PMC-ND
(1.08.09.13)

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

RECIPIENT: White Dog Labs, Inc. **STATE:** DE

PROJECT TITLE: Upgrading of stillage syrup into single cell protein for aquaculture feed

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001689	DE-EE0008251	GFO-0008251-001	

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 White Dog Labs, Inc. (WDL) to demonstrate the production of single-cell protein from cellulosic ethanol stillage syrup for use as an aquaculture feed component. Basic nutritional studies with the generated product would also be conducted to validate its quality.

The proposed project would consist of design, computer modeling, and laboratory research and development (R&D) activities followed by feeding trials at an aquaculture technology research center. R&D-related tasks would focus on validating a fermentation process that uses ethanol syrup and genetically engineered microorganisms to generate a specific type of protein targeted as a feed component for salmon farming. Associated in-lab activities would include: screening and engineering bacterial strains; running and optimizing fermentations at bench (10L) and pilot (1000L) scales; separating biomass from fermentation broths; drying and lysing of separated biomass. All microorganism work, fermentation work, separation work, and some drying work would occur at WDL's research facility (New Castle, DE). Additional post-production cell mass drying would occur at the Buflovak Group research facility (Buffalo, NY). Lysis treatments would be carried out by third-party vendors Custom Processing Services (Reading, PA) and Microfluidics Corp. (Westwood, MA). Desktop work including an initial production plant design plus technoeconomic and lifecycle analyses would be generated by WDL and various subrecipients in their corporate offices. No change in the use, mission or operation of existing facilities would arise out of these efforts.

The salmon feed study would be performed by The Center for Aquaculture Technologies (CATC) located on Prince Edward Island, Canada. CATC operates as a formal, independent contract research organization specifically for aquaculture and related industries. Fish feeding trials would include the design and formulation of feed, growing and feeding of salmon, and laboratory analysis. WDL and CATC are currently undertaking similar activities; no physical modifications, new equipment, or additional permits would be required for the proposed project. The CATC facility is an established, purpose-built research facility focused on R&D activities in cold water aquatic species, with expertise in GxP ("good practice" for regulated industries) compliant research. Therefore, no adverse impacts to sensitive resources are expected as a result of the proposed activities at this location.

At all facilities in which project work would occur, existing health and safety policies and procedures would be followed including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. Additional policies and procedures would be implemented as necessary if new health and safety risks are identified.

In total, the proposed demonstration and scale-up activities would produce approximately 300kg of dried cell mass, requiring an estimated 30,000L of commercially-available feedstock syrup and an additional 30,000L of water to dilute. Fermentations may require up to a total of 300L of ammonium hydroxide to control pH. Existing on-site fermenters would be used for this work, and the scale of production being proposed would not exceed the scope of past and on-going work at WDL. Non-hazardous gases produced during fermentation would be vented according to the requirements of emission permits already in place for WDL. Water removed during post-production processing would be either vented as steam or condensed and disposed of into the sewer system following existing facility procedures. The proposed feeding trials would use approximately 150kg of dried cell mass and require about 22,000L of water. At CATC, wastewater is treated on site and reused as much as possible, or properly treated and discharged following established procedures to comply with applicable regulations. As part of the routine study method, fish would be culled onsite and disposed of in accordance with existing permits necessary for water handling and fish disposal.

The proposed project involves the use and development of genetically engineered microorganisms and recombinant DNA to improve product yield. Such work would include the deletion of certain metabolic pathways in the bacterial host via tools that temporarily introduce foreign DNA in the strain improvement process; however, these would be removed from any final production strain. WDL is experienced in the handling, storage, and disposal of genetically modified bacterial organisms, and would follow appropriate biosafety policies and procedures. These include maintaining strains in a -80C freezer, and bleaching or incinerating all material before disposal. Up to 60,000L of bleached fermentation broths would be disposed of into the sewer system over the course of the project. This expected quantity of this non-hazardous waste would not exceed current permitted limits or require any new treatment actions.

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. Further, DOE has determined that the work to be carried out at CATC is exempt from further review pursuant to Section 5.1.1 of the DOE Final Guidelines for Implementation of Executive Order 12114; “Environmental Effects Abroad of Major Federal Actions.”

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.

Note to Specialist :

Bioenergy Technologies Office
This NEPA determination does not require a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 11/22/2017

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Kristin Kerwin Date: 12/1/2017

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