

PMC-ND  
(1.08.09.13)

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



**RECIPIENT:** Littoral Power Systems, Inc.

**STATE:** MA

**PROJECT TITLE:** Prefabricated ZAO Omnispecies modular fish passage modules using advanced manufacturing techniques

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0002080	DE-EE0008969	GFO-0008969-001	GO8969

**Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), I have made the following determination:**

**CX, EA, EIS APPENDIX AND NUMBER:**

Description:

**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.)

**B3.3 Research related to conservation of fish, wildlife, and cultural resources**

Field and laboratory research, inventory, and information collection activities that are directly related to the conservation of fish and wildlife resources or to the protection of cultural resources, provided that such activities would not have the potential to cause significant impacts on fish and wildlife habitat or populations or to cultural resources.

**B3.6 Small-scale research and development, laboratory operations, and pilot projects**

Siting, construction, modification, operation, and decommissioning of facilities for smallscale research and development projects; conventional laboratory operations (such as preparation of chemical standards and sample analysis); and small-scale pilot projects (generally less than 2 years) frequently conducted to verify a concept before demonstration actions, provided that construction or modification would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible). Not included in this category are demonstration actions, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to Littoral Power Systems Inc. (LPS) to develop a novel fish passage technology that would facilitate upstream passage of both weak and strong swimming fish species. The Zero-Ascend Omnispecies (ZAO) fish passage module would be integrated into a variety of other components/modules to create a fully-functioning fish passage. Specific components of the fish passage module would be developed, fabricated, and tested as part of this project (e.g. transport tube system, entry/exit systems, and ancillaries). Live fish testing would be performed in a laboratory setting to assess their passage through module components.

This NEPA Determination will be applicable to all BP1 tasks. BP2 tasks would include fabrication and testing activities that have not yet been fully defined. A fabrication methodology and testing parameters would be defined after completion of BP1 and based on the results of the activities performed therein. Accordingly, all BP2 tasks are restricted. These tasks will be reviewed at a later date, once all relevant information has been submitted to the DOE for review.

Proposed project activities for BP1 would focus on computer modeling, design work, and fish testing using existing components supplied by project partner Whooshh Innovations (Whooshh).

Specific activities to be performed during BP1 are as follows:

**Task 1 - Review Advanced Manufacturing and Material Plan:** As part of this task, LPS would develop its preliminary design plans for the project and submit them to Oak Ridge National Laboratory (ORNL) for review. ORNL would serve as a technical consultant and would provide feedback on the reporting materials submitted.

Task 2 - Develop ZAO System Design Requirements: System requirements, engineering criteria, and cost targets would be developed. LPS would also engage with industry stakeholders to assess the current state of fish passage technologies when defining requirements/criteria.

As part of this task, fish passage testing would be performed at the laboratory facilities of Alden Research Laboratory (Alden) in Holden, MA. A full testing plan would be developed prior to initiating any testing activities. The plan would consider fish collection, test fixture set up, and performance of testing activities. Testing would consist of various experiments using existing components from project partner Whooshh's fish passage system. The tests would assess the entry and passage of fish through the structures.

While a full test plan would be developed prior to testing, a basic test plan and requirements have been identified and are described below:

An existing re-circulating indoor test flume would be used at Alden's facilities. Alden routinely performs flume testing as part of its regular course of business. The flume has 10-ft high walls and is approximately 80-ft. long and 20-ft. wide, with a water pumping capacity of up to 500 cubic feet per second (cfs). For the study, a 3-ft. wide by about 6-ft. long and 40" high weir (i.e. a small or low dam built across a river to regulate water flow) entry structure comprised of a through extension, a false weir (i.e. a hollow weir used to capture fish in a bypass), and a flow box supported by a frame would be attached to the base of the flume. A pump would be connected to the weir entry structure using 6", 8" and 10" diameter pipe for a total of about 40-ft. length. A floating net pen, about 3-ft. x 3-ft. x 20", to hold the fish at the beginning of each study session would be assembled and installed immediately upstream of the weir entry structure. A larger floating net pen would be installed downstream of the weir entry structure. This pen would be attached to the walls of the flume to establish an approximately 130 sq. ft. fish collection area. An aluminum walkway with a handrail would be placed across the flume immediately upstream of the floating net pen.

Approximately 300 fish would be released at two different locations in the flume channel during four separate trials. Each trial would last for approximately five hours. Alewife Herring and possibly American Shad would be used for testing and would be collected from the Lawrence Hydroelectric Project Fish Lift, located on the Merimack River in Lawrence, MA. Fish used for testing would be collected in accordance with a Scientific Collection Permit issued by the Massachusetts Division of Fisheries and Wildlife (MassWildlife). The Permit was issued 3/18/2020 and has validity until 12/31/2020. LPS would be responsible for assuring that this permit is renewed if required. Once collected, the fish would remain in a fish holding facility at Alden until the study is completed. Fish used during testing activities would be disposed of through incineration by a qualified third-party company in accordance with Alden's corporate waste disposal policies and as outlined in the MassWildlife Permit.

Testing at Alden would involve the use and handling of heavy machinery and large volumes of moving water. In order to mitigate the hazards associated with the performance of project activities, established corporate health and safety policies and procedures would be adhered to. Protocols would include training of personnel and routine performance of site-specific safety checks. The flume channel in which testing would be performed would also be equipped with appropriate safety measures/systems, including fixed isolation screens to prevent fish from leaving the test area, filtration systems, and an ultraviolet filter to minimize the presence of pathogens.

Approximately 250,000 gallons of water would be used for testing using the flume at Alden's laboratory facility. This water would be discharged back into the waterway that passes through Alden's facility. Alden is permitted through the Environmental Protection Agency, via a National Pollutant Discharge Elimination System (NPDES) permit to carry out this action and would perform water discharge in accordance with permit requirements. Additionally, approximately 10,000 gallons of water would be used to fill a fish holding tank. This water would be acquired from the municipal drinking water supply. Upon completion of testing, the water would be transported to a regional wastewater treatment facility for disposal.

Task 3 - Design and Analyze Floating Box with Respect to Attraction Flow: This task consists of component design/development and computer modeling. Specifically, a floating box would be designed and analyzed for integration into the fish passage. No material fabrication would be performed as part of this task.

Task 4 - Develop Preliminary Design for Prototype ZAO Fish Passage Attraction Module: This task would be performed concurrently with Task 3 and would also consist of component design/development and computer modeling. The ZAO fish passage attraction module and ancillary components would be designed and analyzed for integration into the fish passage. No material fabrication would be performed as part of this task.

Task 5 - Conduct Preliminary Techno-Economic Analysis: This task would consist of economic modeling and reporting.

Task 6 - Plan Budget Period 2 Fabrication and Testing: This task would consist of work activities relating to the planning and reporting on fabrication/testing for BP2. BP2 activities would be fully structured after completion of BP1, based on the results of the analyses performed. Based on BP1 testing, LPS would select a component or components

to fabricate and test. Both the fabrication and testing processes would be defined as part of this task.

All project activities would be coordinated by LPS. LPS and its project partners Electric Power Research Institute (EPRI), Whoosh, and ORNL would perform design work, computer analysis/modeling, and project management related activities at office-based locations operated by each entity. Whoosh would also furnish components regularly developed and fabricated at its dedicated manufacturing facility in Seattle, WA. All testing activities would be performed at Alden's facility in Holden, MA, as described under Task 2. Facility modifications would be limited to those described under Task 2, and would consist of modifications to equipment installed in Alden's flume channel. No other changes in the use, mission or operation of existing facilities would be required as part of this project.

LPS and its project partners would observe all applicable Federal, state, and local health, safety, and environmental regulations when performing project work.

## NEPA PROVISION

DOE has made a conditional NEPA determination.

The NEPA Determination applies to the following Topic Areas, Budget Periods, and/or tasks:

All Budget Period 1 Tasks.

The NEPA Determination does not apply to the following Topic Area, Budget Periods, and/or tasks:

All Budget Period 2 Tasks.

Notes:

Water Power Technologies Office  
This NEPA determination requires a tailored NEPA provision.  
Review completed by Jonathan Hartman, 07/28/2020

## FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

A portion of the proposed action is categorically excluded from further NEPA review. The NEPA Provision identifies Topic Areas, Budget Periods, tasks, and/or subtasks that are subject to additional NEPA review.

## SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:

 Electronically Signed By: **Roak Parker**

NEPA Compliance Officer

Date: **7/28/2020**

## FIELD OFFICE MANAGER DETERMINATION

- Field Office Manager review not required
- Field Office Manager review required

**BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :**

Field Office Manager's Signature: \_\_\_\_\_  
Field Office Manager

Date: \_\_\_\_\_