PMC-EF2n
(2.04.02)

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

RECIPIENT: Colorado School of Mines **STATE:** CO

PROJECT TITLE : Time-lapse Joint Inversion of GEOphysical Data and its Application to Geothermal Prospecting GEODE

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DOE DE-FOA-0000522	DE-EE0005513	GFO-0005513-001	0

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.)

B3.1 Site characterization and environmental monitoring
Site characterization and environmental monitoring (including, but not limited to, siting, construction, modification, operation, and dismantlement and removal or otherwise proper closure (such as of a well) of characterization and monitoring devices, and siting, construction, and associated operation of a small-scale laboratory building or renovation of a room in an existing building for sample analysis). Such activities would be designed in conformance with applicable requirements and use best management practices to limit the potential effects of any resultant ground disturbance. Covered activities include, but are not limited to, site characterization and environmental monitoring under CERCLA and RCRA. (This class of actions excludes activities in aquatic environments. See B3.16 of this appendix for such activities.) Specific activities include, but are not limited to: (a) Geological, geophysical (such as gravity, magnetic, electrical, seismic, radar, and temperature gradient), geochemical, and engineering surveys and mapping, and the establishment of survey marks. Seismic techniques would not include large-scale reflection or refraction testing; (b) Installation and operation of field instruments (such as stream-gauging stations or flow-measuring devices, telemetry systems, geochemical monitoring tools, and geophysical exploration tools); (c) Drilling of wells for sampling or monitoring of groundwater or the vadose (unsaturated) zone, well logging, and installation of water-level recording devices in wells; (d) Aquifer and underground reservoir response testing; (e) Installation and operation of ambient air monitoring equipment; (f) Sampling and characterization of water, soil, rock, or contaminants (such as drilling using truck- or mobile-scale equipment, and modification, use, and plugging of boreholes); (g) Sampling and characterization of water effluents, air emissions, or solid waste streams; (h) Installation and operation of meteorological towers and associated activities (such as assessment of potential wind energy resources); (i) Sampling of flora or fauna; and (j) Archeological, historic, and cultural resource identification in compliance with 36 CFR part 800 and 43 CFR part 7.

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.

B3.11 Outdoor tests and experiments on materials and equipment components
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. Covered actions 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. Covered actions would not involve source, special nuclear, or byproduct materials, except encapsulated sources manufactured to applicable standards that contain source, special nuclear, or byproduct materials may be used for nondestructive actions such as detector/sensor development and testing and first responder field training.

Rational for determination:
The Colorado School of Mines (CSM) would utilize DOE and cost share funds to improve the characterization of geothermal reservoirs by developing joint inversion of several geophysical techniques to better delineate the geothermal resource and monitor thermal fluid motion. Laboratory work would occur at the Green Center on the CSM campus in Golden, CO.

This project includes two Phases but this NEPA review is for Phase 1 only. Prior to initiating Phase 2 activities, there would be a go/no-go decision point after which DOE would determine whether or not to fund Phase 2 activities. Additional NEPA review will be required if this project is selected to continue with Phase 2 activities.

Project Management and Reporting
Phase 1 – Assemble Data and Model Development
1. Assemble & Assess Data
2. Formulate Joint Inversion Model
3. Establish Database
4. Rock Samples Gathered from Jersey Valley – samples would be gathered by hand and laboratory analysis would include complex resistivity, density, porosity, permeability, and ultrasonic compressional and shear velocities measurement
5. Testing of the Electromagnetic System – CSM would calibrate and test the Controlled Source AudioMagnetoTelluric system (MT/CS-AMT) and evaluate the feasibility of joint inversion with seismic or other data. Testing would initially be done in the vicinity of the CSM campus where data is available and then in the Upper Arkansas Valley near the Mt. Princeton Geothermal field in Colorado where CSM has collected seismic and resistivity data in a previous DOE project. Cabling for the test would be laid along existing roads or open ground. Minimal surface disturbance is anticipated as a result of project activities.
6. Acquisition Planning

Phase 2 will require additional NEPA review if the project is selected to continue with Phase 2 activities.

According to the R&D laboratory questionnaire, laboratory work would consist of standard geological/geophysical analysis of rock samples and requires no special permitting or safety equipment beyond safety glasses.

Project Budget: $255,586 (DOE) $21,000 (cost share)

Phase 1 of this project is comprised of information gathering, analysis, and dissemination; site characterization and environmental monitoring; laboratory operations; and outdoor tests and experiments on materials and equipment components; therefore the DOE has categorized this into Categorical Exclusions A9, B3.1, B3.6, and B3.11.

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:
Phase 2 (all tasks)
This restriction does not preclude you from:
Project Management and Reporting
Phase 1 (all tasks)
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:
CSM must provide DOE with any permits/approvals (federal, state, or county) that may be required for project field work (Tasks 4 and 5) prior to the commencement of those field activities.

Note to Specialist :

EF2a prepared by Casey Strickland

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature: _____ Date: 2/10/2012
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