

August 23, 2012

MEMORANDUM TO: Andrew Persinko, Deputy Director  
Environmental Protection and  
Performance Assessment Directorate  
Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

THRU: Gregory Suber, Chief **/RA/**  
Low-Level Waste Branch  
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Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
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Office of Federal and State Materials  
and Environmental Management Programs

SUBJECT: ONSITE OBSERVATION GUIDANCE FOR SEPTEMBER 26-27,  
2012, WASTE MONITORING VISIT TO THE SAVANNAH RIVER  
SITE, F AREA TANK FARM

The U.S. Nuclear Regulatory Commission (NRC) staff is planning an onsite observation visit on September 26-27, 2012, to the U.S. Department of Energy's Savannah River Site, F Area Tank Farm to monitor activities related to the disposal of non-high-level-waste, per NRC's responsibilities under Section 3116 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005.

Enclosure: Onsite Observation Guidance

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## **ONSITE OBSERVATION GUIDANCE FOR SEPTEMBER 26-27, 2012, MONITORING VISIT AT THE SAVANNAH RIVER SITE F TANK FARM**

### **PURPOSE:**

To provide onsite observation guidance for a planned visit on September 26-27, 2012, to the U.S. Department of Energy's (DOE) Savannah River Site F Tank Farm to monitor activities related to the disposal of non-high-level waste, per the U.S. Nuclear Regulatory Commission's (NRC) responsibilities under Section 3116(b) of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA).

### **OBJECTIVES:**

This monitoring site visit will focus observation and technical review of activities related to recent completion of grouting operations in Tank 18 and 19. Staff will continue several follow-on activities that arose from observation of grouting operations on June 12, 2012. The NRC staff also anticipates discussions with DOE regarding subsequent near-term closure activities (e.g. closure of Tanks 5 and 6).

### **BACKGROUND:**

Section 3116(a) of the NDAA authorizes DOE, in consultation with the NRC, to determine whether certain radioactive waste related to the reprocessing of spent nuclear fuel is not high-level waste, provided certain criteria are met. Section 3116(b) of the NDAA requires NRC to monitor DOE disposal actions to assess compliance with Title 10 of the Code of Federal Regulations (10 CFR), Part 61, Subpart C, performance objectives for low-level waste.

On September 30, 2010, DOE submitted to the NRC a draft waste determination titled, "Draft Section 3116 Determination, F Area Tank, Savannah River Site." The purpose of the draft waste determination was to demonstrate compliance with the criteria in Section 3116(a) of the NDAA, including compliance with the performance objectives in 10 CFR Part 61, Subpart C. In its consultation role, the NRC staff reviewed the draft waste determination and highlighted a number of technical concerns during a series of public meetings. In October 2011, NRC staff documented the results of its review in a Technical Evaluation Report (TER). In the TER, NRC staff made a number of recommendations to DOE that NRC believes will enhance the likelihood that DOE can meet the performance objectives of Part 61 during the F Tank Farm closure process. The NRC staff, pursuant to its monitoring responsibility under the NDAA, is in the process of preparing a monitoring plan for the F Tank Farm. The monitoring plan will incorporate these recommendations as part of the monitoring areas that will be the framework of the monitoring plan. This onsite observation guidance has been developed in advance of the availability of the final monitoring plan.

## OBSERVATION REQUIREMENTS:

NRC's onsite observation of the disposal actions taken by DOE focuses on the performance objectives set out in 10 CFR Part 61, Subpart C. These performance objectives are: (i) protection of the general population from releases of radioactivity (10 CFR 61.41); (ii) protection of individuals against inadvertent intrusion (10 CFR 61.42); (iii) protection of individuals during operations (10 CFR 61.43); and (iv) stability of the disposal site after closure (10 CFR 61.44). Ensuring protection of the general population and disposal site stability predicates heavily on the performance of closed tanks and ancillary facilities within the period of compliance. Protection of individuals during operations depends, in part, on proper implementation of work activities associated with emplacement of grout. The staff will observe features important to impeding migration of or access to residual tank waste and will use the following guidance to direct the observation while visiting the SRS facility.

During its first monitoring site visit on June 12, 2012, NRC staff was provided an overview of various aspects of tank grouting operations. Staff was briefed on safety and radiation protection measures. Staff was able to view real time grout placement by way of in-tank video cameras. Staff was then given a tour of various aspects of grout operations including transport arrival and test protocols, staging of vehicles and methods for grout delivery, as well as methods to minimize introduction of extraneous liquids to tanks.

Following the tour, NRC and South Carolina Department of Health and Environmental Control staff had an opportunity to interact with DOE staff and contractors regarding observations and related technical reviews. Several follow-up items evolved from the discussions. These are among the items to be the subject of the second monitoring site visit.

In addition, to items arising from the first monitoring site visit, NRC staff will focus on anticipated near-term closure activities. These include activities related to the isolation and closure of Tanks 5 and 6.

Further, because of the importance of the long-term evolution of plutonium solubility, NRC staff intends to gather additional information and insight into this important topic.

### Specific On-Site Observation Activities:

#### Tank and Vault Grouting

- Supplemental Review video of Tanks 18 and 19 grouting- *follow up from June 12 visit*
- Review of "as built" documentation of grouted tanks including estimates of void volume in equipment and in tank tops
- Continue discussion regarding development and testing of shrinkage compensating additives and testing of the potential for grout shrinkage- *follow up from June 12 visit*
- Discuss thermal calculations conducted to support tank grouting, testing, and evaluation of the potential for thermal cracking
- Discuss tank vault component grouting (e.g., leak detection channels)-*follow up from June 12 visit*
- Discuss results of follow-up testing of grout (e.g. compressive strength)

#### Radiation Protection Program

- Review activity-specific radiation protection program and final collective dose calculations

#### Waste Retrieval and Closure

- Discuss schedule for Tanks 5 and 6 closure
- Review final inventories developed for Tanks 5 and 6
- Review cost benefit analysis for Tanks 5 and 6, if available
- Review special analysis for Tanks 5 and 6, if available
- Discuss anticipated changes in grouting operations given "lessons learned" from Tanks 18 and 19 grouting
- Discuss progress on cleaning of other FTF tanks

#### Waste Release/Solubility

- Discuss plans for experiments to study key radionuclide solubility for key risk drivers at FTF
- Discuss plans for experiments to study grout conditioning of infiltrating groundwater

#### Environmental Data

- Discuss monitoring plan for FTF groundwater
- Discuss monitoring results for FTF wells
- Review historical information regarding initiating event and releases from FTF and HTF tanks