

PMC-ND

(1.08.09.13)

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

**RECIPIENT:** North Carolina State University**STATE:** NC

PROJECT TITLE: Device Design and Robust Periodic Motion Control of an Ocean Kite System for Marine Hydrokinetic Energy Harvesting

| Funding Opportunity Announcement Number | Procurement Instrument Number | NEPA Control Number | CID Number |
|---|-------------------------------|---------------------|------------|
| DE-FOA-0001837 | DE-EE0008635 | GFO-0008635-002 | G08635 |

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.)

B3.6 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 funding to North Carolina State University (NCSU) to design fabricate, and test a 1/10 scale ocean kite system for harvesting marine hydrokinetic energy through controlled periodic flight.

The proposed project has been divided into 11 Tasks. DOE completed one previous NEPA determination covering Tasks 1-6 and task 11 (GFO-0008635.001; CX A9, B3.6; 03/20/2019). This determination is for the remaining tasks, Tasks 7-10.

Task 7 would include fabrication and testing a 1/20th scale device. The device would be fabricated at NCSU in preexisting laboratory facilities. The device would be an ocean kite system with a wingspan of approximately .5 meters, and length of approximately .45 meters and a fuselage diameter of .125 meters. The kite would be fabricated from foam, carbon, and fiber. Electric components would be included within the fuselage. Once fabricated the device would be tested in the NCSU aquatic center pool. Testing would consist of towing the device across the pool utilizing a tow raft system.

Task 8 would involve analysis of data compiled in Task 7.

Task 9 and 10 would include fabrication and testing of a 1/10th scale device. The 1/10th scale device would also be fabricated at NCSU. The device would be twice the size of the 1/20th scale device. The kite would be fabricated from foam, carbon, and fiber. Electric components would be included within the fuselage. Once fabricated the device would be tested at Lake Norman, in North Carolina. Testing would consist of launching a boat (approximately 20 feet in length) at Pinnacle Access area, a paved boat ramp. The kite would then be towed behind the boat at a speed of 1 to 1.5 meters a second. Total testing time would be approximately 24 hours over several days of testing.

There are several species of Endangered Species Act listed plants, and one listed species of bog turtle that could be in the area of Lake Norman. There are no critical habitats within the project area. Testing would be limited to open water, would not engage bogs or marsh areas, and would not impact natural shorelines. The United States Fish and Wildlife Service reviewed the proposed testing and found that they had no concerns or objections to the proposed testing. As such, DOE has determined that the proposed testing would have No Effect on any Endangered Species Act listed species that could be in the area and No Effect on any critical habitat.

Project work would include the fabrication of the devices from standard non-hazardous materials. In order to mitigate potential risks associated with the handling of these substances and the use of machinery, established University health and safety policies and procedures would be adhered to. Likewise, standard University health and safety policies and procedures would be followed during all testing. NCSU reports that all necessary permits and approvals have been obtained for testing in Lake Norman.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

[Water Power Technologies Office](#)

[This NEPA determination does not require a tailored NEPA provision.](#)

[Review completed by Roak Parker, 12/15/2020](#)

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: **Roak Parker**

NEPA Compliance Officer

Date: 12/16/2020

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: _____