PMC-EF2a
(2.0.6.0.2)

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

RECIPIENT: Cal Poly Corporation **STATE:** CA

PROJECT TITLE : Recycling of Nutrients and Water in Algal Biofuels Production

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
0000615	EE0005994	GFO-0005994-001	GO

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 Cal Poly Corporation (CPC) to support California Polytechnic State University (Cal Poly) to conduct research, development and demonstration activities to advance efficient recycling of water and nutrients in algal biofuels production. CPC is a separate, nonprofit 501(c)(3) corporation, that supports the educational mission of Cal Poly and provides post-award fiscal and administrative support with projects sponsored on Cal Poly's behalf. DOE and cost share funding would be used to modify existing experimental algae ponds with equipment to operate the algae ponds and execute the nutrient and water recycling demonstration, potentially install and operate additional above ground experimental algae tanks and perform research and analysis in a laboratory environment. This project would be carried out in two 1.5 year Phases. Phase I would establish baselines for the research and develop a detailed research plan for more extensive recycling of water and nutrients in Phase II.

At this time all research, development and demonstration field work activities would be completed at an existing Cal Poly operated experimental algae pond site located within the City of San Luis Obispo's Wastewater Reclamation Facility (WRF) at 35 Prado Road, San Luis Obispo, California. The half-acre algae pond site is surrounded by earthen berms and contains nine above ground 30-m2 (30-cm deep) raceway paddle wheel-mixed algae ponds.

If determined to be beneficial to this project, an additional temporary field site may be installed to perform experiments in a more controlled environment on the Cal Poly campus at 1 Grand Ave., San Luis Obispo, California. This site would be located in a previously disturbed area, and would contain up to nine small (~3-m2 by 30-cm deep) above ground self-contained paddle wheel-mixed algae tanks. The algae tanks would be placed within a plastic lined secondary containment system and contain water and fertilizer as the liquid medium. Liquid effluent from these tanks (primarily salts) would periodically be discharged into the Cal Poly campus waste water system. The installation and operation of this temporary proposed site would be under the supervision of Cal Poly Environmental Health and Safety Program and follow all applicable regulations and guidelines. All applicable permits are in place and no new permits would be required.

The proposed activities at the WRF algae ponds would include installation of additional gravity clarifiers, filters, a centrifuge, a cell homogenizer, and three to nine small digester tanks (3000-liter maximum). Experiments would be operated to demonstrate a stable process for maximum nutrient and water recycling during algae biomass production. Small quantities of wastewater from the WRF would be pumped into the algae ponds to grow algae biomass. The algae biomass would be harvested from the ponds. After harvesting, the remaining supernatant water would be

recycled back to the ponds and the harvested algae biomass would be transferred to tanks to be anaerobically digested. Biogas would be a by-product of the anaerobic digestion process. Per each digester tank, approximately 180 m3 of biogas would be produced annually. The biogas would be measured and then released to the atmosphere through a "bubbler" vent. The WRF is not within an EPA Designated Nonattainment Area for Criteria Pollutants. The digester effluents would be recycled back to the algae growth ponds. Algae pond effluents would then be pumped back to the municipal wastewater system for final processing. All activities at the WRF would be conducted under the existing WRF operating permit.

Laboratory analysis work of field samples generated at the WRF algae pond site would be completed on the Cal Poly campus at 1 Grand Ave., San Luis Obispo, California.

Cal Poly has completed an R&D questionnaire addressing the protocols for laboratory safety, risk management, chemical handling, hazardous and non-hazardous waste handling and disposal at the WRF algae pond site and the on-campus laboratory/field site. All facilities operate under the rules and guidelines of the Cal Poly Environmental Health and Safety Program and comply with all standard safety procedures. Small amounts of hazardous waste would be generated in the laboratory and handled and disposed of in accordance with all applicable regulations. All applicable permits are in place and no new permits would be required. The WRF is a fully permitted municipal wastewater treatment plant and the addition of the experimental algae ponds in 2010 received a California Environmental Quality Act (CEQA) "Notice of Exemption" as an expansion to an existing facility. The campus laboratory has all the necessary safety equipment in place and all fume hoods are permitted. On a weekly basis, approximately 18 one-gallon samples in secondary containment chests would be transported from the WRF algae ponds to the campus laboratory for analysis. Transportation of samples would occur under the rules and guidelines of the Cal Poly Environmental Health and Safety Program. No additional permits would be needed to run the proposed experiments at the WRF algae ponds or at the Cal Poly campus and GMO organisms would not be used in this project.

The U.S. Fish and Wildlife Service Endangered Species Program website identified multiple species of flora and fauna as a threatened or endangered species within San Luis Obispo County. DOE has determined that these species would not be affected because the proposed activities at the WRF algae ponds would occur at an existing site and would involve the addition of ancillary equipment to an existing facility; and the proposed activities at the proposed Cal Poly campus site would occur in previously disturbed area of campus, not significant in size. The proposed project would not have adverse effects on wetlands, floodplains, or cultural resources, as these resources are not known to occur at the proposed project sites.

Based on review of the project information and the above analysis, DOE has determined the research, development and demonstration activities to advance efficient recycling of water and nutrients in algal biofuels production 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 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 completed by Obadiah Broughton 12/10/2012

DOE Funding: $ 1,300,000
Cost Share: $ 400,000
Total Funding: $ 1,700,000

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 12/10/2012
NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION