

**SECTION A. Project Title:** Enabling the near-term commercialization of an electrorefining facility to close the metal fuel cycle

**SECTION B. Project Description and Purpose:**

The proposed action is a joint research and development (R&D) project between Argonne National Laboratory (Argonne), Idaho National Laboratory (INL), Oklo Inc, and Deep Isolation. Information obtained from this activity will be used to 1) inform a potential licensing basis for a future industrial electrorefining facility in the United States if a regulatory path for such development becomes available, and 2) the development of a final waste disposal strategy compatible with deep borehole disposal. Oklo, Inc. and Deep Isolation will give input regarding operational needs, and off-site work at these entity's locations is anticipated to be administrative in nature. The proposed action will use and modify existing pyroprocessing equipment at Argonne and INL. DOE evaluated the Argonne portion of the proposed action in Categorical Exclusion (CX)-025527 (<https://www.energy.gov/sites/default/files/2022-03/CX-025527.pdf>). The proposed action uses surrogate materials and does not use nuclear fuel.

INL will perform work at the Materials and Fuels Complex (MFC) in building 789 (MFC-789), Engineering Development Laboratory (EDL). The proposed action will use the fractional crystallization apparatus and well furnace in MFC-789. Chloride salts (i.e., NaCl, KCl, LiCl, CsCl, SrCl, REEC13) will be loaded into a crucible and loaded into the furnace. The salt will be melted and the cold plate (equipped with a cooling gas) will cause crystallization of the salt onto the cold plate. The purified salt on the cold plate will be manually extracted from the crystallization apparatus and collected for testing via inductively coupled plasma mass spectrometry (ICP-MS) at the Analytical Laboratory at MFC. At the end of the project, Waste Generator Services (WGS) will dispose of the salt. The project anticipates that about 10 kg of salt will be generated and disposed of as industrial waste. No radioactive materials will be used during the research and no radioactive waste will be generated.

**SECTION C. Environmental Aspects or Potential Sources of Impact:**

**Air Emissions**

NA

**Discharging to Surface-, Storm-, or Ground Water**

NA

**Disturbing Cultural or Biological Resources**

NA

**Generating and Managing Waste**

When wastes are generated, how they are disposed can adversely affect the environment. Managing wastes appropriately and responsibly and implementing recycling or reuse practices, where feasible, during project activities can reduce the potential impact on the environment.

**Releasing Contaminants**

When chemicals are used during the project there is the potential for spills that could impact the environment (air, water, soil).

**Using, Reusing, and Conserving Natural Resources**

NA

**Environmental Justice**

The INL Site is located within the boundaries of several census tracts identified as disadvantaged communities by the Council on Environmental Quality (CEQ) Climate and Economic Justice Screening Tool (CEJST) but has no permanent residents within its boundaries. There are no anticipated impacts to EJ in the communities surrounding the lab from the proposed action. ANL is not located in a disadvantaged community and the nature of the proposed work does not present a high potential to impact EJ conditions in surrounding communities. Deep Isolation and Oklo are not conducting work that presents a reasonable potential to impact any EJ conditions. Overall, any impacts across all communities are anticipated to be negligible should work partners follow their local, state, and federal procedures and regulations as required in their contract agreements.

**SECTION D. Determine Recommended Level of Environmental Review, Identify Reference(s), and State Justification:** Identify the applicable categorical exclusion from 10 Code of Federal Regulation (CFR) 1021, Appendix B, give the appropriate justification, and the approval date.

For Categorical Exclusions (CXs), the proposed action must not: (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environmental, safety, and health, or similar requirements of Department of Energy (DOE) or Executive Orders; (2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment or facilities; (3) disturb hazardous substances, pollutants,

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contaminants, or Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)-excluded petroleum and natural gas products that pre-exist in the environment such that there would be uncontrolled or unpermitted releases; (4) have the potential to cause significant impacts on environmentally sensitive resources (see 10 CFR 1021). In addition, no extraordinary circumstances related to the proposal exist that would affect the significance of the action. In addition, the action is not "connected" to other action actions (40 CFR 1508.25(a)(1) and is not related to other actions with individually insignificant but cumulatively significant impacts (40 CFR 1608.27(b)(7)).

**References:** B3.6 "Small-scale research and development, laboratory operations, and pilot projects"

**Justification:** Based on the purpose and need and description of the proposed action and potential environmental impacts, the proposed action fits within the class of actions that is listed in Appendix B CX B3.6. 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.

Authorizing the proposed action will not (1) threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health, including DOE and/or Executive orders; (2) require siting of new facilities or expansion of existing facilities; (3) disturb hazardous substances, pollutants, or contaminants; (4) adversely affect environmentally sensitive resources; or (5) involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act)     Yes     No

Approved by Robert Douglas Herzog, DOE-ID NEPA Compliance Officer on: 12/6/2024