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(108.09.13)

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



RECIPIENT: HRL Laboratories, LLC

STATE: CA

PROJECT TITLE : Boron-based hydrogen storage: ternary borides and beyond

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000827	DE-EE0006630	GFO-0006630-001	

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 federal funding to HRL Laboratories, LLC in order to develop boron-based reversible hydrogen storage materials with capacities of greater than 11 weight percent and with the thermodynamic and kinetic properties required for application in transport vehicles.

This project would be carried out through a combination of experimental and theoretical efforts organized into three major technical tasks. These tasks are identified as ternary borides, lithiated boranes, and computations and theory. The first task, ternary borides, would focus on the manufacture and classification of ternary borides and borohydrides, the fine-tuning of the composition of Magnesium-based ternary borides and borohydrides and the optimization of the performance of the borides and borohydrides through the use of added catalysts. The second task, lithiated boranes, would be focused on developing borane-based hydrogen storage materials that undergo necessary dehydrogenation/rehydrogenation reactions when exposed to lithium hydride as well as optimization of hydrogen capacity and kinetics. The final task, computations and theory, would focus on calculations that would guide the choice of systems used for both the ternary borides and lithiated boranes. All of these tasks would be undertaken concurrently with the administrative task of managing and reporting.

Manufacture, testing, and classification of hydrogen storage materials would take place in two locations. The first, HRL Laboratories, is a private industrial lab located at 3011 Malibu Canyon Rd in Malibu, CA 90265. The second, Sandia National Laboratory, is a national lab located at 1515 Eubank Blvd. in Albuquerque, NM 87123. All numerical computations would take place at the University computer lab at the University of Missouri located at 221 N Grand Blvd. in Saint Louis, MO 63103. All research and development activities would take place in existing facilities; therefore, no modifications or new permits, licenses and/or authorizations would be necessary.

Each facility where proposed project activities would occur has existing health and safety policies including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. All work would follow the guidelines set forth in those policies and pose no threat to statutory, regulatory or permit requirements for environment, health and/or safety. Hazardous materials utilized in the course of this project would include metals and industrial solvents. The particular materials used include non-aqueous laboratory solvents, metal borides, metal borohydrides and solid boranes. These quantities are lab scale (i.e. under 100 grams and typically under 10 grams). All such handling would occur in-lab where project proponents have dedicated hazardous material handling and disposal practices in place. All hazardous materials would be managed according to the Manufacturer's Material Safety Data Sheet with regards to their storage, handling, and disposal and would comply with federal, state, and local

environmental regulations.

Based on review of the project information and the above analysis, DOE has determined that the research, development and testing activities of this project would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined the proposed project is consistent with actions outlined in DOE categorical exclusion A9 "information gathering, analysis and dissemination," and B3.6 "Small-scale research and development, laboratory operations, and pilot projects" and is therefore 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 :

This NEPA determination does not require a tailored provision.
Review completed by Rebecca McCord 07/25/2014.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____

Electronically
Signed By: Kristin Kerwin
NEPA Compliance Officer

Date: 7/30/2014

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: _____