

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



RECIPIENT: NREL

STATE: CO

PROJECT TITLE: NREL-23-017 HERO WEC Deployment - Nags Head, NC

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
	DE-AC36-08GO28308	NREL-23-017	GO28308

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:

**B3.16
Research
activities in
aquatic
environments**

Small-scale, temporary surveying, site characterization, and research activities in aquatic environments, limited to: (a) Acquisition of rights-of-way, easements, and temporary use permits; (b) Installation, operation, and removal of passive scientific measurement devices, including, but not limited to, antennae, tide gauges, flow testing equipment for existing wells, weighted hydrophones, salinity measurement devices, and water quality measurement devices; (c) Natural resource inventories, data and sample collection, environmental monitoring, and basic and applied research, excluding (1) large-scale vibratory coring techniques and (2) seismic activities other than passive techniques; and (d) Surveying and mapping. These activities would be conducted in accordance with, where applicable, an approved spill prevention, control, and response plan and would incorporate appropriate control technologies and best management practices. None of the activities listed above would occur within the boundary of an established marine sanctuary or wildlife refuge, a governmentally proposed marine sanctuary or wildlife refuge, or a governmentally recognized area of high biological sensitivity, unless authorized by the agency responsible for such refuge, sanctuary, or area (or after consultation with the responsible agency, if no authorization is required). If the proposed activities would occur outside such refuge, sanctuary, or area and if the activities would have the potential to cause impacts within such refuge, sanctuary, or area, then the responsible agency shall be consulted in order to determine whether authorization is required and whether such activities would have the potential to cause significant impacts on such refuge, sanctuary, or area. Areas of high biological sensitivity include, but are not limited to, areas of known ecological importance, whale and marine mammal mating and calving/pupping areas, and fish and invertebrate spawning and nursery areas recognized as being limited or unique and vulnerable to perturbation; these areas can occur in bays, estuaries, near shore, and far offshore, and may vary seasonally. No permanent facilities or devices would be constructed or installed. Covered actions do not include drilling of resource exploration or extraction wells.

Rationale for determination:

The U.S. Department of Energy's (DOE) National Renewable Energy Laboratory (NREL) is proposing to subcontract with the Coastal Studies Institute (CSI) of East Carolina University to deploy, monitor, and recover the Hydraulic and Electric Reverse Osmosis Wave Energy Converter (HERO WEC) at Jennette's Pier Wave Energy Test Center in Nags Head, North Carolina. The Jennette's Pier Wave Energy Test Center is an established site that is used to test temporary installations of small-scale wave energy devices and is located alongside and adjacent to Jennette's Pier.

PROJECT NEPA HISTORY

The proposed project is in support of the Waves to Water Prize, which involved deploying and testing small, wave powered desalination systems at Jennette's Pier. The Prize was administered in five stages, and NEPA reviews have been completed for all stages. Two NEPA reviews for the first four stages of the Prize (CONCEPT, DESIGN, ADAPT, and CREATE) were signed by the DOE NEPA Compliance Officer: the first on June 6, 2019 (GFO-WavesPrize-001) and the second on June 19, 2020 (GFO-WavesPrize-002). The final stage of the Prize, DRINK, involved deployment and testing of the devices and the NEPA review was signed by the DOE NEPA Compliance Officer on April 15, 2021 (NREL-20-030).

PROPOSED PROJECT

NREL proposes to redeploy the HERO WEC, which was previously deployed during the DRINK stage of the Prize. The purpose of the redeployment is to understand wave and current conditions, evaluate sub-system performance of the mooring and anchoring systems under dynamic WEC forces, and to gain additional insight into potential mooring failure modes or other challenges.

HERO WEC AND SUPPORTING EQUIPMENT

The HERO WEC consists of an inflatable hexagonal ring made of PVC fabric and coated in polyurethane. Components fit inside the ring and are mounted to a frame attached to the float. The ring has an outer diameter of approximately 2 meters (6.6 feet) and is equipped with a strobe light. A Spectra LB-400 Reverse Osmosis (RO) unit would be installed on the pier, and a 24DC submersible pump electrical system would be mounted below the pier to feed water to the RO system. The WEC would have an electrical connection and hose connection to the dock.

DEPLOYMENT

The HERO WEC would be deployed twice during the winter season for approximately 6 to 8 weeks each time. The decision to deploy the device would depend on favorable weather and ocean conditions to ensure safe operations.

The HERO WEC would be shipped to CSI in North Carolina from NREL in Golden, Colorado. Once at CSI, the WEC would be configured for deployment and loaded onto the R/V Miss Caroline, a 12.8-meter long (42 foot) Duffy. The vessel is berthed at the CSI marina and would deploy from this location.

The R/V Miss Caroline would traverse a nearly straight, established route from the CSI marina to Jennette's Pier. Travel to and from the location would take approximately one day in each direction. The HERO WEC would be attached to an existing anchor at the test site, and a smaller secondary anchor may be used to prevent the device from spinning. Once anchored in place, divers would connect water delivery hoses and power cables from the HERO WEC to the chain pile marker buoy and along the seabed to the pier. The RO unit would then be connected.

Water generated from testing would be collected in containers and disposed of in the ocean as authorized. CSI personnel would maintain 24/7 monitoring of the device and would respond to any system failure or environmental concern in a timely manner during daylight hours.

DECOMMISSIONING

At the conclusion of testing, the HERO WEC and its supporting connections would be removed. Water and power systems would be shut down and disconnected prior to separating it from the anchor. The Tiki XIV, a 24.4-meter (80 foot) steel trawler would remove the primary and secondary anchors. The Tiki XIV would travel approximately 278 kilometers (150 nautical miles) to Jennette's Pier on a near straight, established route along the Continental shelf of the North Atlantic Ocean, which would take one day to travel in each direction. The anchors would be hauled aboard using the vessel's A-frame and winch, where it will be secured on deck before traversing back to CSI's pier.

PERMITTING

The North Carolina Ocean Renewable Energy Program (hereafter "the Program"), operated out of CSI, has a Coastal Area Management Act (CAMA) major permit for the Program's Wave Energy Test Center at Jennette's Pier, which is a joint permit between North Carolina Division of Coastal Management and the U.S. Army Corps of Engineers (USACE). Additionally, the USACE issued the Program Nationwide Permit #5, Scientific Measurement Devices, for the Wave Energy Test Center at Jennette's Pier. Additional permits that could be required include: U.S. Coast Guard Private Aids to Navigation or Notice to Mariners; and/or a Land Use permit. Project activities shall not commence until all required permits have been obtained.

FWS CONSULTATION

There are 16 federally listed threatened or endangered species under FWS's jurisdiction that could occur in the Project area. DOE determined that the proposed project would have no effect on 15 species and may affect, not likely to adversely affect, one species, the West Indian manatee. The Prize team would implement WIM Guidelines: Precautionary Measures for Construction Activities in North Carolina Waters. Manatees are not likely to encounter the Project given the time of year, but if a manatee is seen within 100 yards of the project, all appropriate precautions shall be implemented to ensure their protection. NREL communicated this determination to FWS on February 12, 2021. The FWS concurred with this determination on February 19, 2021. The proposed redeployment is consistent with this consultation.

NMFS CONSULTATION

There are 14 federally listed endangered species under NMFS's jurisdiction that could occur in the proposed project area. The proposed project location also includes designated critical habitat for one species, the Loggerhead sea turtle. The proposed project has the potential to impact these species and designated critical habitat, and DOE requested expedited informal Endangered Species Act consultation with the National Marine Fisheries Service (NMFS) on April 5, 2021.

Physical effects to species could include collisions with the vessel and/or project equipment during deployment and retrieval. The likelihood adverse impacts is anticipated to be very low due to: the deployment of anchors in a slow and controlled manner to avoid marine mammal strikes; adherence to NMFS-recommended BMPs and conservation measures; the presence of divers and marine mammal observers and use of the onboard active acoustic fish finder to alert to the team to the presence of marine life; avoidance of sea turtle nesting season (which begins in mid-May); and the spacing of devices and anchors to allow marine animals safe and unrestricted access through the area.

NMFS concurred with DOE's determination that the proposed project is not likely to adversely affect the NMFS ESA-listed species and/or designated critical habitat. The letter of concurrence was received by DOE on April 13, 2021.

DOE reinitiated expedited informal consultation with NMFS on July 27, 2022. The redeployment was necessary as the initial deployment did not yield useable data. NMFS concurred with DOE's determination that the proposed project is not likely to adversely affect the NMFS ESA-listed species and/or designated critical habitat. The letter of concurrence was received by DOE on July 27, 2022.

The current proposed redeployment is consistent with the activities and impacts assessed in the initial consultation and reinitiation of consultation.

ADDITIONAL IMPACTS

Cultural resources were not identified in the project area. The proposed project would occur at an established wave energy test site that is used for device testing, and all land-based activities would occur at existing facilities; as such, the project would not affect the use of the area by marine life or human activity. The discharge of brine and fresh water produced by the devices and the operation of vessels would not affect the use, availability, or quality of water resources, or planned or ongoing land uses.

Vessel use would result in de minimus air emissions. Project activities may temporarily elevate noise levels and would likely be masked by the existing background noise in the area from waves, existing recreational and commercial vessel activity, and other activities that regularly occur in the project area.

Individuals working on this project could be exposed to various hazards during equipment and device assembly, deployment, testing, and retrieval. Existing corporate health and safety policies and procedures would be followed, including employee training, proper protective equipment, and engineering controls; additional policies and procedures would be implemented as new health and safety risks are identified.

NEPA PROVISION

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

All required permits, permissions, notifications, and approvals shall be received prior to commencing project activities.

CSI shall abide by all of the mitigation measures resulting from DOE's consultation with NMFS and FWS.

Notes:

NREL
Nicole Serio, 9/13/2023

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: Matthew Blevins** _____ Date: _____
NEPA Compliance Officer

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: _____ Date: _____
Field Office Manager