

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** University of Washington**STATE:** WA

**PROJECT TITLE:** In-situ Photophysical Monitors and Corrective Algorithms for Photovoltaic Film Deposition and Rapid Thermal Processing in Scalable Roll to Roll Manufacturing

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0001840	DE-EE0008541	GFO-0008541-001	

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.)

**B3.15 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 federal funding to the University of Washington (UW) to develop improved process control during roll to roll (R2R) manufacturing of perovskite thin film solar materials and to characterize the phase transformation processes that occur during scalable continuous deposition of these new materials.

The proposed project would consist of outreach, data analysis, computer modeling, preliminary engineering/design, and laboratory research tasks. Associated activities would include the design, fabrication and testing of optical equipment for in-situ characterization of the rapid R2R manufacturing of thin film solar films. All work would occur at UW (Seattle, WA) primarily in the Washington Clean Energy Testbeds laboratories, a purpose-built facility that currently houses the R2R printer and characterization tools that would be utilized for the proposed project. Some tasks may be conducted in the dedicated UW Photonic Research Center. No change in the use, mission, or operation of existing facilities would arise out of this effort. The Recipient would not need any new permits, licenses, and/or authorizations to perform project activities.

Approximate quantities of materials to be used would not exceed 4 liters of various chemicals plus 300 feet of polyester flexible substrates. Approximately 200 square feet of methylammonium lead iodide-based solar cell films would be produced. The proposed project would involve the use and handling of hazardous materials such as

flammable organic solvents and lead-containing compounds. In addition, the proposed project would involve the use of inks for solar cell fabrication which may include metal nanomaterials. These materials would be in solution or in solidified thin films, and would not be present in powder or other forms likely to result in exposure to employees. Existing health and safety policies and procedures would be followed at all times, including employee training, personal protective equipment (PPE), and fume extraction systems.

Small quantities of lead-containing product and waste would be appropriately stored in nitrogen-containing gloveboxes in-lab and/or disposed of in designated hazardous solvent and solid waste receptacles, following existing procedures of UW facilities which regularly handle these types of materials. No equipment would require decommissioning or disposition at the conclusion of the proposed project. Any excess materials produced would be retained and re-used in future experiments or disposed of in the approved waste streams for these materials following standard laboratory practices.

#### NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Solar Energy Technologies Office

This NEPA determination does not require a tailored NEPA Provision.

NEPA review completed by Whitney Doss, 11/30/2018

#### 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: Kristin Kerwin  
NEPA Compliance Officer

Date: 11/30/2018

#### 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: \_\_\_\_\_

Field Office Manager

Date: \_\_\_\_\_