PMC-EF2a

(2.04.02)

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

RECIPIENT: San Diego State University

STATE: CA

PROJECT TITLE : A Small Particle Solar Receiver for High Temperature Brayton Power Cycles

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-SOL-0000595	DE-EE0005800	GFO-0005800-001	GO5800

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:

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 San Diego State University (SDSU) to perform laboratory research and development activities to develop a gas-cooled solar receiver capable of powering a gas turbine engine to produce electricity at solar central receiver plants.

Researchers would develop a volumetric central receiver called a Small Particle Heat Exchange Receiver (SPHER). The central receiver is designed to convert solar energy into thermal energy by delivering high temperature, pressurized air to a gas turbine. The SPHER would have a window at one end to allow light to penetrate into the cavity. Small carbon particles would be seeded into the SPHER to produce a smoke-like mixture of air and carbon. As the solar energy heats the air/particle mixture, the carbon particles oxidize into carbon dioxide, and then pass safely through the turbine. The amount of carbon dioxide produced is minimal (approximately 1-2% of the amount of a traditional gas turbine).

Project activities would occur primarily at SDSU, Department of Mechanical Engineering, in the Combustion and Solar Energy Laboratory and the department machine shop. Fabrication of the window for the SPHER would occur at L-3 Brashear in Pittsburgh, PA. Prototype testing of the particle generator, window, and receiver would take place at Sandia National Lab (SNL) in Albuquerque, New Mexico. For all work conducted at DOE laboratories, project activities may be subject to additional NEPA review by the cognizant NEPA Compliance Officer at the lab.

SDSU completed an R&D questionnaire addressing the protocols for laboratory safety, risk management, chemical handling and waste disposal. SDSU adheres to standard university laboratory and machine shop training for students. L-3 Brashear operates a complete Environmental Health & Safety Program that is certified to both OSHA and L-3 Corporate Program standards. SNL complies with all OSHA standards and monitors and assures compliance through independent internal assessments and audits. Laboratories involved in the project have all applicable permits in place to conduct research on site. No additional permits are needed for project activities.

Project Funding: $2,606,000 (DOE); $869,000 (cost share); $3,475,000 (total)

Based on this information, DOE has determined the work outlined is consistent with activities identified in categorical exclusion 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:

If you intend to make changes to the scope or objective of your project you are required to contact the Project Officer identified in Block 11 of the Notice of Financial Assistance Award before proceeding. You must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved.

Note to Specialist :

EF2a prepared by Casey Strickland

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Kristin Kerwin 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