

April 30, 2012

Mr. Mark Gilbertson
Deputy Assistant Secretary for Site Restoration
Office of Environmental Management
U.S. Department of Energy
1000 Independence Avenue, S.W.
Washington, DC 20585

SUBJECT: LETTER OF CONCERN (TYPE IV) REGARDING U.S. DEPARTMENT OF
ENERGY DISPOSAL ACTIVITIES AT THE SAVANNAH RIVER SITE
SALTSTONE DISPOSAL FACILITY

Dear Mr. Gilbertson:

The purpose of this letter is to express the U.S. Nuclear Regulatory Commission's (NRC's) concern regarding salt waste disposal actions planned by the U.S. Department of Energy (DOE) at the Savannah River Site (SRS) Saltstone Disposal Facility (SDF). For reasons described below and in the associated Technical Evaluation Report (TER) [available via the NRC's Agencywide Documents Access and Management System (ADAMS) at Accession Number ML121020140], the NRC does not have reasonable assurance that salt waste disposal at the SDF meets the performance objectives in Title 10 of the *Code of Federal Regulations* (10 CFR) Part 61. This conclusion is based on information provided to the NRC by DOE and the NRC staff's independent analysis. Specifically, the NRC staff has reviewed DOE's proposed action and concluded that the performance objective in §61.41 for protection of the general population from releasesⁱ may be exceeded by DOE's current proposed disposal activities for salt waste. Although the NRC staff cannot conclude that the performance objective in §61.41 is met, the potential dose to an off-site member of the public from DOE's disposal actions is still expected to be relatively low (i.e., approximately 1 mSv/yr [100 mrem/yr], the public dose limit in §20.1301).

Section 3116(b) of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA) requires the NRC to monitor certain disposal actions taken by the DOE for the purpose of assessing compliance with the performance objectives set out in 10 CFR Part 61, Subpart C. NRC monitoring activities of the Saltstone facility began following the 2007

completion of the *U.S. Nuclear Regulatory Commission Plan for Monitoring the U.S. Department of Energy Salt Waste Disposal at the Savannah River Site in Accordance with the National Defense Authorization Act for Fiscal Year 2005*, and have included a range of onsite observations, technical reviews, and meetings with DOE related to assessing DOE's compliance with the 10 CFR Part 61, Subpart C performance objectives.

The NRC staff has reviewed the *2009 Performance Assessment for the Saltstone Disposal Facility at the Savannah River Site* (2009 PA) and associated documentation in accordance with its monitoring responsibilities under Section 3116(b) of the NDAA. The 2009 PA is an update to DOE's February 2005 Performance Assessment (2005 PA) performed in support of the *Draft Section 3116 Determination, Salt Waste Disposal, Savannah River Site*. In its December 2005 Technical Evaluation Report (TER) (ML053010225) documenting the NRC's review of DOE's 2005 PA for the SDF, the NRC staff concluded that it had reasonable assurance that salt waste disposal at the SDF would meet the performance objectives of 10 CFR Part 61 provided certain assumptions in DOE's analyses were verified during monitoring. During the current review, the NRC staff carefully evaluated new information related to the assumptions identified in the previous review, as well as new factors of importance to the modified disposal plans and revised conceptual model. Our conclusion is based on the NRC staff's review of the 2009 PA, DOE responses to the NRC's requests for additional information (RAI's), and supporting references as well as independent calculations and analyses, as documented in the staff's April 30, 2012, TER (ML121020140).

DOE concludes that any dose greater than 0.25 mSv/yr (25 mrem/yr) would occur more than 10,000 years after site closure; however, the staff disagrees with many of the assumptions in DOE's model. The staff expects that any exceedance of the §61.41 limit would occur many years after site closure but finds that DOE has not provided a sufficient basis for DOE's conclusion that any exceedances would occur beyond 10,000 years. In accordance with NUREG-1854, *NRC Staff Guidance for Activities Related to U.S. Department of Energy Waste Determinations*, the time for which the 0.25 mSv/yr (25 mrem/yr) dose limit in §61.41 must be met is generallyⁱⁱ 10,000 years.

The NRC has met with DOE multiple times to discuss the issues that led to this finding. Following the NRC's second RAI (sent to DOE on December 15, 2010), the staff participated in two public meetings (ML111950042 and ML111780433) and one closed NRC/DOE management meeting (ML111610563) in which details of the NRC staff's concerns were provided to the DOE.

The NRC is sending this letter of concern to both DOE and the South Carolina Department of Health and Environmental Control (SC DHEC) so that SC DHEC is kept informed and has an opportunity to provide input and comments, and to provide DOE with an opportunity to furnish information that demonstrates its disposal actions are in compliance with the performance objectives. For example, DOE may present new or additional information or make design

changes that would enable the NRC to conclude with reasonable assurance that salt waste disposal at the SDF meets the Part 61 performance objectives. If the staff determines that, based on the information provided, there is a sufficient basis to conclude that the performance objectives are met, NRC will send a notification of resolution letter. This letter and the potential resolution letter will be made publicly available on NRC's Web site as they formally document the NRC's concern and its resolution.

If, after having reviewed any additional information received from DOE, the staff determines that it still cannot conclude there is reasonable assurance the performance objectives will be met, the NRC will issue a noncompliance notification letter to the DOE in accordance with the NDAA. Also in accordance with the NDAA, the NRC is required to inform DOE, the covered State, and Congress if it considers any of DOE's waste disposal actions to be noncompliant with the performance objectives of 10 CFR 61, Subpart C. As stated in NUREG-1854, there are three primary reasons that DOE disposal actions could be found noncompliant: (1) if there are sufficient indications that the requirements of the performance objectives are currently not being met, (2) if there are sufficient indications that there is no longer reasonable assurance that the dose limits specified in the performance objectives will be met in the future, or (3) if key aspects relied upon to demonstrate compliance with one or more performance objectives are no longer supported due to the lack of supporting information obtained during the monitoring period. As documented and explained in the TER, the NRC is not stating that releases have occurred from the disposal facility that could lead to annual doses that exceed the limits established in §61.41 (item 1 listed above). The NRC staff is, however, concerned that (i) information collected during the monitoring period (e.g., hydraulic conductivity assessments, technetium sorption measurements) does not support DOE's compliance demonstration and (ii) sufficient information has not been provided to support many key modeling assumptions relied on for performance (items 2 and 3 above).

In accordance with §2.390 of the NRC's "*Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders*," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or using its ADAMS accession number ML120650576). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

The NRC, like DOE, considers it to be in the public interest and important to dispose of the salt waste in a safe and timely fashion. We welcome the opportunity to meet with your staff to resolve concerns identified in the TER. If you have any questions or need additional information please call me at (301) 415-7197, or call Nishka Devaser, the Saltstone project manager, at (301) 415-5196.

Sincerely,

/RA/

Mark A. Satorius, Director
Office of Federal and State Materials
and Environmental Management Programs

cc: S. Wilson
Federal Facilities Liaison
Environmental Quality Control
Administration
South Carolina Department of Health
and Environmental Control
2600 Bull Street
Columbia, SC 29201-1708

ⁱ §61.41 states “Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public.” NRC has evaluated compliance using a dose limit of 0.25 mSv/yr (25 mrem/yr) Total Effective Dose Equivalent (TEDE) consistent with the approach discussed in final rule (66 FR 55752) “Because each of the organs had the same limit under the older system even though each had a different level of radiosensitivity, it is very difficult to directly compare the old standards with the new standards. As noted in the proposed rule, the Commission considers 0.25 mSv/yr (25 mrem/yr) TEDE as the appropriate dose limit to compare with the range of potential doses represented by the older limits that had whole body dose limits of 0.25 mSv/yr (25 mrem/yr).” The DOE performance assessment and NRC’s review have used the most updated dose factors consistent with Commission direction in SRM-SECY-01-0148 to calculate the potential dose.

ⁱⁱ NUREG-1854 also indicates that assessments beyond 10,000 years may be necessary in some cases to demonstrate that the disposal of certain types of waste does not result in high impacts to future generations.

The NRC, like DOE, considers it to be in the public interest and important to dispose of the salt waste in a safe and timely fashion. We welcome the opportunity to meet with your staff to resolve concerns identified in the TER. If you have any questions or need additional information please call me at (301) 415-7197, or call Nishka Devaser, the Saltstone project manager, at (301) 415-5196.

Sincerely,

Mark A. Satorius, Director
Office of Federal and State Materials
and Environmental Management Programs

cc: S. Wilson
Federal Facilities Liaison
Environmental Quality Control
Administration
South Carolina Department of Health
and Environmental Control
2600 Bull Street
Columbia, SC 29201-1708

DISTRIBUTION: GAlexander ARidge KPinkston RidsFsmeOd Fsme r/f

ML120650576

| | | | | |
|------|-----------|----------|-------------|-----------|
| OFC | DWMEP:PM | DWMEP:BC | DWMEP:BC | OGC |
| NAME | NDevaser | GSuber | CMcKenney | BJones |
| DATE | 03/05/12 | 03/07/12 | 03/08/12 | 04/18/12 |
| OFC | DWMEP | DWMEP:DD | FSME:TechEd | FSME:OD |
| NAME | APersinko | LCamper | CPoland | MSatorius |
| DATE | 04/19/12 | 04/19/12 | 04/26/12 | 04/30/12 |

OFFICIAL RECORD COPY

ⁱ §61.41 states “Concentrations of radioactive material which may be released to the general environment in ground water, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public.” NRC has evaluated compliance using a dose limit of 0.25 mSv/yr (25 mrem/yr) Total Effective Dose Equivalent (TEDE) consistent with the approach discussed in final rule (66 FR 55752) “Because each of the organs had the same limit under the older system even though each had a different level of radiosensitivity, it is very difficult to directly compare the old standards with the new standards. As noted in the proposed rule, the Commission considers 0.25 mSv/yr (25 mrem/yr) TEDE as the appropriate dose limit to compare with the range of potential doses represented by the older limits that had whole body dose limits of 0.25 mSv/yr (25 mrem/yr).” The DOE performance assessment and NRC’s review have used the most updated dose factors consistent with Commission direction in SRM-SECY-01-0148 to calculate the potential dose.

ⁱⁱ NUREG-1854 also indicates that assessments beyond 10,000 years may be necessary in some cases to demonstrate that the disposal of certain types of waste does not result in high impacts to future generations.