PMC-EF2a
(2.04.02)

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

RECIPIENT: Potter Drilling Inc **STATE:** CA

PROJECT TITLE : Development of a Hydrothermal Spallation Drilling System for EGS

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-PS36-09GO99018	DE-EE0002746	GFO. 10-166	GO2746

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).

B3.7 Siting, construction, and operation of new infill exploratory and experimental (test) oil, gas, and geothermal wells, which are to be drilled in a geological formation that has existing operating wells.

B3.11 Outdoor tests and experiments for the development, quality assurance, or reliability of materials and equipment (including, but not limited to, weapon system components), under controlled conditions that would not involve source, special nuclear, or byproduct materials. Covered activities may include, but are not limited to, burn tests (such as tests of electric cable fire resistance or the combustion characteristics of fuels), impact tests (such as pneumatic ejector tests using earthen embankments or concrete slabs designated and routinely used for that purpose), or drop, puncture, water-immersion, or thermal tests

B1.11 Installation of fencing, including that for border marking, that will not adversely affect wildlife movements or surface water flow.

Rational for determination:

Potter Drilling, Inc. (PDI) would develop a field-ready drilling system using PDI's Hydrothermal Spallation technology as a solution to the current high cost of drilling for geothermal power. PDI would build and demonstrate a working prototype drilling unit that would accelerate commercial deployment of Enhanced Geothermal Systems (EGS) as a domestic energy source. The project work would take place at a field test site near Raymond in Madera County, California and in PDI's facility located at 599 Seaport Boulevard, Redwood City, CA 94063. PDI would also cooperate with Jefferson Tester's group at Cornell University in Ithaca, New York.

The project is divided into multiple tasks:

1. Bottom Hole Assembly (BHA) Design and Fabrication
2. Drill Rig and Tubing Modification and Design, Fabrication, and Integration of Surface Equipment Needed for the Drilling Operations.
3. Field Site Preparation and Starter Well Construction to a Depth of 300 Feet (to run concurrently with Tasks 1 and 2).
4. Test Plan Definition and Completion of Starter Wells to a Depth of 1000 Feet.
5. Advanced Heating Technologies (Cornell University – Concurrent to previous tasks)

5.1 Fabrication and assembly of a laboratory-scale pressurized flow system to evaluate various chemical heating systems for the SGA.

5.2 Design and construction of a laboratory-scale experimental flow system capable of analyzing dissolution kinetics and fluid properties at both sub and supercritical pressures, and crystallization and deposition behavior that might affect the performance of downhole heat exchangers.

6 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, PDI has safety protocols and emergency response plans that are monitored and meet OSHA requirements for the storage, use, disposal and handling of the chemicals (hydrogen peroxide and methanol) involved. Both laboratory and field test drilling systems are designed as closed loop systems, so no liquid effluent would be discharged. No toxic wastes or air pollutants would be produced.

In a phone conversation with Matthew Gore (Environmental Health Specialist) at Madera County, California, the permits for grading and starter well construction have been obtained but a well deepening permit would be needed from Madera County before the starter wells could be completed (Task 4). Madera County has determined that the project is exempt from CEQA. Biological and cultural surveys with associated reports were completed for the field test site. No cultural resources were identified within the Area of Potential Effects or adjacent to it. Therefore, the cultural report found that the proposed project would have "No Effect on Historic Properties." The biological assessment found that, "Due to the small footprint (0.11 acre) of the corral, existing disturbance regimes, impacts on habitat value (i.e., importance, desirability, benefit, etc.) for special status species and sensitive biotic habitats is anticipated to be low."

This project is comprised of information gathering, data analysis, and document preparation; installation of fencing; conventional laboratory operations and small-scale research and development projects; drilling of experimental geothermal wells; and outdoor tests for the development, quality assurance, and reliability of equipment. The DOE has categorized this proposal into Categorical Exclusions A9, B1.11, B3.6, B3.7, and B3.11.

NEPA PROVISION

DOE has made a final NEPA determination for this award

Insert the following language in the award:

Note to Specialist :

Task 4 requires a well deepening permit from Madera County before the starter wells could be completed. PDI must submit copies of the permits that are in place and the well deepening permit once obtained, as well as a copy of the CEQA determination from Madera County, California.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 4/1/10

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