UNDOCUMENTED ORPHANED WELLS PROGRAM

Program 095, September 2024

NATIONAL ENERGY TECHNOLOGY LABORATORY

The Undocumented Orphaned Wells program will develop technologies and methodologies to enable the finding and characterization of undocumented orphaned wells by determining their physical locations, integrity of the wellbore, and additional environmental factors like methane emissions. This program focuses on undocumented orphaned oil and natural gas wells located on private, State, Federal, and Tribal land across the United States (U.S.).

This program will establish a collaborative framework via a consortium, develop and test technologies and processes in the field, develop best practices for orphaned well identification and characterization, and ultimately deploy these developed technologies at scale. The technologies developed under this program will help further the Administration's emissions reduction goals to cut methane emissions by 30% compared with 2020 levels by 2030.

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

U.S. Department of ENERGY

Generally, orphaned wells are defined as an idle well for which the operator is unknown or insolvent. It is estimated that there are hundreds of thousands of undocumented orphaned wells leaking methane in the U.S. with unknown locations and missing information such as ownership or construction details. The total estimated number of undocumented orphaned wells reported by states is between 310,000 and 800,000.

The Bipartisan Infrastructure Law (BIL), signed in late 2021, directs DOE to implement a research program focused on assisting the Federal land management agencies, States, and Indian Tribes in identifying and characterizing undocumented orphaned wells.

NETL's Undocumented Orphaned Wells program is a multi-lab effort to establish a collaborative framework via the consortium, develop and test technologies and processes in the field, create best practices for identification and characterization, and ultimately deploy these new technologies at scale.

NETL'S RESEARCH WILL IMPROVE EFFORTS TO PROTECT THE ENVIRONMENT BY INVESTIGATING:

WELL IDENTIFICATION — To develop, integrate, and deploy technologies to locate and identify undocumented orphan wells.

METHANE DETECTION AND QUANTIFICATION — To develop, integrate, and deploy technologies to detect and quantify methane leakage from undocumented orphan wells.

WELL CHARACTERIZATION — To develop, integrate, and deploy technologies to characterize undocumented orphan wells so that they can be prioritized for plugging or for risk mitigation by the appropriate agency.

SENSOR FUSION AND DATA INTEGRATION WITH MACHINE LEARNING — To employ and integrate the latest hardware (e.g., drones, UVAs, satellites) to advance the state of the art in identifying and characterizing undocumented orphan wells.

INTEGRATION AND BEST PRACTICES — To provide means for Federal, State, and Tribal agencies and operators to access records and information that will assist in locating and characterizing undocumented orphaned wells.

RESEARCH CONSORTIUM

To develop this program, DOE, in collaboration with the Interstate Oil and Gas Compact Commission (IOGCC), created a research consortium that consists of five national laboratories — Los Alamos National Laboratory, NETL, Lawrence Berkely National Laboratory, Sandia National Laboratory, and Lawrence Livermore National Laboratory. This consortium leverages institutional knowledge, existing processes, and fundamental and applied science expertise to undertake the primary objectives as defined in the BIL, focusing specifically on undocumented orphaned oil and gas wells in multiple basins and plays on private and Federal land across the U.S.

The National Energy Technology Laboratory is a U.S. Department of Energy national laboratory that drives innovation and delivers technological solutions for an environmentally sustainable and prosperous energy future. Through its world- class scientists, engineers, and research facilities, NETL is ensuring affordable, abundant and reliable energy that drives a robust economy and national security, while developing technologies to manage carbon across the full life cycle, enabling environmental sustainability for all Americans, advancing environmental justice, and revitalizing the economies of disadvantaged communities.

NETL lends its expertise toward achieving a carbon-free power sector by 2035 and a net-zero economy by 2050 while catalyzing economic revitalization, creating good-paying jobs, and supporting workers in energy communities, especially hard- hit coal, oil and gas, and power plant communities across the country. One of the most rewarding aspects of NETL's research is that our innovations and technologies have the potential to improve people's lives in meaningful ways.