

SECTION A. Project Title: Separated waste stream immobilization of iodine and offgas caustic scrubber solution**SECTION B. Project Description**

Washington State University proposes to produce waste forms for the immobilization of caustic scrubber (CS) solution and iodine waste streams resulting from reprocessing of spent nuclear fuel. The proposal will demonstrate a laboratory-scale process for separately immobilizing CS solution and the iodine obtained from an eluted solid silver sorbent, and deliver reference waste forms to the national laboratories for corrosion testing using a dynamic leach test. The CS solution will be immobilized in a glass-bonded composite of cancrinite/sodalite. The synthesis of ceramic waste forms will be accomplished by low-temperature (~90°C) processes. In the case of silver iodide (AgI)-based sorbents, a proof of concept stripping process will remove iodine from AgI by converting it to sodium iodide (NaI(aq)), followed by immobilization of the latter into a durable glass-bonded iodosodalite (ISOD)-based waste form. Alternatively, the AgI could also be immobilized directly in Ag-ISOD.

SECTION C. Environmental Aspects / Potential Sources of Impact

Chemical Use/ Disposal/ Chemical Waste – Approximately five liters of chemical waste is expected to be generated, which may include organic solvents (for example: ethanol) and inorganic aqueous solutions for example: NaOH, HCL, etc. The university has procedures in place to handle any waste that will be generated through this project.

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 Installation of, or improvements to, building and equipment instrumentation (including, but not limited to, remote control panels, remote monitoring capability, alarm and surveillance systems, control systems to provide automatic shutdown, fire detection and protection systems, announcement and emergency warning systems, criticality and radiation monitors and alarms, and safeguards and security equipment).

Justification: The activity consists of demonstrating a laboratory-scale process for separately immobilizing caustic scrubber solution and the iodine obtained from an eluted solid silver sorbent using chemical processes.

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 8/11/2020