February 10, 2006

MEMORANDUM TO: Scott Flanders, Deputy Director
Environmental & Performance Assessment Directorate
Division of Waste Management
and Environmental Protection
Office of Nuclear Material Safety
and Safeguards

THRU: Ryan Whited, Chief
Low-Level Waste Section
Environmental & Performance Assessment Directorate

FROM: Michele O'Shaughnessy /**RA**/
Project Manager
Low-Level Waste Section
Environmental & Performance Assessment Directorate

SUBJECT: SEPTEMBER 20, 2005, MEETING SUMMARY: MEETING WITH U.S. DEPARTMENT OF ENERGY (DOE) REGARDING AN OVERVIEW OF THE DOE HANFORD SITE, OFFICE OF RIVER PROTECTION

On September 20, 2005, staff and management from the U.S. Nuclear Regulatory Commission and U.S. Department of Energy met to discuss technical issues associated with the Basis for Exception to the Hanford Federal Facility Agreement and Consent Order Retrieval Criteria for Single-Shell Tank (SST) 241-C-106 and the methodology for the Hanford SST System Performance Assessment. The meeting summary is enclosed for your use.

Enclosures
1: Summary of Meeting
2: Attendee List
3: Presentation Slides
4: Public Written Comments Submitted

cc: K. Picha/DOE

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SUMMARY OF SEPTEMBER 20, 2005, OPEN MEETING
REGARDING AN OVERVIEW OF THE
U.S. DEPARTMENT OF ENERGY HANFORD SITE, OFFICE OF RIVER PROTECTION

Introduction

On September 20, 2005, staff and management from the U.S. Nuclear Regulatory Commission (NRC) and U.S. Department of Energy (DOE) met to discuss technical issues associated with the Basis for Exception to the Hanford Federal Facility Agreement and Consent Order (HFFACO) Waste Retrieval Criteria for Single-Shell Tank (SST) 241-C-106 and the methodology for the Hanford SST System Performance Assessment (PA). The Basis for Exception to the HFFACO Waste Retrieval Criteria for SST 241-C-106 was received by NRC on October 24, 2004, while Chapters 1 - 3 of the SST System PA were received by NRC on August 18, 2005. This meeting was open to the public and was held at the Hanford House Red Lion in Richland, WA.

In addition to NRC and DOE staff and contractors, the meeting was attended by representatives from the Hanford Advisory Board, State of Washington Department of Health, Defense Nuclear Facility Safety Board, State of Washington's Department of Ecology, and members of the public.

The list of attendees is included as Enclosure 2, the presentation slides used by DOE are included as Enclosure 3, and public written comments submitted to NRC are included as Enclosure 4.

Discussion

DOE initiated the discussion with an overview of DOE Hanford including an overview of the DOE Hanford Facility, the Office of River Protection (ORP), tank farm history, and current site conditions. DOE Hanford Facility has been operated by the government for nearly six decades. It is 560 square miles and is operated by two contractors: (1) CH2M HILL Hanford Group who is responsible for contract management and the safety oversight, and (2) Bechtel who is responsible to accomplish the tank waste cleanup. The ORP was created in 1998 by Washington Congressman Doc Hastings as an independent office to focus additional attention and resources on the cleanup of Hanford's tank waste. There are currently 53 million gallons of tank waste in the 177 tanks at DOE Hanford. One hundred forty-nine of the 177 tanks are single-shell tanks (SSTs), have exceeded tank design life, and contain ~32 million gallons of saltcake, sludge, and liquid. 67 of the 149 SSTs are assumed to have leaked approximately 500,000 to 1 million gallons. Twenty-eight of the 177 tanks are double-shell tanks (DSTs), approaching tank design life, and contain ~22 million gallons of waste. In order to characterize the waste, over 600 samples have been taken since 1994. As of January 1, 2004, the total radionuclide inventory in both the SSTs and DSTs was 193 MCi (mostly ^{90}Sr and ^{137}Cs).

The next agenda item discussed was the SST Farm Vadose Zone Project. This project was created in 1998 to implement the Resource Conservation Recovery Act Corrective Action Program due to the SSTs leaked contaminants moving through the vadose zone. The main objective of this project was to collect and analyze new vadose zone data to refine and improve the vadose zone conceptual models, and reduce the groundwater impacts. New technologies

such as the Slant Borehole Drill and Direct Push Technology have been deployed to collect data samples around the tank farms for characterization. Tank constituents currently detected in the groundwater, include ^{99}Tc, NO_3, Cr(VI), and uranium.

DOE then presented an update on the waste retrieval technologies. The current waste goal, in accordance with the Tri-Party Agreement or HFFACO, is retrieval of greater than 99% by volume (#360 ft^3 in 100-series tanks and #30 ft^3 in 200-series tanks). Retrieval technologies which have been deployed include sluicing, modified sluicing along with a dissolution such as acid, and vacuuming. In addition, future retrieval system technologies were presented such as the in-tank vehicle, off-riser sampler, and hydrolazer water lance. NRC staff asked clarifying questions regarding the time frame for testing and deployment of these technologies. DOE explained that the in-tank vehicle and a vacuum retrieval arm were deployed in the C-101 tank retrieval process, hydrolazer water lance would be deployed in October for the S-112 tank, and the off-riser sampler is in the development stage and would be deployed for C-103 tank after procedures were developed. NRC staff asked DOE the method they used for determining the volume of waste left in each tank. DOE explained that the volume is determined by pictures from a video camera installed at the top of the tank dome which are used to develop a CAD model. Another question by NRC staff was with regard to the assumption made of the material left on the sides of the tanks. DOE explained that an assumption of 1/16" is assumed across the residual material on the sides of the tank, as well as around the pipes. NRC staff asked DOE about the final disposition of the retrieval equipment. DOE explained that the retrieval / closure strategy is to leave the equipment in the tanks. Lessons learned have been tracked for retrieval technologies deployed. One major retrieval lesson learned is that the Cold Test Facility, a full-size tank with superstructures, will be beneficial for testing all current and future technologies before they are deployed in the field for “hands on” experience under simulated conditions.

Following discussion of the waste retrieval technologies, DOE proceeded to provide an overview of its SST System PA. Chapters 1 - 3 of the SST System PA were received by NRC on August 18, 2005. DOE stated that the last chapters of the PA are currently being prepared for DOE Hanford internal review. The PA addresses intruder, atmospheric, and groundwater pathways. DOE stated that alternative scenarios to the base case would be presented to establish the robustness of the performance of the system. The analysis will be performed for 10,000 years and consideration will be given for institutional controls of up to 300-500 years that would limit intruder contact with the waste. The PA is deterministic and numerous sensitivity analysi=es will be performed to evaluate parameter and scenario uncertainty. NRC staff asked a clarifying question with regard to the intruder scenario and the assumption made for containers being breached. DOE explained that the assumption is that the intruder breached multiple containers and the water table is reached. NRC staff asked DOE about the cap design. DOE explained that a capillary cap is being developed and tested at DOE Hanford.

The final topics discussed were the tank waste treatment approaches, the demonstration bulk vitrification system (DBVS), and the integrated disposal facility (IDF) and its PA. Two supplemental pretreatment options outlined were (1) selective dissolution and (2) fractional crystallization. With regard to the DBVS, the bulk of the concrete work is completed, and 4 of 7 system designs have been submitted to the State of Washington, Department of Ecology and 3 have been approved. The purpose of the IDF is to dispose of low activity waste produced by the waste treatment plant, DBVS and potentially by supplemental treatment plant, waste treatment plant secondary waste, and other Hanford and DOE complex low-level waste.

Public Comment

A member of the public and retired Hanford employee provided oral and written comments. Some of the concerns noted with regard to the performance assessments are:

- Inventories of the different tank waste streams
- Assumption of waste form release rates without an adequate technical basis
- A one dimensional model for sediment retardation in the soil column with a perfect, homogenous soil column which has no input for lateral hydraulic flow
- Model assumptions not conservative

The public written comments submitted to NRC are included as Enclosure 4.

A representative of the State of Washington, Department of Ecology stated that they support the criteria outlined in the Technical Basis for Classification of Low-Activity Waste Fraction from Hanford Site Tanks, September 1996 (WHC-SD-WM-TI-699, Rev. 2). He also stated that NRC's role is critical in evaluating residual waste left in the tanks. Finally, he stated that the sensitivity analysis is important to the State but they have concerns.

Closing Remarks & Action Items

DOE stated that it intends to provide NRC with an updated version of chapters 1 – 3 of the SST System PA with the remaining chapters of the SST System PA. Both agencies agreed that the meeting was useful and the meeting was adjourned.