

**U.S. DEPARTMENT OF ENERGY
OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY
NEPA DETERMINATION**



RECIPIENT: NREL

STATE: CO

PROJECT TITLE : NREL-24-011 Anaerobic Digester Pilot Experiment - AK

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
	DE-AC36-08GO28308	GFO-NREL-24-011	GO28308

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), I have made the following determination:

CX, EA, EIS APPENDIX AND NUMBER:

Description:

A9 Information gathering, analysis, and dissemination

Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)

B3.6 Small-scale research and development, laboratory operations, and pilot projects

Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

Rationale for determination:

The U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) is proposing to install and operate four small-scale anaerobic digesters at the Applied Research for Communities in Extreme Environments (ARCEE) Campus just west of the Research and Testing Facility (RTF) located in Fairbanks, Alaska.

The purpose of this project is to test and study the process of breaking down organic matter with bacteria in an Artic environment. Anaerobic digesters would be constructed at ARCEE to support this research.

The proposed project would involve the construction and installation of four anaerobic digester systems and supporting infrastructure directly west of the Cold Climate Housing and Research Center facility. The following would be installed:

- 6 feet x 6 feet passive solar heating unit;
- 8 feet x 6 feet structure with a 20 thousandths of an inch thick reinforced polyethylene (plastic) liner with industrial rubber for spill containment housing the following equipment: a resistor for ambient "dump load" heating to remove excess heat; an ambient heat unit; biogas capture units; unit with a heating blanket; and an unheated "control" unit;
- Battery bank (lead-acid 12 volt); and
- Set of six 260-watt photovoltaic (solar) panels.

NREL would operate and maintain the digesters after they have been installed.

During operation, each anaerobic digester system would have a 55-gallon drum containing 35-gallons of sludge. The digesters would sit on top of an appropriately sized spill containment pallet or tray for secondary containment. Each digester would process a synthetic feces recipe (20-40lbs of dry materials), 100-gallons of water, and approximately 5-gallons of inoculum (initial material of microorganisms). The inoculum proposed for the project would be treated effluent by a wastewater anaerobic digester in Talkeetna, AK. Collection of inoculum would be completed by Talkeetna Sewer & Water, and the inoculum would be transported to NREL by the Environmental Protection Agency (EPA).

NREL would collect a sludge sample once a week from each digester during the operational period. NREL staff would deliver the sludge samples to EPA for chemical analysis, as well as to Pollen Environmental Services in Fairbanks for fecal coliform testing. These locations are within 20-miles of the RTF.

The digesters would be monitored (via temperature and gas production data) to determine when they have reached a stable state. Once a stable state of production is reached, each digester would be fed semi-continuously with food waste once a week; the weekly sampling of the sludge would occur simultaneously. During this process, approximately 1.5-gallons of the resulting digestate (material remaining after anaerobic digestion) and organic matter would be pumped out from a sample port and an equivalent volume of feedstock of synthetic feces would be added into the system.

The proposed project would begin in the summer of 2024 and is expected to be completed in 2026. After the project has been completed, the system would be decommissioned.

Impacts

All waste generated during the project would be reused, recycled, or disposed of in accordance with applicable regulations and NREL's policies and procedures. Excess digestate would be disposed of into an on-site septic system. Any non-disposable and contaminated materials resulting from operation would be decontaminated with a bleach solution. Contaminated, disposable items would be placed in biohazardous waste container and disposed of in accordance with requirements.

Biogas would be vented from gas collection systems in the process of sludge sampling. Local travel, construction, and research activities would result in de minimis air emissions. Workers would follow NREL's specifications and all other applicable requirements to limit air emissions from the site. Emissions are not anticipated to appreciably contribute to the local load of air pollutants. Construction-related noise would consist of a short-term, intermittent increase in ambient noise levels and would follow applicable noise ordinances.

Ground disturbance is expected during project installation. Erosion and stormwater impacts would occur because of ground disturbance. Erosion control measures would be installed and maintained throughout the project lifecycle. Workers would follow NREL's stormwater construction requirements and all other applicable requirements. All ground disturbance would occur in areas that have been previously disturbed. Ground disturbing activities would be conducted in accordance with existing NREL policies and procedures.

DOE has considered potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate adverse impacts to any resources.

Individuals working on this project could be exposed to various hazards during construction and operation. Existing corporate health and safety policies and procedures would be followed including employee training, work/worker authorization, proper protective equipment, engineering controls, and monitoring, as well as obtaining a Safe Work Permit. Additional policies and procedures would be implemented as necessary if new health and safety risks are identified.

Operations would involve working with and transporting Risk Group 2 organisms. According to the National Institute of Health (NIH), Risk Group 2 organisms are "agents that are associated with human disease which is rarely serious and for which preventive or therapeutic interventions are often available. These agents represent a moderate risk to an individual but a low risk to the community." All work would be conducted in accordance with established biosafety policies and procedures. All procedures including but not limited to inoculation, sampling, feeding data monitoring, hibernation, and decommissioning have been documented and approved by the Institutional Biosafety Committee.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

A migratory bird nesting survey shall be completed if project activities involving ground disturbance occur between March 15 and September 15.

All required permits, procedures and permissions shall be obtained as required prior to commencing project activities.

Notes:

NREL
Brandon Bammel, 6/25/2024

FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  **Electronically Signed By: Nicole Serio** Date: 6/25/2024
NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- Field Office Manager review not required
- Field Office Manager review required

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____
Field Office Manager