

DOE-ID NEPA CX DETERMINATION

Idaho National Laboratory

SECTION A. Project Title: Canadian Nuclear Laboratories Nuclear Materials demonstration with Spark Plasma Sintering

SECTION B. Project Description and Purpose:

Canadian Nuclear Laboratories (CNL) is a lead nuclear energy and environmental cleanup laboratory charged with similar research, development, and demonstration (RD&D) responsibilities for the Canadian government as Idaho National Laboratory (INL) is for the United States government. CNL is developing nuclear materials forms for waste disposition purposes and is interested in exploring Spark Plasma Sintering (SPS) as a method to rapidly consolidate nuclear waste streams for stable disposition.

INL Will complete the following for the project:

- 1) Receive uranium-bearing powders supplied by CNL
- 2) Conduct up to 10 SPS tests to form pellets from the powders per the process specification table below:
- 3) Measure geometric density of pellets
- 4) Measure immersion density of pellets
- 5) Return all sample materials to CNL

Item	Process Specification
Material	Uranium-bearing powders supplied by CNL. Powder composition and preparation details to be provided after NDA signed.
Pellet size	40 mm
Die material	Tungsten carbide (supplied ready to use by CNL)
Powder mass per sample	100-150 g each
Pressure	Up to 25 tons (~200 MPa for 40 mm die)
Temperature range	500-800°C
Heat/cool ramps	Various
Number of tests	Up to 10

The work will take place at Materials Fuels Complex (MFC-784) Advanced Fuels Facility (AFF) Spark Plasma Sintering furnace and glovebox.

The work involves generating general laboratory waste, such as weighing trays, kim wipes, and cleaning materials used to maintain cleanliness of glovebox during work. The work will generate natural or depleted uranium. The amount of waste generated will be less than 10 grams of natural or depleted uranium. The feedstock and products will be returned to CNL. General lab consumables, such as paper towels including materials that come in contact with the natural and depleted uranium and PPE will be estimated to be less than 1 kg. TRU waste will not be generated for this project.

**DOE-ID NEPA CX DETERMINATION
Idaho National Laboratory**

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

Emissions will be bound by existing equipment and are in compliance with the current Air Permitting Applicability Determination (APAD INL-17-008 R3) for Advanced Fuels Facility.

Discharging to Surface-, Storm-, or Ground Water

N/A

Disturbing Cultural or Biological Resources

N/A

Generating and Managing Waste

The waste generated will consist of natural or depleted uranium along with industrial waste: general laboratory waste (weighing trays, kim wipes, and cleaning materials) used to maintain cleanliness of the glovebox during work. No impact.

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

All materials will be reused and recycled where economically practicable. All applicable waste will be diverted from disposal in the landfill where conditions allow.

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, 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:

10 CFR 1021, Appendix B to subpart D, items B3.6, "Small-scale research and development, laboratory operations, and pilot projects"

Final Site-Wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Off-Site Locations in the State of Nevada (DOE/EIS-0426, December 2014).

Justification:

The proposed R&D activities are consistent with CX B3.6 "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); 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 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."

The environmental impacts of transferring LLW from the INL Site to the Nevada National Security Site were analyzed in the 2014 Final Site-Wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Off-Site Locations in the State of Nevada (DOE/EIS-0426) and DOE's Waste Management Programmatic EIS (DOE/EIS-200). The fourth Record of Decision (ROD) (65 FR 10061, February 25, 2000) for DOE's Waste Management Programmatic EIS established the Nevada National Security Site as one of two regional LLW and MLLW disposal sites.

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

Approved by Jason L. Anderson, DOE-ID NEPA Compliance Officer on: 12/06/2022