

PMC-ND  
(LOR 09-13)

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



RECIPIENT: Southern Research Institute

STATE: NC

**PROJECT TITLE :** Biomass Conversion to Acrylonitrile Monomer-Precursor for Production of Carbon Fibers

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0000996	DE-EE0006781	GFO-0006781-001	

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Order 451.1A), 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.
- B5.15 Small-scale renewable energy research and development and pilot projects** Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Southern Research Institute (SRI) for bioenergy research that would increase algal biomass productivity via technological innovation while reducing operational cost in a seawater-based system. The proposed project would utilize biomass derived sugars, advanced catalysts innovations and process intensification approaches to produce carbon fiber ready biomass derived acrylonitrile (bio-ACN) at a cost of \$1.00/lb. The project would demonstrate the proposed technologies at laboratory scale and move through bench scale development, with the goal to be ready for integrated pilot /demonstration scale by the end of the project.

Proposed activities at SRI laboratories would include catalyst synthesis and development, catalyst testing on laboratory and bench scale skids, catalyst characterization, parametric testing for process conditions and required analytical testing, modeling and life cycle analysis of commercial system embodiment. Additionally, the study would include bench scale design and operation of a micro-reactor, safety and storage, design and commissioning, continuous operation, periodic bio-ACN validation and cycle analysis for commercial embodiment of the system. SRI would need to install five storage vessels for storing feeds, intermediates and product/byproducts, ranging in size from four at 500 liters and one would be 1000 liters. Small retrofitting would be required for a support structure to accommodate the vessels. SRI is a certified large waste generator facility with the state of North Carolina. They are permitted to handle large amounts of aqueous, organic and acid waste. A full time safety manager supported by a materials manager oversees regular shipments of waste as specified by state and federal regulations.

SRI would also partner with Cytec Carbon Fibers LLC and New Jersey Institute of Technology. Cytec Carbon Fibers LLC would complete bio-ACN validation and polymerization. The New Jersey Institute of Technology would then complete catalyst characterization supplied by Southern Research Institute using Raman spectroscopy and scanning electron microscope (SEM) characterization. All hazardous materials would be collected and disposed of by a certified hazardous materials company according to local, state and federal regulations.

The proposed project is a standalone effort and is not connected to a larger project. Project work occurring at each



laboratory facility would conform to existing facility usage. All facilities have existing health and safety policies in place for the anticipated project work. Each facility has dedicated hazardous material handling and disposal practices and all hazardous materials would be managed in accordance with federal, state, and local environmental regulations.

Based on review of the project information, DOE has determined that project activities would not have a significant individual or cumulative impact to human health and/or the environment. DOE has determined that these activities are consistent with actions contained in DOE categorical exclusions A9 "Information gathering, analysis, and dissemination," B3.6 "Small-scale research and development, laboratory operations, and pilot projects," and B5.15 "small-scale renewable energy research and development, and pilot projects" and are categorically excluded from further NEPA review.

**NEPA PROVISION**

DOE has made a final NEPA determination for this award

Insert the following language in the award:

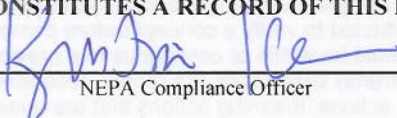
If you intend to make changes to the scope or objective of your project you are required to contact the Project Officer identified in Block 11 of the Notice of Financial Assistance Award before proceeding. You must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved.

Note to Specialist :

Bioenergy Technologies Office  
This NEPA Determination does not require a tailored NEPA provision.  
NEPA review completed by Diana Heyder, 01/12/15

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature: \_\_\_\_\_



NEPA Compliance Officer

Date: \_\_\_\_\_

1/14/2015

**FIELD OFFICE MANAGER DETERMINATION**

Field Office Manager review required

**NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:**

- Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
- Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

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

Field Office Manager's Signature: \_\_\_\_\_

Field Office Manager

Date: \_\_\_\_\_