

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Impact of Coupled Gas Migration and Thermo-hydro-mechanical Processes on the Performance of Repositories for High-Level Nuclear Waste – Texas A&M University

SECTION B. Project Description

Texas A&M University, in collaboration with UPC, Spain and CIEMAT, Spain, proposes to gain a better understanding on the possible effect of gas migration (particularly through discontinuities) on the performance and long-term behavior of engineered barrier systems (EBS) envisaged for the isolation of high-level radioactive waste (HLW). Fundamental, experimental and numerical investigations will be contemplated on this project. The fundamental studies will be aimed at gaining a better understanding of the phenomena behaving gas migration. The formation of discontinuities in barrier materials will be another important component of this research. The experimental activities will focus on replicating in the lab under controlled conditions plausible scenarios that may lead to the development of preferential pathways in EBS. Flow of fluids and transport properties through discontinuities will be investigated in the laboratory. The numerical investigation will be advocated to extend a current modeling framework to deal with pre-existing (e.g. interfaces) and evolving (e.g. cracks) discontinuities in EBS materials.

SECTION C. Environmental Aspects / Potential Sources of Impact

The university has procedures in place to handle any waste that will be generated through this project. The action would not create additional environmental impacts above those already permitted at the university.

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 university-scale research activities aimed at improving the understanding of the role of gas migration and discontinuities in the performance of HLW disposals to improve the design of the EBS.

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 08/06/2018