

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



RECIPIENT: Washington State University

STATE: WA

PROJECT TITLE: Towards Durable Carbon-Negative Concrete: Using Biochar to Replace Part of the Clinker and Fine Aggregate

|   |                               |                     |            |
|---|-------------------------------|---------------------|------------|
| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
| DE-FOA-0002804                          | DE-EE0010855                  | GFO-0010855-001     |            |

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:

|   |  |
|---|--|
| <b>A9 Information gathering, analysis, and dissemination</b>                                | 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.)   |
| <b>B3.6 Small-scale research and development, laboratory operations, and pilot projects</b> | 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. |
| <b>B5.15 Small-scale renewable energy research and development and pilot projects</b>       | 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 funding to Washington State University (WSU) to use different biomass feedstocks to develop a biochar substitution for concrete that would decrease its carbon intensity without decreasing its strength and durability.

Award activities would focus primarily on modeling, development, production, laboratory research, and intramural and extramural field testing of cement and concrete containing different types of biochar substitutions. Characterization, preparation, and testing of biomass feedstocks and biochar-concrete blends both in lab and in test plots would take place at WSU (Pullman, WA). Qualterra (Cheney, WA) and their selected subcontractors would carry out fabrication and testing of biochar production equipment and shipping-container sized biomass processing units. Cemex USA (Riverview, FL; Victorville, CA) would test biochar-concrete and biochar-cement blends at test plots blended with their existing cement production stream.

Cemex USA in Victorville is a pre-existing facility that was purpose-built for cement production activities. However, some facility modifications and ground disturbing activities would occur in order to deploy two biomass processing units at the site. The biomass processing units to be installed would be composed of prefabricated 20-foot (ft) shipping containers and bio-char sorting machines and storage silos capable of storing up to 2000 cubic meters of bio-char. The storage silos would require 3-ft deep foundations, 12 yards in diameter. Trench excavation would be needed to connect the biomass processing units to the existing electrical supply at the facility. This would require trenches 3-ft deep, 2-ft wide, and 80 linear feet for a total excavation volume of 480 cubic ft of top soil. The excavated material would be reused on the industrial site.

At this time, all intramural field test sites and most extramural test sites have been identified. Extramural test sites located at WSU and Cemex USA would be on previously disturbed ground and thus would be unlikely to affect any resources of concern. However, any further sites that would be identified as part of Subtasks 9.2 and 9.3 would require further NEPA review.

Award activities would involve the production and modification of biochar and cement which could involve high temperatures, skin irritation, and the risk of nano-scale biochar particle inhalation. Materials would be managed in accordance with federal, state, and local environmental regulations. Existing university health and safety policies and procedures will be followed, including employee training, proper protective equipment, engineering controls, monitoring, and internal assessments. This would include exhaust ventilation, air locks, and sealed containers to mitigate the risk of nanoparticle inhalation.

DOE has considered the scale, duration, and nature of proposed activities to determine potential impacts on resources, including those of an ecological, historical, cultural, and socioeconomic nature. DOE does not anticipate impacts on these resources which would be considered significant or require DOE to consult with other agencies or stakeholders.

## NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

The following conditions must be met for potential field-testing site selections:

- 1) If the location selected by the Recipient is not a previously disturbed, pre-existing industrial site, the Recipient must submit the proposed field-testing site to the DOE at [GONEPA@ee.doe.gov](mailto:GONEPA@ee.doe.gov);
- 2) If DOE determines it necessary, DOE completes necessary consultations with other agencies or stakeholders; and
- 3) The Recipient receives written authorization from the DOE to move forward with the activities stated above at the selected field-testing site.

Notes:

Industrial Efficiency and Decarbonization Office (IEDO)  
This NEPA determination requires legal review of the tailored NEPA provision.  
NEPA review completed by Alex Colling on 01/22/24.

## 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:



Casey Strickland, NEPA Compliance Officer

Date: 1/26/2024

**FIELD OFFICE MANAGER DETERMINATION**

- 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: \_\_\_\_\_

Field Office Manager

Date: \_\_\_\_\_