

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** University of Michigan**STATE:** MI

PROJECT TITLE: Low-Energy Biomembrane Filtration Process for Advanced Water Resource Recovery Systems

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002336	DE-EE0009498	GFO-0009498-001	GO9498

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 funding to the University of Michigan to design, develop, fabricate, and field test a novel biomembrane filtration process at a pre-pilot scale level that would achieve an effluent suitable for discharge or input to water reuse technologies at reduced cost and energy relative to existing filtration processes. The project would be completed over two Budget Periods (BPs) with a Go/No-Go decision point between each BP. This NEPA determination is applicable to both BPs.

Proposed project activities would include water sample analysis, computer modeling, laboratory testing, design and fabrication of a filtration system, and pre-pilot scale testing with wastewater. University of Michigan would oversee the project. City of Ann Arbor Wastewater Treatment Plant (WTP) in Ann Arbor, MI and InCTRL Solutions in Haven, CT would be project partners.

A three-stage biomembrane filtration process (nitrification, denitrification, and filtration) would be created to treat pollutants in wastewater such as nitrogen, total suspended solids, and biochemical oxygen demand. InCTRL Solutions would model and test the three stages to understand how each stage works to treat wastewater. University of Michigan would also design and model the nitrification and denitrification stages as well as analyze samples collected weekly from Ann Arbor WTP. Equipment for all three stages would be assembled and installed at Ann Arbor WTP. Denitrification and filtration stages would be evaluated and design criteria would be refined in order to update the process model and integrate each stage into a complete biomembrane filtration process model. Continuous testing of the pre-pilot scale integrated system with municipal wastewater would be carried out at the Ann Arbor WTP, diverting up to 300 gallons per day of the primary effluent to the biomembrane filtration system which would then be reintegrated into the existing onsite treatment train. Automatic control of the biomembrane filtration process would be further developed. Techno-economic analysis and lifecycle assessments would be run throughout the project.

No changes in the use, mission, or operation of existing facilities would be required as part of this project and no additional permits would be required in order to conduct any of the work activities.

Project activities would involve the use and handling of various hazardous materials including microorganisms, acids, bases, strong oxidants, heavy metals, and organic solvents. In addition, the project would involve the use of municipal wastewater. Any risks associated with the handling of these materials would be mitigated through adherence to established health and safety policies and procedures. Protocols would include using the lowest amount of reagents

feasible, employee training, the use of personal protective equipment, monitoring, engineering controls, and internal and external assessments. All waste products would be disposed of by licensed waste management service providers. University of Michigan and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

[Advanced Manufacturing Office](#)

[This NEPA determination does not require a tailored NEPA provision.](#)

[Review completed by Shaina Aguilar on 8/13/21.](#)

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: Casey Strickland

NEPA Compliance Officer

Date: 8/17/2021

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: