APPENDIX H
IMPACTS OF PRINCIPAL PLUTONIUM SUPPORT FACILITIES

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This appendix addresses the impacts associated with operation of the principal facilities at the Savannah River Site (SRS) and Los Alamos National Laboratory (LANL) supporting the pit disassembly and conversion and plutonium disposition options analyzed in this *Draft Surplus Plutonium Disposition Supplemental Environmental Impact Statement* (*SPD Supplemental EIS*). The principal SRS plutonium support facilities are as follows:

- *K-Area storage* – Provides a capability at the K-Area Complex to store surplus plutonium, principally at the K-Area Material Storage Area.
- *K-Area Interim Surveillance (KIS)* – Provides a capability at the K-Area Complex to perform surveillance of stored, surplus plutonium in accordance with the requirements of DOE-STD-3013-2012 (DOE 2012).
- *Waste Solidification Building (WSB)* – Provides a capability at F-Area to treat liquid radioactive wastes generated from pit disassembly and conversion and plutonium disposition activities.
- *E-Area* – Provides waste management capabilities, including the capability to store, stage, and certify transuranic (TRU) waste for shipment to the Waste Isolation Pilot Plant (WIPP) near Carlsbad, New Mexico, for disposal. E-Area also provides management capabilities for other types of waste, including storage of radioactive and hazardous wastes before shipment to offsite facilities and disposal of low-level radioactive waste (LLW).

The principal LANL facilities supporting pit disassembly and conversion are currently located in Technical Area 54 (TA-54) and provide capabilities for TRU waste characterization, packaging, certification, and storage pending shipment to WIPP for disposal. Among other capabilities, TA-54 also provides management capabilities for other types of waste, including characterization of radioactive and chemical wastes; storage of radioactive and chemical wastes, pending shipment to offsite facilities; and disposal of LLW.

Appendix B provides descriptions of these support facilities. Appendix F addresses impacts from the options for pit disassembly and conversion; Appendix G, impacts from options for plutonium disposition; and Appendix I, impacts from the use of mixed oxide (MOX) fuel in commercial nuclear power reactors. Chapter 4 describes the environmental consequences of implementing the *SPD Supplemental EIS* alternatives, including the impacts from operating the SRS and LANL plutonium support facilities.

Impacts from construction of these support facilities are not addressed in this appendix because no new construction is expected. The K-Area storage, KIS, and E-Area waste management capabilities are already operational at SRS, as are the waste management capabilities at LANL. The WSB is under construction, and the impacts from WSB construction have been addressed in previous National Environmental Policy Act (NEPA) analyses (e.g., the *Supplement Analysis for Construction and Operation of a Waste Solidification Building at the Savannah River Site* [DOE 2008a]).

The K-Area storage and KIS capabilities are specifically addressed in this appendix because their principal activities pertain to plutonium management, while WSB is addressed because it is intended to process liquid waste from several plutonium facilities. E-Area at SRS and TA-54 at LANL are addressed because of the quantities of waste that could be generated under some *SPD Supplemental EIS* alternatives and would be managed at these areas. Other facilities at SRS and LANL provide analytical or waste management support to sitewide activities rather than primarily focusing on surplus plutonium management, with the result that the incremental impacts that could be attributed to surplus plutonium activities would be very small, with little or no change in annual impacts such as worker exposures, releases of radioactive and nonradioactive material to the air, or resource use. These facilities are addressed as needed in the context of the analyses in this and other appendices and Chapter 4 of this *SPD Supplemental EIS*.

For example, the F/H-Laboratory at SRS is a large complex designed to accommodate a variety of missions, and it would also provide an analytical support capability for new facilities such as the K-Area Pit Disassembly and Conversion Project (PDC) if it is constructed, as well as continue to provide analytical support services for currently operating SRS facilities such as H-Canyon/HB-Line. Minor modifications may be needed at F/H-Laboratory if PDC is constructed and operated at K-Area, or if H-Canyon/HB-Line is used to support conversion of pit plutonium to plutonium oxide (see Appendix F). These minor modifications are not expected to result in environmental impacts on workers or the public. Samples analyzed at the F/H-Laboratory in support of plutonium management activities would account for only a small fraction of the overall activities performed there and are not expected to add to the annual environmental impacts associated with operation of this facility. Similar laboratory analysis would also be performed at LANL if pit disassembly and conversion activities were done there. This analysis would be done at the Chemistry and Metallurgy Research Building and the Radiological Laboratory/Utility/Office Building (RLUOB). No new construction at the Chemistry and Metallurgy Research Building or RLUOB is expected to support activities under any pit disassembly and conversion option addressed in this *SPD Supplemental EIS*. Impacts from sample analysis at these facilities are not expected to add to their annual environmental impacts.

H.1 Principal Savannah River Site Plutonium Support Facilities

The following sections address impacts from operation of K-Area storage, KIS, and WSB for the following resource areas: air quality, human health, socioeconomics, waste management, transportation, environmental justice, water resources, noise, and infrastructure. Operation of these three support facilities is expected to have no impacts on land resources (land use and visual resources), geology and soils, and ecological and cultural resources because there would be no new land-disturbing construction activities. Therefore, these resource areas for these three support facilities are not addressed further in this appendix.

Section H.1.4.4 addresses the impacts associated with operation of E-Area to support radioactive and nonradioactive waste management activities at the plutonium facilities. Impacts associated with other resource areas are expected to result in no or negligible incremental impacts or are better addressed on a system-wide rather than a facility-specific basis. Because there would be no new land-disturbing construction activities at E-Area, operation of E-Area in support of the other SRS plutonium facilities is expected to have no impacts on land resources, geology and soils, and ecological and cultural resources. Operation of E-Area is expected to result in negligible incremental radiological impacts on workers and the public and present no additional risks from potential accidents. Because no additional employment is projected for E-Area, there would be no socioeconomic impacts. Noise levels from E-Area operations would be similar to existing conditions (see Chapter 3, Section 3.1.4.3). E-Area operates in accordance with existing National Pollutant Discharge Elimination System (NPDES) permits (see Chapter 3, Section 3.1.3.1). There would be no additional withdrawals of groundwater to support E-Area activities, and staging activities are expected to have negligible impacts on surface water resources and no impact on groundwater quality or SRS available capacity. Water and utility use at E-Area is not expected to be significantly affected by the particular mix of waste management activities that may take place at E-Area under each of the *SPD Supplemental EIS* alternatives.[1]

Two resource areas, transportation and environmental justice, are meant for system-wide analysis rather than analysis of just a portion of the system (e.g., just the principal SRS plutonium support facilities). Therefore, for the same reasons discussed in Section H.1.5 for K-Area storage, KIS, and WSB, the analysis of transportation impacts associated with E-Area operations is deferred to Appendix E, which provides a detailed analysis of the transportation impacts associated with the alternatives being evaluated in this *SPD Supplemental EIS*, including the impacts associated with the principal plutonium support facilities. Similarly the analysis of environmental justice impacts associated with E-Area operations (Section H.1.6) is deferred to Chapter 4, Section 4.1.6, which presents the potential impacts on populations surrounding the facilities that would be involved in surplus plutonium activities, including the impacts associated with the principal plutonium support facilities.

H.1.1 Air Quality

Nonradioactive air pollutant impacts are evaluated in this section. Radioactive air pollutant impacts are evaluated in Section H.1.2.

Operation of the principal SRS plutonium support facilities could result in emissions of criteria, hazardous, and toxic air pollutants.

Concentrations resulting from existing sources at SRS (see Chapter 3, Section 3.1.4.2, Table 3–7) include contributions from currently operating facilities such as K-Area storage and KIS, from which the contributions are expected to be essentially unchanged. Maximum concentrations resulting from WSB operations, as determined using worst-case meteorology at the distance of the nearest site boundary, were estimated using the EPA SCREEN3 model (EPA 1995). As shown in **Table H–1**, contributions of criteria pollutants and particulates from WSB operations would be minor. Concentrations of toxic pollutants from WSB were estimated to represent less than 0.0001 percent of the acceptable source impact levels for all the toxic pollutants except nitric acid, which was estimated at 0.12 percent.

H.1.2 Human Health

H.1.2.1 Incident-Free Operations

The following section presents the potential incident-free radiological impacts on workers and the general public associated with the principal plutonium support facilities at SRS. Human health risks from normal operations are evaluated for several individual and population groups, including onsite involved workers, a hypothetical maximally exposed individual (MEI) at the site boundary, and the regional population.

Tables H–2 and **H–3** summarize the potential radiological impacts on involved workers and the general public, respectively, which are associated with the support facilities. Activities at K-Area storage are not expected to result in radioactive emissions, so there would be no radiological impacts on the public.

Tables H–2 and H–3 present the estimated doses and latent cancer fatality (LCF) risks from 1 year of operations and the life-of-project risks for each support facility. Life-of-project risks were determined by multiplying the annual impacts of a facility by the number of years the facility is projected to operate (see Appendix B, Table B–2). Table H–2 shows that up to 1 LCF may be projected among workers over all years of the project. Table H–3 shows that potential doses to all public receptors would represent a small fraction of the 311 millirem dose these receptors are each assumed to receive from natural background radiation (see Chapter 3, Section 3.1.6.1).

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[1] *From Chapter 3, Section 3.1.9: E-Area annually requires about 2,900 megawatt-hours of electricity and 20,000,000 gallons (76,000,000 liters) of water. Each requirement represents less than 1 percent of SRS's available electrical and water capacity. Fuel oil is not used at E-Area.*

Table H–1 Estimated Air Pollutant Concentrations from Operation of the Waste Solidification Building

Pollutant	Averaging Period	More Stringent Standard or Guideline [a]	Significance Level [b]	Contribution From WSB [c]
Criteria Pollutants (micrograms per cubic meter)				
Carbon monoxide	8 hours	10,000	500	Not applicable
	1 hour	40,000	2,000	Not applicable
Nitrogen dioxide	Annual	100	1	Not applicable
	1 hour	188	7.5	Not applicable
PM_{10}	24 hours	150	5	0.000061
$PM_{2.5}$	Annual	15	0.3	0.000012
	24 hours	35	1.2	0.000061
Sulfur dioxide	Annual	80	1	Not applicable
	24 hours	365	5	Not applicable
	3 hours	1,300	25	Not applicable
	1 hour	197	7.8	Not applicable

PM_n = particulate matter with an aerodynamic diameter less than or equal to *n* micrometers; WSB = Waste Solidification Building.

[a] The more stringent of the Federal and state standards is presented if both exist for the averaging period.

[b] EPA 1990; Page 2010a, 2010b; 40 CFR 51.165(b)(2).

[c] WSRC 2008.

Table H–2 Potential Radiological Impacts on Involved Workers from Operation of K-Area Storage, K-Area Interim Surveillance, and the Waste Solidification Building [a]

Receptor Impacts	Facilities			Total
	K-Area Storage	KIS	WSB	
Number of radiation workers	24	40	50	114
Collective workforce dose (person-rem per year)	8.9	25	25	59
Annual LCFs [b]	0 (5×10^{-3})	0 (2×10^{-2})	0 (2×10^{-2})	0 (4×10^{-2})
Life-of-project LCFs [b, c]	0 (0.1 to 0.2)	0 to 1 (0.1 to 0.6)	0 (0.3 to 0.4)	1 (0.6 to 1)
Average worker dose (millirem per year) [d]	370	630	500	520
Average annual LCF risk	2×10^{-4}	4×10^{-4}	3×10^{-4}	3×10^{-4}
Life-of-project average LCF risk [c]	4×10^{-3} to 9×10^{-3}	3×10^{-3} to 2×10^{-2}	6×10^{-3} to 7×10^{-3}	5×10^{-3} to 1×10^{-2}

KIS = K-Area Interim Surveillance capability; LCF = latent cancer fatality; WSB = Waste Solidification Building.

[a] LCF risks were determined using a risk factor of 0.0006 LCFs per rem or person-rem (DOE 2003).

[b] The first value is the projected number of LCFs over the life of the project; the second set of values, in parentheses, is the calculated product of the dose and risk factor.

[c] Ranges in impacts are due to differences in the number of years that facilities would operate under the *SPD Supplemental EIS* alternatives.

[d] Engineering and administrative controls would be implemented to maintain individual worker doses below 2,000 millirem per year and as low as reasonably achievable.

Note: Doses are rounded to two significant figures; LCF risks are rounded to one significant figure. Sums and products presented in the table may differ slightly from those presented in Appendix C due to rounding. Values are derived from analyses presented in Appendix C.

Table H–3 Potential Radiological Impacts on the Public from Operation of K-Area Storage, K-Area Interim Surveillance, and the Waste Solidification Building [a]

Receptor Impacts	Facilities			Total
	K-Area Storage [b]	KIS	WSB	
Population within 50 miles				
Annual dose (person-rem)	0	4.3×10^{-5}	0.031	0.031
Annual LCFs [c]	0	0 (3×10^{-8})	0 (2×10^{-5})	0 (2×10^{-5})
Life-of-project LCFs [c, d]	0	0 (2×10^{-7} to 1×10^{-6})	0 (4×10^{-4})	0 (4×10^{-4})
Maximally exposed individual [e]				
Annual dose (millirem)	0	8.5×10^{-7}	0.00063	0.00063
Annual LCF risk	0	5×10^{-13}	4×10^{-10}	4×10^{-10}
Life-of-project LCF risk [d]	0	4×10^{-12} to 2×10^{-11}	8×10^{-9} to 9×10^{-9}	8×10^{-9} to 9×10^{-9}
Average exposed individual [f]				
Annual dose (millirem)	0	5.3×10^{-8}	3.6×10^{-5}	3.6×10^{-5}
Annual LCF risk	0	3×10^{-14}	2×10^{-11}	2×10^{-11}
Life-of-project LCF risk [d]	0	2×10^{-13} to 1×10^{-12}	5×10^{-10}	5×10^{-10}

KIS = K-Area Interim Surveillance capability; LCF = latent cancer fatality; WSB = Waste Solidification Building.

[a] LCF risks were determined using a risk factor of 0.0006 LCFs per rem or person-rem (DOE 2003).

[b] Storage operations are not expected to result in radiological emissions; therefore, no impacts on the public are expected.

[c] The first value is the projected number of LCFs over the life of the project; the second set of values, in parentheses, is the calculated product of the dose and risk factor.

[d] Ranges in impacts are due to differences in the number of years that facilities would operate under the *SPD Supplemental EIS* alternatives.

[e] The dose to the maximally exposed individual is conservatively estimated by summing the highest dose to an offsite individual for each facility, even though the hypothetical individual receiving that dose would be in different locations.

[f] Impacts to the average individual are determined by dividing the population dose by the number of people in the offsite population within a 50-mile (80-kilometer) radius (approximately 869,000 persons for F-Area and 809,000 for K-Area).

Note: Doses are rounded to two significant figures; LCF risks are rounded to one significant figure. Sums and products presented in the table may differ slightly from those presented in Appendix C due to rounding. Values are derived from the analyses presented in Appendix C.

H.1.2.2 Accidents

The following subsections present the potential impacts on workers and the general public at SRS that are associated with possible accidents involving the principal plutonium support facilities. Human health risks from these accidents are evaluated in **Table H–4** for several individual and population groups, including noninvolved workers, a hypothetical MEI at the site boundary, and the regional population. Impacts are presented as estimated doses and LCF risks from the accidents under consideration (see Appendix D for further details on these accidents).

H.1.2.2.1 K-Area Storage and K-Area Interim Surveillance

The limiting design-basis accident for K-Area plutonium activities would be a fire in the KIS vault leading to a rupture of a plutonium storage container and a pressurized release of radioactive material. If this accident were to occur, the public residing within 50 miles (80 kilometers) of SRS would receive an estimated dose of 52 person-rem. This dose would result in no additional LCFs among the general public. The MEI would receive a dose of 0.18 rem, which represents an increased risk to the MEI of developing a latent fatal cancer of 1×10^{-4}, or 1 chance in 10,000. A noninvolved worker located 1,000 meters (3,281 feet) from the accident source at the time of the accident, who was unaware of the accident and failed to take any emergency actions, would receive a dose of 4.5 rem, with an increased risk of developing a latent fatal cancer of 3×10^{-3}, or about 1 chance in 330.

Table H–4 Limiting Accidents Associated with K-Area Storage, K-Area Interim Surveillance, and the Waste Solidification Building

Accident	Facilities				Total	
	K-Area Storage and KIS		WSB			
	Dose	LCFs	Dose	LCFs	Dose	LCFs
Population within 50 miles (80 kilometers) (dose in person-rem)						
Limiting design-basis accident	52	0 (0.03)	0.13	0 (8×10^{-5})	52	0 (0.03)
Design-basis earthquake [a]	1.8	0 (0.001)	0.13	0 (8×10^{-5})	1.9	0 (0.001)
Beyond-design-basis earthquake [a, c]	2,500	2	180	0.1	2,700	2
Maximally Exposed Individual (dose in rem and risk of an LCF if the accident were to occur)						
Limiting design-basis accident	0.18	1×10^{-4}	0.00046	3×10^{-7}	0.18	1×10^{-4}
Design-basis earthquake [a]	0.0063	4×10^{-6}	0.00046	3×10^{-7}	0.0068	4×10^{-6}
Beyond-design-basis earthquake [a, c]	9.1	0.005	0.62	4×10^{-4}	9.7	0.006
Noninvolved Worker (dose in rem and risk of an LCF if the accident were to occur)						
Limiting-design-basis accident	4.5	3×10^{-3}	0.010	6×10^{-6}	4.5	3×10^{-3}
Design-basis earthquake [b]	0.16	9×10^{-5}	0.010	6×10^{-6}	0.16	9×10^{-5}
Beyond-design-basis earthquake [b, c]	310	0.4	16	0.01	310	0.4

KIS = K-Area Interim Surveillance capability; LCF = latent cancer fatality; WSB = Waste Solidification Building.

[a] Design-basis and beyond-design-basis earthquake doses and risks are added across for multiple SRS plutonium support facilities.

[b] Design-basis and beyond-design-basis earthquake doses and risks to noninvolved workers are presented for the highest dose to such an individual at a specific area because a noninvolved worker at K-Area would not be near H-Area should an accident occur there and vice versa.

[c] Impacts from a beyond-design-basis earthquake involving K-Area storage and KIS include those from a seismically induced fire.

Source: SRNS 2012.

A design-basis earthquake involving K-Area plutonium storage and KIS would expose the public residing within 50 miles (80 kilometers) of SRS to an estimated dose of 1.8 person-rem. This dose would result in no additional LCFs among the general public. The MEI would receive a dose of 0.0063 rem, which represents an increased risk to the MEI of developing a latent fatal cancer of 4×10^{-6}, or 1 chance in 250,000. A noninvolved worker would receive a dose of 0.16 rem, with an increased risk of developing a latent fatal cancer of 9×10^{-5}, or about 1 chance in 11,000.

A beyond-design-basis earthquake with fire involving K-Area plutonium storage and KIS would expose the public residing within 50 miles (80 kilometers) of SRS to an estimated dose of 2,500 person-rem. This dose would result in 2 additional LCFs among the general public. The MEI would receive a dose of 9.1 rem, representing an increased risk to the MEI of developing a latent fatal cancer of 0.005, or 1 chance in 200. A noninvolved worker would receive a dose of 310 rem, with an increased risk of developing a latent fatal cancer of 0.4, or 1 chance in 2.5.

H.1.2.2.2 Waste Solidification Building

The limiting design-basis accident at WSB in F-Area would be an explosion resulting in the release of radioactive material. If this accident were to occur, the public residing within 50 miles (80 kilometers) of SRS would receive an estimated dose of 0.13 person-rem. This dose would result in no additional LCFs among the general public. The MEI would receive a dose of 0.00046 rem, which represents an increased risk to the MEI of developing a latent fatal cancer of 3×10^{-7}, or about 1 chance in 3.3 million. A noninvolved worker located 1,000 meters (3,300 feet) from the accident source at the time of the accident, who was unaware of the accident and failed to take any emergency actions, would receive a dose of 0.010 rem, with an increased risk of developing a latent fatal cancer of 6×10^{-6}, or about 1 chance in 170,000.

A design–basis-earthquake involving WSB would expose the public residing within 50 miles (80 kilometers) of SRS and noninvolved workers to doses and risks similar to those cited for the limiting design-basis accident.

A beyond-design-basis earthquake involving WSB would expose the public residing within 50 miles (80 kilometers) of SRS to an estimated dose of 180 person-rem. This dose would result in no additional LCFs among the general public. The MEI would receive a dose of 0.62 rem, representing an increased risk to the MEI of developing a latent fatal cancer of 4×10^{-4}, or 1 chance in 2,500. A noninvolved worker would receive a dose of 16 rem, with an increased risk of developing a latent fatal cancer of 0.01, or 1 chance in 100.

H.1.2.2.3 Accidents Involving K-Area Support Activities and WSB

A design-basis earthquake involving K-Area storage, KIS, and WSB would expose the public residing within 50 miles (80 kilometers) of SRS to an estimated dose of 1.9 person-rem. This dose would result in no additional LCFs among the general public. The MEI would receive a dose of 0.0068 rem, which represents an increased risk of developing a latent fatal cancer of 4×10^{-6}, or 1 chance in 250,000. A noninvolved worker would receive a dose of 0.17 rem with an increased risk of developing a latent fatal cancer of 1×10^{-4}, or 1 chance in 10,000.

A beyond–design-basis earthquake involving K-Area storage, KIS, and WSB would include a seismically induced fire in the case of K-Area storage and KIS. This combined event would expose the public residing within 50 miles (80 kilometers) of SRS to an estimated dose of about 2,700 person-rem. This dose would result in 2 additional LCFs among the general public. The MEI would receive a dose of about 9.7 rem, which represents an increased risk of developing a latent fatal cancer of 0.006, or about 1 chance in 170. A noninvolved worker would receive a dose of 310 rem, resulting in an increased risk of an LCF of 0.4, or 1 chance in 2.5.

H.1.3 Socioeconomics

This section analyzes the potential socioeconomic impacts associated with operation of plutonium support facilities at SRS. Impacts on direct and indirect employment, economic output, value added, and earnings are presented for the surplus plutonium activities at these facilities during the peak years of operations. The area that would experience the impacts presented in this section is the region of influence (ROI) surrounding each facility. The socioeconomic ROI for the facilities at SRS is defined as the four-county area of Columbia and Richland Counties in Georgia, and Aiken and Barnwell Counties in South Carolina. All values are presented in 2010 dollars.

H.1.3.1 K-Area Storage

Table H–5 summarizes the annual socioeconomic impacts that would be generated by K-Area plutonium storage operations. Annual direct employment at K-Area storage is expected to peak at 26 workers. The direct employment would generate an estimated 31 indirect jobs in the ROI. The direct economic output during peak operations is estimated to be $4.6 million annually, of which $3.9 million is estimated to be value added to the local economy in the form of final goods and services directly comparable to gross domestic product (GDP). Approximately $2.3 million of the value added would be in the form of direct earnings of those employed at K-Area storage.

H.1.3.2 K-Area Interim Surveillance

Table H–5 summarizes the annual socioeconomic impacts that would be generated by operations at KIS. Annual direct employment at KIS is expected to peak at 41 workers. The direct employment would generate an estimated 49 indirect jobs in the ROI. The direct economic output during peak operations is estimated to be $7.3 million annually, of which $6.2 million is estimated to be value added to the local economy in the form of final goods and services directly comparable to the gross domestic product.

Approximately $3.6 million of the value added would be in the form of direct earnings of those employed at KIS.

Table H–5 Annual Socioeconomic Impacts from Operation of K-Area Storage, K-Area Interim Surveillance, and the Waste Solidification Building

Resource	*Facilities*			*Total*
	K-Area Storage	*KIS*	*WSB*	
Direct Employment	26	41	60	127
Indirect Employment	31	49	71	151
Output ($ in millions)	$4.6	$7.3	$11	$23
Value Added ($ in millions)	$3.9	$6.2	$9.0	$19
Earnings ($ in millions)	$2.3	$3.6	$5.3	$11

KIS = K-Area Interim Surveillance capability; WSB = Waste Solidification Building.

H.1.3.3 Waste Solidification Building

Table H–5 summarizes the annual socioeconomic impacts that would be generated by operations at WSB. Annual direct employment at WSB is expected to peak at 60 workers. The direct employment would generate an estimated 71 indirect jobs in the ROI. The direct economic output during peak operations is estimated to be $11 million annually, of which $9.0 million is estimated to be value added to the local economy in the form of final goods and services directly comparable to GDP. Approximately $5.3 million of the value added would be in the form of direct earnings of those employed at WSB.

H.1.4 Waste Management

This section analyzes the waste management impacts associated with operation of the principal SRS support facilities associated with pit disassembly and conversion and plutonium disposition. The waste types addressed include TRU and mixed TRU waste (analyzed collectively), solid LLW, solid mixed low-level radioactive waste (MLLW), solid hazardous waste, solid nonhazardous waste, liquid LLW, and liquid nonhazardous waste.

Waste management facilities and their associated capacities at SRS are described in Chapter 3, Section 3.1.10. Waste management impacts are evaluated as a percentage of treatment, storage, or disposal capacity, depending on a particular waste type's onsite disposition. Appendix F, Table F–10, provides a summary of capacities for SRS waste management facilities and the evaluation criteria used to assess impacts.

H.1.4.1 K-Area Storage

Negligible quantities of waste would be generated from plutonium storage operations at K-Area. Years of operation would vary depending on the combination of pit disassembly and conversion options that might be implemented under the *SPD Supplemental EIS* alternatives.

H.1.4.2 K-Area Interim Surveillance

Table H–6 summarizes the peak annual quantities of waste that would be generated from KIS operations. Years of operation would vary, depending on the combination of pit disassembly and conversion options that might be implemented under the *SPD Supplemental EIS* alternatives. Operations would generate TRU waste, solid LLW, solid hazardous waste, and solid nonhazardous waste. The quantities of waste generated would represent small percentages of the capacities of SRS waste management facilities.

Table H–6 Waste Management Impacts for the K-Area Interim Surveillance Capability

Facility	TRU Waste	Solid LLW	Solid MLLW	Solid Hazardous Waste	Solid Nonhazardous Waste	Liquid LLW	Liquid Nonhazardous Waste
	Peak Annual Operations Waste Generation						
	(cubic meters per year)					*(liters per year)*	
KIS	0.4	20	negligible	0.1	21	negligible	negligible
Percent of SRS Capacity	*<0.1*	*<0.1*	*negligible*	*<0.1*	*<0.1*	*negligible*	*negligible*

KIS = K-Area Interim Surveillance capability; LLW = low-level radioactive waste; MLLW = mixed low-level radioactive waste; SRS = Savannah River Site, TRU = transuranic.
Note: To convert cubic meters to cubic feet, multiply by 35.314; liters to gallons, multiply by 0.26418.
Source: SRNS 2012.

H.1.4.3 Waste Solidification Building

Table H–7 summarizes the peak annual quantities of waste that would be generated from WSB operations. Table H–7 includes waste generated from treatment of liquid high-activity waste that would come from activities that could occur under the PDCF or PDC Options for pit disassembly and conversion, as discussed in Appendix F, Sections F.4.1 and F.4.2. Operations would generate TRU waste, solid LLW, solid hazardous waste, solid nonhazardous waste, liquid LLW, and liquid nonhazardous waste. The quantities of waste generated would represent small percentages of the capacities of SRS waste management facilities.

Table H–7 Waste Management Impacts for the Waste Solidification Building

Facility	TRU Waste	Solid LLW	Solid MLLW	Solid Hazardous Waste	Solid Nonhazardous Waste	Liquid LLW	Liquid Nonhazardous Waste
	Peak Annual Operations Waste Generation						
	(cubic meters per year)					*(liters per year)*	
WSB	200	320	negligible	0.2	280	8,500,000	10,200,000
Percent of SRS Capacity	*1.5*	*0.9*	*negligible*	*0.1*	*<0.1*	*1.4*	*0.7*

LLW = low-level radioactive waste; MLLW = mixed low-level radioactive waste; SRS = Savannah River Site; TRU = transuranic; WSB = Waste Solidification Building.
Note: To convert cubic meters to cubic feet, multiply by 35.314; liters to gallons, multiply by 0.26418.
Source: SRNS 2012.

H.1.4.4 E-Area

Waste management in E-Area would generate negligible quantities of additional waste that would require treatment, storage, or disposal. The annual quantities of wastes that would be managed at E-Area, which would generally entail temporary storage or staging of TRU and other wastes for offsite shipment, would depend on the *SPD Supplemental EIS* alternative selected. Yet even with the largest quantities of wastes projected for E-Area management under any of the alternatives, it is not expected that E-Area waste treatment, storage or staging, or disposal capacities would be exceeded. (These capacities are discussed in Chapter 3, Section 3.1.10.) Years of E-Area operation attributable to surplus plutonium management and disposition would vary depending on the *SPD Supplemental EIS* alternative selected, but would generally coincide with the need to ship TRU waste to WIPP or another authorized disposition facility.

H.1.5 Transportation

Transportation involves the movement of materials and wastes between facilities involved in the Surplus Plutonium Disposition Program, including pit disassembly and conversion facilities, plutonium disposition facilities, principal plutonium support facilities, and domestic commercial nuclear power reactors. This type of system-wide analysis does not lend itself to analysis of a portion of the system (e.g., just the principal plutonium support facilities) when evaluating impacts from transportation of materials and wastes. See Appendix E for a detailed description of the transportation impacts associated with the alternatives being evaluated in this *SPD Supplemental EIS*, which includes impacts associated with the principal plutonium support facilities. Appendix E, Section E.10, provides a discussion of the impacts associated with onsite shipments at SRS.

H.1.6 Environmental Justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, directs Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health and environmental effects of their programs, policies, and activities on minority and low-income populations. The alternatives considered in this *SPD Supplemental EIS* involve construction and operation of several facilities in various combinations, with different levels of efforts and operational timeframes. This type of system-wide analysis does not lend itself to analysis of a portion of the system (e.g., just the principal plutonium support facilities). Chapter 4, Section 4.1.6, presents the potential impacts on populations surrounding the facilities at SRS and LANL that could result from surplus plutonium activities under the *SPD Supplemental EIS* alternatives. Included are the impacts associated with the principal plutonium support facilities.

H.1.7 Other Resource Areas

H.1.7.1 Water Resources

This section analyzes impacts on water resources (surface water and groundwater) resulting from the principal plutonium support facilities at SRS.

H.1.7.1.1 K-Area Storage and K-Area Interim Surveillance

Annual water use at K-Area is estimated to be about 3.6 million gallons (14 million liters) per year (see Table H–8). Most activities at the K-Area Complex are associated with continued storage and surveillance of surplus plutonium. No impacts on surface water, groundwater quality, or SRS available capacity are expected from plutonium storage or surveillance activities at the K-Area Complex.

H.1.7.1.2 Waste Solidification Building

WSB is projected to annually use approximately 12 million gallons (45 million liters) of water (see Table H–8). Uncontaminated heating, ventilating, and air-conditioning condensate wastewater from WSB would be discharged into the sanitary sewer, while facility stormwater runoff would be discharged into Upper Three Runs and ultimately into the Savannah River at NPDES outfall H-16 under the conditions of South Carolina Department of Health and Environmental Control Permit SC0000175 (SRNS 2012; WSRC 2008). Contamination of surface water from this outfall would be minimal because, under the conditions of the permit, pollutant concentrations would be limited to safe levels. Impacts on surface water from WSB operations are expected to be minimal. No impacts on surface water, groundwater quality, or SRS available capacity are expected.

H.1.7.2 Noise

Noise impacts due to K-Area storage, KIS, and WSB operations would be similar to those described for existing conditions at SRS in Chapter 3, Section 3.1.4.3. Noise sources during operations could include diesel generators, cooling systems, vents, motors, material-handling equipment, and employee vehicles and trucks. Traffic noise associated with operation of these facilities would occur on site and along offsite local and regional transportation routes used to bring materials and workers to the site. Noise from traffic associated with the operation of facilities is expected to increase by less than 1 decibel as a result of the increase in staffing.

Given the distances to site boundaries, noise from facility operations is not expected to result in public annoyance. Non-traffic noise sources are far enough away from offsite areas that the contribution to offsite noise levels would be small. Some noise sources could have onsite noise impacts, such as the disturbance of wildlife. However, noise would be unlikely to affect federally listed threatened or endangered species or their critical habitats. Some change in the noise levels to which noninvolved workers are exposed could occur. Appropriate noise control measures would be implemented under U.S. Department of Energy (DOE) Order 440.1B, *Worker Protection Program for DOE (Including the National Nuclear Security Administration) Federal Employees*, to protect worker hearing.

H.1.7.3 Infrastructure

This section analyzes the infrastructure impacts associated with operation of plutonium support facilities at SRS. The resource types addressed include electricity, water, and fuel oil.

H.1.7.3.1 K-Area Storage and K-Area Interim Surveillance

Table H–8 summarizes the annual resources that would be used by K-Area storage and KIS operations. Combined operations would use about 1 percent or less of SRS's available electrical and water capacity (4.1 million megawatt-hours and 2.63 billion gallons [9.96 billion liters], respectively), annually. Fuel oil usage is not limited by site capacity because fuel oil is delivered to the site as needed. However, fuel oil use for K-Area storage and KIS operations is estimated at 170,000 gallons (640,000 liters) per year, representing approximately 41 percent of SRS's current annual fuel usage (410,000 gallons [1,600,000 liters] – see Chapter 3, Section 3.1.9).

Table H–8 Annual Infrastructure Requirements from Operation of K-Area Storage, K-Area Interim Surveillance, and the Waste Solidification Building

Resource	*Facility*		*Total*
	K-Area Storage [a] and KIS	*WSB*	
Electricity (megawatt-hours)	9,200	35,000	44,000
Water (gallons)	3,600,000	12,000,000	16,000,000
Fuel oil (gallons)	170,000	2,500	170,000

KIS = K-Area Interim Surveillance capability; WSB = Waste Solidification Building.
[a] Values for K-Area are for operation of the entire K-Area Complex, rather than solely plutonium storage and KIS operations; plutonium storage with associated examination at KIS are the main activities at K-Area.
Note: To convert gallons to liters, multiply by 3.7854.
Source: DOE 2008a; WSRC 2008.

H.1.7.3.2 Waste Solidification Building

Table H–8 summarizes the annual resources that would be used by WSB. Operations would use less than 1 percent of SRS's available electrical and water capacity. Fuel oil use is estimated at 2,500 gallons (9,500 liters) per year, representing less than 1 percent of SRS's current annual fuel usage.

H.2 Principal Los Alamos National Laboratory Plutonium Support Facilities

Negligible quantities of waste would be generated from TRU waste characterization and staging, or from onsite disposal of LLW or from characterization or temporary staging of LLW, MLLW, or hazardous waste pending offsite shipment. TRU waste generated from pit disassembly and conversion activities at the Plutonium Facility (PF-4) would be transferred to Area G in TA-54 for WIPP characterization, including the use of real-time radiography, assay, and head-space gas analysis. TRU waste would then be transferred to the Radioassay and Nondestructive Testing Facility (RANT), also located in TA-54, for final packaging in Transuranic Package Transporter (TRUPACT) containers for shipment to WIPP. If some LLW, MLLW, and hazardous waste could not be shipped directly from PF-4 to an offsite disposal facility, some of this waste may be characterized and temporarily staged at TA-54 prior to shipment for offsite disposal.

Because of the requirements in a 2005 Compliance Order on Consent between DOE/National Nuclear Security Administration (NNSA) and the New Mexico Environmental Department, the waste management capabilities in Area G are being transitioned to other locations along the Pajarito Road corridor (i.e., other locations on the same mesa as TA-54).[2] Because of this, it is expected that after packaging to meet WIPP specifications, characterization of TRU waste from pit disassembly and conversion activities at PF-4 would shift to the RANT facility where TRUPACT-loading would also occur. After it becomes operational, management of TRU waste from pit disassembly and conversion activities could also occur at the new TRU Waste Facility planned for construction in TA-63. LLW, MLLW, and hazardous waste management capabilities would be transitioned to other locations in TA-54.

The annual quantities of wastes that would be managed would depend on the pit disassembly and conversion option selected. Yet even with the largest quantities of wastes projected for management at the LANL support facilities under any of the options (see Appendix F, Section F.4), it is not expected that the waste characterization, storage or staging, or authorized disposal capacities at LANL (presented in Appendix F, Table F–11) would be exceeded. Years of support facility operation attributable to surplus plutonium management and disposition would vary depending on the *SPD Supplemental EIS* alternative selected, but would generally coincide with the need to ship TRU waste to WIPP or another authorized disposition facility.

Impacts associated with other resource areas are expected to result in no or negligible incremental impacts resulting from pit disassembly and conversion activities at LANL, or are better addressed on a system-wide rather than facility-specific basis. Because there would be no new land-disturbing construction activities, operation of the principal facilities in support of PF-4 is expected to have no impacts on land resources, geology and soils, and ecological and cultural resources. Operation of these facilities is expected to result in negligible incremental radiological impacts on workers and the public and present no additional risks from potential accidents. Because no additional employment is projected, there would be no socioeconomic impacts. Noise levels from operations would be similar to existing conditions (see Chapter 3, Section 3.2.4.3). TA-54 operates in accordance with existing NPDES permits (see Chapter 3, Section 3.2.3.1), as would the new TRU Waste Facility proposed for TA-63. There would be no additional withdrawals of groundwater, and staging activities are expected to have negligible impacts on surface water resources and no impact on groundwater quality or LANL available capacity. Water and utility use at the principal support facilities is not expected to be significantly affected by the particular combinations of waste management activities that may take place under each of the *SPD Supplemental EIS* alternatives.

Two resource areas, transportation and environmental justice, are meant for system-wide analysis rather than analysis of just a portion of the system (e.g., just LANL waste management capabilities). Therefore, for the same reasons discussed in Section H.1.5 for K-Area storage, KIS, and WSB at SRS, the analysis of transportation impacts associated with support facility operations is deferred to Appendix E, which provides a detailed analysis of the transportation impacts associated with the alternatives being evaluated in this *SPD Supplemental EIS*, including the impacts associated with the principal plutonium support facilities. Appendix E, Section E.10, provides a discussion of the impacts associated with onsite shipments at LANL. Similarly, the analysis of environmental justice impacts associated with support facility operations is presented in Chapter 4, Section 4.1.6, which presents the potential impacts on populations surrounding the LANL facilities that would be involved in surplus plutonium activities, including the impacts associated with the principal plutonium support facilities. This approach is consistent with that taken for SRS support facilities (see Section H.1.6).

[2] *DOE decided to transition the waste management capabilities at LANL (73 FR 55833), including construction of the new TRU Waste Facility in TA-63, based on the analysis of environmental impacts in the 2008* LANL SWEIS *(DOE 2008b).*

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