

**COMMENT RESPONSE MATRIX FOR
SOUTH CAROLINA GOVERNOR'S NUCLEAR ADVISORY COUNCIL
COMMENTS ON:**

**DRAFT BASIS FOR
SECTION 3116 DETERMINATION FOR CLOSURE OF
F-TANK FARM AT THE SAVANNAH RIVER SITE
DOE/SRS-WD-2010-001, REVISION 0
SEPTEMBER 30, 2010**

**SAVANNAH RIVER SITE
AIKEN, SOUTH CAROLINA**

DOE-SR COMMENT RESOLUTION FORM

March 2012

COMMENT RESPONSE MATRIX

UNITED STATES DEPARTMENT OF ENERGY SAVANNAH RIVER SITE		Document Review Record	
Document No./Title: DOE/SRS-WD-2010-001, Draft Basis for Section 3116 Determination for Closure of F-Tank Farm at the Savannah River Site		Rev.: Revision 0	SRR-CWDA-2011-00119, Revision 0 Doc. Date: 9/30/2010
Commenter(s): Ben C. Rusche		Contact: Sherri Ross	
No.	Comments	Comment Resolution	

1	The document is an excellent history of all aspects of the tank farm, and should be archived for its historic value.	The Department of Energy (DOE) agrees and the document has been archived.
2	We suggest adding an explanation as to why Tank 18 is the primary contributor to dose and why DOE can make this assertion given that most of the tanks in F Tank Farm have not been emptied, cleaned and evaluated for a final inventory of remaining wastes.	The statement in Section 6.4.1 (page 6-11) of the <i>Draft Basis for Section 3116 Determination for Closure of F-Tank Farm at the Savannah River Site</i> (DOE/SRS-WD-2010-001) concerning Tank 18 was referring to Tank 18 as being the primary contributor to the all-pathways peak dose in the performance period based on the F-Tank Farm (FTF) Performance Assessment. DOE has added wording to Section 6.4.1 to clarify this in the final FTF 3116 Basis Document. Additional text regarding Tank 18 contribution to the all-pathways peak dose has also been added to Section 7.1.3 of the final FTF 3116 Basis Document. The final FTF 3116 Basis Document (DOE/SRS-WD-2012-001) is available for public review at the following websites: http://sro.srs.gov/f_htankfarmsdocuments.htm and www.em.doe.gov
3	We understand that cumulative impacts from this waste removal process and other waste removal/closure activities at SRS are not part of these waste determination documents, however, the lack of any discussion or even acknowledgement of cumulative impacts here provides the public an incomplete picture of the impacts of total waste inventories expected to remain on the SRS, particularly in the General Separations area that includes both tank farms, the Saltstone Facility, E-Area, and ultimately several decommissioned processing facilities. We suggest that some frame of reference is necessary for the general public to conclude not only that the tank closure process is adequate independent of any other activities on SRS, but that the sum of all waste disposal processes will also be adequate.	DOE has evaluated the potential cumulative impacts of all sources of radioactive materials expected to remain on the Savannah River Site at the site end state in the <i>Savannah River Site DOE 435.1 Composite Analysis</i> . [SRNL-STI-2009-00512] DOE has inserted information describing the Composite Analysis into Section 7.0, of the final FTF 3116 Basis Document to address this comment. A footnote clarifying that the information is being provided for additional information outside the scope of the final FTF 3116 Basis Document has also been included. The Composite Analysis Executive Summary is provided as an attachment (Attachment 1) to this matrix for information. The final FTF 3116 Basis Document (DOE/SRS-WD-2012-001) is available for public review at the following websites: http://sro.srs.gov/f_htankfarmsdocuments.htm and www.em.doe.gov

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REFERENCES:

DOE/SRS-WD-2010-001, *Draft Basis for Section 3116 Determination for Closure of F-Tank Farm at the Savannah River Site*, Savannah River Site, Aiken, SC, Rev. 0, September 30, 2010.

DOE/SRS-WD-2012-001, *Basis for Section 3116 Determination for Closure of F-Tank Farm at the Savannah River Site*, Savannah River Site, Aiken, SC, Rev. 0, March 2012.

SRNL-STI-2009-00512, *Savannah River Site DOE 435.1 Composite Analysis*, Savannah River Site, Aiken, SC, Rev. 0, June 10, 2010.

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ATTACHMENT 1: Composite Analysis Executive Summary [SRNL-STI-2009-00512]

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1.0 EXECUTIVE SUMMARY

A Composite Analysis (CA) is required by the United States Department of Energy (DOE) Order 435.1 (DOE 1999a) to provide a reasonable expectation that DOE low-level waste disposal, high-level waste tank closure, and transuranic waste disposal ensure radiological protection of the public. This Order requires an accounting of all sources of DOE man-made radionuclides and DOE enhanced natural radionuclides that are projected to remain on the site after site operations have ceased. A 100 mrem/yr primary dose limit, based upon DOE Order 5400.5 (DOE 1990), has been established as the CA performance measure. However to prevent the potential dose from exceeding a significant fraction of the primary dose limit, a dose constraint (i.e., administrative dose limit) of 30 mrem/yr has also been established by DOE. The results of a CA are an estimated dose to a hypothetical member of the public at points of assessment, which are selected based upon the site's land use plans, over a minimum 1,000 year period after disposal facility and tank closure and/or all DOE site operations have ceased.

This CA report documents the projected cumulative impacts to future members of the public from the disposal of low-level radioactive waste (LLW), closure of radioactive liquid waste storage tanks, and potential disposal of transuranic waste at the Savannah River Site (SRS) and all other sources of residual radioactive material projected to be left at SRS that could interact with the disposal facilities and closure sites to affect the future radiological dose of a member of the public. The impacts were compared with the applicable DOE dose limit and constraint.

This CA satisfies the CA requirements identified in DOE Manual 435.1-1 (DOE 1999b), Sections IV.P. (3) and IV.P. (4)(a).

An SRS site description was compiled that is sufficiently detailed to support the development of the conceptual modeling carried out in the CA, to summarize existing information in support of conceptual model development on SRS facilities for which Performance Assessments (PAs) have, or are, being developed in the General Separations Area (GSA), and to provide an overview of related documentation that influences the CA. Following the identification of relevant points of assessment (POAs) and the specification of the assessment period (AP) of interest, screening analyses were conducted to focus the dose analyses on the significant radionuclides and the significant pathways of transport and exposure.

An intensive effort was undertaken to consult with custodial organizations for SRS facilities, waste tanks and waste sites, including the 515 waste sites listed in the SRS Federal Facilities Agreement (FFA), to identify those having a process history associated with radionuclides in order to establish the radionuclide inventory of all sources of residual radioactive material expected to remain on the SRS at the site end state. All identified sources of radioactive material projected to remain at SRS are included in this CA.

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Projected doses to the receptor, a hypothetical future member of the public, from all sources were calculated for a 10,100-year period from 1950 to 12050. The doses from 41 of the sources for which doses had not clearly peaked within the 10,100-yr period were further run to year 102,050 to determine whether maximum doses had been calculated. These analyses included the following three periods:

1. The 1,000-year CA period of assessment required by DOE 435.1-1 (DOE 1999b), beginning at the projected site end-state date of 2025.
2. The 10,025-year period following the projected site end-state date. This period is not mandated by DOE 435.1-1 (DOE 1999b), rather these analyses provide information that is potentially of value for those facilities regulated by Section 3116 of the 2005 National Defense Authorization Act.
3. The post-compliance period (beyond 1,000 years). Analyses were also carried out to year 102,050 to provide perspective on the magnitude of doses beyond the compliance timeframe, as recommended by the DOE PA/CA Format and Content Guide (DOE 1999c).

Because the SRS land use planning foresees perpetual control of the current SRS land, with no residential use, the receptor is assumed to reside near the Savannah River, but not on the Savannah River Site, during all of these time periods. The receptor is assumed to use river water for residential and agricultural uses (e.g., drinking water, vegetables, meat, milk) and to recreate (e.g., boating, fishing) at the mouths of the onsite streams.

This CA focuses on groundwater and surface water transport pathways in calculating potential doses to the receptor. The groundwater transport pathway describes the movement of radionuclides that leach from the source and move vertically down through the vadose zone to the aquifer and transport through the aquifer to the point of outcrop to a surface stream or the river. The model uses stream and river flow rates to calculate concentrations of radionuclides in the streams or river from the flux of radionuclides outcropping from the aquifer and arising from former streambed contamination.

The CA model uses the GoldSim™ code to calculate the transport from each source to its respective POA and the resulting doses at each POA. Table 1-1 and Figure 1-1 and Figure 1-2 summarize the CA results. As shown in Table 1-1, the maximum dose over the 1,000-yr AP occurs at the Lower Three Runs (LTR) POA and is about three mrem/yr, indicating compliance with the 100-mrem primary dose limit and 30-mrem dose constraint. This maximum dose occurs at the projected site end-state date of 2025 and is due primarily to Cs137 contained within the sediment of the LTR streambed. Because Cs137 is the primary contaminant and it has a relatively short half-life of 30 years, the LTR POA dose quickly declines from its 3 mrem/yr high in 2025 to approximately 0.1 mrem/yr in 2150, at which point LTR is no longer the controlling POA. Extending the AP to 10,000 years does not increase the maximum dose.

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Table 1-1. Maximum Cumulative Dose at each POA during CA Period of Assessment

Point of Assessment	Maximum Cumulative ¹ Dose mrem/yr 2025 to 3025	Maximum Cumulative ^{1,5} Dose mrem/yr 3025 to 12050	Major Contributing Source ²	Major Contributing Radionuclide	Major Exposure Scenario/ Pathway
Upper Three Runs	1.06	0.40	H-Canyon	Np237	Recreational/ Fish Ingestion
Fourmile Branch	2.16	0.14	FMB IOU ³	Cs137	Recreational/ Fish Ingestion
Steel Creek/Pen Branch	0.42	0.05	SC IOU	Cs137	Recreational/ Fish Ingestion
Lower Three Runs	2.97	0.05	LTR IOU	Cs137	Recreational/ Fish Ingestion
Savannah River	0.17 ⁴	0.05 ⁴	LTR IOU	Cs137	Residential/ Vegetable Ingestion

¹ Sum of doses from the residential and recreational exposure scenarios, using the respective stream flow rate for recreational dose and the Augusta, GA, river flow rate, unless otherwise noted, for residential dose.

² See Table C-1 for Source Identification corresponding to abbreviations given below.

³ IOU stands for Integrator Operable Unit, which are the stream and river beds.

⁴ Both residential and recreational doses are cumulative from all sources; the highway 301 bridge flow was used.

⁵ In all cases, the maximum dose in the 9,000 years beyond the 1,000 year assessment period occurred in year 3025.

Numerous sensitivity analyses were carried out to consider the effects of such factors as release rates, radionuclide inventories, alternative points of assessment, groundwater divides, stream flow variation, and alternative disposal actions on CA model results. A quantitative uncertainty analysis was also performed to assess the uncertainty in dose calculated from direct discharge of radionuclides to each POA. The results of both types of analyses provide great confidence that the dose to a member of the public will not exceed the performance measures (i.e., 100 mrem/year primary dose limit and the 30 mrem/year dose constraint).

In summary, there is a reasonable expectation that the performance measures identified for the CA will not be exceeded. An options analysis was deemed not necessary because the CA dose constraint of 30 mrem/year was not exceeded.

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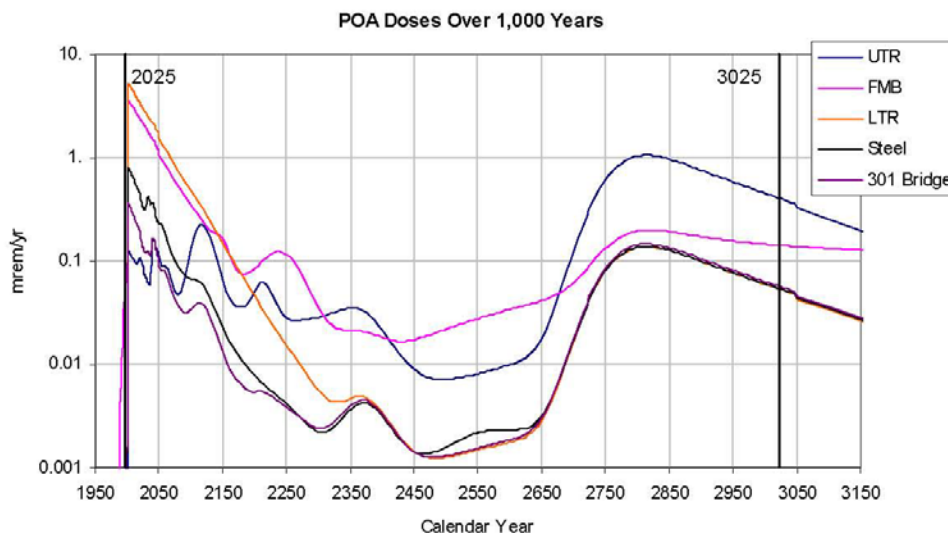


Figure 1-1. Total Cumulative Dose at POAs for 1,000 Year Assessment Period

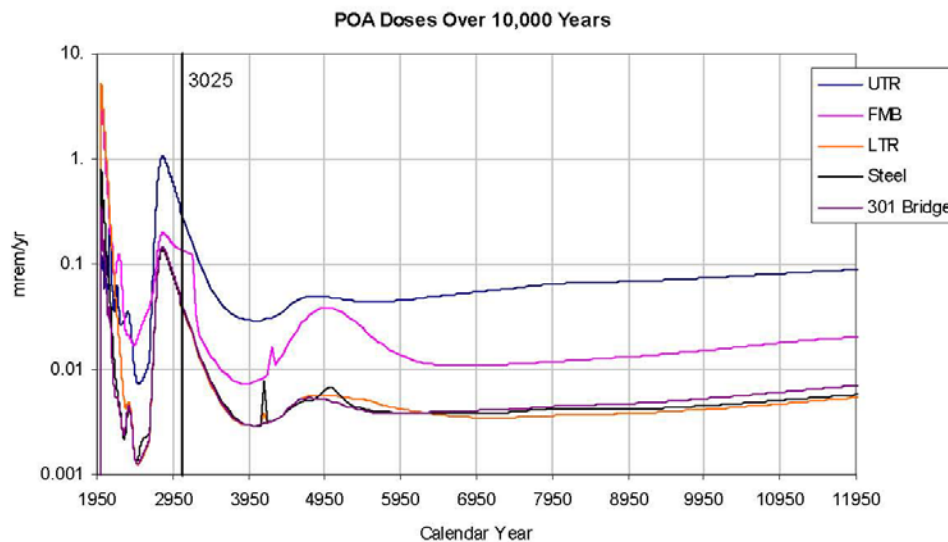


Figure 1-2. Total Cumulative Dose at POAs for Extended 10,000 Year Analysis Period