Environmental Review Form for Argonne National Laboratory

Form:	ANL-985
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Created By:	Flores, Martin Salvador

Creator

Badge:	**304959**	Name:	**Flores, Martin Salvador**
Cost Center:	**254**	Division:	**WSH**
Job Title:	**ESH Multi-Functional 2**	Employee Type:	**Regular Full-Time Exempt**
Building:	**205**	Lab Extension:	**2-3489**

General Information

Project/Activity Title: Operation of 3 MeV electron Van de Graaff Accelerator

ASO NEPA Tracking No.: ASO-CX-258 Type of Funding: operation funds

B & R Code: Identifying Number: ASO-CX-258

SPP Proposal Number: CRADA Proposal Number:

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

Other (explain):

List appropriate NEPA Owners:

Division: EOF NEPA Owner:

Financial Plans

To select a Financial Plan, click the magnifying glass icon to open a search window.

Cost Center: Project: Phase: Task:

Description of Proposed Action

The 3 MeV Van de Graaf electron accelerator is an existing facility maintained and operated by the Experimental Operations and Facilities (EOF) Division to study radiation induced effects in solid, liquid, and gaseous samples. Small quantities of materials (including liquid chemicals) and small mechanisms may be irradiated to determine their stability in high radiation fields. This review covers the operation and maintenance of the 3 MeV Van de Graaf electron accelerator to meet program needs. The accelerator will be operated and maintained within the limits set forth in its DOE-approved Accelerator Safety Envelope (ASE). Any experiment taking place would be evaluated for Unreviewed Safety Issues (USI) according to LMS-PROC-188 "Accelerator Safety" and DOE O 420.2C and its successors. In addition, this review covers any other bench scale experiments that would use the accelerator facility as a part of their research.

Description of Affected Environment

The Van de Graaff accelerator facility is located at Argonne National Laboratory which is a multidisciplinary science and engineering research center. The accelerator facility is located in Building 211, room E-046 (1,010 square ft room) and utilizes a closed loop cooling water system and a one pass air ventilation system. The energy of the generating electrons is low enough that no radioactivity can be induced in common materials. There are only two exceptions: nuclei which have low enough activation thresholds. These two (deuterium and beryllium) are administratively excluded from experiments per the DOE-approved Accelerator Safety Envelope (ASE).

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
	Project evaluated			

1.	for Pollution Prevention and Waste Minimization opportunities and details provided under items 2, 4, 6, 7, 8, 16, and 20 below, as applicable	◉	○	Experiments will be designed to use the minimum of materials needed to obtain the desired results.
2.	Air Pollutant Emissions	◉	○	The accelerator tank is filled with a gas mixture of 2% SF6, 5% CO2, and 93% Nitrogen. On average, two size 300 AirGas cylinders of SF6 and CO2 are used each year. As greenhouse gases, SF6 and CO2 would be managed accordingly with the Argonne Sustainability Program. Some bench-scale research activities may emit low levels of hazardous air pollutants or criteria pollutants but are considered an insignificant activity under the Argonne Title V permit. Radionuclides can be used if they are currently permitted for use.
3.	Noise	◉	○	Noise hazards would be addressed through the work planning and control process. The proposed research activities will not increase outdoor noise levels over background and will not impact any animals or people. Experimental equipment assembly work allowed under this categorical exclusion may generate intermittent indoor noise levels that would require hearing protection and would be identified in the work planning and control process as per LMS-MNL-10 "Work Planning and Control Manual."
4.	Chemical/Oil Storage/Use	◉	○	Small amounts of common solvents are used for cleaning of vacuum equipment during maintenance activities, and the solvents would be stored in approved flammable liquid cabinets when not in use. Bench scale activities that use the accelerator facility for any experiment taking place would be evaluated for unreviewed safety issues according to Proc-188 and DOE O 420.2C and its successors. The proposed activities may involve the use and storage of chemicals. The amount of chemicals used in a single experiment, measurement, or test would be limited to five gallons of hazardous liquid and five pounds of hazardous solid. If project scope changes are identified that would require exceeding the 5 gallon or 5 pound bench-scale limit, this would be identified in the work planning and control process as per LMS-MNL-10 "Work Planning and Control Manual." The production, acquisition, storage, or use of chemicals would follow the requirements outlined in applicable LMS procedures. This includes following the import/export requirements under the TSCA procedures. The proposed activities may involve the use and storage of nanomaterials which would be monitored and approved by Argonne Industrial Hygiene Subject Matter Experts in accordance with LMS-PROC-83 (Safe Handling of Nanomaterials) and the applicable LMS-MNL-10 "Work Planning and Control Manual" processes.
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 (HSE) at 2-4582 or lynch@anl.gov)			
9.	**Waste Management**				
	9a.	Construction or Demolition Waste	○	◉	
	9b.	Hazardous Waste	◉	○	The experiments may entail the production of hazardous waste. All RCRA hazardous waste generated during facility operations would be accumulated (in a Satellite Accumulation Area(s)) by qualified personnel who underwent Argonne-specific training. Requisitions for transfer of accumulated hazardous waste to a central on-site facility are completed by Argonne-certified personnel. The research personnel conform to the requirements in LMS-PROC-103 "Satellite and Central Accumulation Areas." All on-site treatment, storage, and disposal would be performed in accordance with the RCRA Part B permit issued by the Illinois Environmental Protection Agency (IEPA). Any unused feed chemicals would be initially placed on the excess chemical inventory and if no new uses are found they would be disposed of by Argonne's waste management.
	9c.	Radioactive Mixed Waste	◉	○	The proposed activities may involve generation of radioactive mixed waste. The waste would be accumulated, managed, and documented in accordance with LMS-PROC 310 (Radioactive Waste Disposal.) Generators would consult with Health Physics and Waste Management personnel before the generation of unusual or difficult waste streams. Personnel who generate waste and those who prepare waste requisitions are required to complete the chemical waste generator and radioactive waste generator training.
	9d.	Radioactive Waste	◉	○	The experiments may entail the production of radioactive waste. The waste would be accumulated, managed, and documented in accordance with LMS-PROC 310 (Radioactive Waste Disposal.) procedures. Generators would consult with Health Physics and Waste Management personnel before the generation of unusual or difficult waste streams. Personnel who generate waste and those who prepare waste requisitions are required to complete the required radioactive waste generator training in accordance with the requirements outlined in applicable LMS procedures.
	9e.	Asbestos Waste	○	◉	
	9f.	Biological Waste	○	◉	
	9g.	No Path to Disposal Waste	○	◉	
	9h.	Nano-material Waste	◉	○	Experiments with the van de Graaff may require the use of engineered nanomaterials. Nanomaterial waste would be handled in accordance with LMS-PROC-224 "Handling of Engineered Nanomaterials for Disposition."
10.	Radiation		◉	○	The 3 MeV Van de Graaf accelerator can produce ionizing radiation (beta and gamma rays) at energies up to 3 MeV. The produced fields are contained within sufficient shielding to prevent elevated radiation levels outside of the facility, and does not create a radiation hazard for the public. The interlock systems prevent any personnel being inside the shielded volume during operation. Bench scale activities that use the accelerator facility for any experiment taking place would be evaluated for Unreviewed Safety Issues (USI) according to LMS-PROC-188 "Accelerator Safety" and DOE O 420.2C and its successors. Radiological protection would be provided in accordance with LMS-PROC 140 (Radiological Work Permit) Planned radiation exposures would follow the principle of "As Low as Reasonably Achievable" and will not exceed the Argonne administrative limits.
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	○	◉	
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)	○	○	
	Action of a State Agency in a State			

33.	with NEPA-type Law	○	○	
34.	Class I Air Quality Control Region	○	○	

Categorical Exclusion

Other (Use field below to enter other categorical exclusion)

Operation of 3 MeV accelerator could fall under 10 CFR1021, Appendix B: B3.6 Small-scale research and development, laboratory operations, and pilot projects and/or B3.10 Particle accelerators

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:

This project may be excluded under the following classes of action from 10 CFR, Part 1021, Subpart D, Appendix B: B 3.6 Small-scale research and development, laboratory operations, and pilot projects. B 3.10 Operation/Maintenance of particle accelerators with primary beam energy of less than 100 MeV.

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

Reviewed draft of this ERF with DOE and EGS on 10/14/2021. Updates have been made to address those comments.

Add Approver

Approver Name	Approver Badge	Reason	Delete
Woodford, John B.	51790	ESHC	
Harris, Amy M.	49490	NEPA Owner	
Chemerisov, Sergey D.	50531	LEAF Manager	
McCormick, Diep Quan	58921	Radiological Safety	
Mesarch, Matthew B	291600	Environmental & Sustainability	

Notifications

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

Badge	Name	Division	Delete
291600	Mesarch, Matthew B	ESH	
58921	McCormick, Diep Quan	ESH	

ASO-CX Number

ASO-CX- 393

Comments:

ASO-CX-258, which was approved in December 2009, has been updated as ASO-CX-393.

Approval

Approver	Action	Date Routed	Action Date	Approval Reason / Comments	Approval Type
Flores, Martin Salvador	APPROVED	2021-12-02	2021-12-02 11:53:22.0	Creator :	PRIMARY
Flores, Martin Salvador	APPROVED	2021-12-02	2021-12-02 11:53:22.0	Allows access to the form :	PRIMARY
Flores, Martin Salvador	APPROVED	2021-12-02	2021-12-02 11:53:22.0	Project Manager :	PRIMARY
Harris, Amy M.	APPROVED	2021-12-02	2021-12-03 08:39:48.0	NEPA Owner :	PRIMARY
Chemerisov, Sergey D.	APPROVED	2021-12-02	2021-12-13 09:47:46.0	LEAF Manager :	PRIMARY
Woodford, John B.	APPROVED	2021-12-02	2021-12-02 16:14:13.0	ESHC :	PRIMARY
McCormick, Diep Quan	APPROVED	2021-12-02	2021-12-03 12:29:12.0	Radiological Safety :	PRIMARY
Mesarch, Matthew B	APPROVED	2021-12-02	2021-12-06 11:27:05.0	Environmental & Sustainability :	PRIMARY
Harris, Amy M.	APPROVED	2021-12-03	2021-12-03 08:39:48.0	NEPA Owner Approval for Argonne Environmental Review :	PRIMARY
Ptak, Jill S.	APPROVED	2021-12-13	2021-12-17 15:33:26.0	ANL NEPA Reviewer : **ERF for the continued operation of existing accelerator and would serve as generic CX. This approach is rather than doing individual ERF for each experiment run on the equipment**	PRIMARY
Hellman, Karen B.	APPROVED	2021-12-17	2021-12-21 14:42:59.0	ANL-985 Review and Approval :	PRIMARY
Dunn, Michael W.	APPROVED	2021-12-21	2021-12-31 08:14:14.0	ANL-985 ANL Deputy COO Review and Approval :	PRIMARY
Joshi, Kaushik N.	APPROVED	2021-12-31	2022-01-18 11:40:30.0	ANL-985 DOE-ASO Review and Approval : **This DOE's NEPA CX approval is tracked as ASO-CX-393 (new).With this, ASO-CX-258 has been updated.**	PRIMARY
Siebach, Peter Rudolf	APPROVED	2022-01-18	2022-01-18 14:17:44.0	ANL-985 DOE NEPA Compliance Officer Review and Approval :	PRIMARY