PMC-EF2a

(2.04.02)

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

RECIPIENT: Oasys Water Inc **STATE:** MA

PROJECT TITLE: Osmotic Heat Engine for Energy Production from Low Temperature Geothermal Resources

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0000109	DE-EE0002859	GFO-10-358	GO2859

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 (including, but not limited to, literature surveys, inventories, audits), data analysis (including computer modeling), document preparation (such as conceptual design or feasibility studies, analytical energy supply and demand studies), and dissemination (including, but not limited to, document mailings, publication, and distribution; and classroom training and informational programs), but not including site characterization or environmental monitoring.

B3.6 Siting, construction (or modification), operation, and decommissioning of facilities for indoor bench-scale research projects and conventional laboratory operations (for example, preparation of chemical standards and sample analysis); small-scale research and development projects; and small-scale pilot projects (generally less than two years) conducted to verify a concept before demonstration actions. Construction (or modification) will be within or contiguous to an already developed area (where active utilities and currently used roads are readily accessible).

B5.1 Actions to conserve energy, demonstrate potential energy conservation, and promote energy-efficiency that do not increase the indoor concentrations of potentially harmful substances. These actions may involve financial and technical assistance to individuals (such as builders, owners, consultants, designers), organizations (such as utilities), and state and local governments. Covered actions include, but are not limited to: programmed lowering of thermostat settings, placement of timers on hot water heaters, installation of solar hot water systems, installation of efficient lighting, improvements in generator efficiency and appliance efficiency ratings, development of energy-efficient manufacturing or industrial practices, and small-scale conservation and renewable energy research and development and pilot projects. The actions could involve building renovations or new structures in commercial, residential, agricultural, or industrial sectors. These actions do not include rulemakings, standard-settings, or proposed DOE legislation.

B5.2 Modifications to oil, gas, and geothermal facility pump and piping configurations, manifolds, metering systems, and other instrumentation that would not change design process flow rates or affect permitted air emissions.

Rational for determination:

Oasys Water, Inc. (OWI) would demonstrate the economic viability of an Osmotic Heat Engine (OHE) for electricity production from extremely low-grade geothermal resources. Design work on this project would be completed at Oasys Water in Menlo Park, CA. Laboratory work would take place at SRI International, 333 Ravenswood Ave., Menlo Park, CA 94025. Field work would take place at an existing AltaRock geothermal site.

The project is divided into three phases with multiple tasks:

PHASE 1 – FEASIBILITY STUDY AND ENGINEERING DESIGN

1. Well Selection and Characterization – work with AltaRock to identify and characterize specific existing wells with low grade geothermal resources that are otherwise unproductive using the existing recovery processes onsite.
2. Stripper and Absorption Optimization – the existing conceptual design and model of the OHE distillation apparatus would be optimized to accommodate the specific quality of geothermal heat resources produced by the selected well (Task 1).
3. Membrane Development – membrane development for Pressure Retarded Osmosis (PRO) applicaton.
4. Module Development – development of membrane module capable of withstanding elevated pressures.
5. Membrane Module Testing
6. Integration of OHE System into Existing Recovery Systems – evaluate the opportunity for on-line integration of the OHE into an existing powerplant.
7. Integrated System Development – reconfiguration for integrated PRO testing of an existing Engineered Osmosis (EO) water desalination facility at SRI's research facilities for a 90 day performance test.
8. Project Management and Reporting

PHASE 2 – PROCUREMENT, INSTALLATION, AND COMMISSIONING OF EQUIPMENT

9. Fabrication of Pilot Plant – skid mounted pilot plant would be installed at an existing AltaRock site and initial tests performed.
10. Project Management and Reporting

PHASE 3 – OPERATION AND MAINTENANCE

11. Pilot Operation – the OHE pilot facility would be operated continuously for 24 months

12. Project Management and Reporting
Reports and other deliverables would be provided in accordance with the Federal Assistance Reporting Checklist following the instructions included therein.
According to the R&D Laboratory Questionnaire, no permits for lab work would be required. No liquid effluent, toxic waste, or air pollution would be produced. SRI International adheres to standard safety protocols detailed by SRI and the State of California. Standard laboratory safety equipment (fume hoods, alarms, etc.) are integrated into the SRI research facility. Ammonia and carbon-dioxide gases react in solution to form ammonia-carbonate salts in the draw solution in the OHE system. The gases are recycled through the system and full safety precautions would be taken to ensure that gases are not released during pilot testing and operation. All chemicals would be stored in plastic tanks with secondary spill containment. No heavy metals or gases are stored in the system.

The field site has yet to be determined but would be an existing geothermal site. Regardless of the site location selected, there would be no additional environmental consequences beyond those associated with the existing geothermal site attributable to the Phase 2 or Phase 3 activities. The OHE would be installed in-line at the site. Fluids that would normally be directly re-injected back into the reservoir to maintain head pressure would first be run through the OHE to utilize latent heat to produce electricity before being re-injected into the reservoir. Fluids would only be re-routed not discharged.

This project is comprised of information gathering, data analysis, document preparation; indoor bench-scale research projects and conventional laboratory operations; small-scale pilot project; actions to conserve energy through small-scale renewable energy research and development; and modification to piping at an existing geothermal facility; therefore the DOE has categorized this proposal into Categorical Exclusions A9, B3.6, B5.1 and B5.2.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

None Given.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 4/19/10
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