

PMC-ND  
(1.08.09.13)

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



RECIPIENT: NREL

STATE: CO

**PROJECT TITLE:** NREL19-030 DuraMAT Program

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
	DE-AC36-08GO28308	19-030	GO28308

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:

**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.

**B3.11 Outdoor tests and experiments on materials and equipment components** Outdoor tests and experiments for the development, quality assurance, or reliability of materials and equipment (including, but not limited to, weapon system components) under controlled conditions. Covered actions include, but are not limited to, burn tests (such as tests of electric cable fire resistance or the combustion characteristics of fuels), impact tests (such as pneumatic ejector tests using earthen embankments or concrete slabs designated and routinely used for that purpose), or drop, puncture, water-immersion, or thermal tests. Covered actions would not involve source, special nuclear, or byproduct materials, except encapsulated sources manufactured to applicable standards that contain source, special nuclear, or byproduct materials may be used for nondestructive actions such as detector/sensor development and testing and first responder field training.

**DOE/EA-1968 (NREL STM)** SITEWIDE ENVIRONMENTAL ASSESSMENT, U.S. DOE NATIONAL RENEWABLE ENERGY LABORATORY, SOUTH TABLE MOUNTAIN CAMPUS, GOLDEN, COLORADO

Rationale for determination:

The U.S. Department of Energy's (DOE) Solar Energy Technologies Office (SETO) proposes to provide funding to the National Renewable Energy Laboratory (NREL) to partner with other national laboratories, as well as partners in academia and industry, to conduct accelerated PV module durability testing and data analytics. This effort is part of DOE's national laboratory-led Energy Materials Network Consortium for durable module materials (DuraMAT), an initiative which seeks to accelerate the development of new module materials that enable significant reductions in the levelized cost of energy (LCOE) of photovoltaic (PV) systems.

The proposed project would involve indoor and outdoor testing of sample PV modules and material coupons (various PV components, such as backsheets, glass, encapsulants, and metallization paste) at federal, academic, and industry sites. Known partners include:

1. National Renewable Energy Laboratory, Golden, CO (indoor/outdoor testing)
2. Sandia National Laboratory, Albuquerque, NM (indoor/outdoor testing)
3. University of South Florida – Florida Solar Energy Center, Cocoa, FL (outdoor testing)
4. SLAC National Accelerator Laboratory, Menlo Park, CA (indoor testing)
5. Lawrence Berkeley National Laboratory, Berkeley, CA (indoor testing)
6. Sunpower R&D Ranch, Davis, CA (indoor/outdoor testing)
7. Electric Power Research Institute (EPRI), Palo Alto, CA (indoor/outdoor testing)
8. DSM, Parsippany, NJ (indoor testing)

Indoor testing would consist of characterizing solar cell and module performance (e.g., current-voltage and quantum efficiency), performing materials weathering testing using existing environmental chambers, and characterizing materials via destructive and non-destructive methods. Destructive testing would include cutting a core from a module and analyzing it using microscopy and/or compositional analysis, and non-destructive methods would include flash testing, electroluminescence, and infrared imaging. Sunpower and DSM would fabricate mini-modules on their existing research lines for testing. SLAC would characterize materials using compositional and chemical analysis, and testing at their existing x-ray facility. Testing at all sites would occur in existing laboratory space using existing equipment that currently performs such work. Appropriate engineering controls and procedures would be used and followed.

All outdoor testing would be performed at existing outdoor test sites that are equipped with all necessary infrastructure (including fixed racks and electrical, mechanical, and communications systems); as such, no ground disturbance would be required. Outdoor testing would include installation of PV modules, material coupons, and instruments on existing racking infrastructure for approximately 1-2 years to assess degradation in the natural environment. Approximately 10 PV panels would be installed and tested at each location at a time.

At the conclusion of the experiments, the undamaged modules would be removed and either reused, returned to the project partner, or disposed. Small quantities of non-hazardous waste would be produced from destructive testing of the PV modules and coupons. These wastes would be disposed of properly in accordance with established procedures.

Additional partners would be selected via solicitations through FY2021. Future partners could include other federal, industry, or academic sites, and they would perform tasks similar in scope to that described above. Partners would be selected that have all equipment, facilities, and infrastructure necessary to perform the work. At all new locations, testing would be conducted in existing facilities, at existing outdoor test sites, and would use existing infrastructure and equipment; therefore, no facility modifications, construction of new facilities, or ground disturbing activities would be required.

Project activities analyzed in this NEPA review would not affect cultural resources, threatened or endangered species, wetlands, floodplains, or prime farmlands and no permits would be required. No change in the use, mission, or operation of existing facilities would result from the proposed project. As such, no direct or indirect impacts resulting from the proposed project would be anticipated.

Individuals could be exposed physical and electrical hazards during the course of this project. Existing corporate health and safety policies and procedures would be followed, including employee training, proper protective equipment, engineering controls, and monitoring. Additional policies and procedures would be implemented as necessary if new health and safety risks are identified.

This NEPA determination applies to DuraMAT activities completed by the project partners listed above and by partners selected in the future. DOE previously completed individual NEPA determinations for the proposed activities for four of the project partners:

Sunpower: "Advanced Material Development to Support Low LCOE 25-Year Flexible Photovoltaic Modules", NEPA Control Number NREL-19-019, Signed 3/22/2019

NREL, Sandia, USF: "Durable Module Materials Capability Development – Sandia National Laboratory", NEPA Control Number NREL-19-020, Signed 3/21/2019

## **NEPA PROVISION**

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

Should the scope to the project be modified to include activities that involve ground disturbance, NREL shall submit a

new EQ-1 to DOE for additional NEPA review. Activities involving ground disturbance are not authorized until the additional NEPA review is completed.

Notes:

NREL  
Nicole Serio 5/13/2019

#### 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: 5/13/2019

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