PMC-EF2a
(2.06.02)

U.S. DEPARTMENT OF ENERGY
EERE PROJECT MANAGEMENT CENTER
NEPA DETERMINATION

RECIPIENT: New Mexico State University **STATE:** NM

PROJECT TITLE : Hydropower Energy Resource (HyPER) Harvester

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000486	EE0005411	GFO-0005411-001	

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.)

Rational for determination:

DOE is proposing to provide funds to New Mexico State University (NMSU) to research, design and develop a low-head/low-flow hydropower technology that will meet DOE Water Power Program goals for a low cost, highly efficient and modular turbine-generator system which would be easy to manufacture, assemble and deploy. To reach these objectives NMSU is proposing to perform in-depth studies of the turbine dynamics of a venturi–based design for an axial-flow hydropower generating system, and then fabricate two hydropower harvester prototypes for testing and validation.
Projects tasks are broken out into two budget periods (BP). This determination is being conducted for BP1 activities only. BP2 activities are dependent on successful completion of Tasks 1-9 and will require DOE authorization and additional NEPA review to continue after the go/no go decision.

Budget Period 1

Task 1: Update the project management plan
Task 2: Preliminary report
Task 3: Initiate computational fluid dynamics studies
Task 4: Select turbine parameters and appropriate sized magnet alternator, develop simulation models of the prime-mover and generator
Task 5: Design 3-blade and 4-blade impellers
Task 6: Incorporate the impeller dynamics in the simulation model
Task 7: Prepare a design requirements list of mechanical/civil engineering specifications
Task 8a: Prepare a design requirements list of electrical engineering specifications
Task 8b: Develop design requirements for power protection
Task 9: Develop detailed 3-D drawings of the specifications generated from tasks 5 & 6

Budget Period 2

Task 10: Select appropriate sensors to measure voltage, current, generator speed, fluid flow and vibration at critical points.
Task 11: Place an order for alternators and power converters from an appropriate vendor. Test the performance in a laboratory to validate electrical output characteristics.
Task 12: Fabricate venturi-turbine molding
Task 13: Fabricate a water-repellant submarine shell molding to the design specifications.
Task 14: Assemble components into venturi-turbine and submarine shell.
Task 15: Complete the turbine-generator assembly for initial water tests in a laboratory. Test seals and waterproofing

from prolonged exposure (1 week or longer inside a water tank).
Task 16: Prepare list of experiments to be conducted that will validate expected performance.
Task 17: Develop instrumentation to record real-time data from experiments. Test the instrumentation using simulation models.
Task 18: Test and validate instrumentation on the prototype by simulating small-scale motion dynamics in a laboratory setting.
Task 19: Deploy prototype and install in preselected EBID test site.
Task 20: Conduct tests, record and analyze data, and prepare test reports.
Task 21: Prepare final report to Department of Energy.

Task 22: Project Management and Reporting

Activities proposed during BP 1 include desktop studies, preliminary design, data analysis, and computer modeling. DOE has determined that Tasks 1-9 and Task 22 are consistent with activities identified in categorical exclusion A9 (Information gathering data analysis, conceptual design, and computer modeling).

NEPA PROVISION

DOE has made a conditional NEPA determination for this award, and funding for certain tasks under this award is contingent upon the final NEPA determination.

Insert the following language in the award:

You are restricted from taking any action using federal funds, which would have an adverse affect on the environment or limit the choice of reasonable alternatives prior to DOE/NNSA providing either a NEPA clearance or a final NEPA decision regarding the project.

Prohibited actions include:
All tasks and their activities associated with budget period 2. This included tasks 10 – 21 per the current Statement of Project Objectives dated 3/9/2012 rev(1).

Expenditure of project for capital equipment purchases, including prototype fabrication, pending additional NEPA review and approvals from DOE NEPA Compliance Officer and the Contracting Officer.

This restriction does not preclude you from:
Budget period 1 activities or tasks 1-9 and task 22 (Project Management and Reporting)
If you move forward with activities that are not authorized for federal funding by the DOE Contracting Officer in advance of the final NEPA decision, you are 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:
Additional NEPA review will be required prior to authorizing funds for BP2.

Note to Specialist :

BP1: $149,858 (DOE); $37,364 (NMSU); $187,222 Total

BP2: $194,454(DOE); $37,464 (NMSU); $186,918 Total

This project contains tasks that require further NEPA review. NEPA does not recommend allowing expenditure of funds for activities associated with tasks 10-21 of this project, including capital equipment or supply purchases, and recommends this project be placed on ASAP approval.

Review completed by Laura Margason on March 4, 2012

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: Kristi Cox Date: 4/11/2012
NEPA Compliance Officer