

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** Southern Research Institute**STATE:** NC

PROJECT TITLE : Regenerative Carbonate- and Silicate-Based Thermochemical Energy Storage System for Concentrating Solar Power

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000805	DE-EE0006535	GFO-0006535-001	

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.)

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 Southern Research Institute to develop thermochemical energy storage (TCES) systems for concentrating solar power (CSP) based on endothermic-exothermic gas-solid reaction cycles. DOE funding would be used to advance the proposed TCES system through testing, design, modeling, evaluation and costing.

The project is divided into two Budget Periods: 1 and 2. This NEPA determination applies to Budget Period 1 activities only. A Go/No Go decision will be made between Budget Periods 1 and 2. At that time, the recipient will be required to submit an application for Budget Period 2 activities, including further NEPA documentation.

During Budget Period 1, a preliminary reactor design would be used to explore the performance metrics for CSP operation of calcium oxide sorbents as materials in a low-cost TCES system.

- Task 1.1: Mayenite containing CaO sorbents will be screened for their ability to meet the long-term durability and performance required for CSP operation
- Task 1.2: Use a combination of Aspen Plus thermodynamic process modeling, computer aided design, and thermal finite element analysis modeling tools to design a reactor and balance of plant that can meet performance and cost targets.

Work would be completed at the following laboratories:

- Southern Research Institute, 5201 International Drive, Durham, North Carolina 27712
- Precision Combustion, Inc., 410 Sackett Point Road, North Haven, Connecticut 06473

The Southern Research Institute in Durham North Carolina is located in a non-attainment area for Carbon Monoxide. The project would generate very small amounts of gaseous effluent waste, primarily CO₂ and helium that would be vented through a laboratory fume hood and therefore there would be no significant impact of emissions into the ambient air resulting from the proposed project activities.

The Southern Research Institute has completed an R&D questionnaire addressing the protocols for laboratory safety, risk management, chemical handling and waste disposal. Dedicated material handling and disposal practices involving sorbent precursors would be practiced at both locations and all materials would be managed in accordance with

federal, state and local environmental regulations. No modifications to the existing facilities would be required for the proposed project and no new permits, licenses, or authorizations would be required. The project activities would pose no risk to the public or project workers and decommissioning will not be necessary.

Based on review of the project information and the above analysis, DOE has determined the research and development under Budget Period 1 (all tasks) would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined the proposed project is consistent with actions contained in DOE categorical exclusion A9 "information gathering, analysis and dissemination" and B3.6 "small-scale research and development, laboratory operations, and pilot projects" and is categorically excluded from further NEPA review.

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 Activities.

This restriction does not preclude you from:

Budget Period 1 Activities.

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.

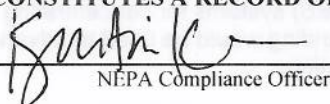
Note to Specialist :

May Mock 03/11/2014

This NEPA determination requires a tailored NEPA provision.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____


NEPA Compliance Officer

Date: _____

3/20/2014

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: _____

Field Office Manager

Date: _____