

DOE-ID NEPA CX DETERMINATION

Idaho National Laboratory

SECTION A. Project Title: Research and Development Activities at the Idaho National Laboratory (INL) Site Facilities (Overarching)

SECTION B. Project Description:

The proposed action would perform analytical and research and development (R&D) activities in numerous laboratories and R&D facilities located at the Idaho National Laboratory (INL), including INL facilities located at the Advanced Test Reactor (ATR) Complex, Central Facilities Area (CFA), Idaho Nuclear Technology and Engineering Center (INTEC), and the Materials and Fuels Complex (MFC). Activities include ongoing and future work including, but not limited to, nuclear energy research, nuclear physics research, basic and applied chemistry, analytical methods development, manipulation and examination of nuclear materials, materials science research, machining of R&D components, and equipment and mock-up/prototype development work. Consistent with the language at 10 Code of Federal Regulations (CFR) 1021, Appendix B, Subpart D, B3.6, project personnel may use this overarching environmental checklist (EC) to initiate the siting, construction (or modification), and operation of future proposed bench-scale research projects and laboratory operations at ATR Complex, CFA, INTEC, and MFC, as long as the activity is within or contiguous to the developed areas of those facilities.

This overarching EC replaces and supercedes the following ECs:

INL-07-010 R1 "MFC and INTEC Analytical and R&D Facilities Operation
INL-08-029 "Idaho National Laboratory Advanced Test Reactor and Post Irradiation Examination User Facility"
INL-10-023 "CFA and ATR-Complex Analytical and R&D Laboratory Operation."

The scope of this EC includes activities associated with the irradiation and examination of non-fuel materials at the ATR User Facility and MFC. The Department of Energy (DOE) designated the ATR User Facility and post irradiation examination (PIE) facilities at the MFC as a National Scientific User Facility (NSUF) in 2007 to support United States (U.S.) leadership in nuclear science and technology. The ATR offers some of the most advanced and unique capabilities in the country for testing nuclear fuels and other materials. The Hot Fuels Examination Facility (HFEF) and associated Neutron Radiography Reactor Facility (NRAD), Analytical Laboratory, Electron Microscopy Laboratory (EML), Radiochemistry Laboratory (RCL), Irradiated Materials Characterization Laboratory (IMCL), and other facilities are uniquely equipped to conduct PIE while maintaining employee radiation exposure to a minimum. By making access easier for new research users--universities, laboratories, and industry--the NSUF would support basic and applied nuclear R&D, further the nation's Advanced Energy Initiative, and help achieve national energy security.

The ATR is a versatile fuels and materials reactor that can subject experiments to high flux environments. ATR is able to duplicate, in weeks or months, the same effects of irradiation that material would receive in years of use in other radiation environments, such as a commercial nuclear reactor. However, the scope of work described in this EC focuses only on non-fuel materials such as instrumentation, cladding specimens, material construction specimens, medical and industrial isotopes, and non-fissile simulated fuels.

MFC supports the NSUF through PIE of ATR experimental materials. HFEF consists of two adjacent shielded hot cells--the main cell is an argon atmosphere, and the decontamination cell is an air atmosphere--and support areas and equipment. The hot cells contain remotely operated equipment for irradiated materials handling, disassembly, and examination. NRAD, located in the basement of HFEF, allows neutron radiography of fuels and materials under examination at HFEF. The Analytical Laboratory provides the capability to conduct a variety of non-destructive and destructive techniques including, but not limited to, x-ray diffraction, gamma scanning, electron probe microanalysis, thermal ionization mass spectrometry, inductively-coupled plasma mass spectrometry, and inductively-coupled plasma-atomic emission spectrometry. The EML and IMCL are used to conduct visual microscopic examinations of a variety of components. The RCL offers instrumentation necessary for the sample preparation and analysis of radiochemical constituents. The Irradiated Materials Characterization Laboratory (IMCL) is a stand-alone state-of-the-art nuclear laboratory used for hands-on and remote handling, characterizing, and examining of irradiated and non-irradiated nuclear material samples.

In addition, numerous office buildings and other support facilities (utilities, communications, and security) would be utilized to support the R&D efforts at the INL. The proposed action includes laboratory-based analytical and R&D activities in laboratories located at CFA and the ATR Complex. These activities include ongoing and future work related to chemistry, biology, materials science, prototype development, and physical measurements including, but not limited to, radiological work. Work would take place at various laboratories at INL, including, but not limited to, CFA-622, CFA-612, CFA-625, Test Reactor Area (TRA)-678, TRA-1626, TRA-666 and TRA-1627. Building modifications may be required to accommodate changes in lab-related analysis or R&D work. In addition, project personnel may move activities between the different laboratories. Project activities that would modify buildings with potential historical significance must receive clearance from the Cultural Resource Management Office (CRMO) before beginning the activity.

Project activities may result in chemical and radiological emissions to the atmosphere and generate hazardous, mixed, radioactive, and industrial waste. Project activities may involve samples for analysis or R&D activity from other INL facilities and outside the INL. Project activities may result in excess samples or sample residues that INL personnel would manage or return to the generator.

This EC does not cover abandoning or restarting laboratories. In addition, this EC does not cover individual activities, which on their own merit do not qualify for a categorical exclusion (CX), e.g., fuel experiments, nuclear fuel fabrication, experimental nuclear fuels separations, nuclear waste treatment, or waste form development research. Project personnel must complete a second-tier EC, submit the EC to the Program Environmental Lead (PEL) for review and technical input in environmental aspects, work activities, and requirements, and work with the PEL to incorporate applicable comments. Project personnel must sign and return a copy of the EC to the PEL. The PEL would provide a signed copy of the EC to the Department of Energy Idaho Operations Office (DOE-ID) National

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Environmental Policy Act (NEPA) Compliance Officer and the Environmental Support and Services (ES&S) NEPA Lead. Project personnel would keep a signed copy of the EC in the project files.

Project activities would involve transporting hazardous and radioactive materials from ATR to MFC using INL owned shipping casks and transported under a DOE-ID approved transport plan or Department of Transportation approved packaging. Project activities could also involve transporting hazardous or radioactive materials to MFC for PIE. INL would ship some select samples back to users for examination at their facilities. Laboratory analysis could be conducted at ATR Complex, if necessary.

Work may include analysis of samples with Polychlorinated Biphenyls (PCBs) and/or R&D regarding PCB analysis or destruction technologies. Any materials that contain PCBs at the threshold limit of 50 ppm or greater would be managed in compliance with 40 CFR 761 Subpart D.

This EC meets the purposes for R&D activities, and project personnel may use and reference this EC to perform work described above. However, each individual project must have its own EC completed and approved by the principal investigator/principal researcher and reviewed by the R&D PEL to verify that the environmental aspects and work activities are within the scope of this overarching EC. Principal researchers are responsible for following appropriate environmental instructions found in Laboratory-wide Procedure (LWP)-8000 as identified in this EC, and any additional project-specific instructions or permits, as identified by the PEL.

This EC gives overarching coverage for those activities described and that fall under the categorical exclusion, B3.6 (e.g., indoor bench-scale research and development projects and conventional laboratory operations; small-scale research and development projects; and small-scale pilot projects conducted to verify a concept before demonstration actions [10 CFR 1021, Appendix B, B3.6]). Each project approved under this overarching EC must meet the conditions of the CX established in 10 CFR 1021, Appendix B to Subpart D, item B3.6.

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions: NSUF projects would involve irradiating materials in ATR, a stationary radionuclide air emissions source. The irradiation of the material in the ATR primary coolant and examination of the material at MFC is not a modification in accordance with Idaho Administrative Procedures Act (IDAPA) 58.01.01.201 and 40 CFR 61 Subpart H; however, ES&S must evaluate each experiment to verify that the experiment and examination does not constitute a modification by rule. Under normal operating conditions, sealed experiments in ATR primary coolant would not contribute or cause an increase in air emissions. ES&S would evaluate each specific experiment and issue an Air Permitting Applicability Determination (APAD) as necessary to verify compliance with air permit requirements, or document applicable requirements in the project specific second tier EC. Users would perform PIE at MFC in stationary radionuclide air emission sources (e.g., HFEF, EML, RCL, etc.). All radionuclide release data associated with the PIE portion of the experiments would be recorded as part of the HFEF continuous stack monitor and calculated and provided to the ES&S organization by January 31 of each year for the preceding calendar year as part of the INL Annual National Emission Standards for Hazardous Air Pollutants (NESHAPs) report to DOE. Releases of radioactive airborne contaminants from this process are not expected to result in an increase to the annual HFEF dose to the Maximum Exposed Individual (MEI).

Project activities could generate chemical and radionuclide emissions during laboratory operations. Environmental Support & Services must evaluate each project with a potential to emit air pollutants through the APAD process.

Activities could necessitate the removal of asbestos containing materials such as pipe lagging or asbestos floor tiles; trained workers would perform removal actions according to INL procedures.

Discharging to Surface-, Storm-, or Ground Water: Project activities may discharge effluents to INL wastewater streams. Before discharging to INL Wastewater Systems, Waste Generator Services (WGS) personnel would characterize and approve each discharge using the Waste Management Authority (WMA) process. Discharges would only be to wastewater systems and not directly to the groundwater.

Project personnel may retain wastewaters from laboratory operations in the laboratory for characterization and management by WGS or personnel may dispose of the wastewaters to laboratory drain systems in accordance with the waste acceptance criteria (WAC), and in coordination with WGS and Facility Management.

Disturbing Cultural/Biological Resources: Many buildings constructed between 1942 and 1976 on the INL are eligible or potentially eligible for the National Register of Historic Places, which may limit the type of activity project personnel can do to or in those facilities or may require mitigative actions. Project activities that modify historic buildings must undergo a cultural resource review from CRMO before beginning the activity. In addition, project activities that take place outside of fenced or disturbed areas and off established tracks or roads have the potential to disturb cultural resources. All activities scheduled outside of fenced areas that would involve ground disturbance or off-road vehicle use must receive a cultural resource review before the activity begins and must comply with recommendations approved as part of the EC process. In the event cultural materials are unexpectedly discovered, project personnel will stop work immediately and contact Brenda Pace (6-0916).

R&D outside facilities boundaries has the potential to disturb wildlife and habitat. Project activities conducted in areas with native or naturalized vegetation, that are within 150 feet of a cave, or that may harm migratory birds, nests, eggs, or young require biological resource surveys to determine the potential for the activity to impact biological resources. Project personnel must work with the

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appropriate PEL to consult with Gonzales-Stoller Surveillance (GSS) and comply with recommendations approved as part of the EC process.

This EC only covers actions within or contiguous to the developed areas of INL facilities.

Generating and Managing Waste: The potential exists for project activities to generate small amounts of hazardous/mixed waste during fabrication and PIE. Users and laboratory personnel would manage hazardous/mixed waste in accordance with laboratory procedures to ensure that project activities comply with applicable Codes, Standards, and Regulations (CSRs). Project activities could also generate small amounts of industrial waste. Project personnel would coordinate waste disposal activities through the WGS and ES&S organizations responsible for hot cell remote-handled waste. In addition, project personnel would incorporate pollution prevention where economically practicable to reduce the volume and toxicity of waste generated.

Laboratory activities have the potential to generate industrial, radioactive, PCB, hazardous or mixed waste. WGS would characterize and manage all solid waste by conducting hazardous waste determinations, as appropriate. Project personnel and WGS would manage hazardous and mixed waste in one or more Satellite Accumulation Areas (SAAs) or a <90-day storage area before shipping to a treatment, storage, and disposal facility (TSDF).

Project personnel must verify that project funds are sufficient and available to properly store, characterize, and disposition all waste generated during and by closeout of the project.

Small amounts of radioactive or hazardous material could be temporarily stored in aboveground tanks during R&D or analytical activities. Radioactive suspect waste tanks are in place in several facilities (such as MFC-752, MFC-774, MFC-765, MFC-785, and RCL). Discharges to these tanks are regulated closely in accordance with facility procedures and a Waste Analysis Plan. Hazardous waste is presently not stored in tanks with the exception of the Analytical Laboratory tanks in MFC-752 and the RCL.

No TRU waste would be generated by projects authorized under this EC.

Releasing Contaminants: Chemicals used in support of the NSUF activities would be subject to Chemical Management requirements for procurement, use and storage, and disposal of the unused chemical and empty container. Laboratory personnel would maintain chemical inventories to verify compliance with applicable codes, standards, and regulations. As described in the air emissions section above, radioactive air emissions are anticipated as a result of irradiation and PIE activities associated with proposed actions. Airborne and liquid releases would not exceed historical values associated with the normal operation of the HFEF facility.

Chemical and/or radioactive contaminants could be released in air emissions or as wastewater contaminants as a result of laboratory R&D activities. Releases would be governed under applicable documentation such as APADs, permits, or Waste Acceptance Criteria.

Project personnel must consult with the appropriate PEL and Radiological Control organization before initiating soil disturbance to prevent impact to or exposure from environmentally controlled areas or from areas with unexploded ordnance.

Work could include analysis of samples with PCBs and/or R&D regarding PCB analysis or destruction technologies. Project personnel would manage waste materials that contain PCBs at the threshold limit of 50 ppm or greater in compliance with 40 CFR 761 subpart D.

Using, Reusing, and Conserving Natural Resources: All materials would be reused and/or recycled where economically practicable. All applicable waste would be diverted from disposal in the landfill where conditions allow. New equipment would meet either the Energy Star or Significant New Alternative Policy (SNAP) requirements as appropriate (see <https://sftool.gov/green-products/0?agency=0>). In addition, the project would practice sustainable acquisition, as appropriate and practicable, by procuring construction materials that are energy efficient, water efficient, are bio-based in content, environmentally preferable, non-ozone depleting, have recycled content, or are non-toxic or less toxic alternatives.

Prior to purchasing new chemicals, material, or equipment, requests would be evaluated to determine if these are available from other programs such as the material exchange program or sharable chemicals in the lab. If not, only the quantity needed would be ordered. Excess chemicals, materials, and equipment would be made available to the material exchange program or the sharable chemicals, and then recycled to the extent practicable prior to disposal.

<p>SECTION D. Determine the Recommended Level of Environmental Review (or Documentation) and Reference(s): Identify the applicable categorical exclusion from 10 CFR 1021, Appendix B, give the appropriate justification, and the approval date.</p>
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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 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 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)).

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References: NEPA Implementing Procedures, Final Rule, 10 CFR 1021 Appendix B to Subpart D, Categorical Exclusion B3.6 "Small research and development, laboratory operations, and pilot projects."

Justification: Project activities in this EC are consistent with 10 CFR 1021 Appendix B to Subpart D, Categorical Exclusion 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 two 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 that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial deployment."

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

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on: 9/24/2014