RECIPIENT: University of Delaware

PROJECT TITLE: Circular Economy of Composite enabled by TuFF Technology

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: A9

Information gathering, analysis, and dissemination

B3.6 Small-scale research and development, laboratory operations, and pilot projects

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to the University of Delaware for the development of new recycling concepts and demonstration of multiple recycling iterations with the Tailorable universal Feedstock for Forming (TuFF) process while maintaining near full property translation. The proposed project would be completed over three Budget Periods (BPs), with a Go/No-Go decision point in between each BP. This NEPA review is applicable to all three BPs.

Proposed project activities by location are listed below:

University of Delaware - Newark, DE
- chemical analysis, resin synthesis, thermal analysis, and mechanical testing of composite coupons

Colorado State University - Fort Collins, CO
- synthesis and characterization of acrylic monomers, and design corresponding polymers with high chemical recyclability

Arkema, Inc. - King of Prussia, PA
- development, characterization, and supply of liquid thermoplastic resins for fabricating composites; fabrication, testing and characterization of lab scale composites

Composites Automation, LLC - Newark, DE
- evaluation of recycled carbon fibers for applicability to the TuFFs manufacturing process, production of highly aligned TuFF preforms with varying orientations, and supply prepreg and dry TuFF preforms

Axiom Materials, Inc. - Santa Ana, CA
- manufacture and characterization of prepreg

National Renewable Energy Laboratory -- Golden, CO
- chemo-catalytic recycling of existing epoxy resins towards demonstrations of closed loop recycling, conduct techno-economic, life-cycle, and melt-flow index analyses on processes
The project would involve the use and handling of various hazardous materials, including reactive polymer resins and industrial solvents. All such handling would occur in purpose-built laboratories. The University of Delaware and its project partners would observe all applicable environmental, health, and safety laws and regulations. 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 personnel training on the use of personal protective equipment, engineering controls, fume hoods, monitoring, and internal assessments. All waste products would be disposed of by licensed waste management service providers. No modifications, new permits, or change in the use, mission, or operation of any facility would be required.

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:

Advanced Manufacturing Office
This NEPA determination does not require a tailored NEPA Provision
NEPA review completed by Diana Heyder, 3/16/2021

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: ____________________________ Date: 3/16/2021

NEPA Compliance Officer

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: ____________________________ Date: ____________________________

Field Office Manager