

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



**RECIPIENT:** University of Oklahoma

**STATE:** OK

**PROJECT TITLE :** Intelligent Repurposing of Hydrocarbon Wells System to Harness the Geothermal Potential of Oklahoma Sedimentary Basin

<b>Funding Opportunity Announcement Number</b>	<b>Procurement Instrument Number</b>	<b>NEPA Control Number</b>	<b>CID Number</b>
DE-FOA-0002525	DE-EE0009962	GFO-0009962-001	

**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.)
- B5.12 Workover of existing wells** Workover (operations to restore production, such as deepening, plugging back, pulling and resetting lines, and squeeze cementing) of existing wells (including, but not limited to, activities associated with brine, carbon dioxide, coalbed methane, gas hydrate, geothermal, natural gas, and oil) to restore functionality, provided that workover operations are restricted to the existing wellpad and do not involve any new site preparation or earthwork that would have the potential to cause significant impacts on nearby habitat; that site characterization has verified a low potential for seismicity, subsidence, and contamination of freshwater aquifers; and the actions are otherwise consistent with best practices and DOE protocols, including those that protect against uncontrolled releases of harmful materials.
- B5.15 Small-scale renewable energy research and development and pilot projects** Small-scale renewable energy research and development projects and small-scale pilot projects, provided that the projects are located within a previously disturbed or developed area. Covered actions would be in accordance with applicable requirements (such as local land use and zoning requirements) in the proposed project area and would incorporate appropriate control technologies and best management practices.

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to provide federal funding to the University of Oklahoma (OU) to perform a feasibility study on the reutilization of existing oil and gas wells for geothermal energy from produced liquids, primarily the water phase due to its higher heat capacity. The proposed project would involve both laboratory work and a field pilot plant to be installed at Blue Cedar Energy facilities in Grady County, OK.

The proposed project is comprised of three Budget Periods (BP) to be completed over 48 months. Activities associated with BP1 would include theoretical studies of the geology, geothermal resources, and potential recoverable capacity of the geothermal resource of the selected project site. Engineering design, permitting, and well workover would also be completed during BP1. Activities associated with BP2 would include the procurement, installation, commissioning, and implementation of the pilot plant. Activities associated with BP3 would include the operation and monitoring of the pilot plant for a minimum of two years. Final project tasks would also involve outreach in the form of a diversity, equity, and inclusion (DEI) educational plan to leverage and connect in-place programs and infrastructure, focusing on building capacity among under-served communities. While the project's goal is to study the potential of generating heat for nearby schools, any such future implementation would be beyond the scope of DOE funding.

Paper studies and in-lab experimental work would occur at the University of Oklahoma Well Construction Technology Center (Norman, OK). All field work would be located at the site of four oil and gas wellbores under the administration of project partner Blue Cedar Energy (SEC 11, TWP 9N, RGE 6W). OU's preliminary evaluation of well integrity in collaboration with Blue Cedar Energy has indicated that the selected wells are in good condition and minimal workover would be required. During BP1, an in-depth study would be carried out to determine injection and production schemes. Before any workover and repair operations commence, a workover plan would be prepared to ensure the selected wells are in proper condition before actual thermal operations. Well intervention or workover required to meet

the resource utilization plan would be conducted with Blue Cedar's truck-mounted diesel engine workover rigs. Related activities may include well logging and pressure test operations, perforations check and cleaning, and injection and production. An Induced Seismicity Mitigation Plan (ISMP) would be developed in advance if any risk is determined by the initial study.

Equipment for heat production would be purchased and installed at the field site during BP2. Surface facilities would include commercially available surge tanks and heat exchangers. Based on a preliminary site survey by OU, there is believed to be sufficient space on each wellsite for setting up the new facilities. Only minimal groundwork is anticipated for pad preparation, which would involve leveling the surface at some well sites to be able to set the equipment in proper orientation, but no major overhaul. At the conclusion of the proposed project, the pilot plant equipment may be kept in place for future demonstrations of direct heat production. The utilized wells would be plugged and abandoned if and when required in consultation with Blue Cedar Energy.

Additional permitting may be required from the Oklahoma Corporate Commission for the injection and circulation of water. OU would ensure all necessary permits are identified and obtained prior to commencing regulated project activities. These are expected to have minimal impact due to extensive prior knowledge of the area geology, controlled injection rate, and monitoring. Wastewater produced by the proposed project would be managed via Blue Cedar Energy's current disposal contractor. Because the project is not expected to involve the use of any non-standard or hazardous chemicals in the proposed operations, no special treatment actions/facilities would be required.

Blue Cedar Energy implements the API standards for Occupational Safety and Health for Oil and Gas Well Drilling and Servicing Operations, including but not limited to the following practices: proper PPE, Well Control Certified personnel on site anytime a rig is on location, and stop work practices. Blue Cedar Energy also implements an internal Job Safety Analysis (JSA) for drilling work.

It is not anticipated that the DOE project system would have any greenfield impact at the Blue Cedar Energy well sites. The proposed geothermal equipment is modular, mobile, and would be deployed at individual existing well pads. Project activities would have limited impacts to the surface environment beyond the footprint of the pilot plant equipment, which would be confined to an area of previous ground disturbance. Based on the relatively small scope of work within the context of previous, extensive oil and gas development, and the temporary nature of the proposed operation to demonstrate direct heat production, DOE does not anticipate any impacts to resources of concern due to the proposed project.

## **NEPA PROVISION**

DOE has made a final NEPA determination.

Include the following condition in the financial assistance agreement:

The Recipient is required to ensure compliance with all permit requirements set forth by the Oklahoma Corporate Commission authorizing project activities. Further, the Recipient is required to submit copies of any new and/or additional written authorizations to the DOE Project Officer. If the preparation of an Induced Seismicity Mitigation Plan (ISMP) is required based on Phase 1 analysis, the Recipient must submit a copy to the DOE Project Officer for further NEPA review.

Notes:

Geothermal Technologies Office (GTO)  
This NEPA determination requires legal review of the tailored NEPA provision.  
Review completed by Whitney Donoghue on 08/23/2022

## **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.

The proposed action is categorically excluded from further NEPA review.

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

NEPA Compliance Officer Signature:  **Electronically Signed By: Casey Strickland** Date: **8/24/2022**  
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