



## Department of Energy

Golden Field Office  
1617 Cole Boulevard  
Golden, Colorado 80401-3393

DOE/EA 1917

### MITIGATED FINDING OF NO SIGNIFICANT IMPACT OREGON STATE UNIVERSITY'S WAVE ENERGY TEST PROJECT, NEWPORT, OREGON

**AGENCY:** U.S. Department of Energy, Golden Field Office

**ACTION:** Mitigated Finding of No Significant Impact (FONSI)

**SUMMARY:** The U.S. Department of Energy (DOE) completed an Environmental Assessment (DOE/EA1917), that analyzed the potential environmental impacts of providing financial assistance to support the Oregon State University (OSU) Wave Energy Test Project (Project), which will be located approximately 2.0 miles (3.2 kilometers) off the coast of Oregon near the city of Newport, Oregon. The Project is an effort by OSU and the Northwest National Marine Renewable Energy Center (NNMREC) to deliver a mobile capability for testing the output of wave energy conversion (WEC) devices.

The EA also analyzed the potential environmental impacts of providing financial assistance in a separate funding agreement with Northwest Energy Innovations, LLC (NWEI) in support of its controlled open-sea deployment of the Wave Energy Technology-New Zealand (WET-NZ) WEC device. The WET-NZ device will be tested using OSU's proposed testing equipment and at the site of the Project.

All discussion, analysis, and findings related to the potential impacts of construction and operations of the Project, including the applicant-committed measures, are contained in the Final EA and the Mitigation Action Plan (MAP). The Final EA and MAP are hereby incorporated by reference.

This Mitigated FONSI was prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality Regulations for Implementing NEPA, as amended, 40 CFR 1500-1508, and DOE NEPA Regulations 10 CFR 1021.322.

DOE's Proposed Action is to authorize the expenditure of federal funds by OSU in support of the Project. Specifically, federal funds will be used to support the design, construction, deployment, operation, removal, and decommissioning of up to two Ocean Sentinel instrumentation buoys; various WEC devices; a TRIAXYS™ wave measurement buoy; and other supporting instrumentation, including OSU-owned vessels. DOE also proposes to provide federal financial assistance in a separate funding agreement to NWEI in support of its controlled open-sea deployment and test of the WET-NZ WEC device using the testing equipment and at the site of the Project in the summer and fall of 2012 and summer of 2013.

The Ocean Sentinel buoy(s) will be capable of receiving technical data on the power generation from a variety of off-grid WEC devices (i.e., devices that do not have a cable connection to the onshore electrical grid). Testing of the WET-NZ device will be the first test of a WEC device at the proposed site.

Additional WEC devices will also be tested during the 10-year project period analyzed in the EA. In addition, a TRIAXYS™ wave measurement buoy and other instrumentation will be used to study and monitor a number of environmental conditions within and near the project site to evaluate the effects of WEC devices on the natural and human environment. The Project will also involve the use of OSU's manned vessel to monitor WEC devices. For a more detailed description of DOE's Proposed Action, see Chapter 2, Proposed Action and Alternatives, in the Final EA.

**ENVIRONMENTAL IMPACTS:** The EA examined the potential environmental impacts of DOE's Proposed Action, authorizing the expenditure of federal funding to implement the Project, as well as the impacts of not implementing the Project (the No Action Alternative). DOE assumed, for purposes of the EA, that OSU will not implement the Project without such financial assistance.

NNMREC is a partnership between OSU and the University of Washington and was established through DOE's Wind and Water Power Program, which supports the development and deployment of advanced water power devices such as those that capture energy from waves, tides, ocean currents, and ocean thermal variables. One goal of the program is to help industry harness this renewable resource to generate environmentally sustainable and cost-effective electricity. Continued research and testing, that will be provided by the Proposed Action and Project, are needed to develop and advance different marine renewable energy technologies for cost-effective use by the industry and to evaluate the technical aspects, performance characteristics, and environmental impacts of developing marine renewable energy.

The project site will consist of a 1-square-nautical-mile (3.4-square-kilometer) area of ocean, off the Oregon coast within Oregon State territorial waters. The majority of the operations, equipment, and infrastructure (Ocean Sentinel, TRIAXYS™ buoy, WEC devices under test, and some of the other associated research and monitoring instrumentation) will be limited to the project site.

The Ocean Sentinel buoys will measure approximately 21 feet (6.5 meters) long, 10.5 feet (3.2 meters) wide, and 24 feet (7.3 meters) high with approximately 15 feet (4.6 meters) above the water line. They will be deployed between 6 weeks to 6 months at a time with some mooring systems left in place for potentially up to the full 10-year project period. A variety of WEC devices will be tested during this time. These devices could include pitching/surging/heaving/sway, point absorber, and oscillating water column designs that will be capable of operating in water depths of approximately 180 feet (55 meters). The first WEC device to be tested will be the WET-NZ device, which will be approximately 59 feet (18 meters) long and 11.5 feet (3.5 meters) wide. It will be deployed for approximately 6 weeks during the late summer and early fall of 2012 (August into early October) and up to 3 months during the summer of 2013; the mooring systems will remain in place for the duration of the proposed test (approximately 2 years).

Communications between the WEC devices under test and the Ocean Sentinel will be provided by fiber-optic cables integrated in an umbilical cable. Connectivity between the Ocean Sentinel and the shore station will be provided by telemetry systems.

The TRIAXYS™ wave measurement buoy will weigh approximately 440 pounds (220 kilograms), including batteries. It will measure approximately 3 feet (0.9 meter) in diameter and when deployed in the water, the top of the spherical buoy will extend approximately 1.5 feet (0.5 meter) above the mean water line. The buoy will be moored, using a single chain line and clump anchor in the prevailing wave

direction from the WEC device under test, and will transmit wave and current data to the Ocean Sentinel via radio telemetry. The WEC device could also be monitored using test equipment mounted on an OSU research vessel, which measures 84 feet (26 meters) long and has berthing for up to 12 people (crew and scientists), two showers, and three heads. This vessel will be moored with a typical onboard anchor.

The mooring system for the Ocean Sentinel buoys and WEC devices will likely consist of three-point moorings although four-point mooring may be used in some applications. The WET-NZ device will be moored approximately 492 feet (150 meters) from the Ocean Sentinel. Collectively, these project components will have a footprint of approximately 820 feet by 1,148 feet (250 meters by 350 meters) within the project site.

No on-site construction activities will be associated with the Project. All project components will be constructed at existing land-based facilities prior to being installed at the project site. Existing pier facilities at Hatfield Marine Science Center in Newport will serve as the mobilization site. The Ocean Sentinel, WET-NZ, and TRIAXYS™ wave measurement buoys, as well as all mooring materials, will be staged at this site for the installation vessels to pick up and transport to the project site.

During full decommissioning at the end of the 10-year period, all system components will be removed from the project site, including the Ocean Sentinel, WEC device(s), TRIAXYS™ wave measurement buoy, anchors<sup>1</sup>, mooring lines, subsurface floats, and the shore station and associated telemetry antennas. Anchors and mooring lines will be disposed of in accordance with federal, state, provincial, and local environmental control regulations and at permitted facilities. Disposition of equipment and material will be in accordance with a detailed decommissioning plan. Removal of any future test devices will follow the same procedures.

In addition, OSU has committed to incorporating a number of specific applicant-committed measures in the implementation of the 2012-2013 WET-NZ tests, as well as throughout the full lifetime of 10 years for the Project to facilitate the safe and compliant deployment of the project technology, and to minimize the environmental impacts of the Project. These applicant-committed measures address planning and development, navigation and transportation, safety and survivability, and biological resources. DOE defines applicant-committed measures as activities or actions established as integral practices and part of the applicant's proposed project plan or scope of work for the applicant's proposed project.

An Adaptive Management Framework has been prepared for the Project for two purposes. First, it provides a means for the broader regulatory and stakeholder communities to stay informed of and provide feedback on OSU and NNMREC's test center monitoring and mitigation for the lifetime of the Project. An Adaptive Management Committee will receive monitoring results, adaptive management thresholds, and mitigation actions taken during each test and will review results and provide guidance on future test center activities. Second, the Adaptive Management Framework provides a foundation for the monitoring and adaptive management associated with individual tests at the proposed project site. For each test performed, an Adaptive Mitigation Plan will be developed that includes thresholds and mitigation actions for the particular test. In addition, results and analysis of previously completed monitoring studies will be used to inform the plans for future tests.

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<sup>1</sup> If plate or pile anchors were used, they may be removed by being cut off at the level of the ocean floor. The portion of the anchor buried in the sediment may be left behind after decommissioning.

DOE has developed a MAP that specifies the methods for implementing mitigation measures to address potential environmental impacts identified by DOE and by the National Marine Fisheries Service (NMFS) Biological Opinion and to assure that impacts will not become significant. Mitigation measures identified in the MAP shall be incorporated into the funding agreements and enforceable as described in the MAP through the lifecycle of the Project. The development of these measures and an implementation plan is a necessary condition for this Mitigated FONSI.

Based on scoping and other information, DOE concluded that the Proposed Action will have no measureable impact on air quality, energy, floodplains, geology and soils, intentional destructive acts, land use, noise impacts on sensitive human receptors, transportation, wetlands, or wild and scenic rivers. Therefore, DOE did not further analyze these resource areas in its Final EA.

### *Biological Resources*

Anti-fouling paints to prevent colonization of the project equipment by marine algae, mollusks such as mussels, sea anemones, and other forms of marine invertebrate life, could result in leaching of copper oxides into the water column. The effects on biological resources will be minimal because the minor amount of copper leachate will be released into a high-dilution environment.

Surfaces that do not have anti-fouling coats could be colonized by marine invertebrate life, which could increase the productivity of the area and provide shelter and forage for free-swimming invertebrates (e.g., squid), fish, sea turtles, and marine mammals. The presence of hard substrate habitat may also result in reduced use of the project area by some species, such as anchovies. Because the area that has the potential to be colonized will be relatively small compared to the surrounding marine environment, it is anticipated the effects of colonization on biological resources will be minimal.

Placement of the mooring systems could result in the displacement of up to approximately 3,000 square feet (0.07 acre) of benthic habitat. The effects are considered minimal because the area lost will be relatively small compared to the Oregon coastal zone that provides suitable habitat for the benthic infaunal community. In addition, the high-energy marine environment of the project site is adapted to frequent physical disturbance and can be expected to quickly repopulate the area of bottom habitat under the anchors after they are removed. Benthic monitoring will also be conducted and any effects will be reviewed and addressed annually through the Adaptive Management Framework. In its Biological Opinion, NMFS determined that the Project may lead to alteration of the composition of benthic communities within the test site with associated impacts on foraging opportunities for some Endangered Species Act (ESA)-listed fish species. Based on the study plans and an Adaptive Management Framework, NMFS determined that the Project is not likely to jeopardize the continued existence of these species. A number of measures to reduce impacts on marine life from benthic habitat alteration—including the plans and procedures identified in the Adaptive Management Framework—are required by the MAP and will ensure that these impacts will not become significant.

Operation of support vessels during Ocean Sentinel and WEC device installation and removal could reach approximately 118 decibels (dB) at 128 meters (420 feet) from the support vessels. These noise levels are below those that have been shown to affect health or behavior of fish and diving seabirds. These noise levels have the potential to affect the behavior of marine mammals; however, these noise conditions will only occur for a short period of time during installation and removal of the devices and will, therefore,

have only brief impacts of a negligible magnitude. Additional sound will be generated by the WEC devices during operation. In its Biological Opinion, NMFS concluded that sound emissions from tests will result in behavioral avoidance of the action area by some ESA-listed fish and marine mammals. Because there is substantial uncertainty about the associated underwater sound generation, noise monitoring will be performed as specified by an acoustical monitoring plan as part of the Adaptive Management Framework and the MAP. OSU will immediately notify NMFS and the Oregon Department of Fish and Wildlife (ODFW) if measured sound pressure levels created by the Ocean Sentinel or WEC device under test were to exceed NMFS criteria for potential harm caused by impulsive or continuous underwater sound effects on salmonid fishes and marine mammals and the appropriate course of action to ensure effects will be minimal. NMFS determined that the monitoring, adaptive management, and mitigation, that is part of the Project, will ensure that sound produced by WEC device tests is below NMFS-established exposure thresholds and will, therefore, not jeopardize the continued existence of these ESA-listed species. A number of measures to reduce impacts on marine life from project-related noise—including the plans and procedures identified in the Adaptive Management Framework—are required by the MAP and will ensure that these impacts will not become significant.

Electromagnetic field (EMF) transmissions from umbilical cables connecting the WEC devices to the Ocean Sentinel or vessel could affect the behavior of marine organisms. In its Biological Opinion, however, NMFS determined that the Project is likely to cause behavioral avoidance of the area by some ESA-listed fish species as a result of EMF from deployed WEC devices and testing equipment. Monitoring and reporting of EMF conditions will ensure that protected marine organisms will suffer minimal harm from EMF effects as part of the Adaptive Management Framework. Based on the provisions of the Adaptive Management Framework, NMFS concluded that EMF is not likely to jeopardize the continued existence of ESA-listed fish species. A number of measures to reduce impacts on marine life from EMF—including the plans and procedures identified in the Adaptive Management Framework—are required by the MAP.

Collision risks will be minimal and will be primarily limited to flying seabirds that might encounter the Ocean Sentinel or vessel and WEC device superstructure. Although seabirds may be attracted to the devices by increased night lighting, lighting on the devices will be minimal and comparable to lighting for NOAA and U.S. Coast Guard navigation and oceanographic data collection buoys. The use of flashing, low-intensity lights will also help to reduce potential night collisions.

Entanglement risks will be limited to encounters between whales and the Ocean Sentinel or vessel and WEC device mooring lines and umbilical cables. Subsea floats will be used to maintain all mooring lines and umbilical cables under substantial tension to substantially reduce risk of entanglement. At most, 16 mooring cables will be used to anchor the devices. This small number of cables is not expected to pose any substantial physical barrier or collision to foraging sea turtles or marine mammals. Furthermore, OSU will ensure that all the WEC device developers testing in the project area will comply with mitigation measures outlined in the MAP in order to minimize impacts on marine life from potential entanglement with project components. Therefore, potential impacts to marine mammals from entanglements are anticipated to be minimal.

Impacts on commercial fishing will be minor because the area where fishing might be limited due to the presence of testing devices will be relatively small compared to the remainder of the coast that will be open for fishing. Additional discussion is presented under *Socioeconomics* below.

There will be no loss of spawning habitat or foraging grounds or impairment or restriction of movement along migration routes for any special-status species. There will be no appreciable permanent alteration of pelagic or benthic habitat. Applicant-committed measures will further minimize potential impacts on marine mammals and their food sources. Additional applicant-committed measures will also reduce potential effects on biological resources associated with invasive species and chemical spills.

#### *Water Resources*

Installation, operation, and removal of the devices will require the use of vessels and associated chemicals, including fuel, hydraulic fluids, and potentially other hazardous materials that could result in accidental spills or leakage. Vessel operators and WEC device testers will be required to develop and implement a Spill Contingency and Emergency Response Plan, which will minimize potential risks of water quality contamination. Water antifouling coatings used to prevent the colonization of equipment by marine organisms will only result in negligible amounts of leaching that will not appreciably affect water quality. Because the ocean floor in the project area is nearly completely sand, turbidity associated with the disturbance of bottom sediments will be localized within a few meters of the activity and the sand will settle to the sea floor within seconds of disturbance.

#### *Marine Navigation*

All project-related vessel traffic will follow the U.S. Coast Guard rules regarding marine navigation and safety. To minimize the potential for the devices and supporting equipment to become a hazard to navigation once they are in place, marker buoys and other aids to navigation will be placed within the project site. OSU will also publish a Local Notice to Mariners describing the Project prior to installation and removal. OSU will include the U.S. Coast Guard, the Fisherman Involved in Natural Energy committee, the Oregon State Police, ODFW, and the Oregon Marine Board in determining the most appropriate navigational designations for the project site. Routine visits to inspect the structures to minimize the potential for devices to break free and a locational device will be used to help locate the structure in the event one did break free. Therefore, potential impacts on marine navigation will be minimal.

#### *Aesthetic Resources*

Minor temporary visual impacts will occur as seen from beach areas, Yaquina Head, and U.S. Highway 101 during installation and removal of the devices as equipment is transported from shore to the project site and back. Longer-term visual changes will occur during operation of the Project when devices will be located at the project site where none previously existed. However, visual impacts will be negligible because of the low number of structures to be placed in the water, the structures' similarity in appearance to customary vessel lighting, and the distance and reduced visibility from shore.

#### *Recreation Resources*

Implementation, operation, and decommissioning of the Project will result in minor restrictions on marine navigational access; however, the number of boating days will not be substantially reduced because

boaters will be made aware of the presence of the Project through the use of aids to navigation and a Local Notice to Mariners. Therefore, it is anticipated boaters and recreational fisherman will travel in other areas surrounding the Project and will not be appreciably affected. Impacts on other recreational activities from shore, such as whale watching, will be negligible because only minor impacts on marine mammals and visual resources are anticipated, as discussed previously.

### *Cultural Resources*

Because no historic properties, archaeological resources, or cultural resources are known to exist within the area of potential effects (APE), the Project will not affect historical and cultural resources. There will be no impacts during the installation, operation, maintenance, removal, or decommissioning of the Project. DOE has consulted with the State Historic Preservation Office (SHPO) in accordance with Section 106 of National Historic Preservation Act. In July 2010, DOE requested concurrence from the SHPO that their Proposed Action will result in no effects on known cultural or historic resources. In a letter dated August 9, 2010, the SHPO concurred with DOE's findings and indicated that no further archaeological research is required.

### *Socioeconomics*

Installation, operation, and decommissioning of the Project will result in a reduction of a portion of the project site available to commercial fisherman. Impacts during installation and decommissioning will be temporary and minor and will result in only negligible effects. These activities will also have a minor beneficial impact through the creation of at least three new local jobs. Operation of the Project will result in a small loss of navigational access in the project site due to the installation of aids to navigation to minimize potential vessel collisions with the Ocean Sentinel or vessel and WEC devices or entanglement in the mooring lines. This may result in a small loss of income by the crabbing industry and reduced county-wide economic output. It may also reduce labor income in the fishing industry and county-wide labor income. However, the losses will be negligible in comparison to the total value of landings in Newport. The operation of the Project will create at least three new local jobs and will result in a minor beneficial employment impact in the area. Additional local economic activity will result from the ongoing influx of personnel associated with the WEC devices during testing.

*Executive Order 12898* directed Federal agencies to incorporate environmental justice considerations into the NEPA process to ensure that low-income households, minority households, and minority businesses do not experience a disproportionate share of adverse environmental effects resulting from any given Federal action. The Project will be located approximately 2.0 miles (3.2 kilometers) offshore from Newport, Oregon. No potential adverse impacts on human health have been identified in the Final EA. Therefore, there will be no disproportionately high and adverse human health or environmental effects on minority populations and low-income populations.

### *Cumulative Impacts*

DOE evaluated the cumulative impacts of past, ongoing, and planned activities in the project area. Reasonably foreseeable future actions include the Yaquina Ocean Dredged Materials Disposal Site, the Newport International Terminal Project, the Ocean Observatories Initiative, the National Oceanic and Atmospheric Administration Marine Operations Center, the Strategic Business Plan for Oregon's

Statewide Port System, and additional wave energy development at the Reedsport OPT Wave Park, the Douglas County Wave and Tidal Energy Project, and the Coos Bay OPT Wave Park.

The Project is relatively small-scale when compared to the surrounding marine environment. In addition, many of the other potential offshore projects are of similar size and the projects proposed along the shoreline are located relatively far away (over 2.0 miles [3.2 kilometers]). When considered along with a finding that the overall effects of the Project on fish, marine mammals, birds, and other marine life are minor, the Project does not represent an incremental impact. Cumulative impacts of the Project will be negligible because there are no past, present, or reasonably foreseeable future actions that, when combined with the Project, will result in impacts beyond those that already exist or have already been identified and discussed in the Final EA.

**PUBLIC PARTICIPATION IN THE EA PROCESS:** DOE sent scoping letters on April 27, 2010, to Federal, state, and local agencies; tribal governments; businesses; organizations; special interest groups; and interested individuals, providing 32 days to comment on the scope of the EA. DOE also published the Scoping Notice on the DOE Golden Field Office Public Reading Room and in the Oregonian and the Newport News-Times newspapers. DOE also held a public scoping meeting on May 5, 2010, at the Hennings Auditorium at Hatfield Marine Science Center in Newport, Oregon. In response to the Scoping Notice and meeting, DOE received comments as presented in Appendix A of the Final EA. In addition, DOE has consulted with NMFS, the U.S. Fish and Wildlife Service, and the SHPO. Appendix B of the Final EA includes copies of agency correspondence and response.

DOE issued the Draft EA for comment on June 25, 2012, and made it publically available via the DOE Golden Field Office Public Reading Room. DOE sent Notices of Availability (NOAs) announcing the availability of the Draft EA to identified stakeholders and published the NOA on the websites and in the paper of the Oregonian and the Newport News-Times. The comment period ended on July 18, 2012. DOE received four comment letters from agencies, organizations, and interested individuals. The Final EA includes a summary of the comments, DOE's responses, and revisions to the Draft EA.

**DETERMINATION:** Based on the information presented in the Final EA (DOE/EA 1917), and the commitment in the MAP to mitigate impacts on biological resources, including species protected under the ESA and the Marine Mammal Protection Act, to less-than-significant levels, DOE has determined that the Proposed Action will not constitute a major Federal action significantly affecting the quality of the human environment within the context of NEPA. Therefore, the preparation of an environmental impact statement is not required, and DOE is issuing this Mitigated FONSI.

OSU's commitment to obtain and comply with all Federal, state, and local permits required for the Project, and to minimize potential impacts through the implementation of best management practices detailed in the Final EA and as documented in the appropriate permits, shall be incorporated and enforceable through DOE's financial assistance agreement and the MAP. The MAP, Final EA, and this Mitigated FONSI are available at the DOE Golden Field Office Reading Room website at

[http://www.eere.energy.gov/golden/NEPA\\_FEA\\_FONSI.aspx](http://www.eere.energy.gov/golden/NEPA_FEA_FONSI.aspx) .



For questions about this Mitigated FONSI or any of the other NEPA documents for this project, please contact:

Laura Margason  
NEPA Document Manager  
U.S. Department of Energy  
DOE Golden Field Office  
1617 Cole Boulevard  
Golden, Colorado 80401  
Laura.Margason@go.doe.gov

For information about the DOE NEPA process, please contact:

Office of NEPA Policy Compliance  
U.S. Department of Energy  
1000 Independence Avenue, SW  
Washington, D.C. 20585  
<http://energy.gov/nepa/office-nepa-policy-and-compliance>

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Carol Battershell  
Manager