

PMC-ND
(1.08.09.13)

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



RECIPIENT: Nevada Bureau of Mines and Geology

STATE: NV

PROJECT TITLE : Discovering Blind Geothermal Systems in the Great Basin Region: An Integrated Geologic and Geophysical Approach for Establishing Geothermal Play Fairways

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
	DE-EE0006731	GFO-0006731-003	GO6731

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.)
- A11 Technical advice and assistance to organizations** Technical advice and planning assistance to international, national, state, and local organizations.
- 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.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to the University of Nevada Reno (UNR) to address the overarching theme of uncertainty quantification and reduction for geothermal exploration, specifically through the development of Geothermal Play Fairways. Phase/Budget Period 1 of the Geothermal Play Fairway Analysis FOA was reviewed by GFO-FOA0000841-001 (CX A9; 7/31/14). Budget Period 2 of this project was reviewed by GFO-0006731-001 (CXs B3.1, B3.2, B3.6; 2/25/16). Budget Period 3 (BP3) of this project was reviewed by GFO-0006731-002 (CXs A9, B3.1, B3.6; 08/28/17), which restricted Task 27 "Temperature-Gradient (TG) Drilling" pending the definition of drill locations and required drilling activities.

This NEPA Determination is to review proposed Task 27 activities in southern Gabbs Valley, one of two primary study areas within the Nevada Play Fairway area. Any Task 27 activities proposed to be conducted at the second study area (northern Granite Springs Valley) would require further NEPA review. This is because the results of Task 27 in Gabbs Valley would inform the decision to target Granite Springs Valley, and if this area is subsequently indicated for

exploratory TG drilling, then data obtained from upcoming planned geoprobe studies (covered in the previous NEPA Determination for BP3) would be used to refine well locations. Hence there is insufficient information available at this time to complete a thorough review of potential drilling activities and any associated impacts at the Granite Springs study area. If Granite Springs Valley is ultimately identified for Task 27, UNR must submit additional site specific information for NEPA review including the geographical coordinates of proposed TG wells.

Task 27 activities under review herein would involve the rotary drilling of as many as 7 TG wells selected from among 10 prospective sites within Southern Gabbs Valley (located southwest of the town of Gabbs, Mineral County, NV) for the measurement of equilibrated temperature gradients. Temperature logs would be run in the wells immediately after completion and three additional times in one-month intervals thereafter to assure that temperatures have equilibrated. Additional field-based analyses would include logging of cuttings and other standard well-logging/sensing techniques using in-house equipment from the Great Basin Center for Geothermal Energy at UNR. Initial results would be evaluated to determine if deeper or shallower TG wells would best define the geothermal system, although a depth range of approximately 500-750 ft (150-230 m) is anticipated.

All 10 prospective TG wells are located on public lands administered by the Bureau of Land Management (BLM) Carson City District Office/Stillwater Field Office. Drilling would be carried out by the United States Geological Survey (USGS) under supervision of experienced USGS personnel. UNR would provide onsite technical assistance/analysis of results during the drilling. Established industry standard operating procedures would be observed by all project participants in order to mitigate hazards associated with rig operations. UNR has submitted a Notice of Intent (NOI) to the BLM Carson City District Office for the proposed rotary TG drilling activities, as well as Geothermal Resource Development Permit applications to the Nevada Division of Minerals (NDOM) for each proposed TG well location. UNR would not begin any Task 27 activities nor would USGS mobilize to the Gabbs Valley study area until such time as BLM and NDOM complete their reviews and provide written authorization to proceed.

The proposed drilling would require the mobilization and short-term deployment of equipment outdoors. All equipment and personnel would be transported to and from the selected drilling sites by overland vehicles. Access to the drill sites has been planned along existing roadways to avoid new ground disturbance, but if any cross-country travel is deemed necessary these routes would be developed in accordance with BLM requirements. Equipment/vehicles would consist of a truck-mounted rotary drill rig and pipe trailer (with a combined footprint of approximately 1,000 sq. ft) in addition to various other staging/storage trucks (logging, service, water), pumps (pallet, piston), and work camp facilities (trash receptacle, portable toilets). A temporary use area measuring approximately 100 ft x 60 ft would be established around each TG well and used for laydown and rig operations. Minor and temporary ground moving activities to accommodate equipment and materials in this area would be limited to shallow (less than 2 ft) trenching for burying pipe and cable in order to prevent tripping hazards.

With the exception of monthly follow-up temperature logging described above, which does not require extensive field deployment, all drilling and measurement activities are expected to be completed within a month of mobilization to the Gabbs Valley study area. After the conclusion of drilling and measurements, all equipment, materials, supplies, camp facilities, and personnel would be demobilized from that location. All ground disturbance would be reclaimed, and the only remaining effect of project activities would be superficial traces of restored surfaces and tire tracks. No surface equipment (i.e. wellheads) would be left on location once measurements are complete. All TG wells would eventually be plugged and abandoned in accordance with applicable state and federal regulations, notably BLM and NDOM rules/requirements for this process and its timeframe. Non-hazardous waste commonly generated on drill rig sites, such as empty paper sacks of concrete or emptied shipping pallets, would be properly contained and entirely removed from the study area at the completion of operations. Rotary drilling creates rock chips of local subsurface formations, and these natural materials would be dispersed over the desert surface in the immediate area of each wellsite in compliance with pertinent regulations and any special stipulations made by BLM and/or NDOM.

DOE has reviewed all 10 prospective well sites and the surrounding environment. Given this context for the activities described above, DOE has concluded that no adverse impacts to sensitive resources are expected as a result of Task 27 at any Gabbs Valley location based on the following summations: Task 27 activities and site access would be located to the extent possible on or immediately adjacent to previously disturbed land, and would be confined to less than an acre of such land at no more than 7 geographically dispersed locations within the relatively expansive Gabbs Valley area. Isolated and short-term sources of vehicular emissions would not have the potential to meaningfully impact atmospheric levels within this rural attainment area. Ground disturbance produced by equipment deployment and work camp activities would be shallow and impermanent, and disturbed areas would be reclaimed as obligated by BLM and NDOM permit conditions of approval per all applicable federal and state regulations. No work would be located in wetlands, designated wilderness areas, or areas with known protected species. The Gabbs Valley project area is proximate to a Wilderness Study Area (WSA). However, none of the proposed TG well locations or associated drilling activities such as site access or equipment mobilization would fall within the WSA, the boundaries of which the recipient is cognizant and would actively avoid. According to the U.S. Fish and Wildlife Service Endangered Species Program website (IPaC), there are no federally listed plant species expected to occur at the Gabbs Valley study area. IPaC identifies two threatened wildlife species that are believed to occur near Gabbs Valley; however, due to the

aforementioned siting elements, lack of critical habitat, minimal footprint and short-term duration of the proposed TG drilling, DOE has determined the proposed activities would have no effect on listed species. The recipient would properly fulfill any BLM permit conditions that are to comply with the Migratory Bird Treaty Act, including but not limited to ground nesting bird surveys. No cultural resources were found during prior BLM site visits and archaeological/tribal database reviews conducted specifically for the purpose of permitting earlier phases of the proposed project. BLM has already authorized geoprobe studies of the Gabbs Valley area and does not anticipate requiring additional cultural resource surveys in advance of the proposed TG drilling. Nonetheless, if during the course of project activities cultural or archaeological artifacts are encountered, USGS personnel, the recipient, or their staff must stop the site installation immediately and inform the BLM and the DOE Project Officer of the discovery so that an evaluation of the discovery can be completed prior to continuing work. The affected work must be relocated to another nearby site.

Based on the review of the proposal, DOE has determined that Task 27 activities at the southern Gabbs Valley study area 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. Task 27 activities at the southern Gabbs Valley study area 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:

Task 27 "Temperature-Gradient (TG) Drilling" activities at the Granite Springs Valley study area and/or any other proposed location outside of the southern Gabbs Valley study area.

This restriction does not preclude you from:

Task 27 "Temperature-Gradient (TG) Drilling" activities at the southern Gabbs Valley study area.

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:

Before undertaking any Task 27 activities at the southern Gabbs Valley study area, including mobilization for drilling to be conducted by the United States Geological Survey, the recipient is required to obtain all requisite permits and/or authorizations from the Bureau of Land Management (BLM) and Nevada Division of Minerals (NDOM). Further, the recipient is required to submit copies of all BLM and NDOM permits and/or written approvals required for Temperature-Gradient (TG) drilling to the DOE Project Officer prior to commencing field work, and must comply with any associated terms and conditions set forth by these agencies.

If during the course of project activities cultural or archaeological artifacts are encountered, USGS personnel, the recipient, or their staff must stop the site installation immediately and inform the BLM and the DOE Project Officer of the discovery so that an evaluation of the discovery can be completed prior to continuing work. The affected work must be relocated to another nearby site.

Note to Specialist :

Geothermal Technologies Office
This NEPA determination requires a tailored NEPA Provision.
NEPA review completed by Whitney Doss, 04/20/18

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  Date: 4/20/2018
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: _____
Field Office Manager

Date: _____

▪