DOE-ID NEPA CX DETERMINATION

CX Posting No.: DOE-ID-20-040

SECTION A. Project Title: Adsorption and Reduction of Uranium in Engineered Barrier Systems: Effects of Iron and Heat – California State University East Bay

SECTION B. Project Description

California State University East Bay proposes to 1) Develop a uranium-montmorillonite surface complexation/reduction model tat can characterize both uranium adsorption and chemical reduction processes in Fe-rich bentonite systems as a function of pH and carbonite concentrations at ambient temperatures; and to 2) Investigate the impacts of various elevated temperatures on uranium reduction and adsorption processes in these systems. Compacted bentonite is often used as part of an engineered barrier system to reduce contaminant mobility in the event of waste package failure and waste form degradation. The proposed project intends to enhance understanding of the sorption distribution coefficients for uranium in long-term subsurface emplacements.

SECTION C. Environmental Aspects / Potential Sources of Impact

Radioactive Material Use / Radioactive Waste Generation – Small quantities (<20 g) of uranium-bearing material will be shipped using approved methods and protocols to National Laboratories for measurement via synchrotron radiation-based techniques. All work will be conducted according to approved procedures and material will be disposed of according to approved protocols. Uranium tracers will be used (~51 μCi total of U-233 and U-238) and waste generated under a Radioactive Material License from the State of California.

Chemical Use/Storage / Chemical Waste / Hazardous Waste Generation – Chemicals used for this work include lab grade salts of low hazard and dilute acids (<5%). Quantities used will be less than 20 L. Hazardous waste generated will be less than 6 gal of dilute acid (2% nitric and hydrochloric acids). This waste will be disposed of using the existing Hazardous Waste Generation system at California State University East Bay.

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 an investigation into the sorption coefficients for uranium in long-term subsurface emplacements..

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 7/29/2020