



U.S. Department of Energy

Categorical Exclusion Determination Form

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Proposed Action Title: University of California, Davis -- RECLAIM: Electrochemical Lithium and Nickel Extraction with Concurrent Carbon Dioxide Mineralization

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Davis and Los Angeles, California

Proposed Action Description:

Funding will support the project team's small-scale, research and development activities of acoustic stimulation and electrolytic proton production to produce lithium (Li) and nickel (Ni) from carbon dioxide (CO₂)-reactive minerals and rocks that contain calcium (Ca) and magnesium (Mg), while sequestering CO₂ in the form of carbonate solids. Specifically, the project team will develop and refine processes to dissolve minerals in water using an electric potential and acoustic stimulation to extract metal ions (Li and Ni). If successful, this project will produce energy-relevant minerals while reducing CO₂ emissions. The principal investigator previously worked at University of Texas at Arlington where project work covered by the attached CX determination, dated December 20, 2022, was performed. The investigator has since moved to the University of California, Davis where the project work will continue.

Project activities will be conducted at existing facilities at the University of California, Davis (Davis, CA) and University of California, Los Angeles (Los Angeles, CA) designed for the applicable activities. Project tasks fit within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impact of the project. Project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and local regulatory requirements. No modifications will be made to the existing facilities to accommodate the proposed work.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

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

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: **GEOFFREY GOODE** Digitally signed by GEOFFREY GOODE
Date: 2023.10.31 11:57:28 -04'00'

Date Determined:



U.S. Department of Energy

Categorical Exclusion Determination Form

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Proposed Action Title: Mining Innovations for Negative Emissions Resource Recovery (MINER) Program (FOA No. DE-FOA-0002707 and DE-FOA-0002708)

Program or Field Office: Advanced Research Projects Agency - Energy

Location(s) (City/County/State): Arlington, Texas; Los Angeles, California

Proposed Action Description:

The MINER Program seeks to increase the U.S. domestic supplies of copper, nickel, lithium, cobalt, and other rare earth elements. Specifically, projects funded under the MINER Program will investigate the potential carbon dioxide-reactive ores to unlock net-zero or net-negative emission technologies. If successful, MINER projects will decrease energy use of mineral processing and increase the yield of energy-relevant minerals via novel negative emission technologies.

The MINER Program is composed of 16 small-scale research and development projects that will be conducted by universities, for-profit entities, and federal laboratories. This Determination covers 1 of the 16 projects (University of Texas - Arlington) (see Attachment A). This project is covered by and fits within the class of actions identified under the DOE Categorical Exclusions identified below. This assessment was based on a review of the proposed scope of work and the potential environmental impacts of each project. All project tasks will be conducted in accordance with established safety and materials/waste management protocols and pursuant to applicable Federal, State, and Local regulatory requirements.

Categorical Exclusion(s) Applied:

A9 - Information gathering, analysis, and dissemination

B3.6 - Small-scale research and development, laboratory operations, and pilot projects

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

For the complete DOE National Environmental Policy Act regulations regarding categorical exclusions, including the full text of each categorical exclusion, see Subpart D of [10 CFR Part 1021](#).

Regulatory Requirements in 10 CFR 1021.410(b): (See full text in regulation)

The proposal 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 proposal that may affect the significance of the environmental effects of the proposal.

The proposal 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.

Based on my review of the proposed action, as NEPA Compliance Officer (as authorized under DOE Order 451.1B), I have determined that the proposed action fits within the specified class(es) of action, the other regulatory requirements set forth above are met, and the proposed action is hereby categorically excluded from further NEPA review.

NEPA Compliance Officer: Approved via email

Date Determined: December 20, 2022

**Attachment A: Projects in the MINER (FOA No. DE-FOA-0002707 and DE-FOA-0002708)
Program**

| Prime Recipient (Control No.) | Project Title | Categorical Exclusion |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------|------------------------------|
| University of Texas – Arlington (2707-1507) | RECLAIM: Electrochemical Lithium and Nickel Extraction with Concurrent Carbon Dioxide Mineralization | A9, B3.6, B3.15 |