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

RECIPIENT: Humboldt State University Sponsored Programs Foundation **STATE:** CA

PROJECT TITLE: Waste to Wisdom: Utilizing forest residues for the production of bioenergy and biobased products

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
	DE-EE0006297	GFO-0006297-004	GO6297

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.)
B3.1 Site characterization and environmental monitoring	Site characterization and environmental monitoring (including, but not limited to, siting, construction, modification, operation, and dismantlement and removal or otherwise proper closure (such as of a well) of characterization and monitoring devices, and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis). Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. Covered activities include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. (This class of actions excludes activities in aquatic environments. See B3.16 of this appendix for such activities.) Specific activities include, but are not limited to: (a) Geological, geophysical (such as gravity, magnetic, electrical, seismic, radar, and temperature gradient), geochemical, and engineering surveys and mapping, and the establishment of survey marks. Seismic techniques would not include large-scale reflection or refraction testing; (b) Installation and operation of field instruments (such as stream-gauging stations or flow-measuring devices, telemetry systems, geochemical monitoring tools, and geophysical exploration tools); (c) Drilling of wells for sampling or monitoring of groundwater or the vadose (unsaturated) zone, well logging, and installation of water-level recording devices in wells; (d) Aquifer and underground reservoir response testing; (e) Installation and operation of ambient air monitoring equipment; (f) Sampling and characterization of water, soil, rock, or contaminants (such as drilling using truck- or mobile-scale equipment, and modification, use, and plugging of boreholes); (g) Sampling and characterization of water effluents, air emissions, or solid waste streams; (h) Installation and operation of meteorological towers and associated activities (such as assessment of potential wind energy resources); (i) Sampling of flora or fauna; and (j) Archeological, historic, and cultural resource identification in compliance with 36 CFR part 800 and 43 CFR part 7.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Humboldt State University Sponsored Programs Foundation (HSU) to research the production of bioenergy and bio-based products through the utilization of forest residues (defined as the biomass material remaining in forests that have been harvested for timber) using different biomass conversion technologies (BCTs) and optimized biomass operations logistics. HSU would conduct field-based experiments to develop innovative tools and systems that improve the economics, accessibility, and production of quality feedstock from forest residues; develop and test field-deployable BCTs to evaluate the economic feasibility of commercialization of BCTs for the production of biochar, torrefied pellets, and briquettes; and perform macro- and micro-economic and life-cycle analyses to quantify the economic and environmental life-cycle benefits of utilizing forest residues with BCTs for the production of bioenergy and bioproducts.

DOE completed three previous NEPA determinations for subtasks defined in Tasks 1, 2, 3, and 4 (GFO-0006297-001, CX A9, B3.6, B3.8, B3.11, 12/20/2013, GFO-0006297-002, CX A9, B3.6, 7/7/2014 and GFO-0006297-003, CX A9, B5.15,

5/18/2015) which included project management, feedstock development, biofuel and bio-based product development and analysis, and testing and field deployment of biochar production, torrefaction and briquetting equipment. This NEPA determination applies to Subtask 4.6 only.

For Subtask 4.6, HSU would be working in collaboration with the U.S. Forest Service's Rocky Mountain Research Station to evaluate the use of biochar as a soil amendment for carbon sequestration and site restoration. Proposed activities include applying biochar to two field sites, planting native seed mixes, sampling soil conditions and vegetation growth before and after the application of biochar, and laboratory analysis of soil samples. Laboratory analysis would occur at the USDA Forest Service Forest Products Laboratory, in Madison, WI.

Two new field sites and four previously established field sites would be used to help determine the use of under-utilized forest residues and the utility of biochar for soil restoration and carbon sequestration.

Field site number one would be located at an old dredge mining operation in the Umatilla National Forest three air miles west of the town of Granite, OR. There would be twelve, eight-by-eight-foot plots upon which biochar would be hand-applied at a rate of five tons per acre for a total of 180 pounds of biochar at this site. One half of each plot is seeded and one half of each plot is planted with native grasses. The plots would be measured for seed germination and planted seedling growth every year for the duration of the study. In year three, ten planted seedlings would be dug from each plot and measured for top and root biomass and root volume. Soil would be sampled and analyzed every six months for nutrient movement. One soil sample from each of two depths (0-10 and 10-20 cm) would be collected in each treatment unit. Ion resin capsules would be deployed and collected in each plot to determine soil solution changes with new capsules inserted every 6 months. Temperature and moisture probes would be inserted in one replicate of each treatment. Data would be continuously logged every four hours for a two-day duration every six months. This location is within an existing, four-acre field study site with currently worked plots in place. The above-described two new plots would be a minimal addition to the existing site, biochar is considered a non-hazardous organic material, and there would be no ground disturbance; therefore, DOE has determined that the proposed activities would not result in adverse effects to the human environment.

Field site number two would be located near the Harris gravel pit in the Humboldt-Toiyabe National Forest. This area of the forest has illegal roads present through over-grazed range land. The plots at this site would be placed directly on the road covering the width of the road at a specified length. For the proposed project, there would be six, 25-by-12-foot plots upon which biochar would be hand-applied. On three of the plots, biochar would be applied at a rate of five tons per acre and on the other three plots, biochar would be applied at a rate of ten tons per acre for a total of 633 pounds of biochar at this site. The full area of each plot would be seeded, and plots would be measured for seed germination every year for the duration of the study. Soil would be sampled every six months for nutrient movement. One soil sample from each of two depths (0-10 and 10-20 cm) would be sampled in each treatment unit. Temperature and moisture probes would be inserted in one replicate of each treatment. Data would be continuously logged every four hours for a two- day duration every six months. Small carbon dioxide monitors would be inserted into the soil and carbon dioxide flux would be measured once every six months. This location is within an existing, two-acre field study site with currently worked plots in place. The above-described plots would be a minimal addition to the existing site, biochar is considered a non-hazardous organic material, and there would be no ground disturbance; therefore, DOE has determined that the proposed activities would not result in adverse effects to the human environment.

Soil sampling activities and vegetation growth measurement would occur at one previously established site within each of the following: Bitterroot National Forest, Umpqua National Forest, Helena National Forest, and Idaho Panhandle National Forest. The researchers would be at each site one time per year for two days at a time over three years. These are existing research sites and the proposed activities are consistent with previously completed research; therefore, no adverse effects to the environment are expected as a result of the soil sampling activities or vegetation growth measurements.

All work would be completed in coordination with the respective Forest Managers and would follow the Forest Management Plan for each National Forest. No special permits or licenses are expected to be required as a result of proposed activities.

Based on review of the project information and the above analysis, DOE has determined that Subtask 4.6 activities 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, data analysis" and B3.1 "Site evaluation and environmental monitoring" 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 :

Bioenergy Technologies Office

This NEPA Determination does not require a tailored NEPA provision.

NEPA review completed by Logan Sholar, 7/6/15

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Kristin Kerwin Date: 7/6/2015

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