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

RECIPIENT: Ocean Energy USA LLC **STATE:** HI

PROJECT TITLE: Ocean Energy Demonstration of the Ocean Energy (OE) Buoy at US Navy's Wave Energy Test Site

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001081	DE-EE0006924	GFO-0006924-002	GO6924

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.)
B5.25 Small-scale renewable energy research and development and pilot projects in aquatic environments	Small-scale renewable energy research and development projects and small-scale pilot projects located in aquatic environments. Activities would be in accordance with, where applicable, an approved spill prevention, control, and response plan, and would incorporate appropriate control technologies and best management practices. Covered actions would not occur (1) within areas of hazardous natural bottom conditions or (2) 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, use of large-scale vibratory coring techniques, or seismic activities other than passive techniques.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to Ocean Energy USA, LLC (OE) to perform the detailed engineering, fabrication, deployment, and testing of a near full-scale demonstration Wave Energy Conversion (WEC) device for comparison of performance, reliability, and levelized cost of energy (LCOE). The results of the testing would allow OE to fully validate the structural loads, device performance, operations and maintenance (O&M) requirements, and build-cost.

The proposed project would include 21 distinct tasks. Design-related activities occur in Tasks 1-10, while fabrication, deployment and testing activities occur in Tasks 11-21. DOE previously completed a NEPA determination for Tasks 1-10 of the proposed project (GFO-0006924-001). This determination is for all remaining tasks.

Tasks 11-21 would include project management (Task 11), permitting (Task 12) fabrication and assembly of the OE Buoy and system components (Tasks 13-18), deployment and testing (Task 19), decommissioning (Task 20) and reporting (Task 21). Tasks 11, 12, and 21 would be administrative and data reporting tasks which are exclusively intellectual, analytical, or academic in nature. Tasks 13-20 would involve fabrication and transportation, as well as deployment, testing, and decommissioning in an open water environment. Deployment and testing would occur at the Wave Energy Test Site (WETS) located offshore of Marine Corps Base Hawaii (MCB Hawaii) at Kaneohe, Hawaii.

In January 2014 the Naval Facilities Engineering Command (NAVFAC PACIFIC) published a Final Environmental Assessment (EA) for WETS. The EA analyzed the development of the WETS site, which includes surface buoys, 3-point mooring and anchoring systems, mooring buoys for anchoring work boats, mooring lines and anchor base, undersea cable, land cable, a utility vault to house the connection of the undersea and land cables, and an equipment shelter where power generated would be connected to the grid system at the MCB Hawaii Tactical Air Navigation site. (Development of the site, as described above, has now been completed.) The EA also included a detailed analysis of the impacts of installation, operation, and decommissioning of two types of Wave Energy Conversion (WEC) devices at WETS; the Point Absorber and the Oscillating Water Column (OWC). Because specific devices had not yet been selected for deployment, testing, and decommissioning, typical properties and design parameters of these two types of devices were analyzed in the EA. In February, 2014, the Department of Defense/Department of Navy issued a Finding of No Significant Impact (FONSI) based on the EA for WETS. DOE did not have a federal action at WETS during the EA process, and thus was not a coordinating agency on the EA. Nonetheless, DOE accepts and relies in part on the analysis of the EA in making this determination.

OE proposes to fabricate the Ocean Energy Buoy (OE Buoy) and transport the OE Buoy to WETS where OE would deploy, test, and eventually decommission the device. The objectives of the OE Buoy deployment and testing are to: 1) confirm sea-keeping performance predictions; 2) confirm the air power performance predictions; 3) confirm the mooring design in open sea conditions; 4) confirm the performance of air turbine in open sea conditions; 5) confirm the predictions of power output at full scale; 6) verify the operational requirements of open sea devices to inform commercial development; 7) validate the target capital costs for the device; and 8) validate the levelized cost of energy (LCOE).

The OE Buoy would be an OWC device that fits within the parameters of OWC devices analyzed in the EA. The main component of the OE Buoy would be the OE35 structure. The OE35 structure would be a steel, barge-type structure with a subsea duct through which air would flow to power the turbine. Construction of the OE35 structure would be similar to typical ship construction configurations and techniques. The total length of the OE35 structure would be 123 feet, with a total width of 57 feet. The subsea duct would be 19 feet in height and would run the width and length of the device. At the turbine end of the device, the subsea duct would protrude above water level and create an air plenum chamber through which air would flow and turn the turbine. The structure would protrude 29 feet into the water. Above the water line the device would include a buoyancy module and turbine, as well as an access walkway between the turbine area and the stern. Mooring line locations would be accessible from the turbine location as well as from the stern via the walkway.

The turbine would be mounted on top of the buoyancy module. The turbine would interface with the subsea duct and air plenum chamber. The turbine would be connected to an electrical generator, which would be mounted atop the buoyancy module. The buoyancy module would include a machine room which would house controllers, a generator cooling system, transformers and switchgear.

The OE Buoy would be fabricated at a shipbuilding facility in Tacoma, WA. Fabrication would be similar to fabrication of a steel barge and would primarily involve welding steel. The turbine, to be supplied by Dresser Rand, would be up to 25 feet in length and 21 feet in diameter, and would be installed during the fabrication process. (Design, fabrication and testing of the turbine itself is a separate DOE award that has undergone a separate NEPA analysis. See, DE-EE00006609). Control room components, including off-the-shelf components such as controllers, generators, and fire suppression devices, would also be installed during fabrication. Most control room components would be supplied by Siemens. No components would contain hazardous materials. Components would contain a small amount of lubrication within sealed bearing systems.

Once fabricated the completed OE Buoy would be transported to Hawaii by wet or barge tow. The OE Buoy would be towed from the west coast to Hawaii by a tug. Towing devices is a common method of ocean transport, used frequently for moving oil platforms into place, though also used for moving barges, and other devices across large expanses of ocean. The OE Buoy is a floating barge-like device, so towing would involve an easier configuration than towing a platform. Once the OE Buoy is at the port in Honolulu, Hawaii the OE Buoy would be towed, around the island to WETS.

Once at WETS, the OE Buoy structure would be moored using preexisting moorings. The preexisting system includes pre-installed anchors, mooring chains, and surface floats. The OE Buoy system would be connected to the existing floats using synthetic rope hawsers of a length (anticipated to be approximately 165 feet) to ensure that in no wave conditions the mooring lines have a pretension load.

The OE Buoy would be connected to existing subsea electrical cables via a subsurface umbilical system and splice box. The cable would be flexible and configured in a lazy S configuration between the splice box and the OE35

structure. The cable would be connected to surface buoys to insure the lazy S configuration and to insure that the cable does not touch the sea floor.

Installation of the OE Buoy, which would be anticipated to take two twelve-hour days, would occur in September/October of 2016. Installation would include the use of a tug boat to move the device into place, and a workboat, and would be conducted in accordance with the following procedures:

1. The OE Buoy would be towed to the site by the tug boat.
2. Tending lines would be transferred to the work boat.
3. The OE Buoy would be connected to the two windward mooring surface floats, with the third line connected to the downward float insuring it is not under tension.
4. Mooring lines would be released and the workboat would perform a systems check to insure proper mooring.
5. Subsurface floats would be attached to the umbilical electrical cable.
6. The umbilical cable would be connected to the OE Buoy.
7. Workboats would move over the location of the splice box.
8. The splice box would be retrieved using an existing line retrieval system
9. The umbilical cable would be connected to the conductors within the splice box.
10. The splice box would be sealed and lowered back to the sea floor.
11. All systems would be checked and confirmed prior to any support or work vessels leaving the installation site.

The OE Buoy would remain on site for approximately 12 months. During the twelve-month testing period the device would collect data to meet the 8 objectives of testing identified above. After approximately 12 months the device would be decommissioned. Removal of the device would involve the reverse of the deployment process described above.

Marine biological resources in the vicinity of and/or potentially affected by the WETS infrastructure and WEC device operation were described in the WETS EA. There are no known threatened or endangered plants or terrestrial fauna within the project area of the Proposed Action. The shoreline, estuaries, and freshwater areas offshore of MCB Hawaii Kaneohe Bay are known habitats for four endemic and endangered waterbirds: the Hawaiian Stilt (Himantopus mexicanus) or ae'o; the Common Moorhen (Gallinula chloropus sandivicensis) or'alae 'ula; the Hawaiian Coot (Fulica alai) or 'alae ke 'oke'o, and Hawaiian Duck (Anas wyvilliana) or Koloa. The Western Pacific Regional Fishery Management Council has designated all the ocean waters surrounding Oahu, from the shore to depths of over 100 feet, as Essential Fish Habitat (EFH) for one or more regulated species. However, there are no areas within the proposed project area that have been designated as Habitat Areas of Particular Concern (HAPC) under the EFH regulations.

Marine species listed under the Endangered Species Act as threatened or endangered, and that are known to occur at North Beach, include the Green Sea Turtle (Chelonia mydas), Hawksbill Turtle (Eretomochelys imbricate), Hawaiian Monk Seal (Monachus schanuinsalndi), Main Hawaiian Islands Insular False Killer Whale (Pseudorca crassidens), and Humpback Whale (Megaptera novaenglaie). The Green Sea Turtle is common within Kaneohe Bay and is believed to frequently transit through the proposed project area. Other less frequent sightings of the Hawksbill Turtle, the Hawaiian Monk Seal, and the False Killer Whale occur within the proposed project area while Humpback Whales use this area on a seasonal basis.

NAVFAC PACIFIC Marine biologists reviewed the specifics of the OE Buoy design. That analysis determined that the OE device in not likely to adversely affect (NLAA) listed species including the Green Sea Turtle, Hawksbill Turtle, Hawaiian Monk Seal, and Main Hawaiian Islands Insular False Killer Whale because the effects are discountable. DOE has also determined that the Proposed Action is not likely to adversely affect the listed species. On November 16, 2015 DOE, the Navy, and OE met with the National Marine Fisheries Service (NMFS) to brief NMFS on the details of the Proposed Action and discuss potential biological impacts of the Proposed Action. On November 25, 2015 Navy sent NMFS two requests for consultation (one on Endangered Species Act and one on Essential Fish Habitat). On December 18, 2015, DOE sent a request to NMFS to join the consultations.

On January 7, 2016, NMFS, issued an opinion to Navy and DOE that the Proposed Action would not adversely affect Essential Fish Habitat. On January 25, 2016 NMFS issued an opinion to Navy and DOE that the Proposed Action would have no effect on Migratory Bird Treaty Act (MBTA) species. On January 26, 2016, NMFS, issued an opinion to Navy and DOE concurring with Navy and DOE's submission to NMFS regarding Endangered Species Act species, finding the Proposed Action not likely to adversely affect ESA species.

In all opinions identified above NMFS required that the project follow all Best Management Practices (BMPs) identified in the EA.

Based on review of the project information and the above analysis, DOE has determined that Tasks 11-21 would not have a significant individual or cumulative impact to human health and/or environment. DOE has determined that these tasks are consistent with actions outlined in DOE categorical exclusions A9 "Information gathering, analysis, and dissemination," and B5.25 "Small scale renewable energy research and development and pilot projects in aquatic environments," and are therefore 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 the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:
Ocean Energy is required to follow the Best Management Practices (BMPs) identified in section 2.2.4 (pages 2-22 to 2-24) of the WETS EA, dated January 2014.

Note to Specialist :

This NEPA determination does require a tailored NEPA provision.
Water Power Program.
Review competed by Roak Parker 4/1/2016.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Kristin Kerwin Date: 4/6/2016

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