PMC-EF2a

(2/06/02)

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

RECIPIENT: Southwest Research Institute

STATE: TX

PROJECT TITLE: Development of a High Efficiency Hot Gas Turbo-Expander and Low Cost Heat Exchangers for Optimized CSP Supercritical CO2 Operation

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000595	DE-EE0005804	GFO-0005804-001	

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.

Rational for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to the Southwest Research Institute (SwRI) to perform laboratory research and development activities to develop a high efficiency, supercritical CO2 (sCO2) turbo-expander for a transient solar power plant and to optimize novel printed circuit heat exchangers for sCO2 applications for concentrated solar power (CSP).

Researchers would design, fabricate and test a scale sCO2 turbo-expander and recuperator (heat exchanger). The turbo-expander would have the ability to utilize waste gas (CO2) for power recovery in the CSP system. The engineering would be performed at SwRI facilities located at 6220 Culebra Road, San Antonio, Texas 78238. The 1 MWe prototype would be constructed at their partner site (GE or SolarTurbine), and the 5MW recuperator would be constructed at their partner site (Thar Energy LLC) and both would be shipped to SwRI. The prototypes would be tested and measured for performance and endurance in the Turbomachinery Building and CO2 Loop on the SwRI campus. The loop is installed inside and outside of an existing building. The motor and compressor are inside while the piping, valves and vessels are mounted outside. The turbo-expander and recuperator would be mounted inside the building using the motor as a generator. SwRI would provide reports on test results, performance and power cycle scalability.

The loop is on a site that occupies approximately one acre on the campus. The building was constructed in 2012. The entire campus is approximately 1200 acres with over 150 office and laboratory buildings. The proposed project would not have adverse effects on wetlands, floodplains, cultural resources, threatened and/or endangered species because the scope of work would occur at a previously developed/disturbed site.

SwRI completed an R&D questionnaire addressing the protocols for laboratory safety, risk management, chemical handling and waste disposal. SWRI complies with standard laboratory safety procedures and has appropriate safety equipment available in all SwRI laboratories. SwRI has all applicable permits in place to conduct research on site. No additional permits are needed for project activities. The laboratory general safety procedures would be followed and have assigned safety managers.

Based on review of the project information and the above analysis, DOE has determined the research and prototype development would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined the proposed project is consistent with the actions contained in DOE categorical exclusion A9 "information gathering, analysis, and dissemination," and B3.6 "small-scale research and development," and is

categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

Diana Scott 8.21.2012

DOE Funding: $6,800,000
Leveraged Funds: $1,700,000
Total Project Cost: $8,500,000

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 8/21/2012
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