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(1.08.09.13)

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

RECIPIENT: Shell Energy North America **STATE:** TX

PROJECT TITLE: Hydro Battery Systems Catalog Development

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0001455	DE-EE0008013	GFO-0008013-002	GO8013

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

CX, EA, EIS APPENDIX AND NUMBER:
Description:

A9 Information gathering, analysis, and dissemination	Information gathering (including, but not limited to, literature surveys, inventories, site visits, and audits), data analysis (including, but not limited to, computer modeling), document preparation (including, but not limited to, conceptual design, feasibility studies, and analytical energy supply and demand studies), and information dissemination (including, but not limited to, document publication and distribution, and classroom training and informational programs), but not including site characterization or environmental monitoring. (See also B3.1 of appendix B to this subpart.)
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 Shell Energy North America, L.P. (SENA) to develop and demonstrate a floating reservoir technology option as a reliable, safe and low-cost way to reconfigure naturally abundant open-loop sites into closed-loop opportunities for pumped storage of hydropower.

The proposed project is divided into two Budget Periods, with a Go/No Go decision point between each Budget Period. DOE previously completed a NEPA review for Budget Period 1 (BP1) (GFO-0008013-001 CX A9; 4/6/2017). BP1 included 5 proposed tasks (Tasks 1.1-1.5), involving design work on systems and components, permitting, preliminary market analysis, preliminary energy intensity analysis, and technical feasibility analysis. This NEPA review is for Budget Period 2 ('BP 2' – Tasks 2.1-2.4).

Task 2.1 would consist of the completion of design work on a floating membrane prototype, procurement of the floating membrane cell, and deployment/testing of the prototype.

Testing would be conducted by Oak Ridge national Lab (ORNL) and the Tennessee Valley Authority (TVA), and would be carried out at a TVA site on the Clinch River, in the Melton Hill Reservoir in Tennessee. This site was selected in partnership with TVA. Permits for carrying out testing activities have been obtained. On July 20, 2018, TVA issued an Endangered and Threatened Species Exclusion Notice which made a 'No Effect' determination regarding any potential impacts to Endangered Species Act listed Threated or Endangered species (T&E species). The Exclusion Notice states that there are nine (9) federally listed mussel species historically reported in the Clinch River within 10 miles of the project area (Melton Hill Reservoir). All recorded species were shown to inhabit areas either downstream from the project or in the upstream reaches. It was noted that habitat alteration in the reservoir area has rendered the project area unsuitable for occupation by the listed species. Accordingly, DOE has determined that the proposed actions would have no effect on T&E species.

The prototype would consist of a rectangular, floating membrane, made of 40 oz. black mehler cell fabric. The

membrane would be surrounded by a floating walkway made of stainless steel materials, measuring approximately 35 ft. x 30 ft. Both the walkway and the membrane would be affixed to the bottom of the riverbed with a series of underwater anchoring cables. The walkway would also be anchored onshore.

Testing would take place over a three-month period, starting in the spring of 2019. Work activities would consist of filling and emptying the membrane, assessment and analysis (e.g. taking measurements of velocity, pressure, impacts on the membrane walls, etc.), and the use of underwater cameras to visually evaluate movements of the membrane. ORNL would provide analytical support on the activities throughout this task. Use of water at the site would be non-consumptive. Materials/equipment to be used would include stainless steel components, pumping equipment, and electronic sensors/communications equipment. No chemicals would be used during the testing process. Noise ordinances would be followed for noise generating equipment associated with the project, such as pumps & boats. At the end of the three-month testing period, the prototype would be decommissioned and a non-destructive recovery of parts would be completed.

Task 2.2 would involve the completion of design work for all land-based components of the pumped storage system. This task would consist solely of design review, development of specifications, reporting and analysis of costs, schedules and feasibility.

Task 2.3 would consist of market value analysis. This task would be completed by Pacific Northwest National Laboratory (PNNL). It would consist solely of computer analysis activities and reporting.

Task 2.4 would consist of energy intensity benchmarking. This task would be completed by Western Washington University ('WWU' – Bellingham, WA) and would consist of data analysis, reporting and presenting at international conferences.

Tasks 2.2, 2.3, and 2.4 would not include any deployment activities.

All facilities in which work would be conducted are pre-existing, purpose built facilities that have conducted work similar to that included as part of this award. No change in the use, mission, or operation of existing facilities would result from any of the proposed project activities.

Any health and safety risks associated with the activities carried out under the tasks reviewed here would be mitigated by adherence to all relevant corporate health and safety policies and protocols. SENA and its project partners would adhere to all local, state, and Federal health, safety and environmental standards when conducting any of the work activities included as part of this project.

Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Based on the review of the proposal, DOE has determined the proposal fits within the class of action(s) and the integral elements of Appendix B to Subpart D of 10 CFR 1021 outlined in the DOE categorical exclusion(s) selected above. DOE has also determined that: (1) there are no extraordinary circumstances (as defined by 10 CFR 1021.410(2)) related to the proposal that may affect the significance of the environmental effects of the proposal; (2) the proposal has not been segmented to meet the definition of a categorical exclusion; and (3) the proposal is not connected to other actions with potentially significant impacts, related to other proposals with cumulatively significant actions, or an improper interim action. This proposal is categorically excluded from further NEPA review.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

If the Recipient intends to make changes to the scope or objective of this project, the Recipient is required to contact the Project Officer, identified in Block 15 of the Assistance Agreement before proceeding. The Recipient must receive notification of approval from the DOE Contracting Officer prior to commencing with work beyond that currently approved. If the Recipient moves forward with activities that are not authorized for Federal funding by the DOE Contracting Officer in advance of a final NEPA decision, the Recipient is doing so at risk of not receiving Federal funding and such costs may not be recognized as allowable cost share.

Insert the following language in the award:

You are required to:
Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Note to Specialist :

Water Power Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Jonathan Hartman, 07/27/2018

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Electronically Signed By: Kristin Kerwin Date: 7/31/2018

NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

☐ Field Office Manager review required

NCO REQUESTS THE FIELD OFFICE MANAGER REVIEW FOR THE FOLLOWING REASON:

☐ Proposed action fits within a categorical exclusion but involves a high profile or controversial issue that warrants Field Office Manager's attention.
☐ Proposed action falls within an EA or EIS category and therefore requires Field Office Manager's review and determination.

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

Field Office Manager's Signature: _____ Date: _____

Field Office Manager