DOE-ID NEPA CX DETERMINATION

CX Posting No.: DOE-ID-18-087

SECTION A. Project Title: Oxidation of Tristructured Isotropic Fuel Forms in Low Oxygen and Steam Partial Pressures and the Role of Matrix Burn Off in the Oxidation Rate at High Temperatures – University of Texas at San Antonio

SECTION B. Project Description

The University of Texas as San Antonio, in collaboration with Oak Ridge National Laboratory (ORNL), proposes to investigate the oxidation behavior of tristructured isotropic (TRISO) particles under a range of atmospheres that incorporate incremental additions of H_2O, O_2, H_2, and CO_2 at high temperature ($800°C \leq T \leq 1{,}700°C$). The corrosion behavior will be observed, dynamics calculated, and the transition from active to passive and passive to active oxidation in steam, with and without additions of other oxidants, will be mapped as functions of temperature and oxidant/contaminant partial pressure.

SECTION C. Environmental Aspects / Potential Sources of Impact

Chemical Use/Storage – Solvents in small quantities will be used and stored in the laboratory. The laboratory is inspected by the University of Texas at San Antonio's Laboratory Safety Division on a quarterly basis for compliance with proper storage and use.

Chemical Waste Disposal – All chemical wastes are collected by the University's Environmental Health and Safety (EHS) and Risk Management departments for storage until wastes are properly disposed of via a licensed waste disposal company. The anticipated amounts of waste for disposal are approximately 0.5 liters per year. This amount is small and anticipated to have minimal impact.

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 investigating the oxidation behavior of TRISO particles under a range of atmospheres and the role of matrix burn off in the oxidation rate at high temperatures.

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 08/13/2018