeability (i)
3. Micro fracture Porosity and Permeability (i)
4. Bulk Density (i)
5. Plug Diffusion Parameter (i)
6. Brinell Hardness (i)
7. Extended Desorbed Gas Analysis (Includes: Helium, Oxygen, Nitrogen, Carbon Dioxide, and Hydrocarbon Components Through C8+)
8. Wettability by Drop Shape Analysis
9. Fluid Optimization by Drop Shape Analysis
10. Dynamic Rock Mechanics (Shear and Compressional Velocities)
11. Static Rock Mechanics (Triaxial Testing)
12. Vitrinite Reflectance
13. Thin Section Preparation and Description
14. Proppant Testing and Optimization
15. Fracture Permeability Studies
16. Isotope Analysis

17. Residual Gas (i)
18. Crushed Rock Analysis (GRI Optimized) (i)
19. Crushed Diffusion Parameter (i)
20. Adsorption Isotherms (CH4 and He)
21. SEM – EDS
22. Mercury Injection Capillary Pressure

23. TOC and Rock Evaluation (i)
24. XRD
25. Capillary Suction Time
26. Acid Solubility
27. Roller Oven
28. Wettability by Drop Shape Analysis
29. Fluid Optimization by Drop Shape Analysis

(i) – included in our standard analysis package (1,2,3,4,5,6,17,18,19 and 23)
Cuttings Analysis

Porosity Measurements performed without removing clay bound water and without altering the organic content

Permeability Calculation based on detailed pore size distribution (Scanning MICP)

Wettability Measurements

Completion Fluids Optimization based on contact angle, spontaneous imbibition, CST, roller oven, mineralogy and elemental analysis
Special Core Analysis

Wettability
Capillary Pressure
Electrical Resistivity
Relative Permeability
Rock Fluid Compatibility
Rock Mechanics
(Static and Dynamic)
Pressure Core and Desorption Isotherms
Core Vault Analysis
Computed Tomography (CT) is used to calculate in-situ saturations at reservoir conditions and to visualize the fluid distribution within the core.

Other applications for CT scanning include:

• CT images of full core, drilled plugs, and rotary sidewall plugs
• Sample screening for EOR, SCAL, and Rock Mechanics testing
• Works in concert with Rock Mechanics testing to visualize possible anisotropy
Drop Shape Analysis

Measures:
- Interfacial Tension
- Contact Angle
- Spontaneous Imbibition

Over 120 images captured in the first five seconds

Use the measured contact angle and spontaneous imbibition to calculate the Wettability Index for oil and water.

We use DSA to optimize fluids for:
- Drilling (well bore stability problems)
- Completion
- Stimulation (surfactant optimization)
- Water Flooding (low salinity flooding)
- EOR
Wettability Measurements (µm DSA)

The Gray Silt has Porosity and Permeability (open generation system)
The organic material was completely converted to hydrocarbons

The Black Shale is Tight (closed generation system)
The organic material was partially converted (S1 and S2 and black color)

Oil          44%  
Water     56%  
Silt  
Reservoir Rock

Oil          91 %  
Water     9%  
Shale  
Molecular and Stratigraphic Trap

Oil          54%  
Water     46%  
Shale-Silt Mix

Primary Reservoir
Special Core Analysis
PVT Laboratory Services

Sampling
Compositional Analysis
Recombination of Separator Fluids
Density and Viscosity Measurement
Constant Composition Expansion
Differential Liberation Expansion
2-Stage Flash Separator Test
PVT Laboratory Services
Automated Oil and Gas Analysis
Enhanced Oil Recovery

Reservoir Fluid Recombination

Minimum miscibility pressure (MMP) determination

Miscible flooding (CO2)

Other EOR floods:
hot water, steam, polymers
Geological Services

Surveying Gamma-Ray Spectrometer
Core Description
Thin Section Petrography
X-ray Diffraction Analysis
Scanning Electron Microscopy
Formation Damage Potential
Integrated Petrology Analysis
Integration of petrology with routine and special core analysis
Geological Services
Advanced Core Description Services

- Brinell Hardness
- Probe Permeameter
- Stereo & Petrophysical Microscopes
- Handheld Spectral Gamma
- X-Ray Fluorescence
- Viewing / Storage Facilities
Contact Us

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