

DOE-ID NEPA CX DETERMINATION

Idaho National Laboratory

SECTION A. Project Title: Lab A19 Cleanroom Construction

SECTION B. Project Description:

The international Neutrino Ettore Majorana Observatory (NEMO) collaboration of scientists is studying the process of nuclear double-beta decay to study the properties of the neutrino. Double-beta decay half-lives are the order of $1E20$ years, or longer, and very sensitive measurements are conducted underground to shield against cosmic rays and with ultrapure materials, including mass-separated isotopes. Idaho National Laboratory's (INL's) role in the NEMO collaboration is ultrapurification of source material. The source material is first dissolved, then separation chemistry is performed to remove thorium- and uranium-chain natural radioisotopes. Finally, the source material is dried, and if it is an oxide, it is reduced to metal in a hydrogen-atmosphere tube furnace.

INL's first ultrapurification clean room was in Test Reactor Area (TRA) Building 604 Lab 100 which was demolished about five years ago. A replacement clean room is needed to collect and purify metals for use in neutrino detection studies. The proposed action would install a clean room in the INL Research Center (IRC) Lab A19. The cleanroom would be free-standing and would form a room-within-a-room. The clean room ceiling would be a bank of high-efficiency particulate air (HEPA) filters interspersed with lights. Fans above the HEPA filters would provide downward air flow. The goal is to reduce dust in the air to 100 particles per cubic foot or less ("class-100" cleanroom operation). The dust in unfiltered indoor air typically contains 100,000 to 300,000 dust particles per cubic foot.

INL has purchased a prefabricated cleanroom to install in Lab A19. Installation requires the following activities:

- Fasten hanger wires to the ceiling
- Install wall panels
- Extend fire sprinkler through the wall panels to protect the inside of the cleanroom
- Attach HEPA filter support grid to hanger wires
- Install HEPA filters and lights

Electrical power would be pulled into the cleanroom to power lights and fans. Modification of the A19 heating, ventilating, and air conditioning (HVAC) system is not anticipated. The two hood/cabinet units in A19 would remain in use. Gases, such as hydrogen and nitrogen, would be used. Lab sinks would be installed using the facility potable water lines and drain lines to the sewer.

A laboratory instruction is being developed for operations of the clean room. This Environmental Checklist (EC) will be revised to capture scope, environmental aspect, and work activities identified in the laboratory instruction for facility operations.

The cost of this construction work is estimated to be about \$125K.

The work will be performed during CY 2015.

SECTION C. Environmental Aspects or Potential Sources of Impact:

Air Emissions - Emissions from interior construction activities are expected to be minimal. No asbestos work is anticipated. Emissions/fumes from common construction adhesives are anticipated.

Generating and Managing Waste - Industrial waste, in the form of common construction debris, is expected. All Solid Waste would be managed by Waste Generator Services (WGS).

Releasing Contaminants - Typical construction chemicals such as lubricants, paints, adhesives, etc., will be used during the project. A chemical inventory list with associated Safety Data Sheets (SDS's) will be required to be submitted by the subcontractor and be approved by Battelle Energy Alliance, LLC (BEA) in the vendor data system. The Construction Chemical Coordinator would enter these chemicals into the Comply Plus chemical management system for tracking purposes. All spills would be reported to the Construction Field Representative and to the Spill Notification Team if applicable.

Using, Reusing, and Conserving Natural Resources - All applicable waste would be diverted from disposal in the landfill when possible. Project personnel would use every opportunity to recycle, reuse, and recover materials and divert waste from the landfill when possible. 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, and are non-toxic or less-toxic alternatives. New equipment will meet either the Energy Star or Significant New Alternatives Policy (SNAP) requirements as appropriate (see <http://www.sftool.gov/GreenProcurement>).

SECTION D. Determine the Recommended Level of Environmental Review (or Documentation) and Reference(s): 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 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,

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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: National Environmental Policy Act (NEPA) Implementing Procedures, Final Rule, 10 CFR 1021, Appendix B to Subpart D, Categorical Exclusion B1.31 "Installation or relocation of machinery and equipment."

Justification: The proposed activities are consistent with CX B1.31 "Installation or relocation and operation of machinery and equipment (including, but not limited to, laboratory equipment, electronic hardware, manufacturing machinery, maintenance equipment, and health and safety equipment), provided that uses of the installed or relocated items are consistent with the general missions of the receiving structure. Covered actions include modifications to an existing building, within or contiguous to a previously disturbed or developed area, that are necessary for equipment installation and relocation. Such modifications would not appreciably increase the footprint or height of the existing building or have the potential to cause significant changes to the type and magnitude of environmental impacts."

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: 6/29/2015