



DECLARATION OF COOPERATION

Reedsport Wave Energy Project

May 15, 2007

Project Conveners

Senator Joanne Verger, Oregon State Senate District 5

Keith Tymchuk, Mayor of Reedsport and Port of Umpqua Commissioner

Preface

The Reedsport Wave Energy Project was designated as an Oregon Solutions project by Governor Kulongoski in October 2006. The goal of the project is to define and ensure broad stakeholder involvement in the regulatory process for the Reedsport Wave Energy Project proposed by Reedsport OPT Wave Park, LLC (OPT). It is intended that as an ancillary benefit this project will also provide valuable information for other wave energy projects along the Oregon Coast.

Background

Oregon is actively working to become a national and international leader in wave energy. Over the past two years, stakeholders, state and federal agencies have been working to understand the impacts and the regulatory processes required for development of this industry in Oregon.

To advance the efforts in the state, the Oregon Innovation Council has recommended that the State Legislature designate wave energy as an emerging industry and invest \$5.23 million in production incentives and investments. The Council estimates the investment in wave energy will provide 243 new jobs and generate more than \$9 million in new labor income.

However, to fully maximize the potential future benefits, Oregon must ensure a thorough and timely planning and regulatory process. The Reedsport Wave Energy Project was designated as an Oregon Solutions project to provide a collaborative environment within which to clarify and define project-specific requirements.

The Reedsport project will provide very useful project-specific information while also highlighting many state-wide issues that must be addressed. These issues are under discussion in other forums and are not intended to be addressed by this project. Further,

The commitments in this Declaration of Cooperation are related specifically to the permitting requirements for the Reedsport project and do not preclude any options from being considered in future statewide policy or planning decisions.

Project Description

The Oregon Solutions effort has the specific purpose of providing broad stakeholder involvement to support a coordinated, well-integrated permitting and licensing process for the Reedsport Wave Energy Project proposed by OPT. The process includes representatives from over 30 different organizations including local residents, recreational and environmental organizations and various federal, county and state governments (Appendix TX).

The initial phase of the Oregon Solutions project outlined the desired timeline for project implementation. Subgroups were formed to define the associated regulatory and permitting processes required to support implementation. The table below identifies the three implementation phases and the associated permit or licensing authority. The Oregon Solutions effort has focused on defining the process for Phase I and Phase II of development.

Phase	Number of Buoys	Number of MW	Number of Homes Served	Wholesale Value of Power¹	Expected Installation Date	Permit/License Authority
I	1	n/a	n/a	n/a	Spring 2008	Corps of Engineers/DSL
II	14	2	800	\$ 306,600	Fall 2008	FERC
III	200	50	20,000	\$7,665,000	Following studies of Phase II	FERC

¹ Estimates are based assumptions of 35% capacity factor and \$50/MWh price of power.

Phase I (Single Buoy Installation)

Phase I involves the installation of a single full scale buoy. The buoy would be anchored to the sea floor but would not provide electricity to the power system. There will be no subsea cable required for this phase. Installation is targeted for spring 2008.

A license from the Federal Energy Regulatory Commission (FERC) is not required for this Phase because the single buoy will not provide power to the electrical grid system. Appendix A includes a detailed description of the single buoy, a summary of all the federal and state permits and authorizations required, and a description of the Corps of Engineers Clean Water Act Section 404 process.

Participating entities have met to propose a list of potential effects, and none of the participants have identified any major issues or impacts that could prohibit single buoy installation.

Phase II (14 buoy installation and landfall)

Phase II involves installation of an additional 13 buoys (for a total of 14), the subsea cable, and new distribution lines to connect to the existing power system. This phase will provide power to the electrical grid system. Installation is targeted for fall 2008.

A FERC license is required for installation and operation of the 13 additional buoys because power will be delivered to the electrical grid system. Appendix B includes a detailed description of the 14-buoy array, a summary of all the federal and state permits and authorizations required, and a description of FERC's traditional licensing process.

Phase III (Full Commercial Build Out)

The addition of buoys beyond the 14 buoys licensed under Phase II requires a "licensing amendment" to the FERC license. FERC has a specified process for securing an amendment to a license and the level of documentation required will be commensurate with the increase in size of the project under the amendment. The amendment process is similar to the licensing process and includes public scoping, public comment, and regulatory review. The amendment would require the same permits and authorizations identified for Phase II. Phase III and the amendment process was not a focus of this stage of the Oregon Solutions project.

Settlement

The licensing process available for wave projects is the same as for licensing and re-licensing of hydroelectric projects on inland rivers. The FERC licensing processes do not apply well to a project that doesn't presently have any structures in the water to study. However, FERC does not presently offer any other alternatives.

Given the interest in getting 14 buoys installed to provide information about the potential effects of the technology, parties have discussed different approaches to licensing. It has been encouraged by FERC and others to pursue a settlement agreement that would be part of the license application. The settlement agreement is expected to provide consensus regarding potential effects, mitigation, and a study plan for the 14-buoy array. With a settlement agreement, the FERC's Traditional Licensing Process is the most efficient.

The benefit of settlement is two-fold:

- Reduces the FERC licensing process by as much as 1 year because it simplifies the evaluation required for a FERC decision.

- Decisions are made locally regarding interpretation of information, assessment of impacts, approach to address impacts, and study plans for gathering additional information.

This document includes commitment by specific regulatory and other appropriate parties to participate in settlement discussions. The FERC process subgroup has developed the following key elements of settlement:

- Purpose of Settlement: Describes the requirement of settlement and the implications of settlement for parties in future actions and regulatory proceedings.
- Project description. Develop a clearly defined project description based on information in the Preliminary Application Document (PAD) and the results of settlement discussions. Capture the modifications from the PAD description that have been agreed to in settlement.
- Information Sources. Capture any new information sources used in the settlement process that were not identified in the PAD.
- Baseline. Include a plan and approach for how to establish baseline conditions. This will include a description of how long baseline information will be collected, where the information will be collected, and how the information will be used in the project assessment, monitoring, and adaptive management processes of the project.
- Study plan. Define the issues to be evaluated and the study design for the 14 buoy array. The study plan will include a timeline that identifies over what time period data will be collected and analyzed and how that data will be incorporated into the project assessment, monitoring, and adaptive management processes.
- Regulatory sufficiency. Provide an evaluation of the sufficiency of measures for meeting all Federal and State regulatory requirements. Describe the intended process for completing those regulatory steps.
- Adaptive Management Plan. The adaptive management plan will include a structure for evaluating information and a process to determine how to apply that information to make decisions about project operation, modification, mitigation, and /or removal. Specifically, it will outline what agencies/organizations will be involved and over what time period the adaptive management will take place.
- Dispute Resolution: The agreement will identify a process to be used in the event of a difference in interpretation.

Oregon Solutions Reedsport Wave Energy Project Commitments

The following commitments represent good faith commitments and are not legally binding. The commitments are not intended to limit or modify any entity's existing rights, powers, responsibilities, or authorities.

The parties commit to the following actions for achievement of Phase I (Single Buoy installation) and Phase II (14 buoy installation) permitting requirements:

- Active participation in the Oregon Solutions Team until a FERC license is issued to the greatest extent practicable given available resources and priorities.
- Agree that Appendix C represents the initial scope of issues identified to date by the team, given present project information. As additional issues or effects are identified, agree to bring issues to the appropriate subgroup to address.
- Continue to solicit and assure that all relevant perspectives and issues are included in the process.
- Utilize Oregon Solutions process as the principal mechanism to identify and resolve issues with this project.
- Distinguish project-specific issues from statewide policy and planning issues through active participation and engagement in the statewide policy and planning process.

In addition to the above commitments, U.S. Fish and Wildlife Service, Oregon Department of State Lands, Oregon Department of Environmental Quality, and Oregon Department of Land and Conservation Development commit to the following actions for achievement of Phase I permitting requirements:

- Timely review of the joint Corps of Engineers Clean Water Act 404 and Department of State Lands removal-fill permit application.
- Timely review of the Clean Water Act 401 certification application.
- Recognize the scheduled spring 2008 installation and will complete required consultation in the shortest timeframe practical in light of available resources and priorities.
- Timely review of application for an authorization to occupy state-owned land.



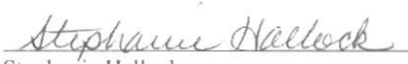
In addition to the above commitments, U.S. Fish and Wildlife Service, Oregon Department of State Lands, Oregon Department of Environmental Quality, Oregon Department of Land and Conservation Development, Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians, Port of Umpqua, Douglas County, Oregon Shores, Oregon Department of Fish and Wildlife, Oregon Water Resources Department, Oregon Parks and Recreation Department, Oregon Fishermen's Cable Commission, Oregon Crab Commission, Surfrider, Oregon Salmon Commission commit to the following actions for achievement of Phase II permitting requirements:

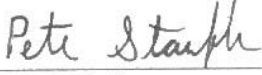
- Commit the necessary policy and technical level resources for settlement discussions to begin in June 2007 with targeted completion in fall 2007 to the greatest extent practicable given available resources and priorities.

- Commitment to settlement and participation in settlement discussions is conditioned on funding for Oregon Department of Environmental Quality and Oregon Department of Fish and Wildlife involvement.
- Agree that at the time this Declaration is signed, the issues identified in Appendix C serve as the initial scope of issues for settlement discussion. As additional issues are identified, agree to bring issues to the appropriate subgroup to address.

In addition to the above commitments, OPT commits to:

- Use a collaborative approach that includes, but is not limited to, settlement to resolve issues and develop a study plan for inclusion in the license application.
- Submit a joint Corps of Engineers Clean Water Act 404 and Department of State Lands removal-fill permit application for the single buoy in June 2007.
- Timely submittal to DSL of an application for an authorization to occupy state-owned land.
- Submit a Notice of Intent/Preliminary Application Document to FERC in June 2007.
- Conduct a physical site characterization study (including sediment sampling and bathymetry analysis) by September 2007.

<p>Signature on File</p> <hr/> <p>Dr. George Taylor Reedsport OPT Wave Park, LLC</p>	 <p>Rick Hohnbaum City of Reedsport</p>
 <p>Sheri Aasen Lower Umpqua Economic Development Forum</p>	 <p>Onno Husing Oregon Coast Zone Management Association</p>
<p>Signature in Progress</p> <hr/> <p>Kevin Watkins PNGC Power</p>	<p>Signature in Progress</p> <hr/> <p>Paul Davies Central Lincoln PUD</p>
 <p>Dr. Ron Vail Dunes Family Healthcare & Reedsport School District</p>	 <p>Kemper McMaster U.S. Fish and Wildlife Service</p>
 <p>Louise Solliday Oregon Department of State Lands</p>	 <p>Stephanie Hallock Oregon Department of Environmental Quality</p>

 Lane Shetterly Oregon Department of Land and Conservation Development	Signature in progress Chairman Robert Garcia Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians
 Allison Asbjornsen Oregon Shores Conservation Coalition	 Virgil Moore Oregon Department of Fish and Wildlife
 Dwight French Oregon Water Resources Department	 Tim Wood Oregon Parks and Recreation Department
 Peter Stauffer Surfrider Foundation	 Mike Grainey Oregon Department of Energy
Signature in Progress Marilyn Kittelman Douglas County	 Barry Nelson Local Fisherman
 Debbie Williams Port of Umpqua	

Single Buoy Design and Process

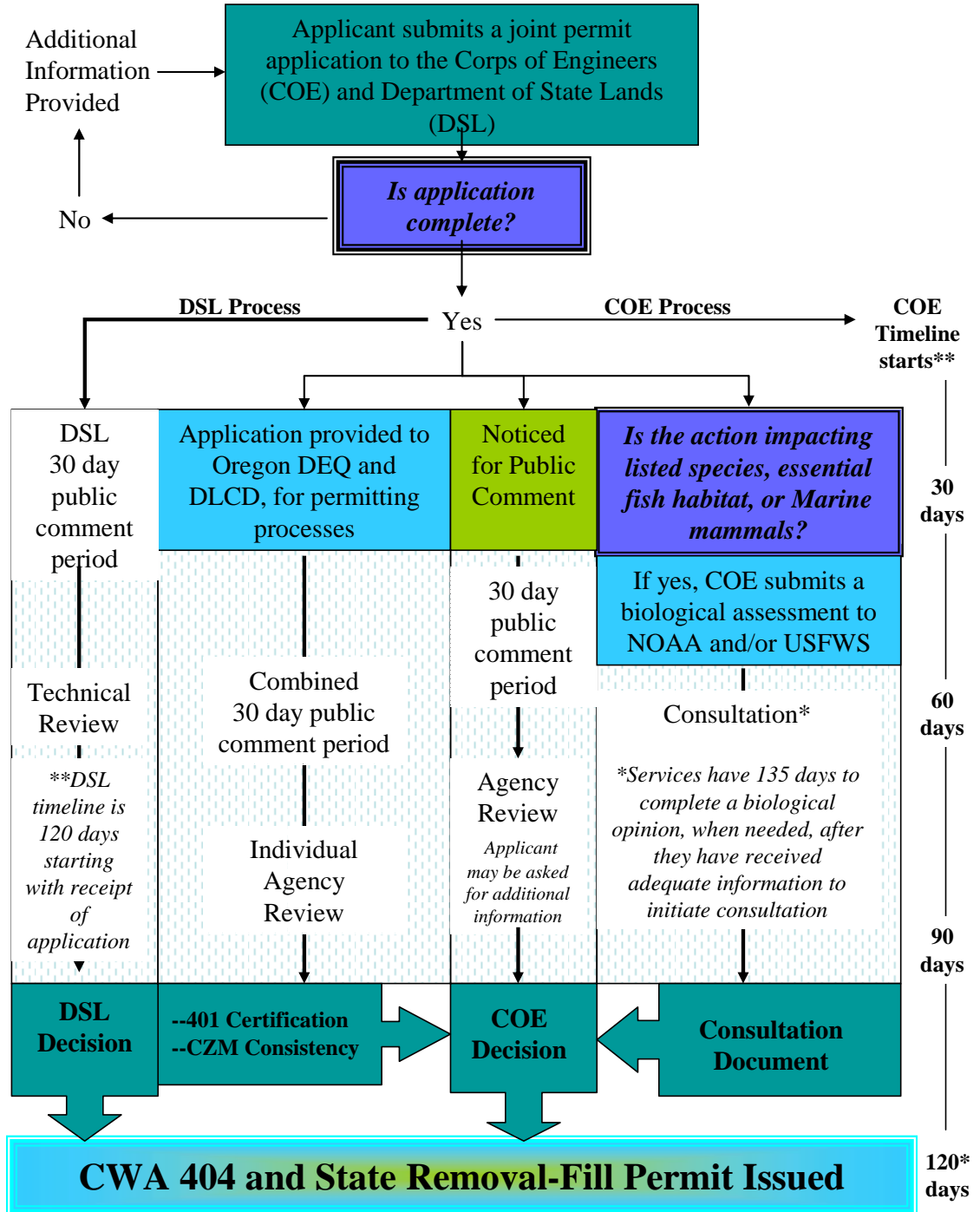
Reedsport OPT Wave Park Phase I: Fact Sheet

Note: All Information is Preliminary and Subject to Change

Location:	5 miles North of the Umpqua River
County:	Douglas
Congressional District:	4 th - Pete DeFazio
Owner/Developer:	Ocean Power Technologies, Inc.
Permitting Authority:	Army Corps of Engineers, Section 404
FERC License:	Not required as Phase I is not grid connected
Project Life:	1 year – until integrated with Phase II
Number of Buoys:	1
Buoy Type:	PowerBuoy® 150 (PB150)
Rated Capacity:	150 kW
Deployment Date:	Spring 2008
Grid Connection:	not initially grid connected
Min. Water Depth:	50-meters (167-feet, 28-fathoms)
Footprint:	400-meters x 400-meters (0.065 sq mile)
Distance from Coast:	4-kilometers (2.5-miles)
Bottom Type:	Sand
Coordinates:	43° 45' N, 124° 14' W
Nearest Port:	Gardiner, OR on the Umpqua River
Distance to Port:	27-kilometers (17-miles)
Channel Depth:	8-meters (26-feet)
Float Diameter:	11-meters (37-feet)
Float Height:	2-meters (6.7-feet)
Height Above Water:	8-meters (27-feet)
Draft:	36-meters (120-feet, 20 fathoms)
Number of Anchors:	3 per buoy
Anchor Type:	Mass, steel case filled with sand
Anchor Mass:	134 metric tons (150 tons)
Anchor Dimensions:	7-meters L x 7-meters W x 3-meters H (5450 cubic feet)

REGULATORY REQUIREMENTS FOR PHASE I			
<i>Lead Federal Agency</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
Corps of Engineers	National Environmental Policy Act (NEPA)	Environmental Assessment (EA) or Environmental Impact Statement (EIS)	Yes
<i>Leases and Easements</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
Department of State Lands	Oregon Administrative Rules 141-125	Temporary use Permit	Yes
<i>Construction Permitting</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
Corps of Engineers	Clean Water Act Section 404 Section 10 of the Rivers and Harbors Act	404 Permit, Section 10 Permit	Yes
Environmental Quality	Clean Water Act Section 401 and OAR 340-048	Dredge and Fill Section 401 Water Quality Certification	Yes
Department of State Lands	Oregon Administrative Rule 141-85	Removal-Fill Permit	Yes
<i>Navigational Safety</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
Coast Guard	Title 33 Code of Federal Regulations 33 part 62 and 66	Private Aids to Navigation Permit	Yes
<i>Ecological Integrity</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
NMFS	Endangered Species Act (ESA), Essential Fish Habitat (EFH), Marine Mammal Protection Act (MMPA)	Biological Opinion, EFH Consultation, Incidental Harassment Authorization	No
USFWS	Endangered Species Act (ESA)	Biological Opinion	No
DLCD	Coastal Zone Management Act	Coastal Zone Certification	Yes

Joint DSL/COE Permit Process Required for Single Buoy



Multi-Buoy Design and Process

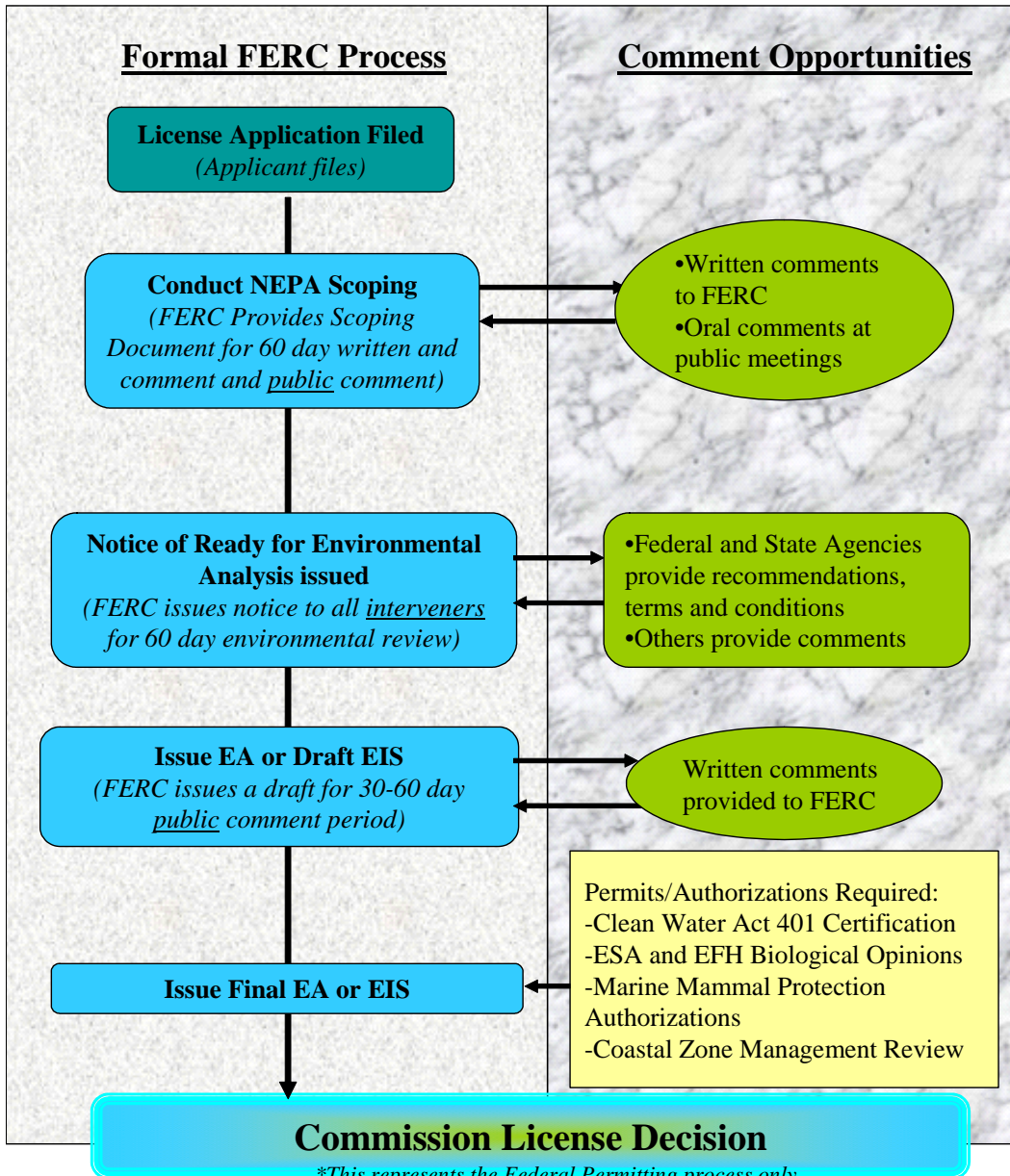
Reedsport OPT Wave Park Phase II: Fact Sheet

Note: All Information is Preliminary and Subject to Change

Location:	5 miles North of the Umpqua River
County:	Douglas
Congressional District:	4 th - Pete DeFazio
Owner/Developer:	Ocean Power Technologies, Inc.
Permitting Authority:	FERC
Project Life:	20 years
Number of Buoys:	14 total (13 new buoys + 1 buoy from Phase I)
Buoy Type:	PowerBuoy® 150 (PB150)
Rated Capacity:	150 kW per buoy, 2.1 MW total
Deployment Date:	Fall 2008
Grid Connection:	PNGC Power at Gardiner Substation
Min. Water Depth:	50-meters (167-feet, 28-fathoms)
Footprint (max):	800-meters x 800-meters (0.26 sq mile)
Configuration:	4 rows x 4 columns
Distance from Coast:	4-kilometers (2.5-miles)
Bottom Type:	Sand
Coordinates:	43° 45' N, 124° 14' W
Nearest Port:	Gardiner, OR on the Umpqua River
Distance to Port:	27-kilometers (17-miles)
Channel Depth:	8-meters (26-feet)
Float Diameter:	11-meters (37-feet)
Float Height:	2-meters (6.7-feet)
Height Above Water:	8-meters (27-feet)
Draft:	36-meters (120-feet, 20 fathoms)
Number of Anchors:	2 per buoy (buoys share 1 anchor)
Anchor Type:	Mass, steel case filled with concrete
Anchor Mass:	134 metric tons (150 tons)
Anchor Dimensions:	7-meters L x 7-meters W x 3-meters H (5450 cubic feet)

REGULATORY REQUIREMENTS FOR PHASE II			
<i>Lead Federal Agency</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
FERC	National Environmental Policy Act (NEPA)	Environmental Assessment (EA) or Environmental Impact Statement (EIS)	Yes
<i>Licensing/Permitting</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
Federal: FERC	Federal Power Act	Federal Hydroelectric License	Yes
State: Water Resources Department	Oregon Revised Statute 543-Hydroelectric Projects (ORS 543)	State Hydroelectric License	Yes
<i>Leases and Easements</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
Department of State Lands	Oregon Administrative Rules 141-125	Ocean Energy Facility License for Commercial Operation	Yes
Oregon Parks and Recreation Department	Oregon Administrative Rules 736-020	Ocean Shores Permit	Yes
<i>Construction Permitting</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
Corps of Engineers	Clean Water Act Section 404 Rivers and Harbors Act Section 10	404 Permit, Section 10 Permit	Yes
Environmental Quality	Clean Water Act Section 401 and OAR 340-048	Hydroelectric Section 401 Water Quality Certification	Yes
Department of State Lands	Oregon Administrative Rule 141-85	Removal-Fill Permit	Yes
<i>Navigational Safety</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
Coast Guard	Title 33 Code of Federal Regulations 33 part 62 and 66	Private Aids to Navigation Permit	Yes
<i>Ecological Integrity</i>			
<u>Agency</u>	<u>Regulation</u>	<u>Permit/Authorization</u>	<u>Public Comment</u>
NMFS	Endangered Species Act (ESA), Essential Fish Habitat (EFH), Marine Mammal Protection Act (MMPA)	Biological Opinion, EFH Consultation, Incidental Harassment Authorization	No
USFWS	Endangered Species Act (ESA)	Biological Opinion	No
DLCD	Coastal Zone Management Act	Coastal Zone Certification	Yes

General Overview of FERC Traditional Licensing Process*



**This represents the Federal Permitting process only.
There is a state permitting process and other state permits and authorizations required.*

Reedsport Wave Energy Project Summary of Potential Effects

Purpose: This table serves as an initial scope of issues, based on present information. The parties that participated in the development of this table were constrained by the limited amount of information available about the effects of wave energy technology. This list is intended to highlight areas that require study and evaluation.

Aquatic/Water Quality Issues

(Appendix D includes a definition of Level 1, Level 2 and Uncertain. In addition, it includes a detailed matrix that was used to determine potential effects.)

No.	Issue/Summary	Relative Impact/Next Steps
1	<p>Marine Mammal Injury/Entanglement Each buoy of the proposed project is connected to the sea floor via 4 to 5 inch diameter synthetic cables. The proposed project is in the migratory path of gray whales and there is concern that whales may become entangled in the mooring system. Experts from the Hatfield Marine Science Center and NOAA Fisheries have suggested acoustic guidance to move the whales around the array.</p>	<p>Level 1: Need further understanding of migratory paths, effectiveness of acoustic guidance, and injury mechanisms. Need to acquire additional information during settlement to support study plan development.</p>
2	<p>Effects of Acoustic Guidance on Mammal and Fish Behavior If acoustic guidance is employed to prevent marine mammal entanglement there could be detrimental impacts to marine mammal migration and fish behavior. Further, there may be an impact from mammals and fish being excluded from the habitat.</p>	<p>Level 1: Need to quantify frequencies and sound pressure levels and to further address impacts. Study plans need to be developed during the settlement process.</p>
3	<p>Effects of Electromagnetic Field (EMF) on Sharks EMF will be created both around the PowerBuoy and the sub sea transmission cables. The buoys will produce electricity at a frequency of less than 12 Hz and it will be transmitted in the subsea cable at a frequency of 60 Hz. Initial evaluation indicates that the level and frequency of the EMF will not attract sharks from great distances. There is an outstanding question as to whether sharks in the area will experience behavioral changes as a result of the low frequency EMF of the buoys.</p>	<p>Level 1: Need to further quantify frequencies and field levels of the EMF and to develop a study plan to understand the impact of EMF on the behavioral response of sharks.</p>

4	<p>EMF on Rays EMF will be created both around the PowerBuoy and the sub sea transmission cables. The buoys will produce electricity at a frequency of about 1 Hz and it will be transmitted in the subsea cable at a frequency of 60 Hz. Initial evaluation indicates that the level and frequency of the EMF will not attract sharks from great distances. There is an outstanding question as to whether rays in the area will experience behavioral changes because of the low frequency EMF of the buoys.</p>	<p>Level 1: Need to further research the effects of EMF on rays to develop a study plan to understand the impact of EMF on the behavioral response of rays.</p>
5	<p>Pinniped Haul Out The floats of the PowerBuoy system present an ideal opportunity for pinnipeds to haul out and colonize. Several design options have been discussed to prevent the pinnipeds from resting on the float. One option incorporates a fence around the float and the other provides a very rough surface on the top of the float in order to make it undesirable for the pinnipeds to remain on the float.</p>	<p>Level 1: Need to further define the options and to evaluate their potential effectiveness.</p>
6	<p>Mooring and Subsea Cable Installation The installation of the mooring system and subsea cables will involve the use of heavy construction equipment including cranes, barges, tugs, and trenching equipment that may harm or kill individuals of some aquatic species.</p>	<p>Level 2: Need to better define the construction process so that an adequate assessment of risks can be determined.</p>
7	<p>Mooring Line Fouling The proposed project will consist of approximately 20 kilometers of synthetic mooring lines that will quickly become encrusted with biofouling. In turn this fouling will have an impact on food supply and may have impact on the quantity and type of fish species that will be located in and around the proposed project.</p>	<p>Level 2: Need to better quantify the impact and make an assessment of the potential impacts, whether positive or negative.</p>
8	<p>Alteration of Seabed Habitat The proposed project will consist of approximately 30 anchors that are monolithic, concrete blocks approximately 7-meters long by 7-meters wide by 3-meters high. The anchors are presently designed to protrude above the ocean floor. It is expected that the anchors will act as an artificial reef and will alter the overall marine habitat and species assemblages.</p>	<p>Level 2: Need to better quantify the impact and make an assessment of impacts. Anchor system may be redesigned so that it is flush with ocean floor.</p>

9	<p>Seabird Collisions The wave power project will consist of large floating buoys which are moored with 4 to 5 inch diameter synthetic lines. Diving birds in their pursuit of food located in close proximity to the buoy system may collide or become entangled in the mooring system or the buoy itself.</p>	<p>Level 2 - Need to better determine the mooring system design and how it may impact diving birds.</p>
10	<p>Seabird Nesting The PowerBuoy design may provide a nesting opportunity for seabirds. Colonization of seabirds on the wave power array may not be desired and as such design alternatives will be required in order to minimize the opportunity for nesting.</p>	<p>Level 2: Need to develop design alternatives that can be evaluated during settlement discussions.</p>
11	<p>Lighting Impacts to Seabirds The wave power array will be lit at night in accordance with USCG regulations to aid the navigation of mariners. It is expected that the 14 buoy array will have approximately 4 to 8 lights, similar in color, intensity, and flash frequency to traditional navigational lights. This type of lighting may have a detrimental impact on seabirds.</p>	<p>Level 2: Once the lighting plan has been established with the USCG, the impact on seabirds needs to be assessed. More information will be provided during settlement discussions.</p>
12	<p>Oil Leakage Impact to Seabirds The PowerBuoy system contains small amounts of hydraulic fluids that in the event a catastrophic failure event could be leaked into the ocean. Although the fluids used are biodegradable, there could be significant impacts to seabirds before dispersal and degradation of the hydraulic fluids.</p>	<p>Level 2: Need to perform a failure analysis and assess the risk of catastrophic failure that would result in fluid leakage.</p>
13	<p>Spills during construction and Installation During the installation and construction of the wave power park, a number of vessels, including tugs, barges, cranes, and workboats will be employed. Each of these vessels contains fuel, hydraulic fluid, and potentially other hazardous materials. There is a risk that during construction and installation, that there could be a spill of such materials.</p>	<p>Level 2: Need to evaluate the risk of leakage based on industry accepted norms for marine construction. These risks will be used to assess the impact to the affected aquatic species.</p>

14	EMF on Plankton EMF will be created both around the PowerBuoy and the sub sea transmission cables.	Uncertain: It is unknown whether EMF has an impact on plankton. Additional research is required and will be presented during settlement discussion.
15	EMF on Salmon EMF will be created both around the PowerBuoy and the sub sea transmission cables.	Uncertain: It is unknown whether EMF has an impact on salmon. Additional research is required and will be presented during settlement discussion.
16	Impact of Installation/Removal on Fish Eggs During construction and removal of the proposed project there will be a significant disturbance to the seabed which may result in the disturbance or destruction of fish eggs, resulting in a negative impact on populations.	Uncertain: Need to better quantify the impact of installation and removal techniques on fish eggs
17	Impact of Installation/Removal on Other Species During construction and removal of the proposed project there will be a significant disturbance in the water column which may disturb and temporarily displace some species.	Uncertain: Need to better quantify the impact of installation and removal techniques on species.
18	Oil Leakages Impacts to Pinnipeds and Cetaceans The PowerBuoy system contains small amounts of hydraulic fluids that in the event a catastrophic failure event could be leaked into the ocean. Although the fluids used are biodegradable, there could minor impacts to pinnipeds and cetaceans before dispersal and degradation of the hydraulic fluids.	Uncertain: Need to better understand how biodegradable hydraulic fluids disperse and degrade and how they might impact pinnipeds and cetaceans.
19	Sea Turtles Although there are several known species of sea turtles that may be found in the project area, there will likely be no impact of the project on these species.	Uncertain: Need to better characterize the existence of turtles in the project area.
20	Macroalgae The project must determine the existence of macroalgae along the proposed subsea transmission path and to assess the potential effects to macroalgae/eelgrass.	Uncertain: Further discussion is needed

21	Cumulative Effects This project has raised the importance of identifying and quantifying the cumulative effects of wave energy projects along the coast.	Uncertain: This issue will be addressed as part of the state wide planning process.
22	Noise/Vibration The PowerBuoy® produces some levels of noise and vibrations which may have potential effects to marine life, primarily marine mammals	Uncertain: Need to quantify frequencies and sound pressure levels and to further address impacts.

Public Safety /Recreation Issues

No.	Issue/Summary	Next Steps
1	System Survivability The system is designed to survive severe weather conditions and the design is based on existing technology used in other industries and has redundancy built in with the multiple mooring cables.	The Preliminary Application Document (PAD) will identify system compliance with existing standards and regulations.
2	Emergency Response/Salvage Plan Although the system is designed to withstand severe weather, OPT will develop, in coordination with OPRD, an emergency response and salvage plan in the unlikely event of a buoy drifting or become detached from its mooring lines. The cost and liability associated with emergency response and salvage is the exclusive obligation of OPT.	The PAD will include information regarding the plan to mitigate the impacts as a result of system failure and to respond to any emergencies.
3	Insurance Insurance may be required to comply with State and Federal laws. OPT's experimental buoys are currently insured with Lloyds.	The PAD will include additional information regarding the insurance requirements and plan for the proposed project.
4	Wave Strength Attenuation There is concern that the project will remove wave energy and affect surfing. Estimates by OPT suggest a cumulative wave energy impact of 12-15%. Given the location of this project and the mixing prior to shore, the expected impacts to surfing opportunities are deemed to be relatively minimal.	Details of OPT estimates will be included in the PAD.

5	National Security The proposed project will supply power to the nation's electricity grid and will be located in an area that could be exposed to acts of terrorism.	Due to the small size and rather remote location, the posed project does not pose a threat to national security that requires additional evaluation at this time.
6	Navigation Safety To provide for navigational safety, OPT plans to request designation of the wave park area as a Restricted Navigation Area and a No Fishing Area. The process for requesting this designation has been identified.	Requirements for designation have been defined and will be applied for as appropriate.
7	Recreation Uses Non-fishing recreational uses that are considered include windsurfing, kite boarding, kayaking, and whale watching. For all but whale watching this area receives minimal use. There is whale watching from the Umpqua lighthouse north to Sea Lion Caves.	Evaluate any changes in whale migration patterns and impacts on whale watching.
8	Electromagnetic Fields (EMF) EMF will be created both around the PowerBuoy and the sub sea transmission cables. Several shark species including white sharks are known to frequent Oregon's nearshore waters. There is an outstanding question as to how the EMF may impact shark behavior and whether this would pose an elevated risk to surfers and other recreational ocean users.	Need to further quantify frequencies and field levels of the EMF and to develop and implement a study plan to understand the impact of EMF on the attraction/repulsion/reorientation of sharks and other aquatic species.
9	Ground Fault Protection Concerns have been raised regarding the risk of electrocution. The system is designed to prevent the risk of electrocution in the event of the electrical system becoming in contact with the seawater.	The PAD will further describe the ground fault protection system.
10	Site Security As the project site will be designated a No Fish Zone and a Restricted Navigation Area, site security may be required to prevent these activities.	The PAD will further address these issues.
11	Project Lighting US Coast Guard regulations require that the project have adequate lighting as aids to navigation to minimize the potential of collisions. The lighting guidelines offer some flexibility in the number, frequency and intensity of the lighting.	Further coordination with the crabbing and fishing community is required to determine the optimal design. The Parks and Recreation Department must also approve the final design.
12	Marine Protected Areas At the current time, the proposed project site is not being considered a Marine Protected Area as it does not meet the current criteria for consideration.	Continue to monitor the status of potential sites being considered for Marine Protected Areas.

13	Beach Access Need to determine whether beach access opportunities will be affected in any way.	Need to further assess this issue.
14	Aesthetics The proposed project is located approximately 2.5 miles from the nearest beach and approximately 7 miles from the Umpqua lighthouse. It is expected that there will be limited view of the project during the daylight from the beach and there are limited elevated viewpoints in this area. Depending on the final configuration of the USCG lighting, the project may be visible at night from the beach.	Need to further assess aesthetics of navigational lighting. Need to confirm that the project has no significant impact on the view (both day and night) from area beaches and elevated viewpoints including those in Umpqua Lighthouse State Park.

Fishing and Crabbing Issues

No.	Issue/Summary	Next Steps
1	Notification to Mariners The proposed project will be designated as a No Fish and Restricted Navigation Area, and as such will require that mariners be notified in advance of construction.	Need further input from fishing community on proposed methodology to communicate the presence of the wave park.
2	Project Lighting US Coast Guard regulations require that the project have adequate lighting as aids to navigation to minimize the potential of collisions. The lighting guidelines offer some flexibility in the number, frequency and intensity of the lighting.	Further coordination with the crabbing and fishing community are required to determine the optimal design.
3	Jobs Creation The proposed project will create an as yet to be determined number of jobs that may be suitable for the skills and assets of the local marine industry. Opportunities to install equipment, perform maintenance, and transport systems to and from the ocean may provide further benefit to the economy.	Need to determine the actual number of jobs, skill levels required, and suitability of existing fishing vessels to perform the required maintenance work.
4	Transport Moratorium The beginning of the Dungeness Crab season has been identified as a time when it may be required to limit or curtail altogether the movement of buoys, vessels, and barges from the port to the wave park, as significant damage could be done to the harvest as a result of impacts with crab pots.	Need to draft a proposal to limit or curtail the transport of buoys during this critical season.

5	<p>East-West Transit Lanes For larger wave parks (i.e. the 50 MW proposed build outs) East-West transit lanes have been proposed that would allow vessels to transit from one side of the park to the other. The proposed project site is approximately 0.5 by 0.5 miles.</p>	<p>Given the small footprint of the proposed project site, no transit lanes will be proposed in the PAD.</p>
6	<p>Transit Lanes from Port to Wave Park The construction and maintenance of the wave park will require a significant number of vessels transiting to and from the wave park from the Port of Umpqua as well as other ports of commerce. During the crabbing season it may be desirable to have a predetermined transit lane, so that crabbers can avoid or minimize the number of crab pots that will be set in this area.</p>	<p>Need to develop a proposal to determine a transit lane and the appropriate roles and responsibilities of both the fishing industry and wave park operator.</p>
7	<p>Sub sea Cable The proposed project will be interconnected to the grid via an underwater cable. Underwater cables pose an impact primarily to trawlers. The Oregon Fisherman's Cable Committee has guidelines for the management of sub sea telecommunications cables.</p>	<p>Need to work with OFCC to incorporate wave park sub sea power cabling in current guidelines.</p>
8	<p>Lost Productivity The proposed project is located in an area that is known to have a beneficial use to the fishing community. They have identified that they may experience a decrease in productivity as a result of the reduction of the area that is available for them to crab and fish. This issue has been primarily raised by local crabbers that view the proposed project site as prime crabbing grounds located close to the Umpqua river.</p>	<p>Need to assess economic impact of lost fishing grounds.</p>
9	<p>Lost Gear In big storms the wind and waves may cause crab pots to move and they may drift into the wave park and become entangled. No information is available as to how long it takes for the crab pot to become so entangled that it would not be recoverable.</p>	<p>Need to develop plan to recover lost gear in a timely manner and/or to compensate crabbers for the value of the lost gear. Liability issues must also be addressed if there is damage to the wave park.</p>

10	Cumulative Effects While it is generally regarded that the impact of the 14 buoy array is minimal, this project has raised the importance of identifying and quantifying the cumulative effects of wave energy projects along the coast.	This impact will be addressed formally in the state's permitting process. In addition, a statewide assessment for policy and planning issues has been initiated.
11	Site Security As the project site will be designated a No Fish Zone and a Restricted Navigation Area, site security may be required to prevent these activities. It has yet to be determined as to how security of the site will be enforced.	The PAD will further address these issues.
12	Open Aquaculture The proposed project does not conflict with any known proposed open aquaculture project.	Need to continue to monitor the proposed plans for open aquaculture projects in the general area of the project.

General Issues

No.	Issue/Summary	Next Steps
1	Erosion/Accretion OPT estimates that the wave park will attenuate the wave strength by approximately 12% immediately behind the wave park. It is expected that this will have an immeasurable effect on the erosion and accretion of the shoreline and the transport of sediment in the general area of the wave park.	This will be further discussed in the Preliminary Application Document (PAD)
2	Cultural Resources Any ground disturbances associated with the placement of the underground cable or interconnection must follow appropriate measure to assure that cultural resources are addressed appropriately.	An MOA between the CTCLUSI, OPT, and Central Lincoln PUD needs to be developed to address any ground disturbances activities.

3	<p>Decommissioning A FERC Hydropower license will permit the proposed project to operate from 30 to 50 years. Financial ability of the developer to remove the project at the end of the license term has been identified as a concern. Although no such requirement exists for conventional hydropower projects that are licensed by FERC, the Oregon State Legislature as well as OR Dept of State Lands have proposed financial guarantees that will be required to assure that the project develop has adequate resources to remove the project.</p>	<p>Need to evaluate and develop a plan to meet this requirement in a way that balances the financial viability of the proposed project with the concern of abandoned equipment.</p>
4	<p>Anchor Removal In the event of a decommission either at the end of the license term, or as a result of a Surrender Request being granted by FERC, it may be impractical or impossible to remove the anchors.</p>	<p>Need to evaluate multiple anchor configurations and assess the benefits and detriments of each design as a function of removal.</p>
5	<p>Economic Impact It is expected that jobs will be created related to the design, construction, operations, and maintenance of the proposed project. However, the proposed project does conflict with the current use of the ocean for commercial and recreational fishing.</p>	<p>OPT has initiated the steps to collect the required information from the identified stakeholders in order to assess the economic impact of the project, however further evaluation needed.</p>
6	<p>General Effects An evaluation of the impact of project construction on the marine environment including potential effects to ecosystem richness is required.</p>	<p>Further evaluation is needed.</p>
7	<p>Other Development The project may have an impact on other developments currently planned or under planning in the area, such as open aquaculture fields.</p>	<p>Further evaluation is needed to understand the other planned development in the areas, however there are no know planned developments that may conflict with the proposed project.</p>
8	<p>Seabed The project may have an impact on the seabed from disturbance during construction, operation, and maintenance. The potential exists for scouring around the anchors.</p>	<p>Need to characterize existing conditions and to determine anchoring and transmission line construction methodology.</p>

9	<p>Terrestrial Transmission Cable The terrestrial transmission cable is the responsibility of Central Lincoln Peoples Utility District but will be part of the FERC license application. The exact route has not yet been finalized, but it is being planned as to have minimal environmental impact and avoid or minimize the need to thin or remove trees.</p>	<p>CLPUD is currently identifying the proposed path for the terrestrial transmission cable. More information will be included in the PAD</p>
10	<p>Terrestrial Effects Construction and maintenance of the proposed project will require areas on the land - likely in the port of Umpqua and Winchester Bay - to assemble and stage the buoys before they are transported to the project site. These requirements may require the construction of temporary or permanent facilities.</p>	<p>More information will be included in the PAD to describe the needs for shore based facilities.</p>
11	<p>Conflict with Disposal Sites The proposed project is not located on or near any dredged materials disposal site.</p>	<p>OPT will further research the location of existing and future dredged materials disposal sites.</p>
12	<p>Additional Uses The proposed license application is solely for the purpose of producing electricity from the motion of waves. No other uses are planned or intended. Furthermore, OPT desires that its State Land Lease provide OPT the exclusive access to the site for the exclusive use of wave energy production.</p>	<p>Need to clarify the intended use of the proposed project site within the State Land lease agreement.</p>

The Aquatic Species subgroup evaluated the potential effects using the matrix on the next page. Each potential effect was identified as a Level 1, Level 2, or uncertain. The definition and potential actions taken in response to the potential effect are defined below.

	Level 1	Level 2	Uncertain
Definition	Potential impact is high and/or potential exposure is high.	Potential Impact and exposure are expected to be low.	Unknown impact and exposure
Potential Actions <i>(The lists are illustrative of actions that may be taken to support evaluation of an issue. Not all Level 1 will require the actions listed. Further, Level 2 and Uncertain issues may become Level 1 issues after initial literature search.)</i>	<ul style="list-style-type: none"> ▪ Literature Search ▪ Specialist/expert consulted ▪ Modified structure or operation of the project ▪ Laboratory study conducted ▪ Site-specific baseline data collected ▪ Post-implementation study conducted ▪ Real-time monitoring 	<ul style="list-style-type: none"> ▪ Literature Search 	<ul style="list-style-type: none"> ▪ Literature Search to determine if other actions in Level 1 are warranted.

Activity (stressor)	Receptor												
	A. Ocean Waves	B. Ocean Currents	C. Sediment and Benthic Habitats	D. Plankton and euphausiids/mysids	E. Fouling Community	F. Pelagic Fish and Invertebrates	G. Forage Fish and Invertebrates	H. Demersal Fish	I. Epibenthic Macroinvertebrates	J. Benthic Infauna	K. Seabirds	L. Pinnipeds	M. Cetaceans
Emplacement													
1. Buoy or Device													
2. Mooring System			2					U	2	2			
3. Electrical Transmission System			2					U	2	2			
Operation													
4. Mooring System			2		2			2			2	2	1
5. Buoy or Device	2	2	2	U	2	1	2	2			2	1	1
6. Electrical Transmission System			2	U	2			1					
7. Chemical Coatings, Fluids and Anodes				2	2						2	U	U
8. Acoustic Guidance System											U	1	1
Decommissioning													
9. Buoy or Device Removal													
10. Transmission System Removal			2					U	2	2			
11. Anchor Removal or Decommissioning			2					U	2	2			
Maintenance and Vessel Use During All Project Phases													
12. Vessel Access – Spills, etc.			2	2	2	2	2	2	2	2	2	2	2

1 = Level 1 (potential impact/exposure is high) 2 = Level 2 (potential impact or exposure is low) U = Uncertain impact and exposure

Oregon Solutions Participants

<p>Tribal Government</p> <p>Confederated Tribes of Coos, Lower Umpqua, and Siuslaw Indians</p> <p>Federal Agencies/Organizations</p> <p>Federal Energy Regulatory Commission Senator Gordon Smith Senator Ron Wyden Congressman Peter DeFazio National Marine Fisheries Service U.S. Fish and Wildlife Service U.S. Coast Guard U.S. Corps of Engineers</p> <p>State Agencies/Organizations</p> <p>Governor's Office Ocean Policy Advisory Council Oregon Department of Fish and Wildlife Oregon Department of State Lands Oregon Department of Land Conservation and Development Oregon Department of Energy Oregon Parks and Recreation Department Oregon Department of Environmental Quality Oregon Water Resources Department</p>	<p>Local Government</p> <p>City of Reedsport Douglas County Port of Umpqua Gardiner Sanitation District Lower Umpqua Economic Development Forum</p> <p>Non-Governmental Organizations</p> <p>Oregon Fishermen's Cable Committee Oregon Dungeness Crab Commission Oregon Salmon Commission Commercial Crabbing Oregon Shores Oregon Coastal Zone Management Association Oregon Environmental Council Dunes Family Healthcare & Reedsport School District Surfrider Foundation</p> <p>Utilities</p> <p>Central Lincoln PUD PNGC Power</p> <p>Developer</p> <p>Ocean Power Technologies</p>
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