

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



RECIPIENT: University of Nevada, Reno

STATE: NV

PROJECT TITLE : Innovative Geothermal Exploration through Novel Investigations Of Undiscovered Systems (INGENIOUS)

Funding Opportunity Announcement Number	Procurement Instrument Number	NEPA Control Number	CID Number
DE-FOA-0002219	DE-EE0009254	GFO-0009254-002	G09254

Based on my review of the information concerning the proposed action, as NEPA Compliance Officer (authorized under DOE Policy 451.1), 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.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide funding to University of Nevada, Reno (UNR) to reduce the exploration risk for hidden geothermal systems in the Great Basin Region (GBR). This would be accomplished by quantifying resource potential, uncertainty, and degree of exploration at several geothermal prospects in the GBR and by developing new geothermal favorability maps, data products, software tools, and a geothermal developers' playbook that integrates the project findings and facilitates easy access for external stakeholders. The project would be completed over 3 Budget Periods (BPs) with a Go/No Go Decision Point between each BP.

Previously, DOE reviewed this project and issued a conditional NEPA determination for Tasks 1 through 3, 4.1, and 6 through 9 (GFO-0009254-001, CXs A9, B3.1, 12/11/2020). At the time, sites had not been selected for temperature gradient (TG) drilling in Tasks 4.2 through 4.6 or slimhole drilling in Task 5. Therefore, those tasks were restricted. The first of up to five project locations for TG drilling has now been identified. Each GBR location would have multiple TG well sites selected and drilled. The first location would be in Granite Springs Valley (GSV) in Pershing County, NV. This NEPA determination is to review all activities associated with Tasks 4.2 through 4.6 at this project location only. As additional project locations are selected, UNR must submit site information to DOE for NEPA review, including geographical coordinates of proposed TG wells. Task 5 (slimhole drilling) remains restricted.

The following is a description of the proposed tasks:

Subtask 4.2: TG drilling to provide information on the subsurface thermal profile, lithologies, water chemistry, and mineralogical characteristics of subsurface formations.

Subtask 4.3: Reservoir/subsurface data analysis, collect downhole temperature logs in new TG holes, and analyze new data.

Subtask 4.4: Ensure TG holes are appropriately plugged and abandoned according to state and federal regulations.

Subtask 4.5: Use new subsurface datasets from TG holes to update conceptual model of the geothermal system(s) at each detailed study area and revise resource estimates.

Subtask 4.6: Recommend future locations and depths of slimholes at study site.

Nine potential drill sites at GSV are being permitted with the Bureau of Land Management (BLM) and Nevada Division of Minerals (NDOM), two to four of these sites would ultimately be selected for drilling. The specified location of each drillhole would be determined upon completion of conceptual and geological modeling. TG holes would be drilled to maximum depths of 2500 to 3000 feet. Final depths would be determined by encountered geology, drilling conditions, value-of-information analysis, and budgetary constraints. If possible, core and water samples would be collected from these holes for geochemical analysis. The work area at each site would occupy approximately 100 feet by 100 feet and would be accessed by existing two-tracks or roads to the extent possible. A truck-mounted drill rig that travels overland would be used. Each site would be occupied for approximately three to five weeks during drilling and only occasionally afterwards such as during geophysical well logging activities. Equipment at the site would include the drill rig and a small sump or truck-mounted mud system. Boreholes would be completed 12 inches below grade with neat cement and a removable, lockable cap and flush mounted monument. A 1.25-inch to 2-inch steel pipe would be installed to allow down-hole temperature readings to be taken once the hole has equilibrated. The TG well 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 and according to the wishes of the lease holder. Abandonment would include filling the pipe with grout, cutting it below the surface, and plugging the hole with cement.

The total drilling campaign duration for all Task 4 sites would depend on the number of sites drilled (2-4) and may last between three to six months. Operations would require running two to three non-road diesel engines for 12 to 24 hours per day, producing several criteria pollutants including particulate matter, carbon monoxide, and nitrogen dioxide. This does not trigger air permitting requirements from the Nevada Division of Environmental Protection.

Potential sites are all within BLM managed land in Granite Springs Valley in Nevada. TG hole sites require permits from NDOM and BLM. A Geothermal Resource Development Permit for each proposed TG well location would be submitted to NDOM at least 60 days prior to drilling. In addition, a Notice of Intent would be submitted to BLM for all TG drilling activities. If additional drilling sites on adjacent private land parcels are considered, written authorization from the landowner, additional DOE NEPA review, and NDOM permitting would be required prior to drilling. UNR would not begin any Task 4 activities, nor would they mobilize to the Granite Springs Valley study area until such time as BLM and NDOM complete their reviews and provide written authorization to proceed.

Project activities would involve the use of drilling machinery. Any risks associated with drilling activities would be mitigated through adherence to established health and safety policies and procedures. Safety protocols would include personnel training, the use of personal protective equipment, monitoring, and oversight. Approximately 2,000 gallons of water per day would be used which would be recirculated and reused. Water, drill cuttings, and drilling fluids (e.g. bentonite and polymers) would be disposed of on site during site reclamation according to BLM/NDOM permitting requirements. University of Nevada, Reno and its project partners would observe all applicable federal, state, and local health, safety, and environmental regulations.

U.S. Fish and Wildlife Service's (USFWS) Information for Planning and Consultation (IPaC) database indicates that one candidate insect species, the Monarch butterfly, has the potential to occur within the project boundary. Based on the Western Monarch Crucial Habitat Assessment Tool (CHAT), the proposed project area does not rank highly as crucial habitat for conservation of monarch butterflies. Considering this information and that project activities would be temporary and occur in a small area, DOE has determined that work in Tasks 4.2-4.6 would not affect crucial habitat or result in a decline in monarch distribution or abundance, therefore would not lead to increased likelihood of this candidate species becoming further threatened or endangered.

No drill pads for TG holes and truck-mounted rigs would be used, so minimal land clearing is expected. Minor excavation may be conducted to create a small sump for disposal of drill cuttings and produced fluids. UNR would follow BLM requirements to ensure protection of wildlife and resources of concern. The USFWS National Wetlands Inventory classifies a majority of the proposed sites as seasonally or temporarily flooded wetland. However, project work would only occur during dry seasons, would not require dredge or fill, and would not result in a long-term change to the ecosystem. Based on timing of the project and above considerations, DOE does not anticipate impacts to resources of concern.

Before undertaking any Task 4 activities at the Granite Springs Valley study area, including mobilization for drilling, UNR is required to obtain all requisite permits and/or authorizations from BLM and NDOM. Further, UNR is required to submit copies of all BLM and NDOM permits and/or written approvals required for 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.

NEPA PROVISION

DOE has made a conditional NEPA determination.

The NEPA Determination applies to the following Topic Areas, Budget Periods, and/or tasks:

Task 1

Task 2

Task 3

Task 4.1

Task 4.2-4.6 (only at proposed location in Granite Springs Valley, Pershing County, NV)

Task 6

Task 7

Task 8

Task 9

The NEPA Determination does not apply to the following Topic Area, Budget Periods, and/or tasks:

Task 4.2-4.6 (for remaining locations not yet identified)

Task 5

Include the following condition in the financial assistance agreement:

Before undertaking any Task 4 activities at the Granite Springs Valley study area, including mobilization for drilling, 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, the Recipient and their staff must stop the site installation immediately and inform 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.

Notes:

Geothermal Technologies Office

This NEPA determination requires legal review of the tailored NEPA provision.

Review completed by Shaina Aguilar on 6/28/22.

FOR CATEGORICAL EXCLUSION DETERMINATIONS

The proposed action (or the part of the proposal defined in the Rationale above) fits within a class of actions that is listed in Appendix A or B to 10 CFR Part 1021, Subpart D. To fit within the classes of actions listed in 10 CFR Part 1021, Subpart D, Appendix B, a proposal must be one that would not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, or similar requirements of DOE or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities (including incinerators), but the proposal may include categorically excluded waste storage, disposal, recovery, or treatment actions or facilities; (3) disturb hazardous substances, pollutants, contaminants, or CERCLA-excluded petroleum and natural gas products that preexist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited to, those listed in paragraph B(4) of 10 CFR Part 1021, Subpart D, Appendix B; (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species, unless the proposed activity would be contained or confined in a manner designed and operated to prevent unauthorized release into the

environment and conducted in accordance with applicable requirements, such as those listed in paragraph B(5) of 10 CFR Part 1021, Subpart D, Appendix B.

There are no extraordinary circumstances related to the proposed action that may affect the significance of the environmental effects of the proposal.

The proposed action has not been segmented to meet the definition of a categorical exclusion. This proposal is not connected to other actions with potentially significant impacts (40 CFR 1508.25(a)(1)), is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1508.27(b)(7)), and is not precluded by 40 CFR 1506.1 or 10 CFR 1021.211 concerning limitations on actions during preparation of an environmental impact statement.

A portion of the proposed action is categorically excluded from further NEPA review. The NEPA Provision identifies Topic Areas, Budget Periods, tasks, and/or subtasks that are subject to additional NEPA review.

SIGNATURE OF THIS MEMORANDUM CONSTITUTES A RECORD OF THIS DECISION.

NEPA Compliance Officer Signature:  Casey Strickland Date: 7/7/2022
NEPA Compliance Officer

FIELD OFFICE MANAGER DETERMINATION

- Field Office Manager review not required
- Field Office Manager review required

BASED ON MY REVIEW I CONCUR WITH THE DETERMINATION OF THE NCO :

Field Office Manager's Signature: _____ Date: _____
Field Office Manager