EERC Laboratory Capabilities

…to Provide Focused Solutions for the Petroleum Industry

EERC
Energy & Environmental Research Center®
Putting Research into Practice

The Energy & Environmental Research Center (EERC) has the laboratory facilities, expertise, and experience to perform all scales of materials analysis and reservoir characterization. EERC laboratories work jointly to address a multitude of standard and nonstandard tests designed and implemented to exceed client needs. From microscale electron microscopy through macroscale core evaluations, the EERC has the capabilities and know-how to address the research needs of the petroleum industry.

Today's oil and gas exploration and production projects begin with detailed applied research and characterization. Whether revitalizing vintage oil fields or enhancing oil production from unconventional reservoirs, the EERC brings together an integrated team of scientists and engineers equipped to provide practical solutions to complex issues associated with characterizing the subsurface.

EERC laboratories possess analytical capabilities suitable for determining key properties of subsurface reservoir rocks and materials used throughout the petroleum industry. Past evaluations have focused on assessing petroleum systems throughout the Williston, Denver–Julesburg, Alberta, and Powder River Basins. Specific assessments have focused on the determination of proppant strength and conductivity, mechanical rock properties, petrophysical characteristics of rocks, and chemical effects of rock and fluid interactions. In each case, EERC researchers have worked with industry and government partners to provide results of site-specific evaluations conducted at multiple scales of examination.







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Analytical Research Laboratory

The ARL provides quality data, flexibility, and rapid turnaround time in support of research activities at the EERC. The lab employs standardized and novel analytical procedures to determine major, minor, and trace constituents in a wide variety of sample types:

- Fossil fuels
- Biomass
- Combustion by-products
- Geologic materials
- Plant materials
- Groundwater
- High TDS (total dissolved solids) reservoir brine
- Wastewater

Natural Materials Analytical Research Laboratory

The NMARL offers analytical services designed specifically to address engineering problems in a wide range of fields. Analytical facilities combined with an experienced team of researchers provide a full range of advanced materials characterization and data interpretation using the following:

- Scanning electron microscopy equipped with x-ray microanalysis
  - Quantitative chemical analysis
  - Image analysis
  - Mineral phase mapping
- X-ray fluorescence
  - Bulk chemical analysis
- X-ray diffraction
  - Quantitative phase analysis
  - Clay-typing analysis

Applied Geology Laboratory

The AGL has the ability to perform testing to determine basic petrographic and routine core properties, mechanical strengths, and flow-through characteristics of samples. Its diverse team of engineers and geologists work to provide solutions relevant to the petroleum industry.

Geomechanical

- Uniaxial compression
- Triaxial compression
- Consolidation/constant rate of strain testing
- Brinell hardness

Geochemical

- Fluid analysis
- Optical mineralogy/thin-section analysis
- Batch reaction exposure studies

Characterization

- Porosity/bulk volume/grain volume/grain density
- Permeability to air and water
- Optical profilometry
- Cloud point
- Geological interpretation
- Fracture analysis

Environmental Chemistry Laboratory

The Environmental Chemistry Laboratory conducts groundbreaking work toward understanding the chemistry of water and carbon dioxide under pressurized super- and subcritical conditions. This knowledge base provides solutions for the CO_2 enhanced oil recovery and storage markets:

- Batch reaction vessels rated to 6000 psi and 350°C
- Multisample continuous exposure for extended durations
- Mixtures of CO_2 and H_2S routinely handled
- Supercritical CO_2 extraction of hydrocarbons from reservoir rocks

For More Information, Contact:

Steven A. Smith
Research Manager
(701) 777-5108
ssmith@undeerc.org

Carolyn M. Nyberg
Research Manager
(701) 777-5057
cnyberg@undeerc.org

Bethany A. Kurz
Senior Research Manager
(701) 777-5050
bkurz@undeerc.org

Energy & Environmental Research Center
University of North Dakota
15 North 23rd Street, Stop 9018
Grand Forks, ND 58202-9018

www.undeerc.org

THE UNIVERSITY OF NORTH DAKOTA