

PMC-ND
(1.08.09.13)

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

**RECIPIENT:** Washington State University**STATE:** WA**PROJECT TITLE:** Advanced Pretreatment/Anaerobic Digestion (APAD)

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002029	DE-EE0008933	GFO-0008933-001	GO8933

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 (DOE) is proposing to provide federal funding to Washington State University (WSU) to develop a novel anaerobic digestion (AD) process for treatment of sewage sludge. The resulting Advanced Pretreatment/Anaerobic Digestion technology (APAD) would seek to increase methane conversion efficiency, as compared to conventional AD methods. Sludge pretreatment would be integrated into the AD process in order to increase carbon efficiency.

Project work would primarily consist of laboratory-based analysis and experiments. Dewatered sludge would be produced at a wastewater treatment plant (WWTP) and transported to WSU's laboratory facilities in Richland, WA for analysis. WSU would also perform biodigestion experiments to inform the development of optimized APAD processes.

This NEPA review is applicable to all project tasks and subtasks, except for Task 1: Study 1.1 -Verification visit of DOE team. Study 1.1 was completed prior to NEPA review. Accordingly, this work cannot be reviewed. Task 1: Study 1.2 and Study 1.3 will be reviewed. All other task work will also be reviewed and discussed below.

Task 1: DOE Verification – As mentioned above, only Study 1.2 and Study 1.3 will be reviewed as part of this NEPA Determination. These two studies consist of intermediate and final-stage project verification reviews. WSU would submit to DOE information to verify project progress, including technical data/performance metrics/targets.

TASK 2: Collection and Dewatering of Digested Sewage Sludge - Anaerobically digested sludge would be collected from the Walla Walla WWTP, in Walla Walla, WA. Project partner CleanVantage (Richland, WA) would perform dewatering of sludge at the site in coordination with Walla Walla WWTP management. This would be a recurring work activity throughout the entirety of the project. The dewatered sludge would then be transported to WSU's laboratory facilities for physical testing/analysis during subsequent tasks. Transport of dewatered sludge would be carried out in amounts less than 35 gallons, utilizing closed, double-lined containers.

Task 3: Pretreatment of the Dewatered Digested Sewage Sludge by Advanced Wet Oxidation/steam Explosion (AWOEx) - The dewatered sludge produced as part of Task 2 would be used for testing the pretreatment process. An existing 100 L pretreatment reactor at WSU would be used to perform characterization experiments to determine optimal operational parameters.

Task 4: Anaerobic Digestion of the AWOEx Pretreated Sewage Sludge - This task would consist of the continuous operation of 15 L bioreactors at WSU's laboratory facilities in order to assess optimal conditions for maximum conversion of AWOEx pretreated sewage sludge after primary digestion. Raw material inputs and anaerobic digestion retention time would be among the variables studied.

Task 5: Converting CO₂ from Biogas to Produce Bio-natural Gas - A bench-scale reactor (25 L biogas production capacity) would be assembled and installed at WSU's laboratory facilities. Assembly would be performed by WSU using commercial, off-the-shelf components. No facility modifications would be required for installation. The bioreactor would be used to assess the conversion of CO₂ from biogas to more methane through the addition of hydrogen. A biocatalyst would be grown and used for the conversion process.

Task 6: Pilot Testing of the APAD Process using the Optimal Parameters Obtained from Task 3, 4 and 5 - Bioreactor operations would be scaled up to 150 L, using an existing 400 L bioreactor system at WSU. The reactor would be operated continuously in order to gather data from larger-scale operations.

Task 7: Techno-economics, Life-cycle Analysis and Modelling of Biosolids Disposal and Cost - A techno-economic analysis and life-cycle analysis would be completed for the complete APAD. Additional computer-based process modeling would also be performed. Pacific Northwest National Laboratory (PNNL – Richland, WA) would assist WSU with computer modeling activities.

All project activities would be coordinated by WSU. No physical modifications to existing facilities, ground disturbing events, or changes to the use, mission, or operation of existing facilities would be required. No additional permits, licenses, or authorizations would be needed.

Project work would involve the use and handling of industrial chemicals and digested sewage sludge; the latter of which could potentially contain human pathogens. This risk would be diminished however, due to pretreatment at the WWTP, as opposed to using raw sewage sludge. All personnel actively working on the project would be provided with access to a Hepatitis B vaccination, as a precautionary measure. Established Standard Operating Procedures would be adhered to at all times when performing project activities. Health and safety protocols would include employee training, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. All waste materials would be handled as biological waste and would be treated and incinerated upon completion of research activities. WSU and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Bioenergy Technologies Office

This NEPA determination does not require a tailored NEPA provision.

Review completed by Jonathan Hartman, 04/22/2020

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: _____



Casey Strickland

NEPA Compliance Officer

Date: 4/22/2020

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: _____

Field Office Manager

Date: _____