PMC-ND

(1.08.09.13)

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

RECIPIENT: William Marsh Rice University **STATE:** TX

PROJECT TITLE : Plasmonic Photocatalysis for LOHC-Based Hydrogen on Demand

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002920	DE-EE0011095	GFO-0011095-001	GO11095

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.)
B3.15 Small-scale indoor research and development projects using nanoscale materials	Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).
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 William Marsh Rice University (Rice) to design, create, and test hydrogenation and dehydrogenation plasmonic photocatalysts for liquid organic hydrogen carriers (LOHC) on a nanoscale antenna-reactor within laboratory settings.

Award activities would focus primarily on design, fabrication, and laboratory testing. The types of activities associated with the award would include nanoparticle synthesis, catalyst synthesis, hydrogenation and dehydrogenation testing, data modeling, reactor design, and local outreach and training.

Design, fabrication, and testing of the antenna-reactor catalyst nanoparticles would be carried out at Rice (Houston, TX), as well as the photocatalyst reactions, optimization of nanoparticles, and data analyses. All testing would occur in existing laboratory facilities. Testing would involve electron microscopy, spectroscopy, material characterization, LED light testing, and laboratory hydrogenation and dehydrogenation studies. Facility modifications would not be required.

A Diversity, Equity, Inclusion, and Accessibility (DEIA) plan would be created for by Rice, in order to provide diversity training and establish relationships with local Hispanic-Serving Institutions (HSIs) and Historically Black Colleges and Universities (HBCUs). Students from local HSIs and HBCUs would be recruited to assist in award activities, work as graduate students, or as interns. Career development would also be provided for researchers from underrepresented and minority groups.

Award activities would involve handling and use of hazardous materials, including laboratory chemicals, nanoparticles, metallic salts, and gases. Handling, storage, and disposal of such materials would occur within controlled laboratory settings and would follow existing policies and procedures. Existing facility health, safety, and environmental policies and procedures would be followed at all facilities, including personnel training, proper personal protective equipment, engineering controls, monitoring, and internal assessments. Fume hoods and proper ventilation would be used when

handling gaseous materials as well as nanoparticles. Nanomaterials would be handled within a chemical hood, glovebox, or enclosed reaction chamber.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Hydrogen and Fuel Cell Technologies Office (HFTO)
NEPA review completed by Alex Colling on 11/15/2023.

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: Andrew Montano Date: 11/29/2023

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