WELL RESEARCH & INNOVATIONS

NETL NATIONAL ENERGY TECHNOLOGY LABORATORY

OVERVIEW

NETL has spent a quarter of a century researching our nation's subsurface energy resources. Some of our nation's oldest and most impactful resources are the more than 5 million wells spanning the federal, state, and tribal lands and waters. Multiple NETL directorates in the Research & Innovation Center (RIC) support well research, including Computational Science and Engineering, Strategic Systems Analysis and Engineering, Materials Engineering and Manufacturing, and Geological and Environmental Systems. Research efforts include core characterization, applied machine learning for well integrity, materials testing, and cost analysis — with the common goal of providing novel, science-based information to support safe domestic decision making for energy planning, development, production and plugging.

Supporting commercial, regulatory and research stakeholders through applied scientific innovations, NETL is expanding its core competencies to evaluate remediation needs, mitigate risk, inform permitting and support national energy security needs. As listed below, NETL has a number of existing competencies supporting well technology innovation, including researchers in the field performing drone surveys to find undocumented wells. Moreover, data science and techno-economic analyses are being applied to creating novel tools to help characterize the integrity of existing wells and evaluate remediation needs.

Albany, OR • Morgantown, WV • Pittsburgh, PA • Houston, TX

**U.S. DEPARTMENT** *of* **ENERGY**

WELL-RELATED COMPETENCIES:

- In-field data collection
- Supply chain analysis
- Emission measurement and monitoring
- Unmanned aerial vehicle (UAV) and ground-truthing surveys
- Fiber optic and surface acoustic wave (SAW) based methane sensor technology for leak detection and measurement
- Core characterization
- Leakage mitigation
- Hydrocarbon blowout and spill modeling
- Materials testing
- Techno-economic assessments
- Well database development
- Infrastructure integrity modeling
- Socio-economic and environmental impact assessments
- Geologic risk analysis
- Enhanced oil recovery suitability
- Carbon and hydrogen storage suitability

RESEARCH PORTFOLIOS:

- Undocumented Orphaned Well
- Marginal Conventional Well
- Methane Mitigation Technologies
- Carbon Transport and Storage
- Hydrogen

NETL researchers in the field evaluating emissions at a well site.
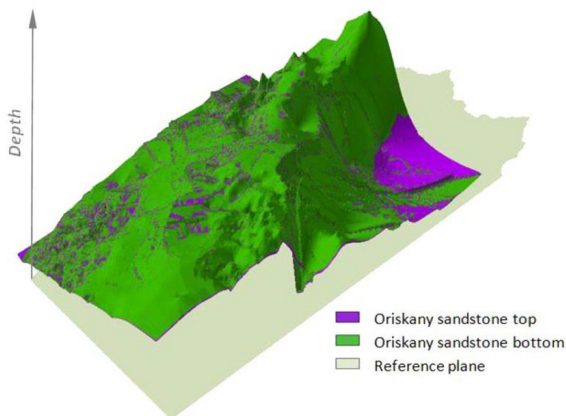
Three-dimensional model of the Oriskany sandstone formation utilized to understand prospective resource potential.
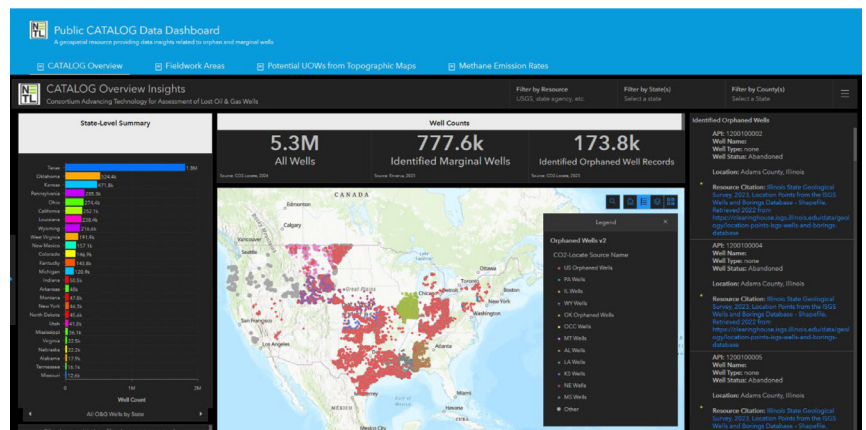
A national well resource mapping application for sharing critical insights with stakeholders, including industry, regulators, and researchers.

NETL is a U.S. Department of Energy (DOE) national laboratory dedicated to advancing the nation's energy future by creating innovative solutions that strengthen the security, affordability and reliability of energy systems and natural resources. With laboratories in Albany, Oregon; Morgantown, West Virginia; and Pittsburgh, Pennsylvania, NETL creates advanced energy technologies that support DOE's mission while fostering collaborations that will lead to a resilient and abundant energy future for the nation.

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