

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** Powdermet Inc**STATE:** OH

PROJECT TITLE: High Toughness Cermets for Molten Salt Pumps

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|--|--------------------------------------|----------------------------|-------------------|
| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
| DE-FOA-0001697 | DE-EE0008383 | GFO-0008383-001 | |

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.)

A11 Technical advice and assistance to organizations Technical advice and planning assistance to international, national, state, and local organizations.

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 Powdermet, Inc. to redesign and fabricate a corrosion resistant salt pump incorporating novel, ultra-high toughness metal matrix ceramic nanocomposite material ("Cermet") that is resistant to the salts utilized in next-generation Concentrated Solar Power (CSP) system technologies.

Budget Period (BP1) of the project would involve: data collection, analysis, and dissemination; outreach to vendors/manufacturers as well as existing test loop facilities/potential future project partners; computer modeling; preliminary design and engineering; and, laboratory-scale fabrication and testing of pump components. Budget Period 2 (BP2) of the project would involve the fabrication and testing of a pump prototype that incorporates the materials developed during BP1. A small-scale molten salt test loop at which to install and validate the pump would be required. The provider of such a facility has yet to be identified, so there is not sufficient information available at this time to review proposed BP2 activities. Therefore this NEPA Determination only applies to BP1. BP2 will require further NEPA review by DOE pending the submission of additional site information.

Proposed BP1 activities would include the molding, machining, and coating of pump components (impellers, bearings, and seals) at Powdermet's industrial pilot plant and research facility in Euclid, OH. Initial assembly and testing of components would be conducted by both Powdermet and subrecipient Sulzer Pump. Project work undertaken by Sulzer Pump would occur at their existing manufacturing facilities located in Switzerland and France. Project progress and performance goals would be coordinated with the National Renewable Energy Laboratory (NREL). Although no physical activities beyond desktop work are proposed to be conducted at NREL based on the current Statement of Project Objectives, any work proposed to be conducted at a DOE laboratory may be subject to

additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

The proposed project would involve the use and handling of nanoscale materials at Powdermet. All such handling would occur in properly equipped laboratories utilizing fume hoods with dust collectors to contain any airborne particles. Existing corporate health and safety policies and procedures would be followed, including employee training and the use of personal protective equipment. Small quantities of scrap metals, salts, and various non-hazardous waste typical of past and ongoing laboratory operations would be generated by the proposed project. All waste would be appropriately managed, then recycled if possible or disposed of using specialized companies in accordance with pertinent regulations and established methods. No siting or major expansion of waste facilities/treatment actions would be necessary.

Powdermet and Sulzer Pump facilities were purpose-built for the type of activities being proposed, and all project work would occur entirely indoors. Consequently, no adverse impacts to sensitive resources are expected as a result of the proposed activities. Project participants have all applicable permits in place to conduct BP1 activities at their respective locations. No change in the use, mission or operation of existing facilities would arise out of these efforts.

Based on the review of the proposal, DOE has determined Budget Period 1 tasks fit(s) 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. Budget Period 1 tasks are categorically excluded from further NEPA review. Further, DOE has determined that the work to be carried out at Sulzer Pump is exempt from further review pursuant to Section 5.1.1 of the DOE Final Guidelines for Implementation of Executive Order 12114; "Environmental Effects Abroad of Major Federal Actions."

NEPA PROVISION

DOE has made a conditional NEPA determination for this award, and funding for certain tasks under this award is contingent upon the final NEPA determination.

Insert the following language in the award:

You are restricted from taking any action using federal funds, which would have an adverse affect on the environment or limit the choice of reasonable alternatives prior to DOE/NNSA providing either a NEPA clearance or a final NEPA decision regarding the project.

Prohibited actions include:

[Budget Period 2.](#)

This restriction does not preclude you from:

[Budget Period 1.](#)

If you move forward with activities that are not authorized for federal funding by the DOE Contracting Officer in advance of the final NEPA decision, you are doing so at risk of not receiving federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Note to Specialist :

[Solar Energy Technologies Office](#)

[This NEPA determination requires a tailored NEPA Provision.](#)

[NEPA review completed by Whitney Doss, 8/27/2018](#)

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  **Electronically Signed By: Kristin Kerwin** Date: **8/28/2018**
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