

August 17, 2011

MEMORANDUM TO: File PROJ0734

FROM: James Shaffner, Project Manager */RA/*
Low-Level Waste Branch
Environmental Protection
and Performance Assessment Directorate
Division of Waste management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Program

SUBJECT: SUMMARY OF TELECONFERENCE BETWEEN THE U.S. NUCLEAR
REGULATORY COMMISSION STAFF AND THE U.S DEPARTMENT OF
ENERGY REPRESENTATIVES CONCERNING RESPONSES TO RAIs
RELATED TO CLOSURE OF F-TANK FARM, SAVANNAH RIVER SITE

On July 21, 2011, the U.S. Nuclear Regulatory Commission (NRC) staff convened a teleconference between NRC and the U.S. Department of Energy (DOE) technical staff and contractors to afford the NRC technical staff a better understanding of responses and rationale therefore. The discussion also identified areas where additional clarification would be helpful. Meeting Participants are included in Enclosure 1; and Summary of discussion is included in Enclosure 2. This is a summary of the topic areas discussed. The meeting was an information exchange. No decisions were required or made.

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Enclosures:

1. Meeting Participants
2. Summary

CONTACT: James Shaffner, FSME/DWMEP
(301) 415-5496

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DATE	7/27/11	7/27/11	8/17/11	8/17/11

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List of Participants
Teleconference with the U.S. Department of Energy Staff Re: Savannah River Site, F Area
Tank Farm

July 21, 2011

Participant

Sherri Ross
Brent Gutierrez
Linda Suttora
Mark Layton
Larry Romanowski
Kent Rosenberger
David Watkins
Laura Bagwell
Cynthia Barr
George Alexander
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Affiliation

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Southwest Research Institute (SRI)
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Summary
Teleconference Between the U.S. Nuclear Regulatory Commission and
the U.S. Department of Energy Staff
July 21, 2011

The purpose of the teleconference was to clarify issues related to the calcareous zone and its role regarding hydraulic conductivity and site stability and to address other issues related to site stability.

RAI FF-1 Calcareous Zones

Discussion

Savannah River National Lab representative Ms. Laura Bagwell addressed 5 issues raised in RAI FF-1.

She noted that for stability considerations, soft zones are considered significant if they are 2' thick or greater. She acknowledged that the soft zone criteria do not account for the potential hydrogeologic properties of soft zones.

To her knowledge there has been no formal mapping of seeps associated with soft zones outcropping on valley walls. Most seeps are thought to occur just above outcropping aquitards. The Department of Energy (DOE) acknowledged that field mapping of calcareous related seeps could be incorporated into future stream valley mapping.

There is no evidence to support or refute calcareous dissolutions nor any evidence that there is preferential flow pathways in the F-Tank Farm (FTF) associated with calcareous zones.

There have been no known tracer tests below the tan clay (semi-)confining zone in the General Separations Area (GSA). Tritium can be used as surrogate tracers, but for obvious reasons, tritium would not be intentionally injected as a tracer below the tan clay (semi-)confining zone. The U.S. Nuclear Regulatory Commission (NRC) staff noted innocuous tracers are commonly used to understand flow and transport.

The DOE discussed the rationale that the FTF flow models used in the performance assessment (PA) were corroborative of pump test data. Analysis supports conclusion of no significant incremental flow from soft zones. The NRC staff noted that given the low relative volume of soft zones compared to non-soft zones in the Upper Three Runs-Lower Zone, it is not surprising that most hydraulic conductivity measurements and most hydraulic head measurements are biased toward measurement of non-soft zone material, and the modeling is consistent with flow behavior in the non-soft zone material. The NRC staff noted that modeling preferential flow in highly porous, highly permeable soft zone material with a single (rather than dual)-domain model is difficult, but the relatively low volume soft zones have the potential to dominate the flow field.

Status

The NRC acknowledged that discussions addressed staff's major concerns. There may be some follow-up suggestions in the Technical Evaluation Report (TER).

Enclosure 2

RAI-SS-1,3 Site Stability

Discussion

The DOE noted that historic settlement records typically indicate tank settlement of < ¼ inch since 1991. Grouted tanks at FTF (Tanks 17 and 20) have settled 0.7" and 0.5" since 1997. In general, settlement has been over predicted, probably because of failure to account for over-consolidated sediments.

The DOE discussed historic recognition of surface topographic depressions; including both "basins" and "sinks" as described by the USACE in 1952 (Each of these two classes of depressions likely includes what are now known as "Carolina Bays."). One "sink" in the footprint of FTF has been identified. Research continues regarding formations that lend themselves to possible site instability. The DOE indicated that an F Area pH map had been compiled, which may be useful for the NRC review of site stability under monitoring.

The DOE stated that soft zones may have originated during a time when the water table was lower with respect to the Santee formation, and that percolation of acidic rainwater through a Santee vadose zone may have caused dissolution. The DOE also noted that, although the Santee formation is currently under saturated conditions and is expected to remain so for the near term, it is important to understand the ramifications of potential future water table draw down and possible effects on dissolution of calcareous materials and site stability. However, the DOE believes that its analysis of settlement has been conservative and reasonable.

The NRC staff discussed a concern that the conclusion of dissolution of calcareous material to be insignificant to Savannah River Site structures was with respect to design and not performance. The NRC staff agrees that dissolution of calcareous material is likely to be very slow due to its location below the water table. However, the current and future rate of dissolution of calcareous material and potential impact on site stability is not clear for the long performance time period.

It was noted that a hypothetical collapse of a 15' soft zone beneath H Tank Farm would result in 7" of subsurface compression and 5" of surface settlement.

The NRC discussed a disparity between the DOE's assumptions regarding grout integrity in different modeling circumstances. The grout is assumed to fully degrade in the waste release section of the PA, however for site stability analysis, degradation of only the outermost 1-2 inches of the grout was assumed. The site stability analysis concluded that cracking would not occur over thousands of years. The DOE explained that the grout monolith was assumed to have microcracks that would lead to conditioning of the infiltrating water, but that these microcracks would not affect the structural stability.

Status

The NRC agreed that they had adequate information for completing this section of the TER.