

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** Research Triangle Institute**STATE:** NC

PROJECT TITLE: Integrated Separations to Improve Biocrude Recovery for Biofuels and Bioproducts

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002203	DE-EE0009262	GFO-0009262-001	

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 Research Triangle Institute (RTI) to address technical challenges of advanced biofuels technology to produce advanced hydrocarbon biofuels and high-value chemicals. A laboratory separation process would be scaled up and integrated into RTI's existing 1 ton per day (TPD) catalytic biomass pyrolysis unit.

Proposed project activities would include data analysis, computer modeling, process design for integrating the hot gas filter and separations unit operations into the 1 TPD pyrolysis unit, integration of biomass conversion technologies, biocrude sample production and characterization, techno-economic analysis (TEA), and life cycle assessment (LCA).

Project partner, Ecostrat Inc (Seattle, WA), would conduct intellectual and analytical activities, as described below. Upon verification of baseline data and project targets, they would conduct a resource assessment of regional feedstock using available aggregate data for various types of biomass available in the Southeast and Pacific Northwest of the United States, including forest residues, thinnings, sawmill residuals, pulpwood, etc. They would evaluate biomass supply chain logistics to optimize biorefinery size and location as a function of sustainable, cost-competitive feedstock resource availability, market dynamics, and regional infrastructure analysis. Additional project partners would provide technical assistance and expertise for refinery integration for coprocessing, bioproduct separation, and market analysis.

RTI (Research Triangle Park, NC) would conduct bench-scale and pilot-scale activities in the Johnson Science and Engineering Building and the Energy Technology Development Facility (ETDF). The Johnson Science and Engineering Building contains roughly 12,000 square feet of laboratory facilities. The ETDF is a 3,000 square foot building with an inside height of 41 feet. This building houses the 1 TPD catalytic biomass pyrolysis unit indoors on an 18 feet by 18 feet skid. RTI would process commercially available feedstocks (provided by Idaho National Laboratory) in this 1 TPD system to produce biocrude for bench-scale separations. RTI and a project vendor would develop designs for integrating separations processes into the 1 TPD unit and a co-processing strategy. RTI would purchase the necessary equipment for separations units and a vendor would assemble and install the equipment at RTI. The final design of the equipment would be completed during the project, however the anticipated equipment to be integrated into the 1 TPD catalytic biomass pyrolysis unit would include a hot gas filter unit (approx. 12 feet tall by 12.75 inches in diameter), 2 liquid-liquid extraction vessels and a separator vessel (each approx. 10 feet tall by 8 inches in diameter), and a distillation column (over 15 feet tall by 6 inches in diameter). The integrated system would

be operated using woody biomass to produce biocrude. Selected biocrude fractions would be co-processed with petroleum intermediates. At least two blends would be selected for longer duration testing (up to 500 hours). The co-product would be tested to identify technical requirements, market entrance challenges, and value chain analysis to inform a commercialization strategy. Over the life of the project, RTI would utilize approximately 10 tons of biomass and 1000 kg of catalyst to produce 200 gallons of biocrude for separation studies, 100 gallons of biofuel, and approximately 600 gallons of by-product. TEA and LCA would be run throughout.

Excluding modifications to RTI's 1 TPD system, no facility modifications would take place. 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 gases, catalysts, and organic solvents. Any risks associated with the handling of these materials would be mitigated through adherence to established health and safety policies and procedures, outlined in RTI's Policies and Procedures Manual. RTI's Johnson Building Lab is equipped with chemical fume hoods, local exhaust systems, and a toxic gas monitoring system to minimize worker exposure to hazardous materials. Air emissions from RTI's laboratories are controlled by the building ventilation system. System modification and biocrude production would be performed in the ETDF which is equipped with a catalytic thermal oxidizer to convert carbon monoxide and hydrocarbons to carbon dioxide (CO₂). Offgases would mainly be CO₂ and would be vented out of the building. All waste products would be disposed of by licensed waste management service providers. RTI 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 Shaina Aguilar on 7/21/21.

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: **Roak Parker**

NEPA Compliance Officer

Date: 7/29/2021

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: _____