

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: BiL<sub>3</sub> Gamma-Ray Spectrometers for Reliable Room-Temperature Nuclear Materials Safeguarding – University of Florida**

**SECTION B. Project Description**

The University of Florida will develop and manufacture BiL<sub>3</sub> detector devices, perform characterization tests using calibration sources to determine detector response and energy-dependent efficiency, and demonstrate their use in reliable spent fuel monitoring within the fuel cycle for safeguarding applications, including burnup validation quantification.

**SECTION C. Environmental Aspects / Potential Sources of Impact**

**Radioactive Material Use** – Gamma and Beta radiation sources will be employed to calibrate the fabricated detectors. The storage and use of these sources will follow standard handling procedure regulated and approved by UF’s Radiation Control Office. No waste will be generated in this process. All radiation sources used are solid, sealed sources.

**Hazardous Waste Generation** – In the process of fabricating the detectors, there will be hazardous waste generated. Specifically, glass ampoules containing residue of bismuth and iodine will be disposed following UF’s Hazardous Waste Management regulated and approved by UF’s Environmental Health and Safety Office.

**Chemical Use/Storage** – As part of the prototype manufacturing procedures, chemicals (bismuth and iodine precursors) will be stored in the PI’s lab following the laboratory safety manual approved and regulated by UF’s Environmental Health and Safety Office.

**Chemical Waste Disposal** – In the process polishing and surface preparation of the single crystals towards detector fabrication, there will be chemical waste (mainly polishing oils and slurries) generated that will be stored in satellite accumulation areas and disposed of following proper disposal methods for UF laboratory chemical waste, as regulated and approved by UF’s Environmental Health and Safety Office.

**SECTION D. Determine the 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.

Note: 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, including requirements of DOE orders; 2) require siting and construction or major expansion of waste storage, disposal, recovery, or treatment 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) adversely affect environmentally sensitive resources. In addition, no extraordinary circumstances related to the proposal exist which would affect the significance of the action, and the action is not “connected” nor “related” (40 CFR 1508.25(a)(1) and (2), respectively) to other actions with potentially or cumulatively significant impacts.

References: 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); and small-scale pilot projects (generally less than 2 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, meaning actions that are undertaken at a scale to show whether a technology would be viable on a larger scale and suitable for commercial development.

Justification: The activity consists of developing detectors for research purposes.

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 10/29/2013