

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



RECIPIENT: Multiple Academic Institutions

STATE: Mult

PROJECT TITLE : Geothermal Lithium Extraction Prize - Phase 3

Funding Opportunity Announcement Number **Procurement Instrument Number** **NEPA Control Number** **CID Number**
 GFO-GeoLithiumPrize-002

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.)

**B3.6 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.

**B3.15 Small-
scale indoor
research and
development
projects
using
nanoscale
materials**

Siting, construction, modification, operation, and decommissioning of facilities for indoor small-scale research and development projects and small-scale pilot projects using nanoscale materials in accordance with applicable requirements (such as engineering, worker safety, procedural, and administrative regulations) necessary to ensure the containment of any hazardous materials. Construction and modification activities would be within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible).

Rationale for determination:

The U.S. Department of Energy (DOE) is proposing to authorize the administration of a prize competition (American-Made Geothermal Lithium Extraction Prize, or "Prize") to de-risk and increase market viability for direct lithium extraction from geothermal brines. The Prize would be administered by the Geothermal Technologies Office (GTO) in partnership with the National Renewable Energy Lab (NREL). The Prize is a three-phase competition designed to incentivize the creation of innovations that improve upon current state-of-the-art technology by identifying, developing, and testing disruptive solutions to improve the profitability of direct lithium extraction from geothermal brines.

Phase 1 of the Prize was launched in April of 2021; subsequently, 15 competitors were selected as semifinalists to compete in Phase 2. During Phase 2, semifinalists worked under the mentorship of Industry Advisory Panel (IAP) members to substantially advance their proposed tool, component, chemical process, or other advancement concept by designing the proposed concepts identified in Phase 1. At the end of Phase 2, teams participated in an innovation pitch meeting to demonstrate what progress they made and presented a plan for how the design would be fabricated and tested using a geothermal brine during Phase 3. At this time, the following five teams have been selected to advance to Phase 3 of the competition:

- SelectPureLi – University of Illinois Urbana-Champaign
- LiSED – Rice University
- Team TELEPORT – University of Virginia
- Ellexco – The George Washington University
- E-LIST – Cornell University

DOE is proposing to award a cash prize to each finalist to build, test, and validate their planned innovation. Phase 3

activities would be limited to the design, development, fabrication, and bench scale testing of a lithium extraction technology by each of the academic institutions. Specifically, work would include the fabrication of electrochemical, electro dialysis, and nanofiltration technologies. Synthetic brines provided by Idaho National Laboratory would be used to test the efficacy of the technologies.

Activities would occur within existing facilities/laboratories designed for the types of activities proposed; therefore, no modifications, new permits, additional licenses and/or authorizations would be necessary. No ground disturbing activities, no changes in the operation of existing facilities, and no installation of equipment outdoors would occur for Phase 3 activities. Semifinalists would be working with small volumes of geothermal brines that may contain corrosive salts and heavy metals. In addition, two applicants would be using nanoscale materials in their technology. All such handling would occur in university laboratory settings with dedicated proper non-hazardous and hazardous materials handling and disposal practices to ensure the activities would pose no risk to the public. All non-hazardous and nanoscale materials would be managed in accordance with pertinent federal, state, and local environmental regulations. Based on a review of the Prize Official Rules and a description of anticipated Phase 3 activities, DOE has determined that no adverse impacts to resources of concern are expected as a result of Phase 3 activities.

Any work proposed to be conducted at a federal facility may be subject to additional NEPA review by the cognizant federal official and must meet the applicable health and safety requirements of the facility.

NEPA PROVISION

DOE has made a final NEPA determination.

Notes:

Geothermal Technologies Office (GTO)
Review completed by Whitney Donoghue on 12/05/2022

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:


NEPA Compliance Officer

Date: 12/6/2022

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: _____
Field Office Manager

Date: _____