PMC-ND
(1.08.09.13)

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

RECIPIENT: MicroBio Engineering Inc. **STATE:** CA

PROJECT TITLE: Air Carbon for Algae Production - AirCAP

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001908	DE-EE0008519	GFO-0008519-001	GO8519

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.
B5.15 Small-scale renewable energy research and development and pilot projects	Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to MicroBio Engineering Inc. (MBE) to develop and validate a model for chemically enhanced carbon dioxide transfer across the air-water interface of large raceway ponds used for the production of microalgal biomass. MBE and subrecipients would investigate the suitability of various algae strains for this novel growth process with laboratory reactors, indoor pond simulator experiments, and small outdoor ponds. The project aims to demonstrate model feasibility for advanced biofuel applications by cultivating selected strains at high productivity; however, the scope of the proposed project would be limited to algae production experiments ranging from indoor bench-scale studies to pilot-scale field trials with approximately 1-acre ponds.

The proposed project would involve preliminary design validation followed by scaled experiments over a period of three years to determine the extent of chemical enhancement in small ponds and to obtain data for model development. Associated activities would include the operation of existing algae raceway ponds and/or algae reactors at three sites around the country. Laboratory facilities collocated with each of the sites would perform water chemistry analyses and assessments of biomass productivity and composition.

MBE would conduct data analysis, project management, and some laboratory measurements at their research headquarters in San Luis Obispo, CA. Additional data analysis and technical advice would be provided by consultant

Global Thermostat in New York, NY. Pacific Northwest National Laboratory (PNNL) would conduct project tasks at both the Sequim Campus in WA and the Satellite Research Station Algal Testbed site located at the City of Sedona wastewater treatment plant in Sedona, AZ. The project would employ indoor climate-simulation ponds, photobioreactors, and biotechnology laboratories at PNNL's Sequim Campus, while outdoor cultivation experiments ranging from 100-1000 L would occur at the Satellite Research Station. Field demonstrations via operation of raceways and mini-ponds (1000 L to 1 acre) would take place at Qualitas Health, Inc. (Qualitas) in Imperial, TX. This is a privately owned algae farm used for commercial biomass production. In parallel, MBE would conduct additional outdoor cultivation experiments utilizing smaller raceway ponds at their algae cultivation facility in Paso Robles, CA. No change in the use, mission, or operation of any of these facilities would arise out of project efforts.

MBE would also carry out a modest "bioprospecting" field sampling effort to collect algae strains from natural high alkalinity environments, likely existing mining operations at Trona, CA. Collected strains would be characterized and potentially shared with PNNL for additional screening, although the project is primarily focused on the use of existing strains of commercially viable species. The proposed investigations into strain suitability would not involve genetic engineering or recombinant DNA.

The total amount of algal biomass produced by experiments at all three sites combined is not expected to exceed 300kg. Quantities of water and materials used by the project would vary according to the scale of activities at each location. The MBE Paso Robles research site and both PNNL sites would each use approximately 20,000 L over the duration of the project. Qualitas would use approximately 25,000,000 L of water for the demonstration activities proposed to be conducted at their larger agribusiness facility. Wastewater generated by the project would primarily consist of spent culture media containing residual nutrients, suspended solids, and alkalinity. Activities at MBE and Qualitas would not result in any discharges because all water is recycled and contained onsite at these facilities. Wastewater produced by project activities at PNNL Sequim Campus would be treated and disposed as per existing federal facility procedures. At the Satellite Research Station, experimental effluent would be subject to regular industrial water treatment systems as negotiated in PNNL's current operating plan with the municipal host facility.

The proposed project would involve the use and handling of hazardous materials, including strong acids, bases, and solvents. All such handling would occur at properly equipped research facilities and would be undertaken by trained employees following established health and safety policies and procedures. Hazardous waste would be managed in accordance with the policies of each facility, which are compliant with all applicable regulatory requirements. No siting, construction or major expansion of waste storage, disposal, recovery or treatment actions/facilities would be required.

Proposed activities specific to each site would not exceed the scope or nature of past or ongoing related work at these purpose-built facilities; therefore, no adverse impacts to sensitive resources are expected as a result of project efforts at any location. While it is possible that some algae raceway configurations would need to be adjusted to accomplish project goals, no new equipment or physical modifications to any permanently installed equipment would be required and the facilities were designed for this type of trial use. No decommissioning or disposition of equipment or materials would be necessary at the end of the project.

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410(2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal 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:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient

moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:
Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Note to Specialist :

Bioenergy Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 10/19/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Casey Strickland Date: 10/23/2018
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