

PMC-ND
(1.08.09.13)

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



RECIPIENT: University of Hawaii at Manoa

STATE: HI

PROJECT TITLE : Development of Magnesium Boride Etherates as Hydrogen Storage Materials

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001412	DE-EE0007654	GFO-0007654-002	GO7654

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.
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).

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to the University of Hawaii at Manoa for the synthesis and characterization of magnesium boride etherates, their reversible hydrogen cycling, and the optimization of magnesium boride etherates hydrogen storage properties. Project work would occur within dedicated laboratory facilities at the University of Hawaii. This is a three-year research project that includes three budget periods. A previous NEPA determination (GFO-0007654-001) was completed for Budget Period (BP) 1 activities. There was a Go/No Go decision point after BP1 that was passed so this NEPA review is for the remaining project activities in BP2 and BP3.

Budget Periods 2 and 3 continue work completed in BP1 and include chemical engineering and material science activities related to the synthesis, characterization, hydrogenation, and hydrogen cycling of metal boride compounds. All remaining project activities would utilize standard laboratory equipment and would occur in the same existing laboratories reviewed for BP1 that are designed for this type of work; therefore no modifications, new permits, additional licenses and/or authorizations would be necessary. No ground disturbing activities, no changes in operation of existing facilities, and no installation of equipment outdoors would occur at either of the facilities involved in the project. Potential hazards during the project include physical hazards such as gas under pressure and flammables and health hazards such as acute toxicity, eye irritation and carcinogenicity. Various hazardous materials would be handled as part of this project. The handling of all hazardous materials would take place inside the laboratory. Laboratory facilities would follow the proper procedures for the handling and disposal of hazardous materials in accordance with the University of Hawaii Hazardous Materials Management Program as well as all federal, state, and local environmental regulations. The University of Hawaii would adhere to the health and safety policies and procedures for the handling, storage, and disposal of gases and chemicals that are covered in the University of Hawaii's Chemical Hygiene Plan. Employee training such as mandatory lab safety trainings and specialized trainings (e.g handling of gases under pressure) would be provided. Use of engineering controls such as fumehoods and

properly rated equipment and components, as well as the correct protective equipment would be required based on detailed quantitative risk assessments. The project would follow all new guidance, policies, and procedures from the University's Environmental Health and Safety Department (ESHO), HIOSH and OSHA to ensure continuous compliance with all new laws and regulations. Nanoscale magnesium materials may be used to make magnesium boride composite materials. Nanoscale materials pose health hazards affecting the respiratory canal on exposure so these materials would be handled at levels of less than 0.1g and always within an enclosed, sealed environment reducing the chance of exposure to personnel. The materials would be stored in a separate waste container and disposed of separately through the EHSO. Other non-hazardous wastes would be disposed of in accordance with established guidelines at each facility. DOE does not anticipate any impacts to resources of concern due to the proposed activities of the project.

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 :

Fuel Cell Technologies Office
 This NEPA determination does not require a tailored NEPA provision.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  Casey Strickland Date: 2/15/2018
 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