

SECTION A. Project Title: – Combining Experiments and Simulations of Extraction Kinetics and Thermodynamics in Advanced Separation Processes for Used Nuclear Fuel. University of California, Irving**SECTION B. Project Description**

University of California, Irving is leading research aimed at investigating extraction systems for used nuclear fuel by addressing important challenges in aqueous separations processes currently under development.

Specific objectives of the proposed research are as follows:

1. Study and establish a rigorous connection between MD simulations based on polarizable force fields and extraction thermodynamic and kinetic data.
2. Compare and validate CFD simulations of extraction processes for An/Ln separation using different sizes (and types) of annular centrifugal contactors.
3. Provide a theoretical/simulation and experimental base for scale-up of batch-wise extraction to continuous contactors.

SECTION C. Environmental Aspects / Potential Sources of Impact

The University of California has a broad radiation user license from the State of California as well as an NRC license (R-116). All radioactive waste will be disposed of in accordance with their existing procedures and policies. All Chemical and hazardous wastes will also be managed and disposed of in accordance with all University and NRC regulations, procedures, and policies. The action will not create additional environmental impacts above those already occurring 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 aimed at investigating extraction systems for used nuclear fuel.

Is the project funded by the American Recovery and Reinvestment Act of 2009 (Recovery Act) Yes No

Approved by Jack Depperschmidt, DOE-ID NEPA Compliance Officer on 08/21/2014