PMC-ND
(1.08.09.13)

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

RECIPIENT: Board of Regents, NSHE obo University of Nevada, Reno **STATE:** NV

PROJECT TITLE: The Grain Boundary Relaxation (GBR) Approach for Manufacturing of High Strength Nanocrystalline Lightweight Metals

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001980	DE-EE0009116	GFO-0009116-001	

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.)
B3.6 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 funding to University of Nevada, Reno (UNR) to develop a novel manufacturing process for the fabrication of nanocrystalline aluminum (NC-Al). Specifically, UNR would fabricate NC-Al samples via a cold-spray additive manufacturing technique, typically used to coat materials, but which UNR would adapt for the purpose of fabrication. UNR would perform computer simulations and physical experiments to optimize the fabrication process, while minimizing unwanted characteristics (e.g. grain coarsening). The project would be completed over two Budget Periods (BPs). This NEPA Determination will be applicable to all project activities for both BPs.

BP1 would focus on the development of a theoretical framework for fabrication processes, as well as initial fabrication runs of NC-Al samples. BP2 would focus on laboratory-scale experimentation and bulk fabrication of NC-Al samples via cold-spray processing. Proposed project activities would include computer modeling/data analysis, material synthesis (e.g. powder synthesis via cryogenic milling), NC-Al sample fabrication, and mechanical testing of components (e.g. durability testing). The NC-Al samples to be fabricated via cold-spray processing would be small, laboratory-scale objects measuring approximately 10 cm × 10 cm × 1 cm. These samples would then be processed into coupons for characterization and mechanical testing.

All project activities would be coordinated by UNR. UNR would perform computer modeling, powder synthesis, and material characterization at its campus in Reno, NV. Project partner ASB Industries would perform component fabrication activities and mechanical testing at its manufacturing facility in Barberton, OH. Final mechanical testing would be performed by a qualified, third-party independent testing facility, which would be selected in coordination with DOE, after the project has been initiated. All project work would be performed at existing, purpose-built laboratory or manufacturing facilities. No modifications to existing facilities, ground disturbing activities, or changes to the use, mission, or operation of existing facilities would be required. No additional permits, licenses, or authorizations would be required.

Approximately 100 pounds of microscale powders would be used throughout the project (Al powders with small amounts of Magnesium). Additionally, liquid nitrogen, high-pressured gases, and powered machinery with moving parts would be used and handled. All such handling would be performed in controlled access, laboratory/manufacturing environments. Any risks associated with the performance of project activities would be mitigated through adherence to established corporate health and safety policies and procedures. Protocols would include personnel training, the use of personal protective equipment, monitoring, and engineering controls. All equipment transmitting high-pressured gases would be pressure tested and fitted with safety locks and emergency shut-offs. ASB Industries regularly works with cold-spray coating technologies.

Micro and nano-sized materials would be produced as part of this project. All synthesis of micro and nano-sized materials would be performed by trained researchers under fume hoods. Researchers would be required to use particulate respirators, gloves, eye-glasses and protective clothing to mitigate against inhalation risks. Powders would be stored inside a sealed container in a cabinet within a fume hood.

Any hazardous waste produced as part of this project would be disposed of in accordance with established corporate waste management policies. UNR and ASB Industries would observe all applicable Federal, state, and local health, safety, and environmental regulations.

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 Jonathan Hartman, 04/06/2020

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: Casey Strickland Date: 4/7/2020

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- [x] 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