February 13, 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: Anna Bradford **/RA/**
Senior Project Manager
Low-Level Waste Section
Environmental & Performance Assessment Directorate

SUBJECT: JANUARY 25, 2006, MEETING SUMMARY: MEETING WITH U.S. DEPARTMENT OF ENERGY TO DISCUSS TECHNICAL ISSUES RELATED TO THE DRAFT WASTE DETERMINATION FOR TANKS 18 AND 19 AT THE SAVANNAH RIVER SITE

On January 25, 2006, staff and management from the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) met to discuss technical issues related to DOE's draft waste determination for Tanks 18 and 19 at the Savannah River Site. The draft waste determination was submitted to the NRC for review on September 30, 2005. The meeting summary is enclosed for your use.

Enclosures:
1. Summary of Meeting
2. Attendee List
3. Handouts

cc: K. Picha/DOE

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SUMMARY OF JANUARY 25, 2006, OPEN MEETING TO DISCUSS TECHNICAL ISSUES RELATED TO THE DRAFT WASTE DETERMINATION FOR TANKS 18 AND 19 AT THE SAVANNAH RIVER SITE

Introduction

On January 25, 2006, staff and management from the U.S. Nuclear Regulatory Commission (NRC) and the U.S. Department of Energy (DOE) met to discuss technical issues related to the draft waste determination for closure of Tanks 18 and 19 at the Savannah River Site (SRS). This meeting was open to the public and was held near the site at a community center in North Augusta, GA.

In addition to NRC and DOE staff and contractors present at the meeting, representatives of DOE-Headquarters, the Center for Nuclear Waste Regulatory Analyses, and the Natural Resources Defense Council participated via conference call. Representatives of the South Carolina Department of Health and Environmental Control (DHEC), the Georgia Department of Natural Resources, the Savannah River Site Citizens Advisory Board (CAB), the Sierra Club, the Blue Ridge Environmental Defense League (BREDL), the Women's Action for New Directions (WAND), and other members of the public were present at the meeting. The list of attendees is Enclosure 2. The handouts used during the meeting are Enclosure 3. DOE's draft waste determination for closure of Tanks 18 and 19 is available in the Agencywide Documents Access and Management System (ADAMS) under accession number ML053110081.

Discussion

The draft waste determination for closure of Tanks 18 and 19 at SRS was submitted to the NRC for review on September 30, 2005. The purpose of the meeting was for DOE and NRC to discuss technical issues related to the draft waste determination. During the meeting, DOE presented information concerning exposure pathways, all-pathways doses, modeling assumptions, and sensitivity analyses (see handouts in Enclosure 3 for details). NRC and DOE staffs discussed the information presented in the slides as well as related topics; some of the issues discussed are presented below.

DOE indicated that its end state vision for SRS is that the site will remain zoned as industrial use, with no residential use, in perpetuity. DOE stated that the production of the upper aquifers is approximately 3-6 gpm and that DHEC uses 10 gpm to determine whether an aquifer should be used for domestic use. Also, the local practice is to put in deep wells that reach the lower aquifer in order to ensure a plentiful supply of water and that on site wells are not expected to be productive enough to support a household. For these reasons, DOE's modeling assumes that the member of the public receptor is located at the boundary of the General Services Area, approximately 1 mile away from Tanks 18 and 19.

NRC staff asked how assuming that the receptor is 1 mile away is consistent with the 10 CFR 61 requirement of assuming that institutional controls fail at 100 years, thereby allowing a member of the public to move on site. DOE responded that it does calculate the doses to a receptor located at 100 m from the tank but that this person is assumed to be an intruder rather than a member of the public because this person would not be allowed to build a house and reside on the site due to zoning laws. NRC indicated that assuming that zoning laws are

effective for 10,000 years might not be realistic and that the reason for assuming that institutional controls fail at 100 years is to assess the impact if someone does move on site. DOE responded that the unproductive on-site wells would be another reason why the receptor would remain located 1 mile away on the other side of Fourmile Branch and that this location would be the point of highest exposure. DOE stated that it looked at what DHEC requires for wells and typical practices of well drillers and that, in general, people do not use the Barnwell-McBean aquifer due to insufficient yield; also, that most drillers would drill a few more feet into the deeper aquifer in order to get a reliably productive well. NRC and DOE staff discussed aquifer production, well yields, and typical household usage rates for water. NRC staff indicated that they were still reviewing the information regarding aquifer productivity, and that it would appear that some on-site wells do produce enough water to support a household. NRC staff asked why DOE assumed that a member of the public would always stay on the far side of Fourmile Branch. DOE responded that it will rely on zoning to keep the public on the far side of Fourmile Branch.

DOE stated that neptunium is the biggest contributor to dose for Tank 18 and technetium is the highest contributor to dose for Tank 19, and that DOE assumed that the tanks fail physically at 500 years but do not fail chemically. Thus, the hydraulically failed basemat is modeled as sand with high K_d's. DOE's modeling assumes that the contamination is located right on top of the basemat and takes no credit for the steel of the tank. DOE also indicated that, although it expected the liquid portion of the waste to mix with the grout, it did not expect a significant amount of mixing between the solid waste and the grout, and that it did not take credit for mixing in the model. NRC staff asked if it was appropriate to use K_d values representing the sorption of waste onto grout if the waste was not expected to mix with grout. DOE responded that it was appropriate because the reducing grout was expected to control the chemical conditions of water contacting the waste. NRC staff said that the solubility limits used for uranium and plutonium seem low, and asked why DOE used those values. DOE staff responded that they will provide the applicable references that support those values. DOE staff stated that they used site-specific values for input parameters whenever possible, and otherwise used conservative values from literature.

NRC and DOE staff discussed the sensitivity analyses performed by DOE (see attached handouts for related tables). DOE performed sensitivity analysis for technetium but not for neptunium K_d's for the grout, and all of the sensitivity analyses were for the drinking water pathway only. DOE staff stated that changing the K_d for technetium had a moderate effect on doses, and that they performed combinations of optimistic and pessimistic K_d's for grout, the basemat, and soil. DOE also indicated that the model software used (MEPAS) provides output in 70-year timesteps, and therefore some actual peak doses may not be accurately reported because the dose is averaged over the 70-year timestep. NRC staff indicated that they need to know the annual peak dose, not doses that are averaged over 70 years. DOE staff stated that they are looking at ways to estimate the doses on an annual basis. NRC staff also stated that averaging the dose over 70 years is apparently masking the effects of the sensitivity analyses by inaccurately reporting the effects of changing parameters; for example, changing the K_d's did not result in a significant change in dose, which is the opposite result than would be expected.

NRC and DOE staff also discussed reducing capacities assumed in the modeling. DOE staff stated that they calculated that the grout is still 95% reducing at 10,000 years. NRC asked whether DOE assumed the cracks in the grout always stay fully saturated, including the cracks that are 1.5 inches wide. DOE staff indicated that they did assume the cracks were always

100% full of water, and that the effect for larger cracks would be that more water would pass through, which would increase the amount of oxygen that contacted the waste. NRC asked what samples were used for the reducing capacities of the grout, and DOE responded that the measurements were made directly on the slag itself and then scaled to the percent of slag in the grout. DOE also assumed that there would be so much water in the system that there would not be any direct air linkages and that the air would be similar to bubbles instead. NRC staff stated that it may be misleading to simply look at the 95% of the grout that remains reducing since the areas that will be oxidized will coincide with the areas that the water contacts.

NRC and DOE staff also discussed the intruder scenarios presented in the draft waste determination. DOE stated that because the NRC recommended that DOE perform an analysis for an intruder who drills through a pipe in the NRC's review of a waste incidental to reprocessing review completed back in 2000, and because it is the piping scenario that has the largest doses, DOE included this scenario in the draft waste determination for Tanks 18 and 19. NRC staff responded that because DOE's draft waste determination specifically says that it is only for Tanks 18 and 19 and does not include associated piping or equipment, DOE should have included an intruder scenario that is related to the facilities being assessed in the draft waste determination, not an intruder for the piping. NRC staff also stated that they recommended the piping scenario back in 2000 because that particular waste determination was for the tank farm as a whole, including the related piping.

NRC staff asked whether there would be oxidation on the bottom of the waste form. DOE responded that the water would flow off of the roof and down the sides, and water going through any cracks would directly flow out of the bottom. DOE stated that there is more oxidation at the top and sides of the waste form than at the bottom because there is only diffusion of water going up into the bottom of the waste form with no advection.

Public Comment

A member of the public stated that he caught beaver in Fourmile Branch and that he did not know about possible contamination from the seepline during that time. He said that his contract specifically said that there was no contamination or hazard in Fourmile Branch.

A representative of BREDL stated that DOE's assumptions about institutional controls are suspect, and that Egyptian tombs had institutional controls but they have all been breached. He indicated that it is not defensible to say the institutional controls will last 5,000 years or even 500 years in this area, and that the site would not continue to look industrial for that entire period of time.

A representative of WAND stated that she is concerned about Section 3116 of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005. She stated that Georgia has no environmental monitoring funding provided by DOE, and the Georgian counties along the Savannah River are concerned about contamination. She was also concerned about discrepancies in waste inventories reported in DOE's Environmental Impact Statement and the draft waste determination for Tanks 18 and 19.

A representative of the SRS CAB stated that he believed the draft waste determination for

Tanks 18 and 19 was an improvement over the salt waste disposal draft waste determination. He stated that the CAB is concerned that DOE plans to submit draft waste determinations for each individual tank and believes that approach would be inefficient. He stated that there should be an overarching waste determination document that assesses the entire tank farm or that somehow the tanks should be grouped sensibly.

A member of the public stated that modeling does not seem to be directly related to public health, and that he is concerned about institutional controls. He believes that the modeling is oversimplified because a lot can happen over 10,000 years. Earthquakes, terrorist attacks, or military activity could lead to failure, or climate changes could cause flooding. He stated that there are many variables not under anyone's control that cannot be predicted.

Another representative of the CAB stated that the CAB supports these open technical meetings between NRC and DOE, and he encouraged NRC to continue to have such meetings in the local area.

Closing Remarks and Action Items

Both NRC and DOE indicated that the exchange of technical information was helpful. DOE stated that it would provide some clarifying information discussed during the meeting (e.g., maps of wells and a corrected figure showing the receptor locations).

Attendees at NRC and DOE Meeting
to Discuss Technical Issues Related to the Draft Waste Determination
for Tanks 18 and 19 at the Savannah River Site

NAME	AFFILIATION	PHONE NUMBER
Anna Bradford	NRC/NMSS	301-415-5228
A. Christianne Ridge	NRC/NMSS	301-415-5673
Karen Pinkston	NRC/NMSS	301-415-3650
Mark Thaggard	NRC/NMSS	301-415-6971
Linda Suttora	DOE	301-903-7921
Sherri Ross	DOE-SR	803-208-6078
Doug Hintze	DOE-SR	803-208-6076
Martin Letourneau	DOE-HQ	301-903-3532
Jim Cook	SRNL	803-725-5802
Alan Toblin	TetraTech	301-926-0582
Philip Young	TetraTech	803-641-4940
Jeff Newman	WSRC	803-208-3215
Tom Robinson	WSRC	803-208-3443
Kent Rosenberger	WSRC	803-208-3147
Ginger Dickert	WSRC	803-208-1527
Steve Thomas	WSRC	803-208-8064
Eloy Saldivar	WSRC	803-208-0245
Thomas Frank England	WSRC	803-557-8825
John Greeves	JTG	301-452-3511
Jim Moore	WSRC	803-952-6245
Len Colland	WSRC	803-725-5862
Greg Flach	SRNL	803-725-5195
Mtesasttemand Wright	WSRC	803-557-9658
Sonny Goldston	WSRC	803-557-6314
W.D. Hooker	GA Bowhunters	706-533-7329

Enclosure 2

Wayne Knox	Advanced Systems Technology	404-478-0210
Howard Page	DOE	803-208-6218
Bobbie Paul	WAND	404-589-9827
Christine Langton	SRNL/WSRC	803-725-5806
Elmer Wilhite	SRNL/WSRC	803-725-5800
Albert Frazier	GA DNR	706-792-7744
Andy Garrabrants	Vanderbilt University	615-322-7226
David Kosson	Vanderbilt University	615-322-1064
Kevin Brewer	BSRI	803-952-6717
Charles Gorman	SCDHEC	803-896-4058
Shelly Sherritt	SCDHEC	803-896-8955
Louis Zeller	BREDL	336-982-2691
Julie Peterson	DOE	
Michelle Ewart	DOE-SR	803-208-6710
Charles Hanson	Parsons	803-502-9503
Joe Ortaldo	SRS CAB	803-649-0227
Judy Gordon	Sierra Club	706-650-8314
Ed Stevens	SRNL	803-725-7751
Claire Shannon	Sierra Club	706-731-9525
Charles Utley	BREDL	706-798-7833
DOE-Headquarters (on phone)		
Center for Nuclear Waste Regulatory Analyses (on phone)		
Natural Resources Defense Council (on phone)		

Enclosure 3:
Slide Presentation: NRC Tank Closure Technical Interface Meeting

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