

Supplement Analysis for the Treating Transuranic (TRU)/Alpha Low-Level Waste at the Oak Ridge National Laboratory, Oak Ridge, Tennessee (DOE/EIS-0305)

Introduction

The U.S. Department of Energy (DOE) prepared this supplement analysis (SA) to evaluate the existing environmental impact statement (EIS) (listed below) considering changes that could have bearing on the potential environmental effects previously analyzed. Section 3.9 of DOE's National Environmental Policy Act (NEPA) Implementing Procedures (June 16, 2026) states that:

- (a) DOE is required to prepare supplements to environmental documents only if a major Federal action remains to occur, and:
 - (1) DOE makes substantial changes to the proposed action that are relevant to environmental concerns; or
 - (2) DOE decides, in its discretion, that there are substantial new circumstances or information about the significance of the adverse effects that bear on the proposed action or its effects.
- (b) When it is unclear whether a supplement to an environmental document is required, DOE may prepare a supplement analysis.

This SA analyzes whether the life extension of the TRU Waste Processing Center (TWPC) in Oak Ridge, Tennessee, and the intake of TRU waste from off-site DOE facilities constitutes substantial changes to the action proposed in the *Final Environmental Impact Statement for Treating Transuranic (TRU)/Alpha Low-Level Waste at the Oak Ridge National Laboratory, Oak Ridge, Tennessee* (DOE/EIS-0305; EIS-0305). This SA also analyzes whether there are significant new circumstances or information relevant to environmental effects compared to those presented in EIS-0305.

DOE's purpose and need for the action, as described in EIS-0305, was to develop and implement safe and efficient treatment and temporary storage for TRU/alpha low-level waste (waste) generated at the Oak Ridge National Laboratory (ORNL) in accordance with the Resource Conservation and Recovery Act (RCRA) regulations. The Record of Decision (ROD) for EIS-0305 documented DOE's selection of the Preferred Alternative for the construction, operation, and decommission/decontamination (D&D) of TWPC to treat and store legacy waste generated at ORNL in preparation for ultimate disposition off-site at the DOE Waste Isolation Pilot Plant (WIPP) in New Mexico.

In EIS-0305, DOE evaluated the potential environmental impacts of five reasonable alternatives, including no action, for construction of facilities with different technologies for treating and storing TRU/alpha low-level waste generated at ORNL. Under the preferred alternative, selected

in the ROD, TWPC was constructed on 5 acres (2 hectares [ha]) of land adjoining the Melton Valley Storage Tanks (MVST) at ORNL.

Changes to the Proposed Action and New Circumstances or Information

This SA addresses the environmental effects of extending the operating life of TWPC from FY2026-FY2052, and the following: preventative maintenance and minor modifications to existing equipment (e.g., minor upgrades to the hot cells); treating/processing approximately 3,109 m³ of on-site waste; and transporting 449 shipments of approximately 4,279 m³ of TRU waste from off-site DOE facilities to TWPC for treatment, characterization, and temporary storage. Subsequent transport of TRU waste to WIPP and mixed low-level waste (MLLW)/low-level waste (LLW) to the Nevada National Security Site (NNSS) is addressed in the analysis and RODs for the *Final Waste Management Programmatic EIS for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste* (DOE/EIS-0200; WM PEIS).

Expected TRU waste generator sites include: Savannah River Site (Aiken, SC), Waste Control Specialists LLC (Andrews, TX), Massachusetts Institute of Technology (Cambridge, MA), Lawrence Livermore National Laboratory (Livermore, CA), Knolls Atomic Power Laboratory (Niskayuna, NY), Separations Process Research Unit (Schenectady, NY), Shallow Land Disposal Area (Vandergrift, PA), NNSS (Nye County, NV), and Los Alamos National Laboratory (Los Alamos, NM). However, under the current updates to the action, DOE may transport TRU waste from any DOE facility to TWPC, including sites not yet identified or included in this SA, assuming all shipments follow applicable laws and regulations. The potential impacts and analysis will not change if additional sites are identified, provided that the shipments and quantities analyzed in this SA remain accurate.

Background

TWPC is a Hazard Category 2 Nuclear Facility and is the Oak Ridge Reservation's (ORR) center for managing, treating, packaging, and shipping TRU waste. TWPC processes TRU waste under the Site Treatment Plan for Mixed Wastes and the Tennessee Hazardous Waste Management Permit Number TNH-200 (EPA ID Number: TN1890090003). Since 2003 (FY2004), 98% of the legacy contact-handled (CH) and remote-handled (RH) TRU waste has been processed and 90% has been dispositioned, leaving ample storage space at TWPC. DOE is reevaluating the EIS-0305 limitation of on-site TRU waste at TWPC to consider acceptance of TRU waste from off-site DOE facilities. Potential impacts associated with the life extension of TWPC and the transportation of TRU material from off-site facilities to TWPC require further consideration. This SA assesses acceptance of TRU waste from off-site DOE facilities by TWPC and the required life extension of the facility, with the assumption that all shipments of radioactive and hazardous waste will follow applicable laws and regulations.

Impact Screening Analysis

Based on the proposed changes and circumstances described above, this SA evaluates the environmental resource areas considered in EIS-0305. Table 1 provides a comparison of potential impacts to each resource area. Based on this screening review, resource areas that would be unaffected, negligibly affected, or bound by EIS-0305 were eliminated from detailed analysis.

Table 1. Comparison of Potential Environmental Impacts

Comparison of Potential Environmental Impacts			
Resource Area	Summary of Potential Effects in EIS-0305	Summary of Potential Effects as a Result of Changes to the Proposed Action	Difference in Potential Effects
Land Use	As described in Chapter 4, Section 4.1: • No change in land use classification; • 2 ha (5 ac) would change from underdeveloped to industrial use; • Buildings and other structures would be visible to workers but not the public.	Land use will not change from current industrial use. The overall facility footprint will remain the same, thus, there is no change from original analysis.	No difference in potential impacts.
Cultural and Historic Resources	As described in Chapter 4, Section 4.2: No cultural, archeological, or historic resources in project area.	The overall facility footprint will remain the same, thus, there is no change from original analysis.	No difference in potential impacts.
Ecological Resources	As described in Chapter 4, Section 4.3: • 2 ha of forested habitat lost and converted to industrial use (revegetated after facility D&D); • Reduction of soil and water contamination because treatment would be available for waste to be removed from Solid Waste Storage Area (SWSA) 5 North trenches under the Comprehensive Environmental Response, Compensation, and Liability Act.	The overall facility footprint will remain the same, thus, there is no change from original analysis.	No difference in potential impacts.

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Resource Area	Summary of Potential Effects in EIS-0305	Summary of Potential Effects as a Result of Changes to the Proposed Action	Difference in Potential Effects
Geology and Seismicity	As described in Chapter 4, Section 4.4: • No impact on geology or regional seismicity; • 2 ha of soil disturbed; • Reduction of soil and water contamination, as noted above in “Ecological Resources.”	The overall facility footprint will remain the same, thus, there is no change from original analysis.	No difference in potential impacts.
Surface Water	As described in Chapter 4, Section 4.5.1: • Potential increased siltation in White Oak Creek, Melton Branch, unnamed tributary; • Reduction of soil and water contamination, as noted above in “Ecological Resources.”	The overall facility footprint will remain the same, thus, there is no change from original analysis.	No difference in potential impacts.
Groundwater	As described in Chapter 4, Section 4.5.2: • No groundwater use; • Positively impacts to groundwater due to waste removal and treatment from SWSA 5 North trenches.	There will not be groundwater use, thus, there is no change from original analysis.	No difference in potential impacts.
Wetlands & Floodplains	As described in Chapter 4, Section 4.5.3: • Small impact from sedimentation to 100-year or 500-year floodplains during construction phase; • Wetland B (0.03 ac) would be eliminated by construction but will be mitigated.	The overall facility footprint will remain the same, thus, there is no change from original analysis.	No difference in potential impacts.
Waste Management	As described in Chapter 4, Section 4.6: • All legacy waste in proposed action would be treated (4,050 m³); • Approximately 10,833 m³ of total generated waste:	<u>On-site waste estimates</u> • FY2004-FY2025: ○ 3,955 m³ of legacy waste processed/treated; ○ 10,980 m³ (1,861 m³ TRU, 2,976 m³ MLLW, 6,143 m³ LLW) generated;	• Additional summary analysis below. • Preventative maintenance and minor modifications to existing equipment (e.g., minor upgrades to the hot cells) were

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Waste Management (cont.)	• 607 m³ CH and RH TRU waste; • 2,778 m³ low-level waste; • 23 m³ low-level mixed waste; • 1,560 m³ of sanitary wastewater; and • 5,550 m³ debris from D&D activities.	○ 28,000 m³ of sanitary wastewater generated. • FY2026-FY2052: ○ 3,109 m³ TRU processed/treated; ○ 8,395 m³ (3,047 m³ TRU, 2,674 m³ MLLW, 2,674 m³ LLW) generated. <u>Off-site waste estimates from other DOE facilities</u> • FY2026-FY2052: ○ 4,279 m³ TRU processed/treated; ○ 11,554 m³ (6,766 TRU, 2,394 MLLW, 2,394 LLW) generated. <u>Total On-site & Off-site Waste Estimates</u> • FY2026-FY2052: ○ 7,388 m³ TRU processed/treated; ○ 19,949 m³ (9,813 TRU, 5,068 MLLW, 5,068 LLW) generated; ○ 38,880 m³ of sanitary wastewater generated. • FY2004-FY2052, total estimated waste from project start through life extension: ○ 11,343 m³ processed/treated; ○ 30,929 m³ (11,674 TRU, 8,044 MLLW, 11,211 LLW) generated; ○ 66,880 m³ of sanitary wastewater generated.	categorically excluded from further NEPA review in 2012 by Categorical Exclusion (CX)-GEN-011 (Bl.3, Bl.27, B2.1, B2.2, and B2.3 in 10 CFR Part 1021, Appendix B) and CX-GEN-012 (Bl.11, Bl.15, and Bl.31 in 10 CFR Part 1021, Appendix B). • Total waste volumes exceed original estimates; however, there is ample space for waste at TWPC due to ongoing shipments to WIPP and NNSS, and no additional waste types are anticipated for the proposed action. • Sanitary wastewater estimates are addressed in Resource Areas Analysis Section below. • Potential impacts are insignificant.
Climate and Air Quality	As described in Chapter 4, Section 4.7: • Minor emissions during normal operations; Slightly higher volatile organic emissions.	• As with original analysis, minor emissions during normal operations and slightly higher volatile organic emissions are anticipated due to waste stream types (e.g., CH and RH TRU).	• Additional summary analysis below. • See Table 2 in Resource Areas Analysis Section

Table 1. Comparison of Potential Environmental Impacts

Comparison of Potential Environmental Impacts			
Resource Area	Summary of Potential Effects in EIS-0305	Summary of Potential Effects as a Result of Changes to the Proposed Action	Difference in Potential Effects
Climate and Air Quality (cont.)		Emissions will remain within the limits of the operating permit (071009P).	- for emissions comparisons. - Potential impacts are insignificant.
Transportation	As described in Chapter 4, Section 4.8: <u>On-site Retrieval & Transport</u> 300 shipments of RH waste from trenches and bunkers, and 245 shipments of CH waste to treatment facility; - Retrieval accidents could result in 6.3E-05 latent cancer fatalities (LCFs) (public) and 7.5E-04 industrial fatalities to involved workers; - Transportation accidents could result in 2.9E-05 LCF (public) and 3.3E-05 non-radiological fatalities; - Total risks to noninvolved workers and public maximally exposed individual (MEI) are 5.3E-07 and 6.2E-09 probability of cancer fatality (PCF), respectively; 8.0E-03 LCF (involved worker (based on 1 rem/year assumed dose limit). <u>Off-site Transport</u> 397 shipments of TRU waste with 3.2E-01 accidents and 4.4E-02 fatalities predicted; - Non-accident LCFs of 8.7E-03 for CH TRU and 3.1E-02 for RH TRU waste; 277 LLW shipments with 2.6E-01 accidents and 3.6E-02 accident fatalities predicted;	<u>On-site Waste Retrieval & Transport Estimates</u> - FY2004-FY2025: 792 shipments of 6,153 drums, 175 boxes, and 398 casks. - FY2026-FY2052: 539 shipments. <u>Transport Estimates from Off-site Facilities to TWPC</u> - FY2026-FY2052: 449 shipments. <u>Transport Estimates from TWPC to Off-site Facilities for Disposal</u> - FY2004-FY2025, 689 total shipments, including: 73 shipments of RH TRU waste to WIPP; 227 shipments of CH TRU waste to WIPP; 389 shipments of MLLW/LLW to NNSS. - FY2026-FY2052, 3,553 total shipments, including: 2,258 shipments of TRU waste to WIPP; 1,295 shipments of MLLW/LLW to NNSS. - FY2004-FY2052, 4,242 total shipments, including: 2,558 shipments of TRU waste to WIPP; 1,684 shipments of MLLW/LLW to NNSS.	- Additional summary analysis below. - On-site retrieval and transport risks are comparable to original analysis. - See Table 3 in Resource Areas Analysis Section for risk predictions (e.g., PCFs, LCFs) for transportation from off-site DOE facilities to TWPC. - Transportation from TWPC to off-site disposal facilities (e.g., WIPP, NNSS) was addressed in the WM PEIS and associated RODs, and no additional NEPA review is required. - Potential impacts are insignificant.

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Comparison of Potential Environmental Impacts			
Resource Area	Summary of Potential Effects in EIS-0305	Summary of Potential Effects as a Result of Changes to the Proposed Action	Difference in Potential Effects
Transportation (cont.)	• 2.1E-09 non-accident LCFs predicted.		
Utility Requirements	As described in Chapter 4, Section 4.9: • About 15,000 Megawatts (MW)* of total electricity usage; and • 5 million gallons of water use during life of project.	• FY2004-FY2025: 13,183 kW of electricity and 1,705,600 gallons of water were utilized. • FY2026-FY2052: 15,580 kW of electricity and 2,015,709 gallons of water are estimated to be needed. • FY2004-FY2052, utility estimates from project start through life extension: ○ 28,763 kW of electricity; ○ 3,721,309 gallons of water.	• Additional summary analysis below. • Total estimated water usage is below amount of original analysis. Total electrical usage will exceed original analysis; however, the impacts are negligible given the electrical grid capacity. • Potential impacts are insignificant.
Human Health	As described in Chapter 4, Section 4.10: • PCF from radiological releases to involved worker estimated to be 3E-08; non-involved worker estimated to be 2E-08; and off-site MEI estimated to be 1E-08 • Collective dose to the affected off-site public population would be 1.2E-01 person-rem, resulting in 6.0E-05 LCFs.	Annual dose estimates for FY2004-FY2025: • PCF from radiological releases to involved worker were estimated to be 8E-10; non-involved worker was estimated to be 6E-10; and off-site MEI was estimated to be 3E-10. • Collective dose to the affected off-site public population was estimated to be 6.1E-03 person-rem, resulting in 4E-06 LCFs. • TWPC emissions will continue to be monitored and stay below radiological release and dose limits in all categories.	• Additional summary analysis below. • Over the operating life of TWPC, annual radiological release doses were lower than predicted in EIS-0305, and impacts are anticipated to be similar to or less than historical values throughout the life extension. • Potential impacts are insignificant.
Noise	As described in Chapter 4, Section 4.12: • Site construction and D&D noise up to 70 dBA; • Noise levels during operations at 50 to 60 dBA; • Noise increases are temporary and minor.	• Noise levels due to continued operation will not change.	• No difference in potential impacts.
Accidents	As described in Chapter 4, Section 4.11:	There are no additional types of waste streams to process with the	No difference in potential impacts.

Table 1. Comparison of Potential Environmental Impacts

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Resource Area	Summary of Potential Effects in EIS-0305	Summary of Potential Effects as a Result of Changes to the Proposed Action	Difference in Potential Effects
Accidents (cont.)	• MVSTs Breach - NA • MVSTs transfer line failure ○ MEI – 3.2E-06 PCF ○ Population – 0.16 LCF ○ Non-involved worker – 2.8E-04 PCF • Vehicle impact - negligible • Earthquake ○ MEI – 4.8E-07 PCF ○ Population – 7.2E-03 LCF ○ Non-involved worker – 4.2E-05 PCF • Vehicle impact/fire - negligible	proposed action, thus, there are no significant changes in accident probabilities from original analysis.	
Socioeconomic	As described in Chapter 4, Section 4.13: • No significant impacts. • Earnings represent 0.1% of the income for the region.	No change in socioeconomic impacts anticipated.	No difference in potential impacts.
Environmental Justice	As described in Chapter 4, Section 4.14: No disproportionately high and adverse impact expected to minority and low-income populations.	Per Executive Order (EO) 14154, resource area is not considered.	Resource area is not considered.
Cumulative Impacts	As described in Chapter 5: No significant cumulative impacts identified. Some indirect dust coating of vegetation. Some beneficial impacts anticipated.	No change in cumulative impacts anticipated.	No difference in potential impacts

** EIS-0305 original analysis used MW for electrical usage projections, and this was likely an error that should have used kW. Henceforth, the current analysis uses kW to estimate future electrical capacity needs based upon 365 days in a year.*

Resource Areas Not Analyzed in Detail in this SA

The following resources that were originally analyzed in EIS-0305 are not analyzed further in this SA because there are no differences in potential impacts anticipated by the changes to the proposed action or new circumstances or information: land use, cultural and historic resources, ecological resources, geology and seismicity, surface water, groundwater, wetlands and floodplains, noise, accidents, socioeconomic, environmental justice (per EO 14154), and cumulative impacts.

Resource Areas Analyzed in Detail in this SA

The following resource areas are analyzed in this SA for the selected preferred alternative in EIS-0305:

Waste Management:

The original analysis in EIS-0305 included four primary waste types: RH TRU mixed waste sludge, liquid low-level waste associated with the sludge, CH TRU/alpha low-level waste solids, and RH TRU/alpha low-level waste solids. For the facility life extension, the primary waste types anticipated to be treated and processed at TWPC are CH and RH TRU. Waste management techniques will not change from the analysis conducted in EIS-0305.

In EIS-0305, 4,050 m³ of waste was estimated for treatment and 10,833 m³ was estimated to be generated at TWPC, including 1,560 m³ of sanitary wastewater. From FY2004-FY2025, 3,955 m³ of legacy waste was processed/treated, 10,980 m³ was generated, and an additional 28,000 m³ of sanitary wastewater was generated. For FY2026-FY2052, the estimate for all waste to be processed/treated is 7,388 m³, with 19,949 m³ generated, and an additional 38,880 m³ of sanitary wastewater generated. From FY2004-FY2052, the total estimated waste for processing/treatment is 11,343 m³ with 30,929 m³ generated, and 66,880 m³ of sanitary wastewater generated.

The larger quantity of sanitary wastewater that was generated on-site compared to that evaluated in EIS-0305 was primarily due to a greater number of staff employed to operate TWPC than was originally anticipated. The annual volume of sanitary wastewater estimated to be generated for FY2026-FY2052 (i.e., 1,495 m³/yr) is comparable to the average annual amount (i.e., 1,273 m³/yr) generated during FY2004-FY2025. Sanitary wastewater from TWPC has historically been disposed of off-site at the Harriman Publicly Owned Treatment Work (POTW) in Tennessee. Harriman POTW has a design capacity flow of 1.5 million gallons per day (MGD) and an average daily flow of 0.5 MGD. In comparison to Harriman POTW's water treatment capacity, the amount of sanitary wastewater generated by TWPC is negligible, and it will not have a significant impact on the capabilities of the utility system.

Preventative maintenance and minor modifications to existing equipment (e.g., minor upgrades to the hot cells) may be needed for TWPC operations. These actions were categorically excluded in 2012 by CX-GEN-011, *Maintenance Activities* (Bl.3, Bl.27, B2.1, B2.2, B2.3 in 10 CFR Part 1021, Appendix B), and CX-GEN-012, *Alterations to Existing Buildings, Construction of Small-scale Support Structures, and Relocation of Machinery and Equipment* (Bl.11, Bl.15, Bl.31 in 10 CFR Part 1021, Appendix B), thus, no additional NEPA review is required. Further NEPA review would be compulsory for future significant facility modifications or for operational activities beyond that evaluated in EIS-0305, this SA, or applied CXs.

The total waste volumes exceed original estimates in EIS-0305; however, there is ample space for waste at TWPC due to ongoing shipments to WIPP and NNSS, and no additional waste types are anticipated for the proposed action. Given the types of waste to be treated, available space at

TPWC, the capacity for sanitary wastewater treatment via Harriman POTW, and CXs described above, no significant impacts are anticipated.

Climate and Air Quality:

Air emissions from DOE's TRU/Alpha Low-Level Radioactive Waste Remediation Operation are permitted under emission source reference number 73-0165-01 at TWPC. TWPC is operated under non-Title V Operating Permit number 071009P. A permit re-application was submitted on July 27, 2025. TWPC continues to operate under permit number 071009P while the draft permit is in review with the Tennessee Department of Environment and Conservation (TDEC) Air Pollution Control Board. The permit covers stabilization, volume reduction, and packaging operations of supernate and sludge wastes contained at the MVST and MVST Annex, as well as CH and RH TRU/alpha low-level radioactive solid waste. While the permit covers each of the four waste streams historically processed at TWPC, continued processing of the solid waste streams (CH and RH) is the primary operation anticipated during the facility life extension.

The operating permit for TWPC includes the following conditions:

- Emissions of radionuclides into the ambient air from all ORR DOE facilities shall not exceed those amounts that would cause any member of the public to receive an effective dose equivalent of 10 mrem/yr. In 2025, an effective dose equivalent of 0.8 mrem was reported for all ORR DOE facilities as discussed in the *Department of Energy Air Emissions Annual Report Oak Ridge Reservation, Oak Ridge, Tennessee 40 Code of Federal Regulations (CFR) 61, Subpart H Calendar Year 2025*, submitted June 30, 2026.
- Particulate matter emitted from TWPC operations shall not exceed 0.002 grain per dry standard cubic foot of exhaust gas (1.03 lbs/hr). This emission limitation is established pursuant to Tennessee Air Pollution Control Regulations 1200-03-07-.01(5), and the voluntary agreement letter with TDEC from Foster Wheeler, dated March 3, 1999. In 2025, the average monthly emissions rate was 8.42E-05 lb/hr with a maximum monthly emissions rate of 2.58E-04 lb/hr.
- Volatile organic compounds emitted from TWPC are not to exceed 46.21 lbs/month or 554.51 lbs during any consecutive 12-month period. In 2025, the estimated emissions rate was 3.97E-04 lb/hr with a total annual amount of 8.26E-01 lb emitted.
- The maximum process material input rate for waste streams is:
 - Supernate Tank Waste: 130,100 lbs/hr
 - Sludge Tank Waste: 115,100 lbs/hr
 - RH Solid Waste: 940 lbs/hr
 - CH Solid Waste: 5,800 lbs/hr

Table 2 provides a comparison between air emissions estimated in EIS-0305, the average and maximum actual emissions for the operational period (FY2004-FY2025) of the facility, and the permitted emission limits.

Table 2. Comparison between estimated and actual emissions from TWPC (FY2004-FY2025)

Compound	DOE/EIS-0305-F Estimated Emissions	Average Actual Emissions	Maximum Actual Emissions	071009P Permit Limits
Volatile Organic Compounds	6.20E-02 lb/hr — —	4.11E-04 lb/hr 3.00E-01 lb/mo 8.54E-01 lb/yr	5.34E-04 lb/hr 7.31E-07 lb/mo 1.11 lbs/yr	— 46.21 lbs/mo 554.51 lbs/yr ^d
Particulate Matter	8.60E-02 lb/hr	8.36E-05 lb/hr	4.48E-04 lb/hr	1.03 lbs/hr
Radionuclides	0.64 mrem/yr (ORR) ^a 5.44E-03 Ci/yr ^b	0.44 mrem/yr (ORR) 1.14E-03 Ci/yr ^c	0.90 mrem/yr (ORR) 8.01E-03 Ci/yr ^c	10 mrem/yr (ORR) —

^a Estimated radiological dose based on cumulative off-site dose from ORR to public maximally exposed individual.

^b Estimated radiological emissions based on HEPA filter efficiency of 99% for each filter in a series of two, instead of the design efficiency of 99.97% for each filter.

^c Average and maximum radiological emissions based on a HEPA filter efficiency of 99.95% for each filter in a series of two.

^d 554.51 lbs during any consecutive 12-month period.

The original analysis for climate and air emission impacts was estimated by considering characteristics of all waste streams to be processed at the facility. Minor emissions during normal operations with slightly higher volatile organic emissions during tank waste processing were expected. Given the primary waste streams (i.e., CH and RH TRU) that are anticipated for treatment during the facility life extension, similar or lesser impacts are expected compared to the original analysis. Per the discussion above regarding average and maximum emissions over the operating period and ongoing monitoring of the facility to stay in compliance with the associated permits, no significant impacts are expected from the proposed life extension and acceptance of off-site waste for treatment at TWPC.

Transportation:

Under the current updates to the action, DOE may transport TRU waste from any DOE facility to TWPC, including sites not yet identified, assuming all DOE shipments follow applicable laws and regulations. The potential impacts and analysis will not change if additional sites are identified, provided that the number of shipments and quantities analyzed in this SA remain accurate. Transportation of waste from TWPC to WIPP or NNSS for disposition are not analyzed in this SA because the actions were addressed by the WM PEIS and associated RODs, and no additional NEPA review is required.

Screening Approach

As stated in the WM PEIS, DOE may incorporate results of the analyses into site-wide and project-specific NEPA reviews. For this SA, DOE used data from the WM PEIS to conduct a screening analysis for potential impacts of transportation associated with the proposed action. This transportation screening analysis uses the maximum impact per mile for each waste type and impact category from the DOE WM PEIS, adjusted for the current dose-LCF conversion factor of E-04 LCF per person-rem and the U.S. population estimate. Accident probabilities have been adjusted to account for current nation-wide accident rates. DOE uses the screening analysis to determine when a more detailed analysis is necessary.

Transportation Shipments

The WM PEIS, and by extension, this analysis, considered impacts to the public including “off-link (along the route, generally assume 0.5 miles on each side of road/rail for incident-free transportation and 50 miles for accidents), on-link (sharing the road)”, and crew. Impacts to a hypothetical MEI would be extremely small and are not analyzed in further detail. Impacts are described as potential LCFs that may result due to radioactive exposure, and fatalities that may result from traffic accidents.

Incident-Free Transportation

DOE estimated the public and crew LCFs and accident fatalities identified in Table 3 for transportation of waste from off-site DOE facilities to TWPC. Where calculated estimates of transportation risk are less than 1 LCF or fatality, no cancers or fatalities are expected to occur.

Table 3. Waste and Materials: Truck Transportation Impacts

Categories	TRU Waste ^g	
	TRU-RH	TRU-CH
Total Miles	774,570	
Total Shipments	449	
Public LCF ^a	6E-02	
Crew LCF ^b	4E-02	
Accident Fatalities (non-radiation) ^c	1E-02	
Maximum Reasonably Foreseeable Accident Probability ^{d,f}	2E-05	2E-05
Maximum Reasonably Foreseeable Accident Consequence ^e	3E-01	2E+01
Maximum Reasonably Foreseeable Accident Risk ^f	6E-06	4E-04

^a Public LCF: mileage x WM PEIS Public LCF/mile for waste type (adjusted for population and dose-risk conversion factor, see screening approach, above, for more information on these conversions)

^b Crew LCF mileage x WM PEIS Crew LCF/mile for waste type (adjusted for dose-risk conversion factor, see screening approach, above, for more information on this conversion)

^c GHG Emissions: EPA's Emissions Factors for Greenhouse Gas Inventories emission rate for vehicle type x miles traveled (EPA 2025)

^d Accident fatalities – mileage x DOT national fatality rate for truck transportation (FMCSA 2023)

^e Maximum Reasonably Foreseeable Accident Probability: WM PEIS probability (adjusted for national accident rate)

^f Maximum Reasonably Foreseeable Accident Consequence: WM PEIS consequence (adjusted for national population)

^g Accident probability and risk for TRU-RH and TRU-CH assume all TRU waste shipments are of the analyzed type.

Accidents and Intentional Destructive Acts

The effects of the maximum reasonably foreseeable transportation accident for this proposed action are expected to be similar to those evaluated for TRU waste in the WM PEIS. The WM PEIS considered a NUREG-0170 Category VIII accident (NRC 1977). In the WM PEIS, characteristics of CH and RH TRU waste for each site were screened to determine the waste with the highest potential radiological consequences if a release were to occur during an accident. The WM PEIS thus used CH-TRU from LANL and RH-TRU from Hanford to provide a higher-end estimate of RH-TRU and CH-TRU accident impacts from other sites.

In the event an accident occurs, a response system is in place. DOE supports training and emergency planning through its Transportation Emergency Preparedness Program. State, Tribal, and local government officials respond to any such accident within their respective jurisdictions. Radiological assistance program teams are available to provide field monitoring, sampling, decontamination, communications, and other related services.

In the aftermath of the events of September 11, 2001, DOE is continuing to assess measures to minimize the risk or potential consequences of radiological sabotage. While it is not possible to determine terrorists' motives and targets with certainty, DOE considers the threat of terrorist attacks to be real and makes a concerted effort to reduce any vulnerability to this threat. In the case of transportation of the waste and material analyzed in this document, the initiating factors for an intentional destructive act would likely be similar to the maximum reasonably foreseeable accident scenario discussed above. The resulting radiological release and consequences to the public and crew would be similar, regardless of the nature of the initiating event. Therefore, the accident impacts presented above are representative of the types of impacts that could result from an intentional destructive act.

Based on the screening analysis above, DOE has determined that the proposed action would not result in significant transportation-related impacts, and that a more detailed analysis would not further the purposes of NEPA or aid the understanding of the public or decision makers.

Utility Requirements:

The Tennessee Valley Authority provides electric power to the ORR, which has a site load of 166 MW. The original analysis identified the bulk of the proposed facility's electrical energy demands as arising from two process requirements: (1) evaporate water from the raw waste to meet disposal site criteria and shipping requirements, and (2) evaporate water used to mobilize the sludge from

the MVSTs. The utility analysis for EIS-0305 accounted for approximately 15,000 kW (See Table 1 footnote) of electricity usage and 5,000,000 gallons of water usage during the life of the project.

Based upon TWPC's utility usage from FY2004-FY2025 (i.e., 13,183 kW of electricity; 1,705,600 gal of water), the 26-year life extension (FY2026- FY2052) is estimated to result in an additional 15,580 kW of electricity usage and 2,015,709 gal of water usage. The total estimated electricity needs from project start through the extended life of the facility is 28,763 kW. The total estimated water usage from the project start date through the extended life of facility is 3,721,309 gallons. The projected electricity usage exceeds the original estimation but is not anticipated to result in significant impacts given the grid capacity for the ORR. The total estimated water usage from FY2004-FY2052 is 1,278,691 gallons less than the projected 5,000,000 gallons of usage in EIS-0305; therefore, no additional impacts are anticipated by extending the operating life of the facility.

Human Health:

Over the operating life of TWPC (FY2004-FY2025), annual radiological release doses to the off-site public MEI, involved worker MEI, non-involved worker MEI, affected population, and facility worker were lower than those predicted in EIS-0305, as discussed below. Future, continued impacts are anticipated to be similar to or less than historic values throughout the life extension.

Radiation Exposure from Air—Maximally Exposed Individual (Public)

In EIS-0305, emissions from the preferred alternative were estimated to contribute an average annual radiation dose of $2.2\text{E-}02$ mrem, or 0.22% of the 10 mrem limit (40 CFR Part 61, Subpart H), to the MEI. The associated PCF risk, with an incidence rate of $4\text{E-}04$ fatal cancers per rem, resulted in an average estimated probability of $1\text{E-}08$ fatal cancers for the off-site public MEI.

During the operational lifetime of TWPC, annual emissions contributed an average of $4.20\text{E-}04$ mrem to the TWPC public off-site MEI. The associated PCF risks, with an incidence rate of $6\text{E-}04$ fatal cancers per rem, resulted in an average operational lifetime estimated probability of $3\text{E-}10$ fatal cancers for the TWPC off-site public MEI. In 2025, TWPC emissions contributed $5.9\text{E-}06$ mrem to the TWPC off-site MEI. The associated PCF risks, with an incidence rate of $6\text{E-}04$ fatal cancers per rem, result in an estimated probability of $4\text{E-}12$ fatal cancers for the TWPC and ORR off-site public MEIs, respectively.

Radiation Exposure from Air—Maximally Exposed Individual (Worker)

In EIS-0305, it was assumed that the involved worker would receive $6.4\text{E-}02$ mrem and the non-involved worker would receive $5.5\text{E-}02$ mrem. The associated PCF risk, with an incidence rate of $4\text{E-}04$ fatal cancers per rem, resulted in an estimated probability of $3\text{E-}08$ and $2\text{E-}08$ fatal cancers for the involved and non-involved worker, respectively.

During the operational lifetime of TWPC, annual emissions contributed an average of $1.3\text{E-}03$ mrem to the involved worker and $1.1\text{E-}03$ mrem to the non-involved worker. The associated PCF risks, with an incidence rate of $6\text{E-}04$ fatal cancers per rem, result in an estimated probability of

8E-10 and 6E-10 fatal cancers for the involved and non-involved worker, respectively. In 2025, TWPC emissions contributed 1.8E-05 mrem to the involved worker and 1.E-05 mrem to the non-involved worker. The resulting PCF risk, with an incidence rate of 6E-04 fatal cancers per rem, resulted in an estimated probability of 1E-11 and 9E-12 fatal cancers for the involved and non-involved worker, respectively.

Radiation Exposure—Affected Population

The risk analysis in EIS-0305 resulted in a collective dose to the affected population of 1.2E-01 person-rem, with a total LCF risk of 6E-05 fatalities per year. During the operational lifetime of TWPC, the average collective dose was 7.99E-03 person-rem, resulting in a total LCF risk for the average collective dose of 5E-06 fatalities per year. In 2025, the collective dose was 2.0E-04 person-rem with a total LCF risk of 1E-07 fatalities per year.

Radiation Exposure—Facility Worker

In EIS-0305, it was conservatively estimated for the preferred alternative that a facility worker would receive a total effective dose equivalent (TEDE) to 100 mrem as compared to the DOE maximum administrative control limit of 5,000 mrem in a year. The associated 70-year risk, using an incidence rate of 4E-04 fatal cancers per rem, resulted in a 3E-03 PCF.

At TWPC, administrative control limits are in place to restrict the maximum worker TEDE to less than 600 mrem and the average worker TEDE to less than 50 mrem. During the operational lifetime of TWPC, the maximum worker TEDE was 160 mrem and the average worker TEDE was 80 mrem. In 2025, the TEDEs were far below the DOE TEDE limit of 5,000 mrem with a maximum worker TEDE of 146 mrem and an average worker TEDE of 18 mrem. The associated 70-year risk for the maximum worker TEDE and average worker TEDE, using an incidence rate of 6E-04 fatal cancers per rem, results in a PCF of 6E-03 and 7E-04, respectively.

TWPC emissions will continue to be monitored and stay below radiological release and dose limits in all categories for the proposed action. Consequently, there would be minimal effects on the health of the public, involved worker, and non-involved worker in comparison to those evaluated in EIS-0305.

Mitigation

Based on this SA, DOE will continue to implement mitigation measures as described in EIS-0305. Section S1.9 of EIS-0305 discusses mitigation measures that will be taken for the potentially adverse environmental impacts, including best management practices. Because the new circumstances are similar in nature to the existing potential adverse environmental impacts analyzed in EIS-0305, no new mitigation measures were identified.

Determination

In accordance with NEPA and DOE's NEPA Implementing Procedures (June 16, 2026), DOE prepared this supplement analysis to evaluate whether the life extension of TWPC and acceptance of off-site TRU waste for treatment and temporary storage requires supplementing the existing EIS-0305 or preparing a new EIS. DOE has considered all relevant information included in the SA, project record, and raised in the NEPA process. DOE concludes that the changes to the proposed action are not a substantial change relevant to environmental concerns, nor are there substantial new circumstances or information about the significance of the adverse effects. Consistent with DOE's NEPA implementing procedures Section 3.9, these changes do not require a new or supplemental EIS. No further NEPA documentation is required; however, DOE will amend the existing ROD for EIS-0305.

Signed in Washington, D.C., on July 24, 2026.



Timothy J. Walsh
Assistant Secretary
for Environmental Management
U.S. Department of Energy

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This document has been reviewed and confirmed to be UNCLASSIFIED and contains no UCNI.

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