

PMC-ND  
(1.08.09.13)

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



**RECIPIENT:** U.S. Geothermal Inc.

**STATE:** NV

**PROJECT TITLE :** A novel approach to map permeability using passive seismic emission tomography

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0001445	DE-EE0007698	GFO-0007698-001	

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:

<b>A9 Information gathering, analysis, and dissemination</b>	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.)
<b>B3.1 Site characterization and environmental monitoring</b>	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.

**Rationale for determination:**

The U.S. Department of Energy (DOE) is proposing to provide federal funding to U.S. Geothermal, Inc. (USG) for the collection of new electromagnetic and passive seismic data to map the permeability of the San Emidio geothermal resource area and the Crescent Valley geothermal prospect in northern Nevada. Processing and integration of datasets would take place at Optim, Inc. in Nevada, Lawrence Berkeley National Laboratory in California, and USG offices in Idaho. If the data collection and analyses in Budget Period (BP) 1 are successful, drill testing of targets would occur in BP2. This NEPA Determination is specific to BP1 activities only. There is a Go-No Go decision point after BP1 to determine if further activities would be justified based on data collected during BP1. Further NEPA review will be required for BP2 once specific well targets have been selected.

Project activities include planning, historic data review, passive seismic surveys, electromagnetic surveys, data evaluation, and modeling. All project work, other than what is discussed below, would occur within existing office and laboratory facilities. No resources of concern, other than those discussed below, were found during review of the proposed project.

Passive seismic and electromagnetic surveys would occur in northern Nevada at the San Emidio geothermal resource area and the Crescent Valley geothermal prospect. Both areas have a mix of private and public lands. Any work



occurring on BLM managed lands would be submitted to the appropriate district office for review prior to initiating field activities on those lands. Project work at San Emidio would occur near the existing geothermal power plant. The geothermal prospect in Crescent Valley would occur near the Barrick Cortez gold mine which recently expanded their dewatering system and installed a new pipeline through the project area. As a result of Barrick's mining activity, an extensive network of roads, pipelines, and powerlines bisect the project area. Access to field sites would be by existing public and private roads, by ATV, or on foot. ATV access would be limited to areas and site conditions that exclude areas with soil or vegetation conditions that would increase the risk of wildfire, erosion, rutting, or loss of perennial vegetation. Field work at each project area would require little or no surface disturbance with any surface disturbance that is required being completed by hand. The level of geophysical work proposed as part of this project has been previously conducted in both project areas.

For the passive seismic surveys, stations would be placed on the ground surface in areas devoid of vegetation. During data collection, a truck-mounted weight-source would be dropped at various locations along existing roads to provide additional constraints and data for the survey. For each project area, the general layout of the passive seismic surveys would be an approximately 1.5 square mile area surrounded by a 6000-ft buffer with seismic sensors deployed at a density of up to 150 per square mile.

Electromagnetic survey work would be distributed across both of the project areas of interest. Magnetotelluric (MT) equipment would require a small amount of surface disturbance (1-m long, 0.3-m deep trench) so that a coil receiver could be buried at each site. No vegetation would be cleared or removed for the installation. Total surface disturbance at each site would be less than 1.5 square meters. Stations would be left in place for approximately 24 hours, removed, and then any disturbance would be reclaimed.

U.S. Fish and Wildlife Service lists only one threatened species (Lahontan Cutthroat Trout) and 19 migratory bird species that could occur in either project area. Because of the project locations, minimal disturbance, short duration, and type of the proposed activities; DOE has determined that there would be no effect to any special status species as a result of project activities.

Extensive cultural and archaeological resource evaluations (literature searches, Class III pedestrian surveys, etc.) have been completed at San Emidio with less extensive work being completed at Crescent Valley. USG's contracted archeologist has reviewed all the proposed MT sites at San Emidio and confirmed that none of them would affect archeological and cultural resources. At Crescent Valley, a contracted archeologist would review each MT site before mobilization into the field to ensure that no archeological and cultural resources are affected. If extensive archaeological resources are found to occur in the area, the archeologist would be on-site during field work to ensure avoidance. During the installation of field equipment, if cultural or archeological artifacts are encountered, the recipient would stop the work immediately and inform the archeologist, project manager, and the DOE Project Officer of the finding. The affected fieldwork would be relocated to another nearby site. DOE does not anticipate any impacts to archaeological or cultural resources because all access to field work locations would either be by existing roads or by foot; surveys and field work would require little or no new surface disturbance; and locations would be selected with the above evaluation, siting, and monitoring requirements in mind.

Based on the review of the proposal, DOE has determined the tasks within BP1 of the proposal fit 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. Tasks and subtasks within BP1 of the proposal are categorically excluded from further NEPA review.

#### 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:

Budget Period 2 tasks and subtasks

This restriction does not preclude you from:

Budget Period 1 tasks and subtasks



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:

During the installation of field equipment, if cultural or archeological artifacts are encountered, the recipient must stop the work immediately and inform the DOE Project Officer of the finding. The recipient must relocate the affected fieldwork to another nearby site.

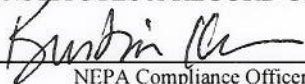
Any work proposed to be conducted at a DOE laboratory may be subject to additional NEPA review by the cognizant DOE NEPA Compliance Officer for the specific DOE laboratory prior to initiating such work. Further, any work conducted at a DOE laboratory must meet the laboratory's health and safety requirements.

Note to Specialist :

Geothermal Technologies Office  
This NEPA determination requires a tailored NEPA provision.  
NEPA review submitted by Casey Strickland 08/29/16

**SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.**

NEPA Compliance Officer Signature: \_\_\_\_\_

  
NEPA Compliance Officer

Date: \_\_\_\_\_

8/29/2016

**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: \_\_\_\_\_

Field Office Manager

Date: \_\_\_\_\_