Department of Energy
Washington, DC 20585

February 28, 2012

Mr. Michael D. Johnson
Acting President and Project Manager
Washington River Protection Solutions, LLC
2440 Stevens Center Place
Richland, Washington 99354

NEL-2012-01

Dear Mr. Johnson:

The Office of Health, Safety and Security's Office of Enforcement and Oversight evaluated a positive Unreviewed Safety Question (USQ) identified by Washington River Protection Solutions, LLC (WRPS) involving a discrepancy in the Tank Farm waste transfer system design temperature, unanalyzed freezing during active waste transfer, and unanalyzed potential failure of relief valves due to solids precipitation. I am writing to provide the results of our evaluation.

WRPS concluded that the American Society of Mechanical Engineers (ASME) code B31.3 analysis of the safety significant waste transfer piping for operational loads and stresses assumed a minimum design temperature of 32 degrees Fahrenheit, although the design temperature cited in the *Safety Significant Waste Transfer Primary Piping Systems Functions and Requirements Evaluation Document*, which supports the Tank Farm Documented Safety Analysis (DSA), was minus 25 degrees Fahrenheit. In addition, WRPS identified that the failure of safety-significant waste transfer structures, systems, and components (SSC) due to freezing during active waste transfer and the subsequent release of waste was not analyzed in the Functions and Requirements Evaluation Documents (FRED) and the Tank Farm DSA. Further, WRPS identified that the potential failure of primary relief valves due to precipitation/deposition of solids in the waste stream was not analyzed in the FREDs or Tank Farm DSA. On November 30, 2011, WRPS self-identified and reported the nuclear safety noncompliances associated with this positive USQ into the Department of Energy's (DOE) Noncompliance Tracking System (NTS) in report NTS-ORP--WRPS-TANKFARM-2011-0009.

The ASME B31.3 analysis of the safety-significant waste transfer piping and the *Safety Significant Waste Transfer Primary Piping Systems Functions and Requirements Evaluation Document* both credit non-safety-significant heat trace for maintaining safety-significant waste transfer pipe temperatures above freezing. This is inconsistent with DOE Standard 3009-94, *Preparation Guide for*

U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses, which states "Identify SSCs whose failure would result in a safety-significant SSC losing the ability to perform its required safety function. These SSCs would also be considered safety-significant SSCs for the specific accident conditions or general rationale for which the safety-significant designation was made originally."

The Office of Enforcement and Oversight evaluated the circumstances that led to the inadequacies in the Tank Farm DSA; this evaluation included reviewing WRPS's Root Cause Analysis report *Positive USQ: Waste Transfer System Design Temperature Discrepancy, Freezing, and Solids Precipitation/Disposition* and *Justification for Continued Operation for Potential Failure of Waste Transfer Systems Due to Freezing and Solids Precipitation/Deposition*. Based on this evaluation, the Office of Enforcement and Oversight identified potential violations of 10 C.F.R. Part 830, *Nuclear Safety Management* that contributed to the identified inadequacies in the Tank Farm DSA. Specifically:

- In September 2009, WRPS developed procedure TFC-ENG-DESIGN-C-45, *Control Development Process for Safety-Significant Structures, Systems, and Components*, which establishes the process for FRED development. However, this procedure did not define sufficiently the organizational roles and responsibilities to ensure that developed FREDs were technically accurate and complete.

- WRPS provided training on the newly developed FRED process as addressed in TFC-ENG-DESIGN-C-45. However, training was not formally developed and conducted until November 2010, which was after the issuance of all but one FRED.

- WRPS determined that its nuclear safety engineers lacked sufficient understanding of what constitutes a support system that is credited in preventing failure of an intended safety function for another safety-significant SSC.

- During development of RPP-RPT-42297, *Safety-Significant Waste Transfer Primary Piping Systems Functions and Requirements Evaluation Document*, WRPS did not realize that non-safety significant heat trace was credited to protect safety significant waste transfer piping.

DOE recognizes that WRPS self-identified the initial inadequacy with the Tank Farm DSA and further examined the issue, which enabled WRPS to proactively identify additional deficiencies. The resulting Justification for Continued Operation details extensive interim administrative controls to allow for continued waste transfer operations. Nonetheless, the Office of Enforcement and Oversight is issuing this enforcement letter to WRPS to convey concerns over the processes used to ensure that Tank Farm waste transfer hazards and potential accidents are

fully analyzed and controlled. It is the responsibility of WRPS to ensure that personnel involved in these processes are fully trained and qualified on all technical aspects associated with safety basis development and maintenance and on the WRPS-specific implementing procedures. In conjunction with the DOE Office of River Protection and the Office of Environmental Management, we will continue to monitor WRPS nuclear safety performance.

No response to this letter is required. If you have any questions, please contact me at (301) 903-2178, or your staff may contact Mr. Steven Simonson, Deputy Director for Enforcement, Office of Enforcement and Oversight, at (301) 903-7707.

Sincerely,

John S. Boulden III
Director
Office of Enforcement and Oversight
Office of Health, Safety and Security

cc: Scott Samuelson, DOE-ORP
Phyllis Bruce, WRPS
Richard Azzaro, DNFSB