

# DOE-ID NEPA CX DETERMINATION

**SECTION A. Project Title: Understanding the Speciation and Molecular Structure of Molten Salts Using Laboratory and Synchrotron based In Situ Experimental Techniques and Predictive Modeling – University of Nevada Reno**

**SECTION B. Project Description**

The University of Nevada Reno (UNR) proposes to develop a robust approach to experimentally determine the structure and speciation of molten salts and then use this information to refine and develop a predictive computational model. The tasks associated with this project are (1) Design and development of an *in situ* multi-spectroscopy system; (2) Determining speciation and structure of molten salts, including effects of cation and/or anion substitution; and (3) Apply density functional theory (DFT) methodology for determining speciation and structure of molten salts. Existing equipment and laboratory facilities will be used.

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

Chemical use/Storage and Chemical Waste Disposal – The experiments will involve the use of a variety of nitrate and chloride molten salts. These salts would then be considered waste after the experiments are completed. Environmental Health and Safety (EH&S) at UNR will dispose of the waste in accordance with federal regulations and requirements.

**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 to determine the structure and speciation of molten salts as well as develop a predictive model of the behavior and composition of these salts over time in a molten salt reactor.

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 08/1/2019