Environmental Review Form for Argonne National Laboratory

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Created By:	Woodford, John B.

Creator

Badge:	**51790**	Name:	**Woodford, John B.**
Cost Center:	**115**	Division:	**NE**
Job Title:	**Manager, ESH/QA Operations**	Employee Type:	**Regular Full-Time Exempt**
Building:	**208**	Lab Extension:	**2-0910**

General Information

Project/Activity Title: Mechanisms Engineering Test Loop

ASO NEPA Tracking No.: Type of Funding:

B & R Code: RC0418000 Identifying Number: NE17-001

SPP Proposal Number: CRADA Proposal Number:

Work Project Number: ANL Accounting Number: (Item 3a in Field Work Proposal)

Other (explain): Nuclear Engineering Division Internal Tracking Number 11-13

List appropriate NEPA Owners:

Division: NE NEPA Owner:

Cost Code

Task: Center: Project: Activity:

Description of Proposed Action

The Mechanisms Engineering Test Loop (Test Loop), a loop for testing small- to intermediate-scale sodium components for advanced reactor technology will be constructed at Argonne. Examples of such components include (but are not limited to) fuel handling systems; self-actuated control and shutdown systems, including fusible links, curie-point magnets, and others; advanced sensors and instrumentation, including hydrogen sensors, impurity detectors, leak detectors, improved level measurement devices, and improved performance sensors; visualization sensors for in-service inspections; self-welding/sealing materials for leak repair in contact with the primary coolant; self-cooled pumps; etc. Testing would include thermal-hydraulic tests of various components and systems, as well as tribological testing of seals and other sliding/rolling components in the sodium environment. The test loop consists of a number of connected sodium test vessels with common pumping, dump tank, cover gas systems, and purification system. The dump tank, a reservoir that can be used to hold the contents of the test loop if it becomes necessary, has a volume of 3000 L, and the total volume of sodium in the loop will not exceed the capacity of the dump tank. A number of the test vessels may also have their own dump tanks.

Description of Affected Environment

The test loop has been constructed in the high bay in Bldg. 308. This area was designed with alkali metal service in mind; although it has smoke detectors, it lacks fire suppression systems, and is constructed of fire-resistant materials. It has a high-capacity scrubber to mitigate the effects of an alkali metal leak or fire. Note that the scrubber already has appropriate permits to operate as a waste treatment facility, and will be used to dispose of any waste sodium produced as a result of experimental and other activities with the test loop. Waste treatment is covered under a separate NEPA evaluation. (ASO-CX-225 Operation of the Alkali Metal Passivation Booths (AMPB) at Buildings 206 and 308.) Where it is not appropriate to use the scrubber (for example, when cleaning incidental sodium contamination adhering to test components), sodium-bearing items will be cleaned via a controlled reaction between the sodium and moist carbon dioxide gas. The reaction produces hydrogen gas and solid sodium bicarbonate, and is sufficiently slow that creation of an explosive mixture of hydrogen is not credible.

Potential Environmental Effects

- Attach explanation for each "yes" response near bottom of form.
- **See Instructions for Completing Environmental Review Form.**

Section A (Complete For All Projects)			Yes	No	Explanation
1.	Project evaluated for Pollution Prevention and Waste Minimization opportunities and details provided under items 2, 4, 6, 7, 8, 16, and 20 below, as applicable		◉	○	See details below.
2.	Air Pollutant Emissions		◉	○	No air emissions are expected during normal facility operations. In the event of a sodium leak and fire, caustic sodium oxide/sodium hydroxide smoke would be produced. This smoke will be managed by the installed scrubber system. The scrubber system is designed to remove at least 99% of this material before it is exhausted from the scrubber.
3.	Noise		◉	○	Normal operation of the test loop will not present a noise hazard. When the scrubber is in operation (only during a sodium fire from the facility or when it is being used for waste treatment), it produces quite a lot of noise. Personnel will be provided with appropriate protective equipment when needed. It is not noisy enough to pose a hazard to the environment outside the building.
4.	Chemical/Oil Storage/Use		◉	○	The test loop once fully operational is proposed to contain up to 3000 L sodium. Other chemicals may include cleaning solvents in the general area, but not in the test loop.
5.	Pesticide Use		○	◉	
6.	**Toxic Substances Control Act (TSCA) Substances**				
	6a.	Polychlorinated Biphenyls (PCBs)	○	◉	
	6b.	Asbestos or Asbestos Containing Materials	○	◉	
	6c.	Other TSCA Regulated Substances	○	◉	
	6d.	Import or Export of Chemical Substances	○	◉	
7.	Biohazards		○	◉	
8.	Effluent/Wastewater (If yes, see question #12 and contact Peter Lynch (FMS-SEP) at 2-4582 or lynch@anl.gov)		◉	○	When the existing scrubber is in use, it produces large volumes of dilute aqueous sodium hydroxide solutions, which are drained to Argonne¿s laboratory sanitary sewer system. No wastewater is anticipated to be produced during normal facility operations, except when the scrubber is being used during a spill or leak of sodium metals or when it is being used as a waste treatment facility as described in ASO-CX-225.
9.	**Waste Management**				
	9a.	Construction or Demolition Waste	○	◉	
	9b.	Hazardous Waste	◉	○	As noted above, the existing scrubber produces large volumes of dilute aqueous sodium hydroxide solutions, which are drained to Argonne¿s laboratory sanitary sewer system. Waste sodium will be treated and disposed of using the scrubber.
	9c.	Radioactive Mixed Waste	○	◉	
	9d.	Radioactive Waste	○	◉	
	9e.	Asbestos Waste	○	◉	
	9f.	Biological Waste	○	◉	
	9g.	No Path to Disposal Waste	○	◉	
	9h.	Nano-material Waste	○	◉	
10.	Radiation		○	◉	

11.	Threatened Violation of ES&H Regulations or Permit Requirement	○	◉	
12.	New or Modified Federal or State Permits	○	◉	
13.	Siting, Construction, or Major Modification of Facility to Recover, Treat, Store, or Dispose of Waste	○	◉	
14.	Public Controversy	○	◉	
15.	Historic Structures and Objects	○	◉	
16.	Disturbance of Pre-existing Contamination	○	◉	
17.	Energy Efficiency, Resource Conserving, and Sustainable Design Features	◉	○	The use of common components and insulation on the sodium loop will allow for reduced energy and material use in the test loop, compared with a set of smaller sodium test facilities that would perform the same range of experiments. In the event of a leak, sodium will be drained into the dump tank, minimizing the amount of sodium that will be wasted in leakage. A purification system to remove dissolved sodium oxide increases the usable lifetime of the sodium in the loop, reducing waste produced. When removing test components from a vessel, sodium will be allowed to drain from the vessel before it is opened, further minimizing the amount of waste.
Section B (For Projects that Occur Outdoors)		**Yes**	**No**	
18.	Threatened or Endangered Species, Critical Habitats, and/or other Protected Species	○	○	
19.	Wetlands	○	○	
20.	Floodplain	○	○	
21.	Landscaping	○	○	
22.	Navigable Air Space	○	○	
23.	Clearing or Excavation	○	○	
24.	Archaeological Resources	○	○	
25.	Underground Injection	○	○	
26.	Underground Storage Tanks	○	○	
27.	Public Utilities or Services	○	○	
28.	Depletion of a Non-Renewable Resource	○	○	
Section C (For Projects Outside of ANL)		**Yes**	**No**	
29.	Prime, Unique, or Locally Important Farmland	○	○	
30.	Special Sources of Groundwater (such as sole source aquifer)	○	○	
31.	Coastal Zones	○	○	
32.	Areas with Special National Designations (such as National Forests, Parks, or Trails)	○	○	

33.	Action of a State Agency in a State with NEPA-type Law	○	○	
34.	Class I Air Quality Control Region	○	○	

Categorical Exclusion

Other (Use field below to enter other categorical exclusion)

10 CFR 1021 Appendix B to Subpart D, B3.6 "Siting/construction/operation/decommissioning of facilities for bench-scale research, conventional laboratory operations, small-scale research and development and pilot projects."

ANL NEPA Reviewer Use Only

○ My approval is the final approval necessary

◉ This form requires additional approval from DOE

To be Completed by DOE/ASO

Section D	Yes	No
Are there any extraordinary circumstances related to the proposal that may affect the significance of the environmental effects of the proposal?	○	◉
Is the project connected to other actions with potentially significant impacts or related to other proposed action with cumulatively significant impacts?	○	◉
If yes, is a categorical exclusion determination precluded by 40 CFR 1506.1 or 10 CFR 1021.211?	○	○
Can the project or activity be categorically excluded from preparation of an Environment Assessment or Environmental Impact Statement under Subpart D of the DOE NEPA Regulations?	◉	○
If yes, indicate the class or classes of action from Appendix A or B of Subpart D under which the project may be excluded: Appendix B.6 Small-scale research and development, laboratory operations, and pilot projects		
If no, indicate the NEPA recommendation and class(es) of action from Appendix C or D to Subpart D to Part 1021 of 10 CFR.		

Attachments

File Description:

Comments

Add Approver

Approver Name	Approver Badge	Reason	Delete
Riel, Roberta T.	30889	Division NEPA Owner (unlisted)	

Notifications

The approval notification email will be copied to the people listed below.

Badge	Name	Division	Delete

ASO-CX Number

ASO-CX- 335

Comments:

Approved under the category of Appendix B.6 Small-scale research and development, laboratory operations, and pilot projects.

Approval

Approver	Action	Date Routed	Action Date	Approval Reason / Comments	Approval Type

Woodford, John B.	APPROVED	2016-11-16	2016-11-16 17:19:53.0	Creator :	PRIMARY
Woodford, John B.	APPROVED	2016-11-16	2016-11-16 17:19:53.0	Project Manager :	PRIMARY
Riel, Roberta T.	APPROVED	2016-11-16	2016-11-17 06:28:35.0	Division NEPA Owner (unlisted) :	PRIMARY
Brocker, William A.	APPROVED	2016-11-17	2016-11-17 08:28:05.0	NEPA Owner Approval for Argonne Environmental Review :	PRIMARY
Ptak, Jill S.	APPROVED	2016-11-17	2016-11-21 17:10:06.0	ANL NEPA Reviewer :	PRIMARY
Hellman, Karen B.	APPROVED	2016-11-21	2016-11-30 15:59:01.0	ANL-985 Review and Approval :	PRIMARY
Stine, Gail Y.	APPROVED	2016-11-30	2016-12-01 14:07:06.0	ANL-985 Review and Approval :	PRIMARY
Kearns, Paul K.	APPROVED	2016-12-01	2016-12-01 15:44:46.0	ANL-985 ANL COO Review and Approval :	PRIMARY
Joshi, Kaushik N.	APPROVED	2016-12-01	2016-12-08 14:42:16.0	ANL-985 DOE-ASO Review and Approval : **ASO-CX-335Approved under the category of Appendix B.6**	PRIMARY
Siebach, Peter R.	APPROVED	2016-12-08	2016-12-13 09:17:34.0	ANL-985 DOE NEPA Compliance Officer Review and Approval :	PRIMARY