

## ENVIRONMENTAL EFFECTS METADATA SURVEY FORM

Name of person updating the form

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Project name: Kaneohe Bay OPT Wave Project

Planned  In Operation  Completed

Project description:

*Project Developer:* US Navy

*Technology Developer:* Ocean Power Technologies

*Technology type:* Point absorber PowerBuoy

*Resource (wave, tidal):* Wave

*Project scale (test site, prototype, array, commercial):* Full-scale prototype

*Installed capacity (MW):* 40 kW

*Project Website:* <http://www.oceanpowertechnologies.com/hawaii.html>

*Launch Date:* 2009

*End Date:* 2011

*Additional Description:* The utility PowerBuoy PB40 was a prototype with unique, direct-drive Power Take-Off system. Compact and modular in design, the PowerBuoy was less than 12 feet in diameter and 55 feet long. It was based on OPT's proprietary design which is primarily below the sea surface when deployed, with minimal visual impact.

Location:

*Ocean/Water body:* Kaneohe Bay, Pacific Ocean

*Closest city:* Oahu, Hawaii

*Country:* The United States

*Depth:* 30 m

*Coordinates:* 21.465886°, -157.754183°

**Process status:** The rising and falling of the waves offshore causes the buoy to move freely up and down. The resultant mechanical stroking is converted via a sophisticated power take-off to drive an electrical generator. The generated wave power is transmitted ashore via an underwater power cable.

OPT has been collecting data since the first OPT unit was deployed in June 2004 and has completed an extensive EA. This congressionally funded project, managed by Naval Facilities Engineering Command (NAVFAC), was intended to demonstrate the feasibility of wave power for naval facilities worldwide. The Buoy was installed in 2009, connected to the grid in September 2010, and decommissioned in 2011.

**Licensing information (brief description):**

*Please provide a brief description listing the organizations involved, licenses needed and duration of consent process. One paragraph should suffice.*

**Key Environmental issues:** The OPT wave power project at Oahu underwent an extensive environmental assessment by an independent environmental firm in accordance with the National Environment Policy Act (NEPA). This study featured evaluation of potential impacts on: the seabed, fish and benthic organisms, mammals, vegetation, and water quality, all within the sensitive ecosystems of Oahu. The project study resulted in a Finding Of No Significant Impact (FONSI), which is the highest environmental rating. The results of this study are included in a Report to Congress prepared by the US Department of Energy, titled “Potential Environmental Effects of Marine and Hydrokinetic Technologies”.

Environmental webpage: <http://www.oceanpowertechnologies.com/enviro.html>

<b>Baseline studies and project effects studies: Kaneohe Bay OPT Wave Project</b>				
<b>General description</b>		Studies prior to deployment, conducted by an independent environmental firm.		
<b>Receptor</b>	<b>Study description including question and/or objective</b>	<b>Design and methods (brief description)</b>	<b>Results (brief description)</b>	<b>Status (planned, underway, completed, with dates)</b>
Threatened and Endangered Species	Green Sea Turtle	Underwater site assessment and desk studies.	No turtles were seen during the assessment, but prior studies showed their presence.	Completed
	Humpback Whales	Underwater site assessment and desk studies.	Humpback whales have been observed in waters as shallow as 15 ft from November through April. Tail slapping, breaching, and pods are routinely observed – as many as 15 individuals as one time.	Completed
	Hawaiian monk seals	Underwater site assessment and desk studies.	An average of three sightings a year occurs on the shoreline and in nearshore waters. None were observed during underwater assessment.	Completed
Commercial,	Identify fishing	Underwater site	Fish such as ono or wahoo	Completed

subsistence, and Recreational Fishing	that occurs in the area	assessment and desk studies.	( <i>Acanthocybium solandri</i> ), aku or skipjack tuna ( <i>Katsuwonus pelamis</i> ), and moano ukali-ulua or goat fish ( <i>Parupeneus cyclostomus</i> ) typically occur along the 100-ft depth contour in the project area. For this reason, commercial, limited subsistence, and recreational fishing is conducted near the project area at this depth. The bottom conditions at the proposed project site do not offer unique habitat for species occurring in the area, and the site is not considered highly productive for spear fishing or uniquely attractive for SCUBA diving.	
Recreation	Identify recreational activities in the area	Desk studies.	Recreational activities in the vicinity of the project area include beachcombing, boating, bodysurfing, bottom fishing, jet skiing, kayaking, outrigger canoe paddling, sailing, trolling, surfing, swimming, sunbathing, pole fishing, thrownet fishing, spear fishing, and SCUBA diving.	Completed
<b>Reports or Papers</b>	<ul style="list-style-type: none"> <li>US Department of the Navy. (2003). Kaneohe Bay OPT Environmental Assessment. (pp. 300).</li> </ul>			
<b>Research Projects</b>	N/A			

Monitoring and adaptive management: Kaneohe Bay OPT Wave Project				
General description				
Receptor	Monitoring program description including question and/or objective (several can be listed per receptor)	Design and methods (brief description)	Results (brief description)	Status (planned, underway, completed, with dates)
Physical environment				
Benthos				
Fish and fisheries				
Large vertebrates				

Birds				
Marine uses/ users				
Other* (can be named)				
<b>Reports or Papers</b>	(Key papers on the areas addressed should be listed here; when possible the files themselves can be made available in downloadable PDF format, alternatively links to the files or project website can be provided when available e.g. SeaGen.)			
<b>Research Projects</b>	(past or on-going environmental research projects at the site)			