

PROJECT-SPECIFIC CATEGORICAL EXCLUSION FOR THE EVALUATION OF SPENT NUCLEAR FUEL, PACIFIC NORTHWEST NATIONAL LABORATORY, RICHLAND, WASHINGTON

Proposed Action:

The U.S. Department of Energy (DOE) proposes to receive eleven spent nuclear fuel rods from the Limerick Generating Station at the Pacific Northwest National Laboratory (PNNL). The eleven rods will be utilized to conduct research associated with isotope capture, non-proliferation, characterization, property testing, separation testing, and other topics.

Location of Action:

The eleven spent nuclear fuel rods were irradiated in Limerick Generating Station boiling water reactors and will be shipped from the Limerick Generating Station in Pottstown, Pennsylvania, to PNNL's Radiochemical Processing Laboratory (RPL, 325 Building), located in the 300 Area of the Hanford Site in eastern Washington. Research associated with the spent nuclear fuel rods will occur in the RPL (Figure 1). Radioactive waste will be shipped following established procedures to the Hanford Site for storage or disposal. Isotopes will be shipped to customers through the DOE-Isotope Program.

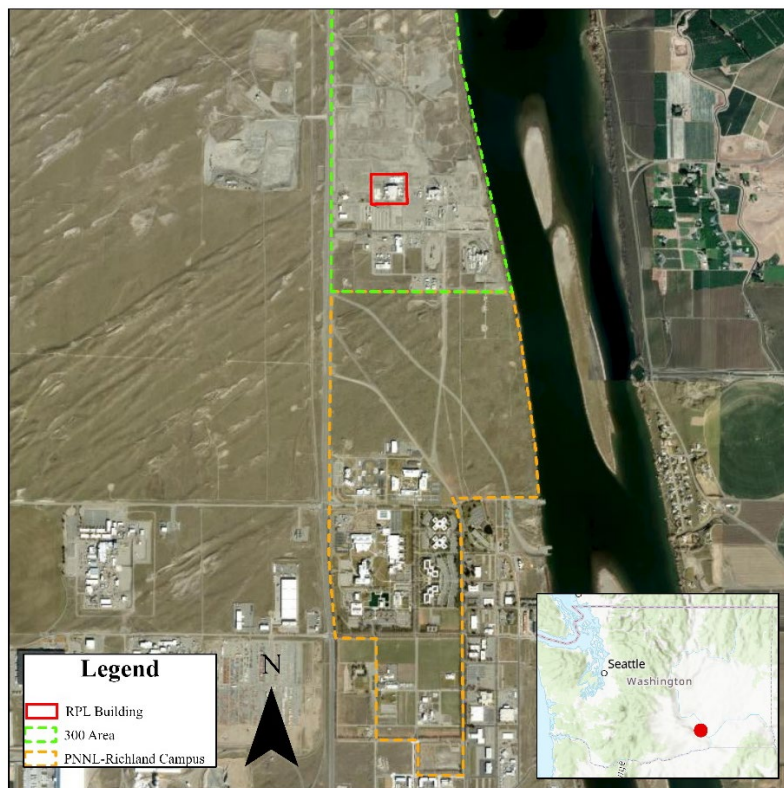


Figure 1. The RPL Building, Hanford Site 300 Area, and PNNL-Richland Campus.

Description of the Proposed Action:

PNNL will receive a shipment of eleven spent nuclear fuel rods from Limerick Generating Station and perform research associated with isotope capture, non-proliferation, characterization, property testing, separation testing, and other topics. The proposed action supports multiple DOE entities, including the National Nuclear Security Administration (NNSA), the Isotope Research, Development, and Production Program (DOE IP), and the Office of Nuclear Energy (DOE NE). Possession of the materials would comply with all facility limits, permits, and other approvals.

The eleven spent nuclear fuel rods were manufactured by Global Nuclear Fuel and irradiated in Limerick Generating Station boiling water reactors. The eleven rods consist of eight full length (165") rods and three partial length (<114") rods. Receipt of the rods at PNNL is expected in calendar year 2024 or 2025. Upon receipt at PNNL's RPL building, DOE will take title to, and own, the spent nuclear fuel. The NAC International-Legal Weight Truck (NAC-LWT) cask will be mated to a hot cell at the RPL, and the rods will be pulled into the hot cell, segmented, and placed in storage tubes.

PNNL will perform research on the spent nuclear fuel rods and byproducts to further national missions such as isotope development and nuclear non-proliferation. Research associated with the spent nuclear fuel rods includes but is not limited to characterization, mechanical property testing, collection of byproducts such as Kr-85 gas, use of solvent extraction and ion exchange to collect Sr-90 and other critical isotopes, solvent extraction flowsheet tests, and development of separation methods. Other projects may utilize the spent nuclear fuel or byproducts. Research activities involving the eleven spent nuclear fuel rods are expected to continue through 2028 and potentially beyond.

Isotopes collected from the spent nuclear fuel may be provided to customers through DOE IP with the mission of providing critical radioactive isotopes. Critical isotopes currently targeted for capture are Kr-85, Sr-90, Am-241, and Pm-147. The isotopes collected may change to meet national needs, which may require updates to permitting to maintain compliance under state and federal law. As planned, the proposed action constitutes a modification under the radioactive air regulations and a revised radioactive air permit (Notice of Construction) will be required to add sampling analysis requirements for certain radioactive isotopes. The proposed action will not measurably increase offsite radiation dose. Separated isotopes can be held in RPL for DOE IP to send to various clients.

Ultimate disposal pathways for waste streams are identified. Waste will be handled and processed for safe transfer. Waste will be within the capacity of the receiving facility and will comply with the receiving facility's waste acceptance criteria. The proposed action will produce low-level, mixed-low level, and transuranic radioactive (TRU) waste. Waste streams will be neutralized, treated, and grouted or solidified for disposal, as appropriate. Radioactive waste will be shipped following established procedures to the Hanford Site for storage or disposal. TRU waste will be sent to the Central Waste Complex (CWC) of the Hanford Site, and ultimately will be disposed of at the Waste Isolation Pilot Plant (WIPP) in New Mexico.

The activities evaluated in this categorical exclusion (CX) would meet all the following criteria:

1. Each activity would be conducted within existing structures that provide appropriate wastewater storage/handling, exhaust ventilation, air filtration, and additional confinement or controls appropriate to the nature of the materials and equipment used in the activity. The proposed action would not increase the quantities of materials in a manner that would necessitate a modification to the accident analyses for the RPL.
2. Each activity would comply with applicable facility safety and environmental administrative controls and permit requirements.
3. Inventories of hazardous and radioactive materials would be maintained at the lowest practicable levels while remaining consistent with continuing operations and research goals, pollution prevention measures, applicable permits and licenses, and waste minimization practices.
4. Releases of liquid and/or airborne substances to the environment would be minimized and remain compliant with applicable facility, local, state, and federal regulations and DOE Orders and PNNL guidelines. The RPL has continuously monitored and permitted stacks equipped with pollution prevention devices such as high-efficiency particulate air filters.
5. Wastes generated by proposed activities would be limited to wastes with an available treatment, storage, and/or disposal pathway(s). Volumes of waste generated by each activity would be reduced as much as possible by pollution prevention measures and waste minimization practices. Wastes would be dispositioned in accordance with applicable local, state, and federal regulations and DOE Orders and guidelines.
6. Materials and waste would be packaged and transported in accordance with local, state, federal, DOT and other applicable regulations.

The proposed action also includes reasonably foreseeable actions necessary for implementation such as radiological control and safety support; material storage, packaging, and transport; equipment and material staging; equipment/instrument installation, modification, calibration, and maintenance; award of grants and contracts; waste management, transport, treatment, storage, and disposal; and obtaining associated regulatory permissions. These activities would be managed in accordance to, and in compliance with, DOE orders, as well as federal, state, and local regulations and guidelines.

Biological and Cultural Resources:

Biological and cultural resource reviews are conducted for proposed actions with the potential to impact environmental resources. Work associated with the proposed action includes research occurring within the RPL. Cultural resources will not be affected by research occurring within facilities. The RPL has been determined eligible for listing on the National Register of Historic Places as a contributing component of the Hanford Site Manhattan Project and Cold War Era Historic District. The proposed action will not alter the property or any character defining features. Sensitive biological resources would not be affected by research occurring within facilities. The proposed action has no potential to impact biological or cultural resources. Activities that could

cause impacts to biological or cultural resources are not included in the scope of this CX.

Categorical Exclusion to be Applied:

As the proposed action is to perform research and development activities using spent nuclear fuel, the following CX, as listed in the DOE National Environmental Policy Act (NEPA) implementing procedures, 10 CFR 1021, would apply:

- 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.

Eligibility Criteria:

The proposed activity meets the eligibility criteria of 10 CFR 1021.41 O(b) because the proposed action does not have any extraordinary circumstances that might affect the significance of the environmental effects, 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 environmental impact statement preparation.

The "Integral Elements" of 10 CFR 1021 are satisfied as discussed below:

INTEGRAL ELEMENTS, 10 CFR 1021, SUBPART D, Appendix B (1)-(5)	
<i>Would the Proposed Action</i>	Evaluation
Threaten a violation of applicable statutory, regulatory, or permit requirements for environment, safety, and health?	The proposed action would not threaten a violation of regulations, DOE orders, or Executive Orders.
Require siting and construction or major expansion of waste storage, disposal, recovery, or treatment facilities?	No waste facilities would be constructed under this CX. Any generated waste would be managed in accordance with applicable regulations in existing facilities. Waste disposal pathways would be identified prior to generating waste and waste generation would be minimized.

Disturb hazardous substances, pollutants, or contaminants that preexist in the environment such that there would be uncontrolled or unpermitted releases?	No preexisting hazardous substances, pollutants, or contaminants would be disturbed in a manner that results in uncontrolled or unpermitted releases.
<p>Have the potential to cause significant impacts on environmentally sensitive resources, including, but not limited, to:</p> <ul style="list-style-type: none"> • protected historic/archaeological resources, • protected biological resources and habitat, • jurisdictional wetlands, 100-year floodplains, • Federal- or state-designated parks and wildlife refuges, wilderness areas, wild and scenic rivers, national monuments, marine sanctuaries, national natural landmarks, and scenic areas. 	No environmentally sensitive resources would be adversely affected by the proposed action. Refer to the Biological and Cultural Resources section for details regarding the project potential to impact environmental resources.
Involve genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species?	The proposed action does not involve the use of genetically engineered organisms, synthetic biology, governmentally designated noxious weeds, or invasive species.

Summary of Environmental Impacts:

The following table summarizes environmental impacts considered when preparing this CX determination.

Environmental Impacts Considered when Preparing this CX Determination	
<i>Would the Proposed Action</i>	Evaluation
Result in more than minimal air impacts?	Air impacts would be minimized as necessary and would be compliant with applicable permits, local, state, and federal regulations, DOE orders, and PNNL guidelines. The proposed action constitutes a modification under the radioactive air regulations and a revised radioactive air permit will be obtained consistent with project activities.
Increase offsite radiation dose measurably?	The proposed action would be performed within applicable environmental permits and would not increase the offsite radiation dose measurably.

<p>Require a radiological work permit?</p>	<p>The proposed action will be conducted in accordance with applicable radiological work permits. The activities will be performed in compliance with as low as reasonably achievable (ALARA) principles, applicable local, state, and federal regulations, DOE orders, and PNNL guidelines. Radiation received by workers during the performance of research activities would be administratively controlled below DOE limits as defined in 10 CFR 835.202(a). Under normal circumstances, those limits control individual radiation exposure to below an annual effective dose equivalent of 5 rem.</p>
<p>Discharge any liquids to the environment?</p>	<p>Liquid wastes can be generated during research activities. Liquid wastes generated by research activities would be discharged into existing treatment systems and/or disposed of in accordance with applicable regulations and best management practices.</p>
<p>Require a Spill Prevention, Control, and Countermeasures plan?</p>	<p>The proposed action is not expected to require a formal Spill Prevention, Control, and Countermeasures plan.</p>
<p>Involve hazardous, radioactive, polychlorinated biphenyl, or asbestos waste?</p>	<p>The proposed action will involve hazardous and radioactive waste streams. Wastes generated by proposed activities would be limited to wastes with an available onsite or off-site treatment, storage, and/or disposal pathway(s). Volumes of waste generated by each activity would be reduced as much as possible by pollution prevention measures and waste minimization practices. Waste will be characterized, handled, packaged, transported, treated, stored, and/or disposed of in treatment, storage, and disposal facilities as appropriate in accordance with applicable regulations.</p>
<p>Use carcinogens, hazardous, or toxic chemicals/materials?</p>	<p>The proposed action may involve the use of carcinogens, hazardous and/or toxic chemicals and materials. Project inventories would be maintained at the lowest practicable levels, and chemical wastes would be recycled, neutralized, or regenerated if possible. Product substitution (use of less toxic chemicals in place of more toxic chemicals) would be considered when reasonable.</p>
<p>Cause more than a minor or temporary increase in noise level?</p>	<p>The proposed action is not expected to cause an increase in ambient noise levels.</p>
<p>Create light/glare, or other aesthetic impacts?</p>	<p>The proposed action is not expected to create light, glare, or other aesthetic impacts.</p>

Require an excavation permit (e.g., for test pits, wells, utility installation)?	The proposed action is not expected to require an excavation permit.
Disturb an undeveloped area?	The proposed action is not expected to disturb an undeveloped area.
Result in more than minimal impacts on transportation and public services?	The proposed action will not have more than minimal impacts on transportation and public services.
Disproportionately impact low-income or minority populations?	The proposed action will not disproportionately impact low income or minority populations.
Require environmental or other permits from federal, state, or local agencies?	Federal, state, and/or local environmental permits will be required for the proposed action. All permits will be acquired or updated prior to project activities and activities will abide by all applicable permit requirements.

Compliance Action:

I have determined that the proposed action satisfies the DOE NEPA eligibility criteria and integral elements, does not pose extraordinary circumstances, and meets the requirements for the CX referenced above. Therefore, using the authority delegated to me by DOE Policy 451.1, I have determined that the proposed action may be categorically excluded from further NEPA review and documentation.

Signature: _____

Tom McDermott
PNSO NEPA Compliance Officer

cc: ES Norris, PNNL