

**U.S. Department of Energy-Idaho Operations Office
National Environmental Policy Act
Categorical Exclusion Determination**

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Categorical Exclusion Posting No.: DOE-ID-INL-26-010

Project Title: METALLIC Signature Projects

Project Description and Purpose:

The U.S. Department of Energy (DOE), through the Office of Fossil Energy and Carbon Management (FECM), established the Supply Chain Research Facility (also known as METALLIC) under the Bipartisan Infrastructure Law to support research and development (R&D) activities (Technology Readiness Levels 3–6) that strengthen domestic critical minerals and materials supply chains. Idaho National Laboratory (INL) will participate as co-lead of the Beneficiation Center and the Separations Center under METALLIC. INL's role supports development, testing, and validation of technologies to improve recovery, processing, and refinement of energy-critical materials from primary, secondary, and unconventional sources.

Proposed Activities

Beneficiation Center Activities

INL will support technology verification and validation activities focused on material characterization, beneficiation, and processing of feedstocks that may contain naturally occurring radioactive materials (NORM). Materials may include:

- Primary ores
- Secondary ores
- Slags and metallurgical byproducts
- Tailings
- Industrial byproducts
- Other geologic or environmental media

Activities may include:

- Geologic and mineralogical characterization
- Physical and chemical analysis
- Bench-scale and pilot-scale beneficiation testing
- Validation and optimization of physical separation methods
- Verification of pre-processing workflows for downstream separations
- Handling, storage, and management of materials consistent with applicable radiological, hazardous material, and waste management requirements

These activities are conducted at bench and pilot scale to verify and validate unit operations and materials performance and do not include commercial-scale mining, extraction, or production operations.

Separations Center Activities

The Separations Center (Center 2) will provide separations technology verification and validation capabilities and technical expertise to METALLIC participants and facility users. Activities will focus on testing, validation, and optimization of advanced separations technologies to enable recovery and purification of critical minerals and materials.

Separations technologies may include:

- Electrochemical processing
- Dimethyl ether crystallization
- Membrane separations
- Solvent extraction
- Precipitation and crystallization methods
- Other laboratory- and pilot-scale advanced separation processes

Activities may involve handling of chemical reagents, metal-bearing solutions, and solid materials, including materials containing NORM. All activities will comply with applicable environmental, safety, and radiological controls. The Beneficiation and Separations Centers at INL will operate in coordination to provide characterized and partially processed feedstocks for downstream technology validation conducted at other DOE National Laboratories participating in METALLIC.

Signature Projects

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METALLIC Signature Projects consist of multi-center, coordinated technology verification and validation efforts addressing defined critical mineral and material supply chain challenges. INL activities may support the following example projects:

Mines to Magnets Project

Activities may include concentration of rare earth elements (REEs) from unconventional resources; separation of magnet REEs (e.g., neodymium, praseodymium, terbium, dysprosium); production of refined rare earth metals at bench and pilot scale for technology validation; and support for advanced manufacturing of neodymium-iron-boron magnets.

STREAM Project

Activities may include beneficiation, purification, and conversion of industrial byproducts and secondary resources into battery-grade graphite and value-added co-products at bench and pilot scale for validation of process performance.

All project activities will remain within technology verification and validation scale (TRL 3–6) and will not include commercial-scale mining, refining, or manufacturing operations.

Locations

Activities will be conducted at INL’s Research and Education Campus (REC). The majority of work will occur in:

- Energy Innovation Laboratory (EIL)
- INL Research Center (IRC) laboratories
- Minor or supporting activities may occur at other REC facilities, as needed and as authorized.

Equipment

Potential equipment that will be purchased/used includes but is not limited to:

- Jeol Electron Microprobe
- Laser Ablation Inductively Coupled Plasma QQQ-Mass Spectrometer
- Ametek micro x-ray fluorimeter
- Retsch jaw crusher
- Retsch ball mill
- Riffle splitter
- Scanning Electron Microscope

Waste

Both the Mines to Magnets and the STREAM Signature Projects will involve laboratory tasks and activities which will give rise to waste streams at INL. The program will also monitor hazardous waste generation in association with the Perpetua project and coordinate with WGS to ensure the projects do not exceed the Small Quantity Generator limits established for the REC complex.

Waste Table:

Type	Materials	Amount
Industrial	Incidental PPE, wipes, pipette tips, and laboratory consumables (non-hazardous materials only)	Estimated at <150 lbs./month
Hazardous	Hazardous chemical waste and liquid organics.	Hazardous chemical waste is estimated at <200 lbs. dry solids/month <100 lbs. of liquid

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		organics per month.
Low level	Radioactive materials (U/Th) but having no hazardous chemicals present	Estimated quantities would be less than <200 lbs/month
Mixed	Both radioactive materials (U/Th) and RCRA Hazardous components	Estimated quantities would be less than <200 lbs/month

Environmental Aspects or Potential Sources of Impact:

Air Emissions

Project activities have the potential to release ozone depleting substances and greenhouse gases.

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.

Rare Earth and Critical Minerals research activities at the Idaho National Laboratory (INL) require the receipt of certain mining derived materials such as mineral ores, concentrates, tailings, and related materials. Some of these materials may contain naturally occurring uranium, thorium, and decay products and/or hazardous constituents. Compliant management of mining waste at INL requires process knowledge, characterization data, and site status of the source material. This will determine how materials and process waste are categorized, which regulatory requirements apply, and ultimately the appropriate disposition strategy. The BEA Waste Management Program's (WMP) Waste Generation Services (WGS) subcontractor assists projects in characterizing and managing source material and waste. WGS brokers handling and shipping of hazardous and radioactive waste.

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

Determination

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

Justification: The proposal fits within the classes of actions listed in Appendix B to 10 CFR Part 1021 or Appendix B and C of DOE's NEPA Implementing Procedures and satisfies the conditions that are integral elements of the classes of actions therein. The proposal does 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, 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

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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, Appendix B.

There is no extraordinary circumstance related to the proposal that is likely to cause a reasonably foreseeable significant adverse effect or for which DOE does not know the environmental effect. Extraordinary circumstances are unique situations presented by specific proposals, including, but not limited to, scientific controversy about the environmental effects of the proposal; uncertain effects or effects involving unique or unknown risks; and unresolved conflicts concerning alternative uses of available resources.

The proposal has not been segmented to meet the definition of a categorical exclusion. Segmentation can occur when a proposal is broken down into small parts in order to avoid the appearance of significance of the total action. However, segmentation does not include proposals that are developed and potentially implemented over multiple phases where each phase results in a decision whether to proceed to the subsequent phase.

B3.6 Small-scale research and development, laboratory operations, and pilot projects. Siting, construction, modification, operation, and decommissioning of facilities for small-scale 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.

Approved by Robert Douglas Herzog, DOE-ID NEPA Compliance Officer on: 5/6/2026