PMC-ND
(1.08.09.13)

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

RECIPIENT: Board of Trustees of the University of Illinois Other Participants (subrecipients): There are 7 subrecipients **STATE:** IL

PROJECT TITLE: Next-Generation Feedstocks for the Emerging Bioeconomy

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001917	DE-EE0008521	GFO-0008521-001	GO8521

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), 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.
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 University of Illinois (UIUC) to field-

test warm-season perennial grass cultivars on marginally productive croplands in IA, IL, NE, SD, and VA. UIUC would assess the yield, biomass quality, and ecological impact of the switchgrass cultivars, as compared to a group of predecessor varieties. Throughout the project, best management practices would be developed to reduce variability in yield and harvested biomass chemical composition for fermentation and pyrolysis conversion processes. The project would be completed over five Budget Periods (BPs), with a Go/No-Go Decision Point after BP1, BP2, and BP3.

All project activities would be overseen by UIUC. Field activities would be performed by UIUC and its project partners Iowa State University, South Dakota State University, the U.S. Department of Agriculture (USDA) Agricultural Research Service, and the Antares Group. Field activities in SD, NE, and IA would be performed on university owned land that is currently in use as farmland. In IL, field activities would be performed on privately-owned land that is also currently used as farmland. In VA, field activities would be performed on privately-owned land managed by Antares Group and currently used as farmland. No clearing of land would be performed as part of this project. Laboratory analysis of biomass feedstock samples would also be performed by the above entities, as well as Idaho National Laboratory and Argonne National Laboratory.

In BP1, UIUC would establish plots with grass strains that are the target of study. Then, in BP1, and continuing through BP5, UIUC would manage production, harvest, testing, and analysis of the grass strains. Best management practices would also be developed throughout all five BPs. Specific activities are discussed further below.

Task 1 in BP1 would involve the establishment of field-scale switchgrass plots at all sites. Switchgrass cultivars would be established in 2-acre plots divided into 1-acre subplots. Five varieties of switchgrass would be established, with the ‘Liberty’, ‘WS10L’, and ‘Independence’ being the target of study, and ‘Sunburst’ and ‘Shawnee’ serving as check cultivars.

Task 2 in BP1 would involve the establishment of small-scale plots at all sites. Advanced lines of switchgrass (e.g. Miscanthus, big bluestem, and prairie cordgrass) would be established in plots measuring approximately 5 ft. by 25 ft. The same switchgrass cultivars used in the field-scale trials would also be included in the small-scale plots for comparison and analysis.

Task 3 in BP1 would focus on development of a machine-learning based predictive model using field generated data. The model would be used to predict biomass yield, chemical composition, and environmental attributes.

Task 4 in BP1 would involve taking ecosystem service measurements (e.g. soil sample analysis, greenhouse gas emissions, water quality, water quantity, and biodiversity analysis). With the exception of soil quality analysis, which would be performed at all sites, these measurements would be restricted to the IL site.

Task 5 in BP1 would focus on development of a harvest and logistics planning methodology, which would then service as the basis of the harvest and logistics field work and analysis during subsequent BPs.

In BP2 – BP5 the established fields would be managed and analyzed throughout each growing season. All tasks from BP1 would be continued into the subsequent BPs, with Tasks 1 and 2 now focused on management of plot production, rather than establishment of the plots. These BPs would also introduce two new tasks. Task 6 would consist of laboratory analysis of biomass samples. Task 7 would consist of techno-economic analysis to assess farm productivity and regional feedstock introduction.

Upon completion of the project, all sites would either be maintained for perennial grass production or would be converted for production of other crops.

The ecosystem measurements that would be completed under Task 4 would include acoustic bird monitoring and insect biodiversity sampling. Acoustic bird monitoring would be performed using recording devices placed throughout the field sites. The devices used would not emit sound and would not disturb bird populations. No trapping of birds would be performed. Insect sampling would adhere to established trap protocols. Insect traps would consist of two 12 oz. plastic bowls containing 6 – 8 oz. of water with a small amount of soap serving as a surfactant. Sampling would be carried out once a week for three weeks during flowering. The bowls would be placed on 1 m high platforms for 24 hour periods under ideal weather conditions (e.g. sunny without rain). Upon collection, insects would be transferred to sterile sampling bags and preserved in ethanol.

The project would involve the use of heavy machinery and herbicides. Biomass harvest would be performed using existing farm-scale equipment, including tractors, high-density balers, equipment for mowing and conditioning

grasses, bale movers, and flatbed/walking-floor bale trailers for hauling. Herbicides would be applied and handled by certified applicators. All personnel operating in the field would be trained in safe field operations and proper handling/disposal practices. Risks associated with the handling of project equipment/materials would be mitigated through adherence to established health and safety policies and procedures. Protocols would include employee training, the use of proper protective equipment, engineering controls, monitoring, and internal assessments.

The Independence, Liberty and WS10L grass strains have all been tested previously in their respective states and in multi-state analyses. With the exception of Miscanthus, all switchgrass, big bluestem and prairie cordgrass strains are native to the areas being evaluated. Miscanthus would only be established in IL and IA. The variety to be tested is sterile and accordingly, would pose no threat as an invasive species.

A small drone would be used at the IL site to collect aerial images of the land. The project site is not in close proximity to any regional airports.

At the IL site, two bat species and two plant species are listed by the U.S. Fish and Wildlife Service (USFWS) as being either threatened or endangered. At the SD site, one bat species, one bird species and two species of butterfly are listed. At the NE site, one bat species, three bird species, and one fish species are listed. At the IA site, two bat species and two plant species are listed. In VA, three bat species are listed. In all cases, the listed bird species are either coastal birds or birds that are typically found near freshwater areas (e.g. marshes) and would not be expected to be present in the farmland environments of each site. Likewise, the fish species that is listed would not be present at the sites, as they are terrestrial farmland environments. The plant species would not be expected to be found at any of the sites, as they are all established agricultural areas and project activities would only be performed on previously disturbed plots of land currently used for field testing. The three bat species that are listed are the Northern Long-eared Bat, the Indiana Bat, and the Virginia Big-eared Bat. All three species establish hibernacula in caves and mines. In the summer months, the species roost in tree cavities. All three species could potentially be present at the sites in the states where they are listed. However, project work, including planting and harvesting, would occur during daylight hours and would not impact the feeding cycles of the bat species. Additionally, the project would not result in any significant change in land use patterns. The two butterfly species that are listed (Dakota Skipper and Poweshiek Skipperling) reside in prairie environments. Though the grasses that would be grown as part of this project are native to prairies in the region, both species require full ecosystems with extensive plant diversity (including flowers). The fields and plots that would be established would not provide this level of plant diversity. Additionally, the project sites are all found in agricultural areas that are isolated from prairie environments, as well as the critical habitats listed for the two species. USFWS profiles for the two species specify that critical habitats encompass all areas in which the species are known or likely to be present. All critical habitats for these species are more than seven miles from the site, which is well beyond the short flight range of either species (approximately 1/3 of a mile). Accordingly, DOE has determined that field activities associated with the project would cause no effects to any of the listed species.

All land in which field testing would be performed is designated by the U.S. Department of Agriculture as prime farmland or as farmland of statewide importance. However, as noted above, all sites are currently in use for agricultural purposes. Additionally, the project activities would not affect the land in such a way as to alter its current designation.

DOE also conducted a review of potential issues relating to other resources of concern and found that no effects would be expected to result from the project.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assisstance agreement:

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

Notes:

Bioenergy Technologies Office
This NEPA determination requires a tailored NEPA Provision.

NEPA review completed by Jonathan Hartman, 02/25/2019

FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

The proposed action is categorically excluded from further NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Casey Strickland Date: 3/1/2019

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- [x] Field Office Manager review not required
- [ ] Field Office Manager review required

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____

Field Office Manager