

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** VISOLIS**STATE:** CA

PROJECT TITLE: Integrated Biorefinery for Chemicals and Fuels Production from Waste Biomass

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001916	DE-EE0008496	GFO-0008496-001	GO8496

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 Visolis to design, develop, fabricate, and test a novel process to convert biomass waste (e.g. food waste and agricultural residues) to bio-products through a modified anaerobic digestion (AD) process. A microbial strain would be genetically modified for the conversion process. The project would be completed over three Budget Periods (BPs), with a Go/No-Go Decision Point between each BP.

Proposed project activities under BP1 would consist solely of baseline validation/bench-scale process demonstration. BP2 activities would focus on strain engineering and AD development. Specific activities would include strain engineering, microbial consortia screening (e.g. optimal microbe selection), directed evolution, development of a feedstock processing system and Techno-Economic Analysis (TEA). BP3 activities would center on process optimization and project scale-up. These activities would include AD optimization, bioreactor optimization (1 L bioreactors), feedstock processing, pilot-scale bio-products production (approximately 100 kg), and final process modeling/TEA.

All experimental activities would be performed at existing, purpose-built laboratory facilities and/or dedicated testing sites operated by Visolis or its project partners. Visolis would oversee all project activities and would perform strain engineering and laboratory-scale fermentations (e.g. shake flask and 1 L bioreactor volumes) at both its facility in Hayward, CA and in incubator space within UC Berkeley's Energy Bioscience Building in Berkeley, CA. AD development and laboratory-scale fermentations would be performed by sub-recipient UC Davis at its campus in Davis, CA. Argonne National Laboratory (Lemont, IL) would assist in the design, development, and fabrication of bio-product extraction systems.

Additionally, pilot scale AD testing would be performed at an existing, on-campus wastewater treatment facility operated by UC Davis over a period of 1-6 months. An existing 35,000 L anaerobic digester would be used for testing. Alterations to the anaerobic digester's plumbing and pumping configuration would be completed in order to

modify the system appropriately to complete project activities. No change in the use, mission or operation of existing facilities would be required, nor would any additional authorizations or permits be required to complete project activities.

The proposed project would involve the use and handling of various acids, bases, organic solvents, and metals. All project activities would be performed indoors in laboratory settings. Any risks associated with the handling of project materials would be mitigated through adherence to established health and safety policies and procedures. Protocols would include personnel training, the use of personal protective equipment, engineering controls, monitoring, and internal assessments. Lab-scale fermentation testing would be performed under a fume hood. Emissions resulting from testing would pass through a HEPA filter prior to being released into the atmosphere.

Microorganism strain engineering would be limited to organisms requiring Biosafety Level 1 (BSL-1) containment protocols. Visolis' facilities, both at Hayward and UC Berkeley, meet requirements for containment of BSL-1 microorganisms and would adhere to Centers for Disease Control and Prevention guidelines for the safe handling of these organisms. Standard Operating Procedures were developed for the handling of the microorganisms and were reviewed and approved by UC Berkeley.

All microorganism strains and biomass material generated during the project would be bleached and/or autoclaved prior to disposal. Digester effluent is regularly produced and treated at the UC Davis wastewater treatment facility. All digester effluent produced as part of this project would be consolidated into the regularly-produced effluent stream and would be managed in accordance with existing UC Davis protocols; including on-site dewatering and transportation of the liquid and solid wastes to either a third party wastewater treatment plant or composting facility via certified transporters. Visolis and its project partners would comply with all Federal, state and local health, safety and environmental laws and regulations.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

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.

Notes:

Bioenergy Technologies Office

This NEPA determination requires a tailored NEPA Provision.

NEPA review completed by Jonathan Hartman, 02/12/2019

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: _____


NEPA Compliance Officer

Date: 2/12/2019

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: _____