

**COMMENT RESPONSE MATRIX FOR THE SAVANNAH RIVER SITE
CITIZENS ADVISORY BOARD WASTE MANAGEMENT COMMITTEE
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	Doc. Date: 9/30/2010
Commenter(s): Joe Ortaldo and Art Domby		Contact: Sherri Ross	
No.	Comments	Comment Resolution	

1	We suggest that DOE further engage the NRC in detailed discussion to enhance the clarity and discipline associated with how the NRC will make its findings of "reasonable assurance of adequate protection." More specifically, the ultimate NRC conclusion is whether the NRC staff "has <i>reasonable assurance</i> that the NDAA criterion can be met for residual waste and related tank/auxiliary components" at the F-Tank Farm. Our reading of the Draft Basis indicates substantial conservatisms selected by DOE in its analyses to assure the criteria will be met, including DOE analyses of groundwater dose extending 20,000 years after closure and DOE quantitative analysis to identify radionuclides down to an aggregate contribution of dose of less than or equal to 1.25 mrem/year (<u>See</u>, footnotes 25 and 26, page 5-4 of the Draft Basis). Yet, the NRC apparently seeks greater specificity and analytical consistency on diverse underlying factors, such as the corrosion initiation time for different Type tanks and different corrosion mechanisms. If the Draft Basis effectively "bounds" these underlying factors by conservatisms, the additional efforts identified by the NRC may add information yet not materially affect the ultimate issues before DOE and the NRC.	The Department of Energy (DOE) appreciates your suggestion, and as suggested, has engaged the Nuclear Regulatory Commission (NRC) in detailed discussions and has provided written responses to the NRC to facilitate both consultation and a Technical Evaluation Report (TER) from NRC. The DOE and the NRC engaged in five public conference calls, between January 20, 2011 and February 17, 2011, to discuss NRC's staff comments (ML1032001240, ML103190402) on both the <i>Draft Basis for Section 3116 Determination for Closure of F-Tank Farm at the Savannah River Site</i> (hereinafter referred to as: Draft FTF 3116 Basis Document) (DOE/SRS-WD-2010-001) and the F-Tank Farm (FTF) Performance Assessment (PA), <i>Performance Assessment for F-Tank Farm Savannah River Site</i> (hereinafter referred to as: FTF PA) (SRS-REG-2007-0002). The DOE also provided other additional information as requested by the NRC and DOE and NRC held seven consultative telephone calls between June 21, 2011 and July 26, 2011. The purpose of the calls was to further consultation under Section 3116(a) of the Ronald W. Reagan National Defense Authorization Act for Fiscal Year 2005 (NDAA), and, although not required by Section 3116 or other law, to discuss the FTF PA developed by DOE under DOE's Order (Order 435.1, Change 1), Manual (Manual 435.1-1), policies and Atomic Energy Act responsibilities. In these discussions, NRC and DOE discussed interpretation of the deterministic and probabilistic analysis in the FTF PA, and whether the PA demonstrated compliance with the performance objectives in 10 Code of Federal Regulations (CFR) 61, Subpart C, as called for by NDAA Section 3116(a)(3)(A)(i) and (a)(3)(B)(i). In this regard, the first NRC performance objective (10 CFR 61.40) calls for "reasonable assurance" that human exposures are within the limits set forth in the other performance objectives. During the discussions, NRC indicated that it assumed that the FTF PA Base Case deterministic analysis was the DOE compliance case.
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		Accordingly, NRC's staff comments during oral discussions and in the NRC Requests for Additional Information and Clarifying Comments tended to concentrate on additional information relating to the technical basis and conservatisms associated with the Base Case analysis. To clarify however, DOE views the deterministic base (expected) case as a reasonably bounding and defensible facility performance model irrespective of the uncertainty around specific parameters. Moreover, DOE considered uncertainties in a number of uncertainty analyses and sensitivity analyses. For clarity, the Base Case analysis is not the most conservative scenario analyzed in the FTF PA. Additionally, DOE acknowledges other scenarios of degradation could occur along with variability of multiple parameters resulting in alternate facility performance as analyzed probabilistically in the FTF PA. DOE considered both the deterministic and probabilistic results in the Draft FTF 3116 Basis Document to demonstrate compliance with the performance objectives (at 10 CFR 61.41 and 61.42). DOE provided written clarification to NRC staff comments with responses to facilitate consultation. [SRR-CWDA-2011-00054] These responses are available for public review at the following websites: http://sro.srs.gov/f_htankfarmsdocuments.htm <u>and</u> www.em.doe.gov The NRC documented their consultative review, observations and recommendations regarding the Draft FTF 3116 Basis Document, with issuance of the NRC's <i>Technical Evaluation Report For F-Area Tank Farm Facility, Savannah River Site, South Carolina</i> (TER) which is available on the publicly accessible ADAMS website. [ML112371715] DOE has fully considered the consultative recommendations provided by the NRC in preparation of the <i>Basis for Section 3116 Determination for Closure of F-Tank Farm at the Savannah River Site</i> (hereinafter referred to as: FTF 3116	

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		Basis Document), as documented in the FTF 3116 Basis Document and it's supporting references. [DOE/SRS-WD-2012-001] After the TER was issued, DOE also completed a <i>Tank 18/Tank 19 Special Analysis for the Performance Assessment for the F-Tank Farm at the Savannah River Site</i>, using the final residual inventories in Tanks 18 and 19, and associated sensitivity analyses using internationally accepted and updated data, which demonstrate that the FTF PA Base Case model incorporates conservative approaches/inputs associated with Pu-239 and that peak dose associated with Pu-239 would likely occur later and be significantly more attenuated than reflected in the FTF PA Base Case. [SRR-CWDA-2010-00124] DOE has considered and reflected these analyses, as well as other new analyses, in the final FTF 3116 Basis Document. Nevertheless, DOE appreciates your concerns regarding the propriety of additional information efforts concerning the FTF PA. DOE will undertake additional recommended studies, taking into account factors such as the availability of other information, the potential reduction in risk and uncertainty, and timing and cost considerations.	
2	We also suggest that, given the conservatisms in the DOE examinations and notwithstanding the pursuit of greater precision in some aspects of DOE analyses, DOE and the NRC develop a methodology or approach to pursue that greater precision without delaying the targeted schedule dates for closing tanks.	To minimize any further delays to the closure program at the Savannah River Site (SRS), DOE responses to NRC's staff comments discuss the bounding nature of both the deterministic and probabilistic analysis already performed in support of the FTF PA. Furthermore, during the conference calls described in the response to Comment #1 above, DOE and NRC initiated discussions concerning potential future work activities such as sampling and analysis, research and development, and analytical modeling to be performed as part of DOE's responsibilities under the Atomic Energy Act, which also would serve to assist NRC monitoring, in coordination with the State of South Carolina, under Section 3116(b) of the NDAA. This is a natural progression between DOE and NRC as consultation between the	

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		agencies is concluding and interactions begin to evolve toward monitoring, under Section 3116(b) of the NDAA, of DOE's FTF disposal actions for the purposes of assessing continued compliance with the NRC performance objectives at 10 CFR 61, Subpart C. In its TER, the NRC states that the NRC will coordinate with the State of South Carolina to develop a plan by which NRC and the State will monitor DOE's disposal actions. The DOE will work with the NRC and the State of South Carolina to facilitate their efforts to fulfill their independent responsibilities. The NRC TER is documented in the publicly accessible ADAMS website. [ML112371715]	
3	We suggest that DOE more extensively describe its "systematic progression" as a prospective game plan for the tanks . Of key significance might be a description of the factors or evaluations that DOE will use to determine that the "maximum extent practical" has been reached, recognizing that real time factors will come into play. For example, DOE might describe the evaluative nature of weighing future cleaning campaigns against the likely reduction in radiological inventory, the manner in which dose to workers will be considered, and the role and responsibilities of specific DOE representatives or groups in decision-making.	Additional information regarding the phases of DOE's systematic waste removal activities is provided in the reference document <i>Approach to Documenting Removal of Radionuclides to Support DOE Closure Authorizations</i> , DOE/SRS-WD-2011-001. The referenced document outlines and describes the approach used by DOE for each of the SRS waste tanks and ancillary structures. DOE has added the information contained in the cited reference, DOE/SRS-WD-2011-001, as an appendix to the final FTF 3116 Basis Document. The above referenced document, DOE/SRS-WD-2011-001, as well as the final FTF 3116 Basis Document (DOE/SRS-WD-2012-001) and the Secretary of Energy's 3116 Determination (DOE-WD-2012-001) are available for public review at the following websites: http://sro.srs.gov/f_htankfarmsdocuments.htm <u>and</u> www.em.doe.gov	
4	We also suggest that more detail be provided in Section 2.3.7 (page 2-64) and Section 5.2.2.2 (page 5-13) with respect to the identification, evaluation and deployment of emerging or additional technologies for waste removal. What we mean by this is a more expanded description of the evaluative process by which DOE prospectively will	Additional information on the process for evaluating and selecting available waste removal technologies for each waste tank and ancillary structure in the closure process is provided in <i>Waste Removal Technology Baseline: Technology Development Description</i> , V-ESR-G-00003. The referenced document provides a more thorough description of the waste removal technology selection process, the current baseline technologies, and	

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	assure that potentially viable, cost-effective and technically-sound (and without appreciable project risk) new technologies might be applied to F-Tank Farm. The description should also clearly delineate, at least in a general narrative or qualitative form, the limitations of such a future evaluative process. In particular, we see little overall benefit from significant departure from proven and deployed, existing technology when the results achieved by the existing technology are consistent with and supportive of the relevant PAs and achievement of the performance objectives in 10 CFR Part 61, Subpart C.	consideration of future technologies. A recent example of how DOE evaluates potential technologies is documented in <i>Cost-Benefit Analysis for Removal of Additional Highly Radioactive Radionuclides From Tank 18</i> , SRR-CWDA-2012-00026. DOE has added a reference to both of these documents in the final FTF 3116 Basis Document. The above referenced documents, V-ESR-G-00003 and SRR-CWDA-2012-00026, are available for public review at the following websites: http://sro.srs.gov/f_htankfarmsdocuments.htm and www.em.doe.gov	
5	We encourage DOE to provide a narrative for the flexibility and judgment that necessarily will be inherent in this “fine tuning” from tank to tank. ¹ Similarly, to the extent that particular techniques or approaches for removal will <i>not</i> be pursued because experience indicates their application is not advantageous, DOE might include additional documentation about the exclusion of those techniques.	Additional information regarding the phases of DOE’s waste removal activities is provided in the reference document <i>Approach to Documenting Removal of Radionuclides to Support DOE Closure Authorizations</i> , DOE/SRS-WD-2011-001. The referenced document outlines and describes the approach used by DOE for each of the SRS waste tanks and ancillary structures. DOE has added the information contained in the cited reference, DOE/SRS-WD-2011-001, as an appendix to the final FTF 3116 Basis Document. In addition, information on the process for evaluating and selecting available waste removal technologies for each waste tank in the closure process is provided in <i>Waste Removal Technology Baseline: Technology Development Description</i> , V-ESR-G-00003. The referenced document provides a more thorough description of the waste removal technology selection process, the current baseline technologies, and consideration of future technologies. A recent example of how DOE evaluates potential technologies is documented in <i>Cost-Benefit Analysis for Removal of</i>	

¹ The NRC’s RAI-MEP-1 suggests that DOE provide a fuller explanation of the waste removal technologies “expected to be deployed” for the different tank types, and the “expected effectiveness of these technologies” based on experience to date. We consider important, too, a discussion of the prospective technical judgment that, without question, will have to be applied to particular circumstances. In this regard, DOE might articulate a threshold, perhaps akin to an Unresolved Safety Question definition, in the absence of which technical judgment may be exercised within the Design Basis.

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		<i>Additional Highly Radioactive Radionuclides From Tank 18</i>, SRR-CWDA-2012-00026. DOE has added a reference to these documents in the final FTF 3116 Basis Document. The above referenced documents, DOE/SRS-WD-2011-001, V-ESR-G-00003, SRR-CWDA-2012-00026, as well as the final FTF 3116 Basis Document (DOE/SRS-WD-2012-001) are available for public review at the following websites: http://sro.srs.gov/f_htankfarmsdocuments.htm <u>and</u> www.em.doe.gov	
6	With respect to the flushing of cooling coils, Section 2.3.5, page 2-63, DOE's knowledge base appears to be more limited, or at least not as extensive, as experience with waste removal from tanks. The Draft Basis should address the potential contingency for plugging cooling coils and leaving them in place with residual waste, should flushing prove less achievable or to address instances in which coils can not be flushed (e.g. blockage; physically constricted coils; damaged coils). Perhaps a narrative on the upper limits ("bounding") volume of liquid waste abandoned in coils might be evaluated as within the conservatisms of the PA, either on a coil, tank or tank farm basis.	Similar to other equipment that will be entombed inside of waste tanks at closure, cooling coils will be evaluated on a tank-by-tank basis to determine the best approach to flushing, grouting, and determination of waste hold up. In their intact design configuration, all cooling coils have a supply pipe and a return pipe that provide access at the tank top for flushing and grouting from either end. Failed cooling coils include those that are broken, cut, or breached, and these coils are typically identified visually or by performing pressure tests on the cooling coils. Failed cooling coils that remain connected to the supply piping or return piping can be flushed and grouted from the tank top utilizing the supply piping, return piping, or both. Sections of cooling coils that are disconnected from both the supply and return piping will be evaluated for potential waste hold up and impact on closure. Failed cooling coils inside the tank that cannot be assuredly filled with grout are not expected to provide a vertical fast flow path from the tank top to the contamination zone at the bottom of the tank for the following reasons. Vertical cooling coils do not extend all the way to the tank roof and are configured so that a minimum of 18 to 25 inches of grout can be placed above the top of the coils, in addition to the 30 inches (or more) of cover provided by the tank roof. As described above, any failed cooling coils that could not be accessed either by the supply piping or return	

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		piping would not extend to the top of the waste tank and therefore would not provide a fast flow path to the residual inventory and would not invalidate the use of Configuration A as the Base Case in the FTF PA.	

REFERENCES:

10 CFR 61, *Licensing Requirements for Land Disposal of Radioactive Waste*, Nuclear Regulatory Commission, Washington DC, January 1, 2010.

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ML112371715, *Technical Evaluation Report For F-Area Tank Farm Facility, Savannah River Site, South Carolina*, Rev. 0, U.S. Nuclear Regulatory Commission, Washington DC, October 27, 2011.

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SRR-CWDA-2010-00124, *Tank 18/Tank 19 Special Analysis for the Performance Assessment for the F-Tank Farm at the Savannah River Site*, Savannah River Site, Aiken, SC, Rev. 0, February 2012.

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SRS-REG-2007-0002, *Performance Assessment for the F-Tank Farm at the Savannah River Site*, Savannah River Site, Aiken, SC, Rev. 1, March 31, 2010.

V-ESR-G-00003, Caldwell, T.B., *Waste Removal Technology Baseline: Technology Development Description*, Savannah River Site, Aiken, SC, Rev. 1, June 2011.