PMC-ND
(1.08.09.13)

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

RECIPIENT: Georgia Institute of Technology **STATE:** GA

PROJECT TITLE: Thermophysical Property Measurements of Heat Transfer Media and Containment Materials

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001697	DE-EE0008371	GFO-0008371-001	

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.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Georgia Institute of Technology (Georgia Tech) to design, develop, and test new measurement techniques to gather thermophysical property data (e.g. thermal conductivity, thermal diffusivity, and specific heat) on heat transfer medias (HTMs) and containment materials (CMs). An immersion sensor would be fabricated and used to take measurements at high temperatures with corrosive materials. Data from the tests would be coupled with existing data to create a publically-accessible thermophysical properties database hosted by the Georgia Tech University Library.

Proposed project activities would include data collection and analysis, computer modeling (e.g. empirical engineering models, and uncertainty analysis), design work/definition of instrument specifications, development of an electrothermal measurement technique for HTMs, fabrication of an immersion sensor, performance testing, development of a photothermal technique for CMs at high temperatures, and development of a thermophysical properties database.

Fabrication would be limited to the development of the immersion sensor. The sensor would consist of a metal-coated fiber, assembled by sputter depositing an approximately 100 nm thick gold layer on a borosilicate core, surrounded by a layer of ceramics. A previously developed, rotary deposition lathe would be used to fabricate the sensor. Once assembled, the sensor would be immersed in a test material (e.g. a molten salt or sand) to assess its thermophysical properties. Testing would be performed using an evacuated vacuum chamber that can be heated to 800°C. Upon immersing the sensor in the test material, an electrical signal would be passed through the probe and the relevant data would be obtained. Fabrication and testing of the sensor would take place at the Carbon Neutral Energy Solutions Laboratory (CNES) at Georgia Tech's main campus.

The project would require approximately 1-2 kg of each of the following materials for testing: chloride-based salts, ceramics, and metal alloys. Inert gases, including nitrogen and/or argon would also be used. Handling of all testing materials would occur indoors, in existing, purpose-built laboratory facilities. No change in the use, mission, or

operation of existing facilities would result from any of the proposed project activities. Georgia Tech would not need to obtain any additional permits in order to conduct the work associated with this project.

Georgia Tech has institutional policies and procedures in place, which would be adhered to for proper handling and disposal of hazardous materials. University health and safety policies and procedures would also be followed, including researcher training, the use of proper protective equipment, engineering controls, monitoring, and internal assessments. All local, state, and Federal health, safety and environmental regulations would also be observed.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410(2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal is 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 the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Note to Specialist :

Solar Energy Technologies Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Jonathan Hartman, 08/07/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Kristin Kerwin Date: 8/7/2018

NEPA Compliance Officer

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: _____ Date: _____

Field Office Manager