PMC-EF2a
(2.04.02)

# U.S. DEPARTMENT OF ENERGY
## EERE PROJECT MANAGEMENT CENTER
## NEPA DETERMINATION

**RECIPIENT:** MIT

**STATE:** MA

**PROJECT TITLE :** Continuous Processing of High Thermal Conductivity Polyethylene Fibers and Sheets

| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
|---|---|---|---|
| DE-FOA0000560 | DE-EE0005756 | GFO-0005756-001 | GO5756 |

**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. |

Rational for determination:

The U.S. Department of Energy is proposing to provide federal funding to the Massachusetts Institute of Technology (MIT) to conduct research and development activities for the continuous processing of high thermal conductivity polyethylene fibers and sheets. DOE funding would be used to produce three generations of polymer drawing platforms.

MIT's proposed project would restructure bulk polymer (plastic) into singular chains to increase the thermal conductivity. The molecular chains would be aligned in the fibers and sheets process through gel spinning with template extrusion. The outcome would establish a continuous manufacturing process for bulk polymer fibers and sheets, and would be a replacement for metals and ceramics in heat transfer devices.

Laboratory work would be conducted at existing facilities, which are located at 777 Massachusetts Avenue, Cambridge MA 02139. MIT has completed an R&D questionnaire addressing the protocols for laboratory safety, risk management, chemical handling and waste disposal. The laboratory complies with standard safety procedures and all processes and procedures are monitored by the Department of Mechanical Engineering Chemical Hygiene Plan. The laboratory contains chemical hoods, lab benches, laser bays, fume hoods, safety shower, eyewash and fire extinguishers. MIT has applicable permits in place to conduct research on campus.

The proposed project would generate three gallons per year of a hazardous waste, decahydronaphthalene, characterized as a RCRA ignitable waste, for a total of nine gallons. MIT utilizes an approved hazardous waste vendor. The waste would be stored in a designated Satellite Accumulation Area within the laboratory. Full containers would be transported to the MIT main accumulation area and within 90 days would be packed for off-site disposal at the vendor's incinerator. There would be sufficient capacity for this ignitable waste at the incinerator and therefore would be in no violation of the RCRA land ban requirements.

Based on this information, DOE has determined the work outlined is consistent with activities identified in categorical exclusion A9 (information gathering, analysis and dissemination) and B3.6 (small-scale research and development, laboratory operations and pilot projects).

**NEPA PROVISION**

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

Kelly Daigle 8.15.2012

DOE Share: $1,000,000
Cost Share: $0
Total: $1,000,000

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature: Electronically Signed By: Lori Gray / Lori Gray Date: 8/20/2012
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