DOE-ID NEPA CX DETERMINATION
Idaho National Laboratory

CX Posting No.: DOE-ID-INL-19-045

SECTION A. Project Title: Nuclear Forensics Deployment Team Training

SECTION B. Project Description and Purpose:

The proposed action plans, prepares, coordinates, ships materials off-site, observes, and completes radiological response training at Idaho National Laboratory (INL) locations. The proposed action furnishes a training environment for the National Nuclear Security Administration (NNSA) to test field team measurements, sample handing and contamination control equipment, and assess simulated radioactive fallout. This Radiological Dispersion Device (RDD) Exercise is designed to train participants in near real life radiological environments. The proposed action uses glass samples containing relatively short-lived radioactive isotopes to simulate radioactive fallout about 48 to 96 hours after an incident. Preparing these glass samples at INL is covered in environmental checklist (EC) INL-14-088 (OA 18). Sealed sources may also be used.

The project plans to generate isotopes on-site, at Idaho State University's (ISU's) accelerator, or use commercial medical isotopes. Radioactive materials may be mixed with small amounts of soil and environmental debris. The source of the soil and debris will be vacuumed from concrete and asphalt surfaces.

The proposed training takes place at the INL Site, at the INL Research Center (IRC)-603 in Idaho Falls, and at ISU in Pocatello. Activities will be performed at the Power Burst Facility (PBF)-623 area at the INL Site OR at IRC-603, not both. The work activities include the following:

- Transferring depleted U foils to the Idaho Accelerator Center at ISU for irradiation
- Transferring irradiated foils back to INL
- Separating fission products from U followed by adding the fission products to glass spheres at Central Facilities Area (CFA)-625 and creating test samples from the radioactive glass spheres
- Transferring radioactive glass spheres to PBF-623 or to IRC-603 labs A-7 and/or A-11
- Establishing a temporary tent-based response center at PBF-623 or the northwest grass area of IRC-603
- Segregating samples based on radiation readings and sample material based on particle size
- Measuring targets using equipment that produces x-rays and gamma rays (e.g., portable x-ray generators, Betatrons and radioisotope sources)
- Creating radiation fields for training and exercises that emulate pre- and post-RDD and Incendiary Nuclear Device (IND) radiation environments
- Examining radiation effects and influence on equipment and measuring devices
- Validating techniques, procedures, and processes used for responding to radiological events
- Dismantling the tent-based response center and returning to home base.

The following controls will be incorporated into the proposed training activities:

- Using only Category IV or less quantity of Special Nuclear Materials (SNM)
- Following INL procedures for using fissionable material.
- Storing and transferring nuclear materials in compliance with INL and BEA procedures
- Receiving, transporting, and returning radiological and nuclear materials
- Handling and staging radioactive materials and sources
- Operating radiation generating devices and equipment
- Demonstrating equipment and supervision in controller and evaluator positions
- Handling radiological and nuclear materials, working in radiologically controlled areas, staging and supporting training under Health Physics/Radiation Control supervision
- Supplying radioactive sources and samples
- Training in dosimetry for participants.

Training Exercises at INL

Equipment is placed on trucks and transported to PBF-622 or PBF-623 at the Critical Infrastructure Test Range Complex (CITRC) or the IRC in Idaho Falls. All activities at PBF-623 take place on asphalt or concrete; no activities are permitted on unpaved surfaces at CITRC. The proposed action utilizes grass-covered surfaces on the northwest side of IRC. At IRC, sieving radioactive materials in sol-gels (glass-type material) will only take place in IRC-603 laboratories A-7 and samples will be stored in IRC-603 A-11. Six tents house the proposed training and support the following operations: command and control, field information management, logistics, health physics, sample sieving, high grade, and triage. Each tent has portable generators for power, lighting, and tables and chairs.

Ten samples will be manufactured at CFA. At CFA, the depleted uranium foils irradiated at ISU will be dissolved, and uranium will be removed from the solvent. Liquid chromatography will be used to isolate and separate select fission products: namely zirconium -95 and -97 (95Zr and 97Zr), molybdenum-99 (99Mo), tellurium-132 (132Te), barium-140 (140Ba), neodymium-147 (147Nd), and cerium-141, -143 and 144 (141Ce, 143Ce, 144Ce). After separation, the fission products will be fully sealed and encapsulated in glass spheres varying in size (several mm in diameter to 30 microns in diameter). Particles less than 30 microns in diameter will be omitted and retained for future use or disposed as low level radioactive waste (LLW). Sample masses will be around 0.5 to 5 grams. Some samples will be mixed with light quantities of soil to test high grade and sieve operations. The project limits SNM to Category IV or less.

The project performs some tasks in a glove bag with HEPA filtration in a tent (if the work takes place at PBF-623). A mobile 15 KW gasoline-powered generator, with a spill tray under it, supplies power to the filter blower and other equipment. Glove bag work at IRC will be performed in Lab A-7.

Trainees perform visual and radiometric sample assessments of the sample, remove non-fallout debris, and reduce sample mass to enable laboratory analysis (from 10's of microns to millimeters in diameter). Samples may be sieved to segregate the fallout from soil and other debris. Larger samples may be removed by hand using tweezers.

Solid and liquid wastes will be collected in containers, and LLW will be stored to allow radioactive decay then disposed as non-radioactive waste. If work is performed at IRC-603, the radioactive samples will be shipped to PBF-623 for analysis, decay, and disposal.

Portable sanitary facilities may be used to support training at PBF, and the effluent may be disposed at the CFA sewage treatment plant or at an off-site municipal sewer system.

Portable/mobile electrical generators may be used to support temporary work locations.

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions

Air emissions from engines are expected to be the primary air contaminant and include exhaust from portable electrical generators and potential radioactive emissions to the air from buildings and tents. Generators will be removed following training and no permitting is required. Potential radioactive emissions from the lab at CFA, PBF, and IRC will be considered in the annual Rad NESHAPS report. Radionuclides sealed in glass generally decay to undetectable quantities before the glass encapsulation degrades enough to release the radionuclides to the free environment.

Disturbing Cultural or Biological Resources

While off-asphalt activities are not planned, project personnel are reminded of sensitive cultural sites near the proposed exercise location. The old pond area northeast of PBF-622 (shown below) is restricted - no entry is allowed.

Generating and Managing Waste

The proposed action has the potential to generate industrial waste, LLW, and sanitary waste. Activities at CFA have the potential to generate hazardous and mixed waste. All waste will have a path for disposition prior to being generated. Low-level radioactive samples and waste may be stored at PBF for decay prior to disposal.

Industrial waste includes common office trash and non-radioactive sample materials. Common wash water may also be generated. Wash water discharged at the IRC will meet city sewer discharge limits. Wash water may be discharged to a local septic system, the Idaho Falls sewer system, or the CFA sewage treatment plant.

LLW includes personal protective equipment (PPE) and sample materials and may be disposed as radioactive waste or stored for decay until cleared by RadCon personnel for disposal as non-radioactive. Liquid radioactive/mixed waste may be solidified before disposal in an off-site landfill. Used HEPA filters will be stored for reuse or disposed as LLW. Sanitary waste may be disposed at the CFA sewage treatment plant or at a permitted off-INL sewage treatment plant such as the Idaho Falls system.

All waste will be managed by WGS.

Activities at off-INL locations in eastern Idaho are expected to generate only industrial waste.

Releasing Contaminants

Emissions from portable/mobile generators will take place. The potential to emit small amounts of radioactive material exists; emissions will be far less than 0.1 mrem/yr.

Using, Reusing, and Conserving Natural Resources

Applicable waste will be diverted from disposal in the landfill when possible.

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, item B1.2, "Training exercises and simulations" and B3.10 "Particle accelerators"

Justification: The proposed action is consistent with 10 CFR 1021, Appendix B to Subpart D categorical exclusion B1.2 "Training exercises and simulations (including, but not limited to, firing-range training, small-scale short-duration force-on-force exercises, emergency response training, fire fighter and rescue training, and decontamination and spill cleanup training) conducted under appropriately controlled conditions and in accordance with applicable requirements;" and

B3.10 "Siting, construction, modification, operation, and decommissioning of particle accelerators, including electron beam accelerators, with primary beam energy less than approximately 100 million electron volts (MeV) and average beam power less than approximately 250 kilowatts (kW), and associated beamlines, storage rings, colliders, and detectors, for research and medical purposes (such as proton therapy), and isotope production, within or contiguous to a previously disturbed or developed area (where active utilities and currently used roads are readily accessible), or internal modification of any accelerator facility regardless of energy, that does not increase primary beam energy or current. In cases where the beam energy exceeds 100 MeV, the average beam power must be less than 250 kW, so as not to exceed an average current of 2.5 milliamperes (mA)."

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

Approved by Jason Sturm, DOE-ID NEPA Compliance Officer on: 7/30/2019