

DOE-ID NEPA CX DETERMINATION

SECTION A. Project Title: Time-Dependent THMC properties and microstructural evolution of damage rocks in excavation damage zone – University of Colorado

SECTION B. Project Description

The University of Colorado, in collaboration with the University of Utah and Idaho National Laboratory, propose to quantify the microstructural alternation under sustained thermomechanical loadings and its impact on the macroscopic transport and creep behavior of damaged rocks, aiming to assess the evolution of excavation damage zone (EDZ) in the coupled temperature, pore pressure and stress field as a function of post-closure time. This project will emphasize the strong coupling between $T \rightarrow M$, $H \leftrightarrow M$, $M \rightarrow C$, $T \leftrightarrow C$, $T \leftrightarrow H$ in the context of evolving microstructures. To accomplish the objectives, the project will quantify the stress-strain and creep behavior of salt and argillite under varying temperature and relative humidity, augmented by the microstructural observations.

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: This activity consists of university-scale research on the microstructural alternation of salt and argillite and its implication on the long-term migration of hazardous species.

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 08/02/2018