CHAPTER 3

Spent Nuclear Fuel

3.1 Introduction

This chapter describes the inventory and location of Spent Nuclear Fuel (SNF) that is either currently managed by the DOE or that will be managed by the DOE in the future. Included is SNF from government, U.S. university, and foreign research reactors. Not included is commercial nuclear power reactor SNF and research reactor SNF that is located at reactor sites and is covered under Standard Contracts pursuant to 10 CFR 961. The SNF under Standard Contracts will be shipped directly from the reactor site to a geologic repository for disposal. The SNF data in this chapter cover the following topics: inventory (storage), new generation, treatment, receipts, and disposal. The data summarize the mass (in metric tons of heavy metal – MTHM[1]) of SNF managed by the DOE in the 1998 and 1999 fiscal years (FY) as well as the latest DOE projections for future SNF management through FY 2070.

A summary of SNF volumes by inventory and management activity for fiscal years 1998 and 1999 is provided in Table 8-1. See Section 8.1.3 for a projection summary of MLLW volumes by inventory and management activity.

3.1.1 SNF Definition and Explanation

SNF is defined as:

> Fuel that has been permanently withdrawn from a nuclear reactor following irradiation, but has not been processed to remove its constituent elements (DOE Order 5660. 1B, Management of Nuclear Materials, May 26, 1994).

Table 3-1
Summary of Total SNF Mass by Inventory and Management Activity as Reported by Sites: FY 1998 and FY 1999 Actuals

In metric tons of heavy metal

	FY 1998 Total	FY 1999 Total
Inventory (Storage)	2,480	2,480
New Generation	1	0.2
Treatment	-	2
Receipts	1	1
Geologic Repository Disposal	-	-

SNF is highly radioactive fuel that has been "burned" (irradiated) in a nuclear reactor to the point where it no longer contributes efficiently to the nuclear chain reaction. The fuel typically consists of rods or pins formed into assemblies that may range in number from one to several hundred, depending upon the reactor size and the design of the reactor and fuel assemblies. Fuel assemblies are constructed in many

[1] The unit MTHM means metric ton (approximately 2,200 pounds) of heavy metal (uranium, plutonium and other actinides).

configurations, but they generally consist of the fuel matrix, cladding, and structural hardware.[2] As the nuclear reactor operates, fissionable uranium and plutonium atoms fission and release energy. When most of the usable uranium has fissioned, the "spent" fuel assemblies are removed from the reactor.[3] Radioisotopes in SNF typically consist of short-lived radioactive byproducts of uranium fission, such as cesium and strontium; or long-lived transuranics, such as plutonium and other heavy, man-made elements. SNF can also include blanket assemblies, uranium/neptunium target materials, pieces of fuel, and debris.

The DOE categorizes SNF – including fuel and targets from weapons production reactors, research reactors, and some power reactors – as materials-in-inventory.

SNF managed by the DOE: The DOE's SNF in inventory today originated from DOE materials production, commercial nuclear power reactors, university research reactors, Navy nuclear propulsion reactors (ships and submarines), and foreign research reactors (FRRs). There are over 250 different fuel types that have different enrichments, fissile materials, cladding, and geometry.

The DOE currently manages about 2,500 MTHM of SNF, most of which is stored at three sites: the Hanford Site, the Idaho National Engineering and Environmental Laboratory (INEEL), and the Savannah River Site. These sites are responsible for the consolidation and interim management of all DOE-managed SNF over the next several years – until a geologic repository (see SNF disposal: Section 3.6) is operational. Several other DOE sites – Argonne National Laboratory-West, Fort St. Vrain, Oak Ridge National Laboratory (at the Oak Ridge Reservation), Sandia National Laboratory-NM, and West Valley Demonstration Project – also store small amounts of SNF. An additional 70 MTHM are expected to be received into the inventory over the next 35 years, primarily from domestic and foreign research reactors and the naval reactors program.

Description of SNF inventory and management activities

SNF inventory (storage): Due to the slow decay of fission products, SNF remains radioactive and thermally hot after it has been removed from the reactor. A fraction of the initial mass of fissionable material (uranium-235 or plutonium) has been converted into fission products, some of which are radioactive with half-lives ranging from a few seconds to thousands of years. The radiation of most concern from SNF is gamma rays. Although the radiation levels can be very high, shielding fuel elements with such materials as concrete, lead, steel, and water readily reduces the gamma-ray intensities. The thickness of the required shielding depends on the energy of the radiation source, the desired protection level, and the density of the shielding material.[4]

The SNF fuel assemblies must be cooled for a period ranging from days to years following removal from the reactor to prevent excessive fuel temperatures from being reached. Typically, the SNF removed from reactors has been stored in water pools for periods of up to 18 months for cooling before transfer to other facilities for storage or processing. Storage and transportation systems are designed to prevent nuclear criticality (nuclear chain reaction).[5]

The DOE stores its SNF in a combination of wet and dry storage facilities. To reduce vulnerabilities and the costs associated with continued storage in aging facilities, each of the three DOE SNF interim

[2] U.S. Department of Energy, *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering and Environmental Laboratory Environmental Restoration and Waste Management Programs: Final Environmental Impact Statement*, DOE/EIS-0203-F (April 1995).
[3] U.S. Environmental Protection Agency, Office of Air and Radiation, *Radioactive Waste Disposal: An Environmental Perspective*, EPA 402-K-94-001 (August 1994).
[4] U.S. Department of Energy, *Programmatic Spent Nuclear Fuel Management and Idaho National Engineering and Environmental Laboratory Environmental Restoration and Waste Management Programs: Final Environmental Impact Statement*, DOE-EIS-0203-F (April 1995).
[5] Ibid.

About the Data in This Chapter[a]

- The FY 2000 DOE Environmental Management (EM) Corporate Database provided the data for this chapter.[a] The data in the EM Corporate Database are available through the Central Internet Database (CID), located at http://cid.em.doe.gov. (Please see Chapter 1 for more information on both the EM Corporate Database and the CID.)
- The SNF quantity data in this report are presented according to various categories, i.e., the amount in inventory, generated, treated, received, etc. When considered across these categories, the data are not necessarily mutually exclusive. In other words, a particular amount of SNF may be newly generated, treated, and disposed of – all during the same fiscal year. The same holds true for data on projected SNF. For these reasons, this report does not provide data summaries across the different data categories that would misleadingly suggest data exclusivity.
- The SNF quantity data are rounded to the nearest metric ton of heavy metal (MTHM) for all summary tables in this chapter (i.e., tables showing data at the DOE level only), and to the nearest 0.1 MTHM for all tables broken-out at the site level. Exceptions occur if the data show less than one MTHM of SNF: in these cases the data are rounded to the nearest significant digit.
- Minor changes in SNF inventories may be observed on a year-to-year basis. These occur primarily due to revised estimates of the amounts of SNF to be generated and received at the DOE SNF interim management sites. Other minor changes are due to revised calculations and measurements of individual SNF items that take place in conjunction with drying and packaging of the SNF in preparation for disposal in a geologic repository.
- The data in this report are in a summary format (i.e., by site rather than by waste stream). The CID offers additional details (e.g., stream level data, or comprehensive data about a specific site or management activity).
- This report does not provide information about radioactivity of SNF because, as of the printing of this report, national data are not available. Additional information about SNF radioactivity may be obtained through the National Spent Fuel Program at the Idaho National Engineering and Environmental Laboratory (http://nsnfp.inel.gov).

[a]Within the FY 2000 EM Corporate Database, two original data sources were used: stream disposition data and data from the Spent Fuel Database.

management sites (the Hanford Site, INEEL, and the Savannah River Site) has programs underway to construct new dry storage facilities and to transfer the SNF out of the older wet basins.

SNF-new generation: Although the vast majority of the DOE's reactors are no longer operating, several research and/or isotopes production reactors continue to operate and, as such, small quantities of SNF will be generated. The Advanced Test Reactor at INEEL and the High Flux Isotopes Reactor at the Oak Ridge Reservation are currently operating and studies are underway to review the operation of research reactors at the Argonne National Laboratory-West and the Sandia National Laboratory-NM.

SNF treatment: "Treatment" refers to efforts other than normal stabilization and packaging needed to prepare the SNF for disposal in a geologic repository. Such efforts, described below, include the processing of at-risk SNF at the Savannah River Site and the treatment of the EBR-II sodium-bonded SNF at the Argonne National Laboratory-West. The majority of DOE SNF will be dried and placed in canisters suitable for interim storage and transport to a geologic repository.

The Hanford Site is currently drying its N-reactor SNF and transferring it from wet basins to a new Canister Storage Building located away from the Columbia River. INEEL is drying the Three Mile Island

Unit 2 core debris and transferring it to a new dry cask storage facility. Other SNF in wet storage at the INEEL will be dried and packaged in standard canisters at a new, privatized dry storage facility. The Savannah River Site is undertaking the development and demonstration of a Melt and Dilute technology for the highly-enriched, aluminum-based SNF. Following demonstration of the technology (including characterization and qualification of the Melt and Dilute product to meet anticipated repository acceptance criteria), the Savannah River Site will begin detailed design, construction, testing, and startup of a Treatment and Storage Facility (TSF). The aluminum-based SNF will remain in existing wet storage until treated and placed in dry storage in the TSF.

The DOE formerly reprocessed SNF to recover plutonium, uranium, and other nuclear materials. Reprocessing SNF resulted in the generation of high-level waste (HLW). In the 1990s, the DOE decided to phase-out reprocessing. Today, only those spent nuclear fuels that present safety concerns or do not meet disposal requirements are to be processed prior to disposal. It is these limited spent nuclear fuels for which the term "treatment" is used. The Argonne National Laboratory-West will treat the EBR-II sodium-bonded SNF and the Savannah River Site will treat its "at-risk" SNF. The resulting HLW from these treatment activities will be sent to a geologic repository for disposal.

SNF receipts: Receipts at DOE sites can be differentiated into three categories: 1) *Off-site receipts*. As part of their interim management roles, INEEL and the Savannah River Site receive small quantities of SNF from non-DOE government reactors, U.S. university research reactors, and foreign research reactors. 2) *Inter-site transfers*. INEEL and the Savannah River Site are also consolidating SNF from other DOE sites. 3) *Shipments for disposal at the geologic repository*. Once a geologic repository is opened, INEEL, the Savannah River Site, and the Hanford Site will begin shipping DOE-managed SNF to the repository. These shipments for disposal are planned as "receipts" at a future geologic repository.

SNF disposal: The DOE considers a long-term geologic repository to be the best solution for SNF disposal. Under the Nuclear Waste Policy Act of 1982, the DOE Office of Civilian Radioactive Waste Management is responsible for characterizing a geologic repository, constructing a repository, and eventually disposing of all DOE-managed HLW, SNF, and commercial SNF.

3.1.2 Organization of SNF data

This chapter provides data on the mass of SNF (MTHM) in inventory and managed by the DOE. The data cover the FY 1998 and FY 1999 "actuals" as well as the projected mass through FY 2070. As DOE SNF is anticipated to be shipped to a geologic repository by 2040, the sites report no SNF-related management activities past FY 2040.

3.1.3 Summary of Total Projected Mass of SNF by Inventory and Management Activity: FY 2000 - FY 2070

The tables and figures in this section provide data on the projected mass of SNF as reported by sites. Table 3-2 summarizes the total (FY 2000 - FY 2070) cumulative projected mass of SNF-new generation, treatment, receipts, and disposal. Table 3-3 provides a more detailed breakdown of the data in Table 3-2 and includes data on the projected SNF inventory. Figure 3-1 illustrates the projected mass of SNF by inventory, receipts, and disposal.

Table 3-2
Summary of Total Projected SNF Mass by Management Activity as Reported by Sites: FY 2000 - FY 2070[a]

In metric tons of heavy metal

New Generation	13
Treatment	49
Receipts[b]	2,560
Geologic Repository Disposal	2,448

Notes:
• Due to data rounding, the totals in this table may not equal the exact sum of the year-to-year specific data shown in Table 3-3.

[a] Other than routine management at the geologic repository, sites do not anticipate any SNF inventories or management after FY 2040.
[b] Includes off-site receipts, inter-site transfers, and shipments for disposal at the geologic repository.

Table 3-3
Summary of Total Projected Mass of SNF by Inventory and Management Activity: FY 2000 - FY 2070[a]

In metric tons of heavy metal

	FY 2000[b]	FY 2001[b]	FY 2002[b]	FY 2003[b]	FY 2004[b]
Inventory (Storage)	2,465	2,464	2,467	2,470	2,469
New Generation	0.3	0.2	0.2	5	0.2
Treatment	16	3	1	3	2
Receipts	1	28	4	8	4
Geologic Repository Disposal	-	-	-	-	-

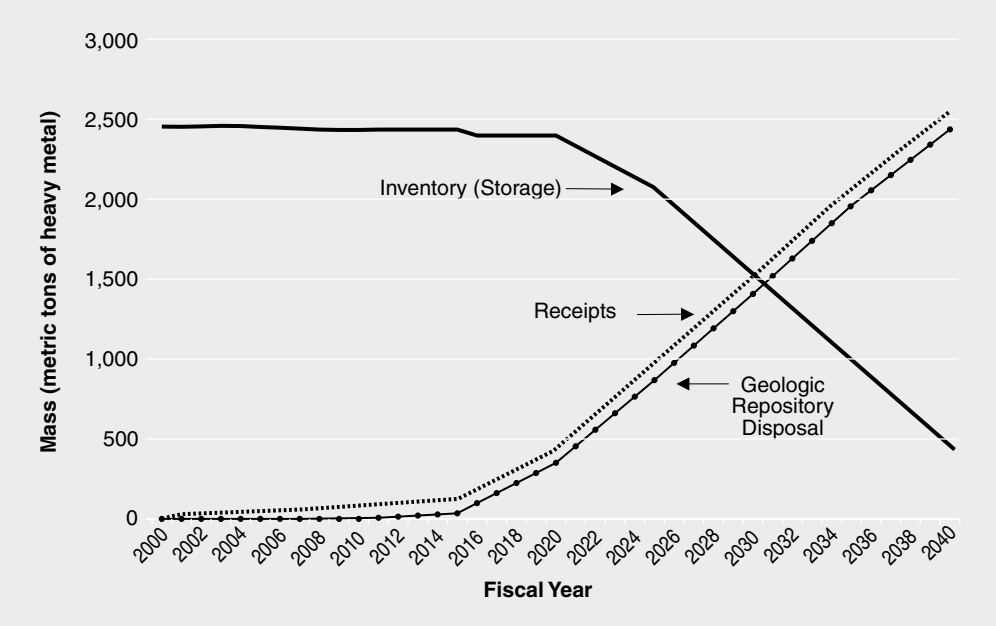
	FY 2005[b]	FY 2006[b]	FY 2007[b]	FY 2008[b]	FY 2009[b]	FY 2010[b]
Inventory (Storage)	2,463	2,459	2,453	2,447	2,445	2,445
New Generation	0.2	0.3	0.2	0.2	0.2	0.2
Treatment	4	4	5	5	5	-
Receipts	3	3	5	4	5	4
Geologic Repository Disposal	-	-	-	-	-	-

	FY 2011-2015	FY 2016-2020	FY 2021-2025	FY 2026-2030	FY 2031-2035	FY 2036-2040
Inventory (Storage)	2,409	2,093	1,576	1,034	479	-
New Generation	1	1	3	0.5	0.6	-
Treatment	-	-	-	-	-	-
Receipts	53	321	530	551	556	479
Geologic Repository Disposal	36	317	520	543	555	479

Notes:
• Hyphens indicate masses of zero.

[a] Other than routine management at the geologic repository, sites do not anticipate any SNF inventories or management after FY 2040.
[b] These data reflect the annual mass projected by sites for FY 2000 - FY 2010. All data (other than the inventory data) reported for the post-2010 time periods reflect the total mass projected for the specified five-year time periods. The post-FY 2010 inventory data reflect the total mass projected for the end of each five-year time period.

Figure 3-1
Summary of Total Projected Mass of SNF by Inventory and Management Activity: FY 2000 - FY 2070[a]



Notes:
• The mass of projected SNF-new generation and treatment is very small relative to SNF inventory, receipts, and disposal. Data on SNF-new generation and treatment can be found in Table 3-3.
• Receipts and disposal are shown as cumulative mass over time.
• Inventory data in this chart reflect annual inventory projections between FY 2000 and FY 2010. After FY 2010, the inventories shown for each year reflect an annual average inventory based on the totals projected for the end of each specific five year time periods (see totals shown in Table 3-3).

[a] Other than routine management at the geologic repository, sites do not anticipate any SNF inventories or management after FY 2040.

3.2 SNF Inventory as Reported by Sites

Inventory is defined as the material that is in storage at a facility or site at a given time. This chapter provides data on SNF end-of-year (e.g., end-of FY 1999) inventories.

The DOE manages most of its inventory (by mass) of SNF at three locations: the Hanford Site stores approximately 86 percent of the DOE total, INEEL stores approximately nine percent of the DOE total, and the Savannah River Site stores approximately two percent of the DOE total. These sites will continue to store and receive SNF until a geologic repository is ready to receive and dispose of SNF. The year-to-year inventories at the Hanford Site, INEEL, and the Savannah River Site will change slightly as small amounts of SNF are consolidated from other DOE sites, university reactors, and foreign research reactors.

3.2.1 SNF Inventory Data by Site and State

A separate table by state is not provided in this section: state totals for all states except Idaho are provided in Table 3-4. The total for Idaho in each fiscal year (1998 and 1999) was approximately 256 MTHM.

The following tables and figures detail the mass of SNF in inventory as reported by DOE sites. Table 3-4 provides the mass of SNF in inventory at each site at the end of FY 1998 and FY 1999; Figure 3-2 shows sites' relative contributions to the total mass of SNF in inventory at the end of FY 1999; and Figure 3-3 shows the geographic distribution of SNF across the U.S. at the end of FY 1999.

Table 3-4
Total Mass of SNF in Inventory as Reported by Sites:
FY 1998 and FY 1999 Actuals

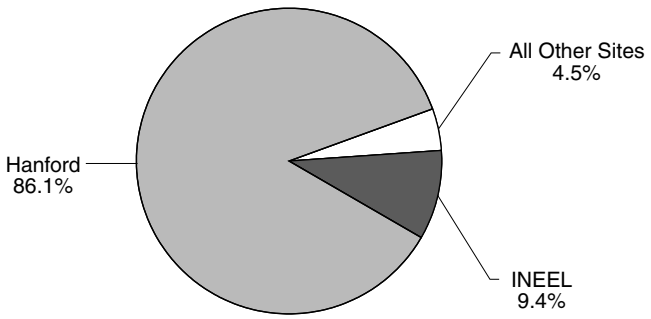
In metric tons of heavy metal

State	Site	Site Code	FY 1998	% 1998 Total	FY 1999	% 1999 Total
CA	General Atomics[a]	GEAT	0.07	<1	0.07	<1
CO	Fort St. Vrain	FSV	14.7	<1	14.7	<1
ID	Argonne National Laboratory - West	ANLW	23.5	<1	22.3	<1
	Idaho National Engineering and Environmental Laboratory	INEEL	232.7	9.4	233.7	9.4
NY	West Valley Demonstration Project	WVDP	26.3	1.1	26.3	1.1
SC	Savannah River Site	SARS	48.0	1.9	46.6	1.9
TN	Oak Ridge Reservation	ORTN	0.7	<1	0.7	<1
WA	Hanford Site	HASI	2,133.9	86.0	2,135.2	86.1
	Total		**2,479.8**	**100**	**2,479.6**	**100%**

Notes:
• Due to data rounding, the totals may not equal the exact sum of the site-specific data.

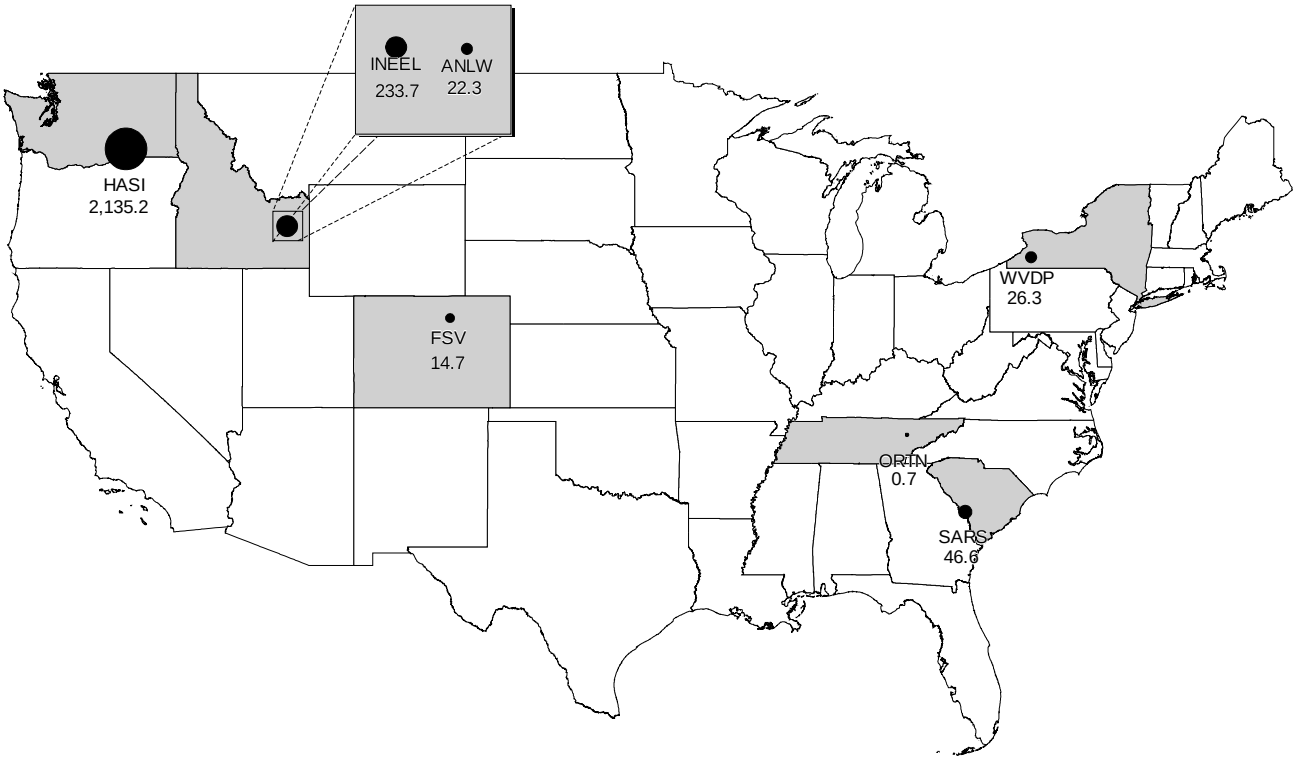
[a] The DOE is not responsible for SNF management at General Atomics. General Atomics is listed here because a small quantity (0.0052 MTHM) of SNF that is located at the site is to be shipped to DOE for interim management pending the opening of the geologic repository. The majority of SNF at General Atomics is research reactor SNF that is covered under a Standard Contract.

Figure 3-2
Sites' Relative Contributions to the Mass of SNF in Inventory as Reported by Sites:
FY 1999 Actuals



Notes:
• At the end FY 1999, the total reported mass of SNF in inventory was approximately 2,480 metric tons of heavy metal.
• The breakout of Sites' Relative Contribution of SNF Mass in Inventory for FY 1998 is the same as for FY 1999. See Table 3-4 for further details.

Figure 3-3
Total Mass of SNF in Inventory as Reported by Sites: FY 1999 Actuals



Notes:
• Mass shown in metric tons of heavy metal.
• While the actual site volumes are labeled numerically on the map, the volume *icons* are based on a logarithmic scale to differentiate more easily between the sites' relative inventories.

3.2.2 SNF Inventory Data by DOE Source Reactor and Facility

The FY 2000 EM Corporate Database provides additional information on the facilities and source reactors associated with each waste stream of SNF in inventory. Because DOE accepts SNF from off-site reactors, the sites where some SNF inventories are located often differ from the sites where the SNF was originally withdrawn from the reactor.

"Source reactor" is defined as the nuclear reactor where the SNF element was irradiated. The data on mass of SNF in inventory (end of FY 1999) by source reactor and DOE site are shown in Table 3-5.

DOE sites report the names of the facilities where the SNF is located (in inventory/storage). "Facilities" are defined as buildings, land, other structures and facilities, and trailers/modulars/containers that are owned or leased by the DOE. The data on SNF in inventory (end of FY 1999) by DOE facility and DOE site are shown in Table 3-6.

Table 3-5
Total Mass of SNF in Inventory by Source Reactor and DOE Site:
FY 1999 Actuals

In metric tons of heavy metal (MTHM)

Site: Fort St. Vrain (State: CO)

Reactor Name	Country	MTHM
Fort St. Vrain Nuc. Gen. Station	U.S.	14.7
Total Site Inventory		**14.7**

Site: Argonne National Laboratory-West (State: ID)

Reactor Name	Country	MTHM
EBR-II	U.S.	22.3
Fast Flux Test Facility	U.S.	0.02
Total Site Inventory		**22.3**

Site: Idaho National Engineering and Environmental Laboratory (State: ID)

Reactor Name	Country	MTHM
Advanced Test Reactor	U.S.	1.1
ARMF/CFRMF	U.S.	0.2
Berlin Experimental Rx. (BER-2)	non-U.S.	0.009
Boiling Reactor Exper. V	U.S.	0.02
Commercial (Misc.)	U.S.	0.3
DRESDEN-1 Reactor	U.S.	0.2
EBR-II	U.S.	2.0
Engineering Test Reactor	U.S.	0.007
Enrico Fermi Atomic Power Plt.	U.S.	38.0
Exp. Propulsion Test Rx	U.S.	0.1
Fort St. Vrain Nuc. Gen. Station	U.S.	8.6
Gas-Cooled Rx Experiment	U.S.	0.003
GE Test Reactor	U.S.	0.004
H. B. Robinson 2	U.S.	0.3
Haddem Neck	U.S.	0.4
Hanover	U.S.	0.01
Heat Transfer Reactor Exp	U.S.	0.001
High Flux Beam Reactor	U.S.	0.06
Ljubljana	non-U.S.	0.04
LOFT (Loss of Fluid Test)	U.S.	2.2
Naval Reactor	U.S.	10.4
Oak Ridge Research Reactor	U.S.	0.003

Site: Idaho National Engineering and Environmental Laboratories (cont'd) (State: ID)

Reactor Name	Country	MTHM
Organic Mod Rx Experiment	U.S.	0.002
Pathfinder Atomic Power Plt.	U.S.	0.05
Peach Bottom Unit 1	U.S.	2.7
Peach Bottom Unit 2	U.S.	0.4
Pitesti	non-U.S.	0.006
Power Burst Facility	U.S.	0.9
Pulstar Buffalo	U.S.	0.2
Rome	non-U.S.	0.03
SEOUL #2	non-U.S.	0.04
SEOUL 1 & 2	non-U.S.	0.01
Shippingport LWBR	U.S.	42.5
Shippingport PWR	U.S.	0.5
Special Power Excur. Rx Test	U.S.	0.0006
Stationary Med Power Plt. 1A	U.S.	0.06
Surry Power Reactor 1 & 2	U.S.	14.6
Systems for Nuc. Aux. Power	U.S.	0.03
Three Mile Island Unit 2	U.S.	81.5
TRIGA (Misc.)	U.S.	0.1
Turkey Point & Surry	U.S.	21.2
Turkey Point Unit 3	U.S.	2.6
U of MO Rolla Reactor	U.S.	0.04
U of WA ARGONANT	U.S.	0.004
University of CA at Berkley	U.S.	0.02
Vallecitos Boiling Water	U.S.	0.01
Unspecified		2.2
Total Site Inventory		**233.7**

Site: West Valley Demonstration Project (State: NY)

Reactor Name	Country	MTHM
Big Rock Point	U.S.	11.2
Robert E. Ginna	U.S.	15.1
Total Site Inventory		**26.3**

(continued…)

Table 3-5 (cont'd)
Total Mass of SNF in Inventory by Source Reactor and DOE Site:
FY 1999 Actuals

In metric tons of heavy metal (MTHM)

Site: Savannah River Site (State: SC)

Reactor Name	Country	MTHM
Argonne Thermal Source Rx	U.S.	0.003
ASTRA	non-U.S.	0.003
Bangkok (TRR-1/M-1)	non-U.S.	0.005
Biological Res. Rx (JANU.S.)	U.S.	0.003
BR-2 & 3 Reactor (Belgium)	non-U.S.	0.01
Bulk Shielding Reactor	U.S.	0.007
Carolinas-VirginiaTube Rx	U.S.	0.07
Cintichem	U.S.	0.13
Commercial (Misc.)	U.S.	0.01
Denmark (DR-3)	non-U.S.	0.1
DRESDEN-1 Reactor	U.S.	2.5
EBR-II	U.S.	16.8
Elk River Reactor	U.S.	5.0
Exp. Boiling Water Rx	U.S.	10.0
FMRB	non-U.S.	0.01
Ford Nuclear Reactor	U.S.	0.05
FRG-1	non-U.S.	0.05
FRJ-2	non-U.S.	0.004
FRM	non-U.S.	0.01
FRM	non-U.S.	0.01
GA SIWABESSY MPR	non-U.S.	0.05
GA SIWABESSY MPR	non-U.S.	0.05
Gas-Cooled Rx Experiment	U.S.	0.06
Gas-Cooled Rx Experiment	U.S.	0.06
Georgia Tech. Research Rx	U.S.	0.004
Georgia Tech. Research Rx	U.S.	0.004
Greece Research Rx Democritus	non-U.S.	0.01
Greece Research Rx Democritus	non-U.S.	0.01
H. B. Robinson 2	U.S.	0.0005
H. B. Robinson 2	U.S.	0.0005
Heat Transfer Reactor Exp.	U.S.	0.004
Heat Transfer Reactor Exp.	U.S.	0.004
High Flux Beam Reactor	U.S.	0.3
High Flux Beam Reactor	U.S.	0.3
High Flux Isotope Reactor	U.S.	0.3
High Flux Isotope Reactor	U.S.	0.3
Hvy. Water Components Test	U.S.	1.8
IAN-R1	non-U.S.	0.003

Site: Savannah River Site (cont'd) (State: SC)

Reactor Name	Country	MTHM
IEA-R1	non-U.S.	0.06
Iowa St. Univ. Argonaut Reactor	U.S.	0.003
Japanese Mat Test Rx (JMTR)	non-U.S.	0.2
Japanese Research Rx (JRR-2)	non-U.S.	0.04
JEN-1 MOD	non-U.S.	0.01
Kyoto University (KUR)	non-U.S.	0.008
LA REINA, RECH-1	non-U.S.	0.004
MIT Research Reactor	U.S.	0.03
Mobile Low Power Plant No. 1	U.S.	0.06
National Institute of Std. & Tech.	U.S.	0.03
Naval Reactor	U.S.	0.0002
Neriede - France	non-U.S.	0.03
Oak Ridge Research Reactor	U.S.	0.09
Ohio St. Research Reactor	U.S.	0.003
Omega West Reactor	U.S.	0.01
Philippine Res. Rx (PRR-1)	non-U.S.	0.022
PTR	non-U.S.	0.005
R-2 Research Reactor	non-U.S.	0.23
RANA	non-U.S.	0.04
RHF(R HAUT Flux France)	non-U.S.	0.005
Rhode Island Nuc. Science Ctr.	U.S.	0.008
RP-1	non-U.S.	0.03
RU-1	non-U.S.	0.02
RV-1 Venezuelan Reactor	non-U.S.	0.04
SAPHIR - Switzerland	non-U.S.	0.1
Saxton Nuc. Exp. Rx Project	U.S.	0.4
Shippingport PWR	U.S.	0.02
Sodium Reactor Experiment	U.S.	2.2
Special Power Excur. Rx Test	U.S.	0.01
SRS Production Reactors	U.S.	5.2
Taiwan ZPRL	non-U.S.	0.02
THOR	non-U.S.	0.004
U. of MO Research Rx COLUM	U.S.	0.2
U. of MO Rolla Reactor	U.S.	0.005
U. of VA Reactor	U.S.	0.01
U. of DELFT (HOR)	non-U.S.	0.004
Vallecitos Boiling Water	U.S.	0.2
Total Site Inventory		**46.6**

(continued...)

Table 3-5 (cont'd)
Total Mass of SNF in Inventory by Source
Reactor and DOE Site: FY 1999 Actuals

In metric tons of heavy metal (MTHM)

Site: Oak Ridge Reservation (State: TN)

Reactor Name	Country	MTHM
Commercial (Misc.)	U.S.	0.08
EBR-II	U.S.	0.005
High Flux Isotope Reactor	U.S.	0.6
Peach Bottom Unit 1	U.S.	0.03
Total Site Inventory		**0.7**

Site: Hanford Site (State: WA)

Reactor Name	Country	MTHM
Calvert Cliffs	U.S.	0.7
Commercial (Misc.)	U.S.	0.02
Cooper Nuclear Station	U.S.	0.4
DOE Fast Misc.	U.S.	0.008
Fast Flux Test Facility	U.S.	7.3
H. B. Robinson 2	U.S.	0.03
Los Alamos Mol. Pu. Rx Exp.	U.S.	0.008
N Reactor	U.S.	2,102.5
Point Beach	U.S.	1.2
Shippingport PWR	U.S.	15.8
Single Pass Reactor	U.S.	3.4
TRIGA (MISC.)	U.S.	0.02
U. of WA ARGONANT	U.S.	0.0001
Unirradiated	n/a	0.0003
Vallecitos Boiling Water	U.S.	0.1
Various LW Test Reactors	U.S.	0.08
Unspecified		3.8
Total Site Inventory		**2,135.2**

Table 3-6
Total Mass of SNF in Inventory by DOE Facility and Site:
FY 1999 Actuals

In metric tons of heavy metal (MTHM)

Site: Fort St. Vrain (State: CO)

Facility	MTHM
Independent Spent Fuel Storage	14.7
Total Site Inventory	**14.7**

Site: Savannah River Site (State: SC)

Facility	MTHM
SRS Basins	46.6
Total Site Inventory	**46.6**

Site: Argonne National Laboratory-West (State: ID)

Facility	MTHM
Fuel Conditioning Facility	1.1
Hot Fuel Exam Facility	0.3
Rad. Scrap & Waste Facility	20.9
Total Site Inventory	**22.3**

Site: Oak Ridge Reservation (State: TN)

Facility	MTHM
Bldg. 3525	0.04
Dry Storage Wells Bldg. 7827	0.06
Dry Storage Wells Bldg. 7829	0.01
High Flux Isotope RX Bldg. 7900	0.6
Total Site Inventory	**0.7**

Site: Idaho National Engineering and Environmental Laboratories (State: ID)

Facility	MTHM
Fuel Storage Area INTEC-666	17.1
Irrad. Fuel Storage INTEC-603	10.5
Materials Test RX Canal TRA603	0.3
Power Burst Facility PER-620	0.6
TAN Cask Storage Pad TAN-791	38.4
TAN Hot Shop TAN-607	85.1
TMI Dry Storage Facility	0.01
Underground Str. Facility INTEC-749	78.1
Underwater Fuel Str. INTEC-603	1.3
Unspecified	0.1
Total Site Inventory	**233.7**

Site: Hanford Site (State: WA)

Facility	MTHM
105 KE Basin	1148.5
105 KW Basin	957.4
200 Area Burial Grounds	0.05
400 Area Interim Storage Area	0.02
Fast Flux Test Facility	7.2
Plutonium Finishing Plant	0.08
Post-Irrad. Test Lab 327 Bldg.	0.02
Rad-Chem. & Analysis Lab 325 Bldg.	0.01
Radiochem. Eng. Cells 324 Bldg.	2.3
T-Plant	15.8
Unspecified	3.8
Total Site Inventory	**2,135.2**

Site: West Valley Demonstration Project (State: NY)

Facility	MTHM
Fuel Receiving & Storage Facility	26.3
Total Site Inventory	**26.3**

SNF Inventory Site Projection Data:

Table 3-7 and Figures 3-4 and 3-5 provide detailed inventory projections for SNF from FY 2000 - FY 2070. There are no SNF inventory projections reported past the FY 2036-2040 time period because this is when the SNF will have been shipped to a geologic repository.

Table 3-7
Total Mass of Projected SNF Inventories as Reported by Sites: FY 2000 - FY 2070[a]

In metric tons of heavy metal

State	Site	Site Code	FY 2000[b]	FY 2001[b]	FY 2002[b]	FY 2003[b]	FY 2004[b]	FY 2005[b]
CA	General Atomics[c]	GEAT	0.07	0.07	0.07	0.07	0.07	-
CO	Fort St. Vrain	FSV	14.7	14.7	14.7	14.7	14.7	14.7
ID	Argonne National Laboratory - West	ANLW	22.1	21.5	20.9	20.2	18.9	17.7
	Idaho National Engineering and Environmental Laboratory	INEEL	234.7	261.9	264.5	268.3	266.4	264.8
NY	West Valley Demonstration Project	WVDP	26.3	-	-	-	-	
SC	Savannah River Site	SARS	30.9	29.5	30.2	30.3	30.6	29.9
TN	Oak Ridge Reservation	ORTN	0.8	0.8	0.5	0.5	0.5	0.5
WA	Hanford Site	HASI	2,135.8	2,135.8	2,135.7	2,135.7	2,137.5	2,135.2
	Total		**2,465.4**	**2,464.3**	**2,466.6**	**2,469.8**	**2,468.7**	**2,462.8**

State	Site	Site Code	FY 2006[b]	FY 2007[b]	FY 2008[b]	FY 2009[b]	FY 2010[b]
CA	General Atomics[c]	GEAT	-	-	-	-	-
CO	Fort St. Vrain	FSV	14.7	14.7	14.7	14.7	14.7
ID	Argonne National Laboratory - West	ANLW	13.9	9.4	4.9	-	-
	Idaho National Engineering and Environmental Laboratory	INEEL	262.7	258.8	255.9	255.0	257.4
NY	West Valley Demonstration Project	WVDP	-	-	-	-	-
SC	Savannah River Site	SARS	31.5	34.0	35.9	39.5	36.9
TN	Oak Ridge Reservation	ORTN	0.4	0.4	0.4	0.4	0.4
WA	Hanford Site	HASI	2,135.2	2,135.2	2,135.2	2,135.2	2,135.2
	Total		**2,458.5**	**2,452.5**	**2,447.0**	**2,444.8**	**2,444.5**

State	Site	Site Code	FY 2011-2015	FY 2016 - 2020	FY 2021-2025	FY 2026-2030	FY 2031-2035	FY 2036-2040
CA	General Atomics[c]	GEAT	-	-	-	-	-	-
CO	Fort St. Vrain	FSV	14.7	14.7	7.3	-	-	-
ID	Argonne National Laboratory - West	ANLW	-	-	-	-	-	-
	Idaho National Engineering and Environmental Laboratory	INEEL	252.1	148.7	123.2	71.7	0.1	-
NY	West Valley Demonstration Project	WVDP	-	-	-	-	-	-
SC	Savannah River Site	SARS	22.8	14.8	9.8	5.0	-	-
TN	Oak Ridge Reservation	ORTN	0.4	0.3	0.2	0.2	0.1	-
WA	Hanford Site	HASI	2,119.4	1,914.3	1,435.6	957.0	478.5	-
	Total		**2,409.4**	**2,092.7**	**1,576.1**	**1,033.8**	**478.7**	**0**

Notes:
• Hyphens indicate masses of zero.
• Due to data rounding, the totals in this table may not equal the exact sum of the site-specific data.

[a] Sites did not report SNF inventories past FY 2035.
[b] These annual data reflect the total mass projected by sites for FY 2000 - FY 2010. All data reported for the post-2010 time periods reflect the total mass of SNF projected for the specified five-year time periods.
[c] DOE is not responsible for SNF management at General Atomics. General Atomics is listed here because a small quantity (0.0052 MTHM) of SNF that is located at the site is to be shipped to DOE for interim management pending the opening of the geologic repository. The majority of SNF at General Atomics is research reactor SNF that is covered under a Standard Contract.

Figure 3-4
Total Projected Mass of SNF Inventories as Reported by Sites:
FY 2000 - FY 2010

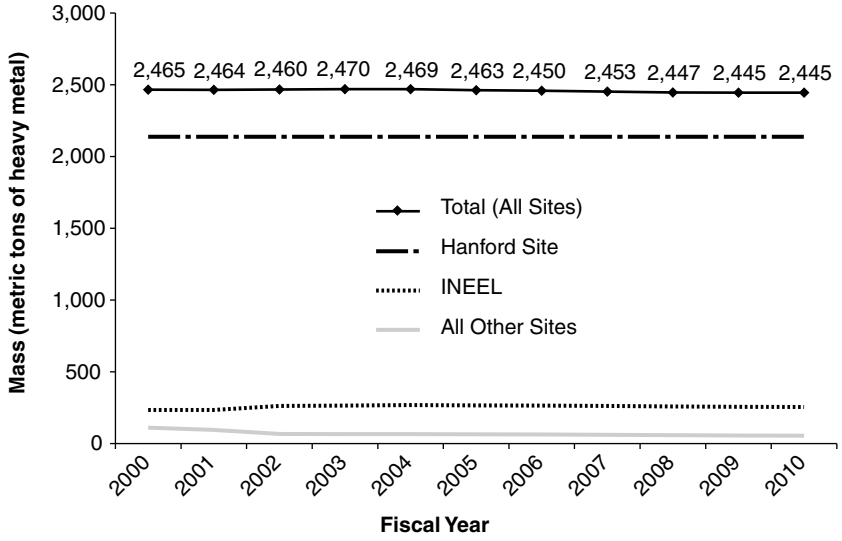
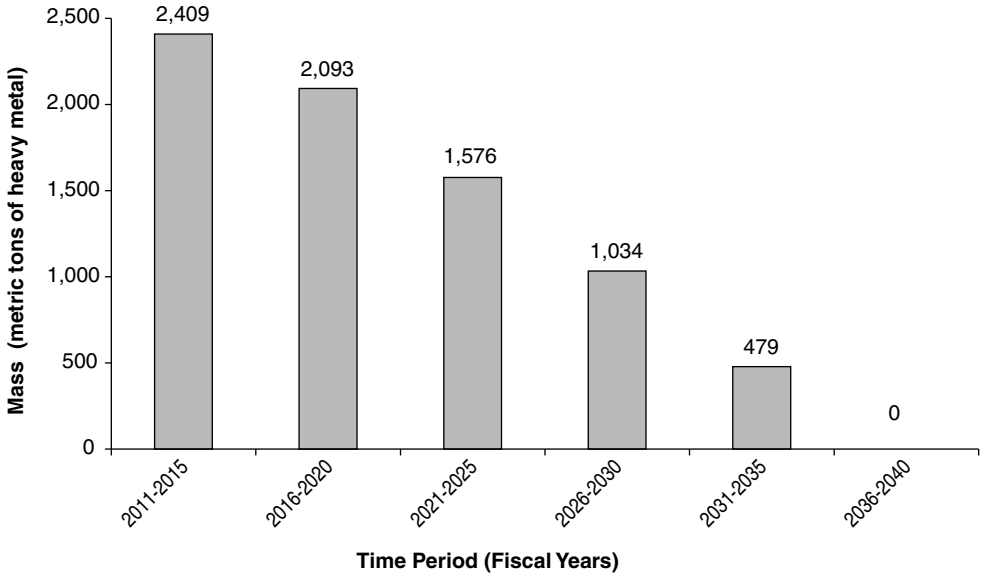


Figure 3-5
Total Projected Mass of SNF Inventories as Reported by Sites:
FY 2011 - FY 2070[a]



Note:
[a] Sites did not report any SNF inventories after FY 2035.

3.3 SNF - New Generation as Reported by Sites

Generation is defined as the origination of new SNF from various DOE research and isotopes reactors.[6,7]

Although the vast majority of DOE's reactors are no longer operating, several research and/or isotopes production reactors continue to operate and, as such, small quantities of SNF will be generated. The Advanced Test Reactor at INEEL and the High Flux Isotopes Reactor at the Oak Ridge Reservation are currently operating and studies about future research reactor operation are underway.

3.3.1 SNF - New Generation Data by Site and State[8]

Table 3-8 provides data on SNF-new generation for FY 1998 and FY 1999.

Table 3-8
Total Mass of SNF Newly-Generated as Reported by Sites:
FY 1998 and FY 1999 Actuals

In metric tons of heavy metal

State	Site	Site Code	FY 1998	% 1998 Total	FY 1999	% 1999 Total
ID	Idaho National Engineering and Environmental Laboratory	INEEL	1.0	99.9	-	-
TN	Oak Ridge Reservation	ORTN	0.001	<1	0.2	100
	Total		**1.0**	**100**	**0.2**	**100**

Notes:
• Hyphens indicate masses of zero.
• Due to data rounding, the totals in this table may not equal the exact sum of the site-specific data.

SNF-New Generation Site Projection Data:

Based on current assumptions, approximately 13 MTHM of SNF will be generated between FY 2000 and FY 2040. Table 3-9 provides the data on projected (FY 2000 - FY 2070) SNF-new generation, and Figures 3-6 and 3-7 illustrate these projections.

[6] U.S. Department of Energy, Office of Environmental Management, *Integrated Data Base Report—1996: U.S. Spent Nuclear Fuel and Radioactive Waste Inventories, Projections, and Characteristics*, DOE/RW-0006, Rev. 13 (December 1997).
[7] In this report, the reported SNF-new generation is the SNF mass that sites categorize as "new additions."
[8] A separate table is not given for state totals. State totals are found in Table 3-8.

Table 3-9
Total Projected Mass of SNF-New Generation as Reported by Sites:
FY 2000 - FY 2070[a]

In metric tons of heavy metal

State	Site	Site Code	FY 2000[b]	FY 2001[b]	FY 2002[b]	FY 2003[b]	FY 2004[b]	FY 2005[b]
ID	Argonne National Laboratory - West	ANLW	-	-	-	4.6	0.01	0.03
	Idaho National Engineering and Environmental Laboratory	INEEL	0.1	0.1	0.1	0.1	0.1	0.08
TN	Oak Ridge Reservation	ORTN	0.2	0.1	0.1	0.1	0.1	0.1
NM	Sandia National Laboratories - NM	SNLN	-	-	-	-	-	-
	Total		**0.3**	**0.2**	**0.2**	**4.8**	**0.2**	**0.2**

State	Site	Site Code	FY 2006[b]	FY 2007[b]	FY 2008[b]	FY 2009[b]	FY 2010[b]	FY 2011-2015
ID	Argonne National Laboratory - West	ANLW	0.07	-	-	-	-	-
	Idaho National Engineering and Environmental Laboratory	INEEL	0.1	0.1	0.1	0.1	0.1	0.5
TN	Oak Ridge Reservation	ORTN	0.1	0.1	0.1	0.1	0.1	0.5
NM	Sandia National Laboratories - NM	SNLN	0.04	-	-	-	-	-
	Total		**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**1.0**

State	Site	Site Code	FY 2016-2020	FY 2021-2025	FY 2026-2030	FY 2031-2035	FY 2036-2040	Site Total	% Total
ID	Argonne National Laboratory - West	ANLW	-	-	-	-	-	4.7	35.6
	Idaho National Engineering and Environmental Laboratory	INEEL	0.4	-	-	-	-	2	15.2
TN	Oak Ridge Reservation	ORTN	0.6	0.6	0.5	0.6	-	3.9	29.5
NM	Sandia National Laboratories - NM	SNLN	-	2.6	-	-	-	2.6	19.7
	Total		**1.0**	**3.2**	**0.5**	**0.6**	**0**	**13.2**	**100**

Notes:
• Hyphens indicate masses of zero.
• Due to data rounding, the totals in this table may not equal the exact sum of the site-specific data.

[a] Sites did not report SNF-new generation past FY 2035.

[b] These annual data reflect the total volume projected by sites for FY 2000 - FY 2010. Post-2010 data reflect the total SNF-new generation projected for each five-year time period.

Figure 3-6
Total Projected Mass of SNF-New Generation (All DOE Sites Combined) as Reported by Sites: FY 2000 - FY 2010

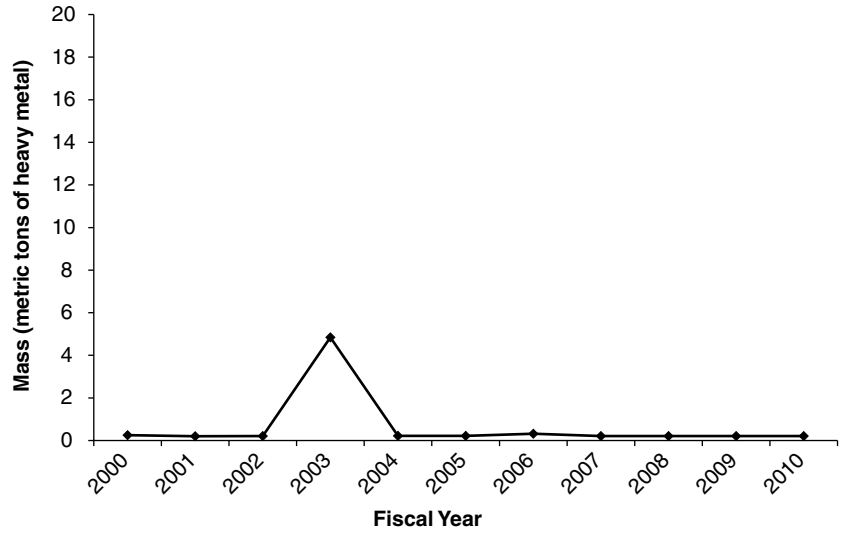
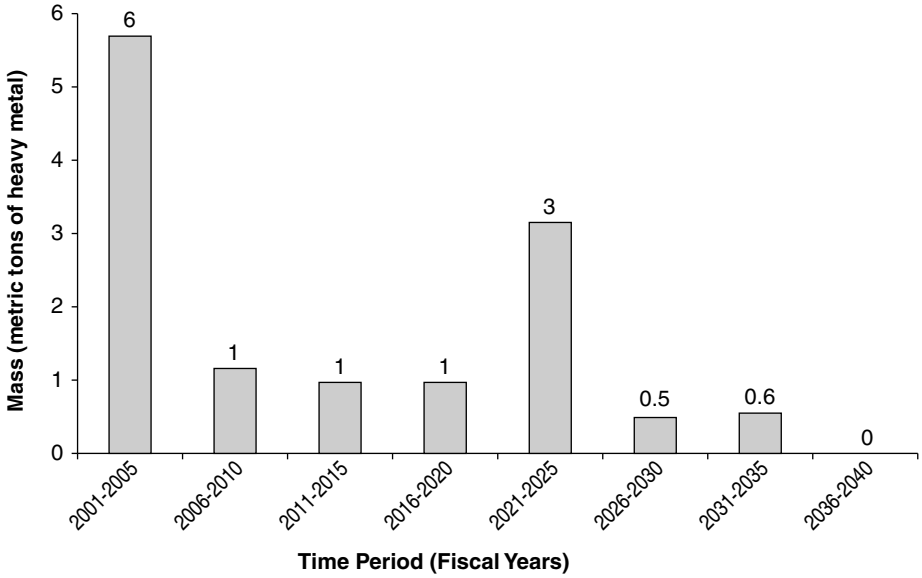


Figure 3-7
Total Projected Mass of SNF-New Generation as Reported by Sites: FY 2001 - FY 2070[a]



Note:
[a] Sites did not report any SNF-new generation after FY 2035.

3.4 SNF Treatment as Reported by Sites

"Treatment" refers to efforts other than normal stabilization and packaging needed to prepare the SNF for disposal in a geologic repository. Such efforts, described below, include the processing of at-risk SNF at the Savannah River Site and the treatment of the EBR-II sodium-bonded SNF at the Argonne National Laboratory-West. The majority of DOE SNF will be dried and placed in canisters suitable for interim storage and transport to a geologic repository.

The Hanford Site is currently drying its N-reactor SNF and transferring it from wet basins to a new Canister Storage Building located away from the Columbia River. INEEL is drying the Three Mile Island Unit 2 core debris and transferring it to a new dry cask storage facility. Other SNF in wet storage at the INEEL will be dried and packaged in standard canisters at a new, privatized dry storage facility. The Savannah River Site is undertaking the development and demonstration of a Melt and Dilute technology for the highly-enriched, aluminum-based SNF. Following demonstration of the technology (including characterization and qualification of the Melt and Dilute product to meet anticipated repository acceptance criteria), the Savannah River Site will begin detailed design, construction, testing, and startup of a Treatment and Storage Facility (TSF). The aluminum-based SNF will remain in existing wet storage until this facility is operational and then placed in dry storage in the TSF.

The DOE formerly reprocessed SNF to recover plutonium, uranium, and other nuclear materials. Reprocessing SNF resulted in the generation of high-level waste (HLW). In the 1990s, the DOE decided to phase-out reprocessing. Today, only those spent nuclear fuels that present safety concerns or do not meet disposal requirements are to be processed prior to disposal. It is these limited spent nuclear fuels for which the term “treatment” is used. The Argonne National Laboratory-West will treat the EBR-II sodium-bonded SNF and the Savannah River Site will treat its “at-risk” SNF. The resulting HLW from these treatment activities will be sent to a geologic repository for disposal.

3.4.1 SNF Treatment Data by Site and State

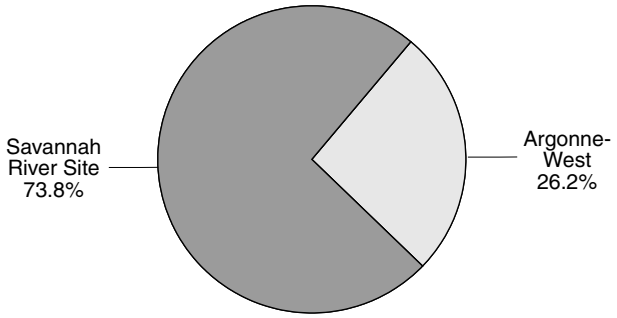
Sites did not report any treatment during FY 1998. Table 3-8 provides data on SNF-new generation for FY 1999. Figure 3-8 shows sites’ relative contributions to the total mass of SNF treated at the end of FY 1999.

Table 3-10
Total Mass of SNF Treated as Reported by Sites:
FY 1999 Actuals

In metric tons of heavy metal

State	Site	Site Code	FY 1999	% 1999 Total
ID	Argonne National Laboratory - West	ANLW	0.6	26.2
SC	Savannah River Site	SARS	1.7	73.8
	Total		**2.3**	**100**

Figure 3-8
Sites' Relative Contributions to Mass of SNF Treated as Reported by Sites:
FY 1999 Actuals



Note:
The total reported mass of SNF treated in FY 1999 was approximately 2.3 metric tons of heavy metal. See Table 3-10 for further details.

SNF Treatment Site Projection Data:

DOE sites expect to complete the majority of the SNF treatment by FY 2009. Sites may determine a need to continue some limited SNF treatment prior to disposal, but have not yet established the need to do so. Table 3-11 provides the data on projected SNF treatment, and Figures 3-9 and 3-10 illustrate these projections.

Table 3-11
Total Mass of Projected SNF Treatment as Reported by Sites:
FY 2000 - FY 2070[a]

In metric tons of heavy metal

State	Site	Site Code	FY 2000[b]	FY 2001[b]	FY 2002[b]	FY 2003[b]	FY 2004[b]	FY 2005[b]	FY 2006[b]	FY 2007[b]	FY 2008[b]	FY 2009[b]	FY 2010[b]
ID	Argonne National Laboratory-West	ANLW	0.2	0.6	0.6	0.7	1.3	2.0	4.3	5.0	5.0	5.0	-
SC	Savannah River Site	SARS	16.2	2.1	0.7	2.0	1.1	2.2	-	-	-	-	-
	Total		**16.4**	**2.7**	**1.3**	**2.7**	**2.4**	**4.2**	**4.3**	**5.0**	**5.0**	**5.0**	**0**

State	Site	Site Code	FY 2011-2015	FY 2016-2020	FY 2021-2025	FY 2026-2030	FY 2031-2035	FY 2036-2040	Site Total	% Total
ID	Argonne National Laboratory-West	ANLW	-	-	-	-	-	-	24.6	50.3
SC	Savannah River Site	SARS	-	-	-	-	-	-	24.3	49.7
	Total		**0**	**0**	**0**	**0**	**0**	**0**	**48.9**	**100**

Notes:
• Hyphens indicate masses of zero.

[a] Sites did not report SNF treatment activity past FY 2009.

[b] These annual data reflect the total volume projected by sites for FY 2000 - FY 2010. Post-FY 2010 data reflect the total SNF treatment projected for each five-year time period.

Figure 3-9
Total Projected Mass of SNF Treatment as Reported by Sites:
FY 2000 - FY 2010

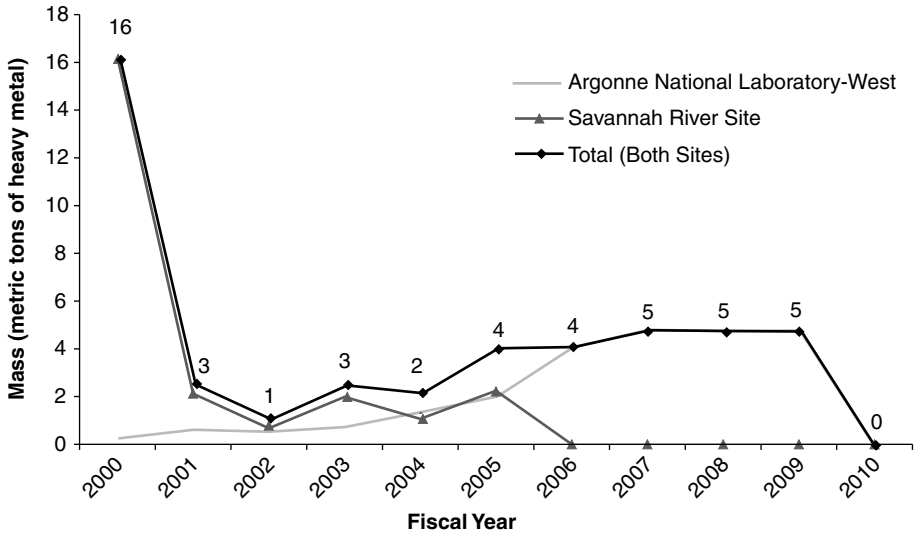
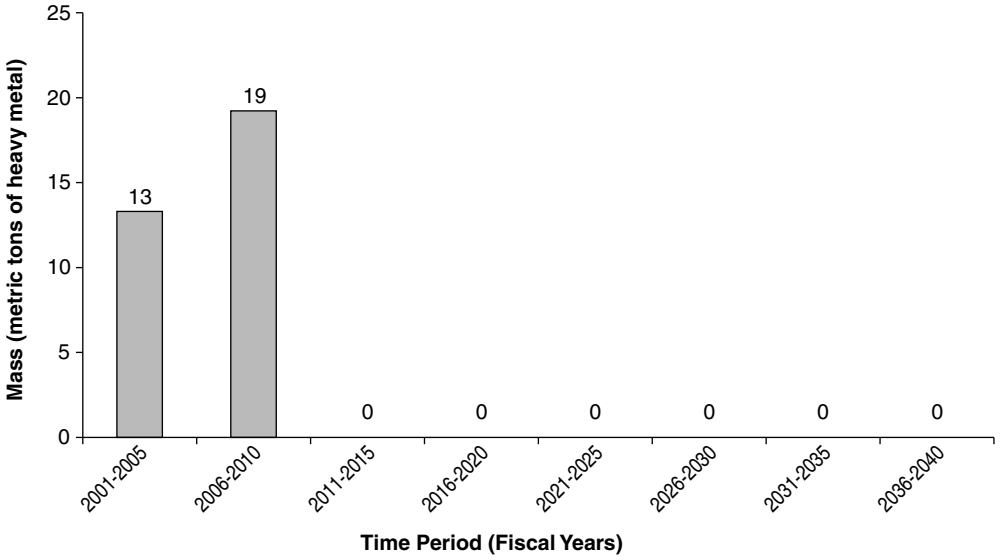


Figure 3-10
Total Projected Mass of SNF Treatment as Reported by Sites:
FY 2001 - FY 2070[a]



Note:
[a] Sites did not report SNF treatment activity past FY 2009.

3.5 SNF Receipts as Reported by Sites

Receipts at DOE sites can be differentiated into three categories: (1) *Off-site receipts*. As part of their interim management roles, INEEL and the Savannah River Site receive small quantities of SNF from non-DOE government reactors, U.S. university research reactors, and foreign research reactors. (2) *Inter-site transfers*. INEEL and the Savannah River Site are also consolidating SNF from other DOE sites. (3) *Shipments for disposal at the geologic repository*. Once a geologic repository is opened, INEEL, the Savannah River Site, and the Hanford Site will begin shipping DOE-managed SNF to the repository. These shipments for disposal are planned as "receipts" at a future geologic repository.

3.5.1 SNF Receipts Data by Site and State

Table 3-12 provides data on the mass of SNF received in FY 1998 and FY 1999.

Table 3-12
Total Mass of SNF Receipts as Reported by Sites:
FY 1998 and FY 1999 Actuals

In metric tons of heavy metal

RECEIVING SITE: Idaho National Engineering and Environmental Laboratory (INEEL) (State: ID)

Shipping Site	State	FY 1998	FY 1999
Foreign Research Reactor	n/a	0.1	0.08
Naval Reactor Facility	ID	-	0.9
INEEL Total		**0.1**	**1.0**
INEEL's contribution to DOE receipts total:		***7.7%***	***75.9%***

RECEIVING SITE: Savannah River Site (State: SC)

Shipping Site	State	FY 1998	FY 1999
Combined Foreign Research Reactor and Domestic Research Reactor	n/a	1.2	0.05
Oak Ridge	TN	-	0.1
Savannah River Site Total		**1.2**	**0.2**
Savannah River Site's contribution to DOE receipts total:		***92.3%***	***11.9%***

All DOE Sites

	FY 1998	FY 1999
DOE Total	1.3	1.1

Notes:
• Hyphens indicate masses of zero.
• Due to data rounding, the totals in this table may not equal the exact sum of the site-specific data.

Table 3-13
Total Mass of Projected SNF Receipts as Reported by Sites: FY 2000 - FY 2070[a]

In metric tons of heavy metal

RECEIVING SITE: Argonne National Laboratory-West (State: ID)

State	Shipping Site	Site Code	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
ID	Idaho National Engineering and Environmental Laboratory	INEEL	-	-	-	-	-	0.5	0.5	0.5	0.5	0.04	-
WA	Hanford Site	HASI	-	-	-	-	-	0.3	-	-	-	-	-
	Argonne National Laboratory-West Total		**0**	**0**	**0**	**0**	**0**	**0.8**	**0.5**	**0.5**	**0.5**	**0.04**	**0**

RECEIVING SITE: Idaho National Engineering and Environmental Laboratory (INEEL) (State: ID)

State	Shipping Site	Site Code	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
CA	General Atomics	GEAT	-	-	-	0.01	-	-	-	-	0.1	-	-
CO	Fort St. Vrain	FSV	-	-	-	-	-	-	-	-	-	-	-
ID	Argonne National Laboratory-West	ANLW	-	-	-	4.6	0.01	0.03	0.1	-	-	-	-
	Naval Reactor Facility	NAVY	0.9	1.0	2.3	1.1	2.7	1.3	1.9	3.6	2.7	1.0	0.4
IL	Argonne National Laboratory-East	ANLE	-	-	-	0.001	-	-	-	-	-	-	-
NM	Sandia National Laboratories-NM	SNLN	-	-	-	-	-	-	0.04	-	-	-	-
NY	West Valley Demonstration Project	WVDP	-	26.3	-	-	-	-	-	-	-	-	-
SC	Savannah River Site	SARS	-	-	-	-	-	-	-	-	-	-	2.9
TN	Oak Ridge Reservation	ORTN	-	-	0.2	-	-	-	-	-	-	-	-
n/a	Domestic Research Reactor	DRR	-	-	-	0.1	0.6	0.01	-	0.03	-	0.02	0.3
	Foreign Research Reactor	FRR	0.02	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-
	INEEL Total		**0.9**	**27.4**	**2.6**	**5.9**	**3.3**	**1.4**	**2.1**	**3.7**	**2.8**	**1.1**	**3.6**

RECEIVING SITE: Savannah River Site (State: SC)

State	Shipping Site	Site Code	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
ID	INEEL	INEEL	-	-	-	-	-	-	-	-	-	-	0.4
TN	Oak Ridge Reservation	ORTN	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
n/a	Combined FRR and DRR	n/a	0.3	0.6	1.2	1.7	0.9	1.0	0.4	1.0	0.5	3.2	0.0
	Savannah River Site Total		**0.5**	**0.7**	**1.3**	**1.8**	**1.1**	**1.1**	**0.5**	**1.1**	**0.6**	**3.3**	**0.6**

RECEIVING SITE: Geologic Repository (State: n/a)[b]

State	Shipping Site	Site Code	FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
ID	INEEL	INEEL	-	-	-	-	-	-	-	-	-	-	-
SC	Savannah River Site	SARS	-	-	-	-	-	-	-	-	-	-	-
WA	Hanford Site	HASI	-	-	-	-	-	-	-	-	-	-	-
	Geologic Repository Total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

All DOE Sites

			FY 2000	FY 2001	FY 2002	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
	DOE Total		**1.4**	**28.1**	**3.9**	**7.7**	**4.4**	**3.4**	**3.1**	**5.4**	**4.0**	**4.5**	**4.2**

Notes:
- Hyphens indicate masses of zero.
- Due to data rounding, the totals in this table may not equal the exact sum of the site-specific data.
- These annual data reflect the total volume projected by sites for FY 2000 - FY 2010.

[a] Other than routine management at the geologic repository, sites do not anticipate any SNF inventories or management after FY 2040.

[b] The location for a geologic repository has yet to be determined.

(continued…)

Table 3-13 (cont'd)
Total Mass of Projected SNF Receipts as Reported by Sites: FY 2000 - FY 2070[a]

In metric tons of heavy metal

RECEIVING SITE: Argonne National Laboratory-West (State: ID)

State	Shipping Site	Site Code	FY 2011-2015	FY 2016-2020	FY 2021-2025	FY 2026-2030	FY 2031-2035	FY 2036-2040	Site Total
ID	Idaho National Engineering and Environmental Laboratory	INEEL	-	-	-	-	-	-	**2.0**
WA	Hanford	HASI	-	-	-	-	-	-	**0.3**
	Argonne National Laboratory-West Total		**0**	**0**	**0**	**0**	**0**	**0**	**2.3**
								Argonne National Laboratory's contribution to DOE total:	**0.1%**

RECEIVING SITE: Idaho National Engineering and Environmental Laboratory (INEEL) (State: ID)

State	Shipping Site	Site Code	FY 2011-2015	FY 2016-2020	FY 2021-2025	FY 2026-2030	FY 2031-2035	FY 2036-2040	Site Total
CA	General Atomics	GEAT	-	-	-	-	-	-	**0.06**
CO	Fort St. Vrain	FSV	-	-	7.4	7.3	-	-	**14.7**
ID	Argonne National Laboratory-West	ANLW	-	-	-	-	-	-	**4.7**
	Naval Reactor Facility	NAVY	-	-	-	-	-	-	**18.9**
IL	Argonne National Laboratory-East	ANLE	-	-	-	-	-	-	**0.001**
NM	Sandia National Laboratories-NM	SNLN	-	-	2.6	-	-	-	**2.6**
NY	West Valley Demonstration Project	WVDP	-	-	-	-	-	-	**26.3**
SC	Savannah River Site	SARS	14.5	2.8	-	-	-	-	**20.2**
TN	Oak Ridge Reservation	ORTN	-	-	-	-	-	-	**0.2**
n/a	Domestic Research Reactor	DRR	0.08	0.3	0.08	0.06	0.05	-	**1.6**
	Foreign Research Reactor	FRR	-	-	-	-	-	-	**0.7**
	INEEL Total		**14.6**	**3.1**	**10.1**	**7.4**	**0.1**	**0.0**	**90.1**
								INEEL's contribution to DOE total:	***3.5%***

RECEIVING SITE: Savannah River Site (State: SC)

State	Shipping Site	Site Code	FY 2011-2015	FY 2016-2020	FY 2021-2025	FY 2026-2030	FY 2031-2035	FY 2036-2040	Site Total
ID	INEEL	INEEL	2.1	0.9	-	-	-	-	**3.4**
TN	Oak Ridge Reservation	ORTN	0.5	0.5	0.5	0.5	0.5	-	**4.0**
n/a	Undetermined DOE sites	n/a	0.2	0.2	0.2	0.2	0.1		**11.8**
	Savannah River Site Total		**2.8**	**1.5**	**0.7**	**0.7**	**0.6**	**0.0**	**19.1**
								Savannah River Site's contribution to DOE total:	***0.7%***

RECEIVING SITE: Geologic Repository (State: n/a)[b]

State	Shipping Site	Site Code	FY 2011-2015	FY 2016-2020	FY 2021-2025	FY 2026-2030	FY 2031-2035	FY 2036-2040	Site Total
ID	INEEL	INEEL	18.6	106.1	35.6	58.9	71.6	-	**290.8**
SC	Savannah River Site	SARS	1.0	5.2	5.2	5.2	5.2	-	**22.0**
WA	Hanford Site	HASI	15.8	205.2	478.6	478.6	478.5	478.5	**2,135.2**
	Geologic Repository Total		**35.5**	**316.5**	**519.5**	**542.8**	**555.3**	**478.5**	**2,448.1**
								Geologic Repository's contribution to DOE total:	***95.6%***

All DOE Sites

		FY 2011-2015	FY 2016-2020	FY 2021-2025	FY 2026-2030	FY 2031-2035	FY 2036-2040	DOE Total
	DOE Total	**52.8**	**321.1**	**530.2**	**550.9**	**556.0**	**478.5**	**2,559.6**

Notes:
- Hyphens indicate masses of zero.
- Due to data rounding, the totals in this table may not equal the exact sum of the site-specific data.
- Data for the post-FY 2010 reflect the total mass projected for each five-year time period.

[a] Other than routine management at the geologic repository, sites do not anticipate any SNF inventories or management after FY 2040.
[b] The location for a geologic repository has yet to be determined.

3.6 SNF Geologic Repository Disposal as Reported by Sites

The DOE expects to permanently dispose of SNF when a geologic repository (GRD) becomes operational. The following data reflect sites' expectation that the GRD will be operating during the FY 2010 - FY 2040 time period.

As shown in Table 3-14 and Figure 3-11, the Savannah River Site, the Hanford Site, and INEEL plan to dispose of approximately 2,448 MTHM of SNF in a geologic repository. Additional shipments of SNF from the Naval Nuclear Propulsion Program will be made directly from the Naval Reactor Facility in Idaho to the repository beginning in FY 2010. These Navy shipments are not included in the totals below.

3.6.1 SNF Disposal Data

Table 3-14
Total Mass of Projected SNF Disposal as Reported by Sites:
FY 2011 - FY 2070[a]

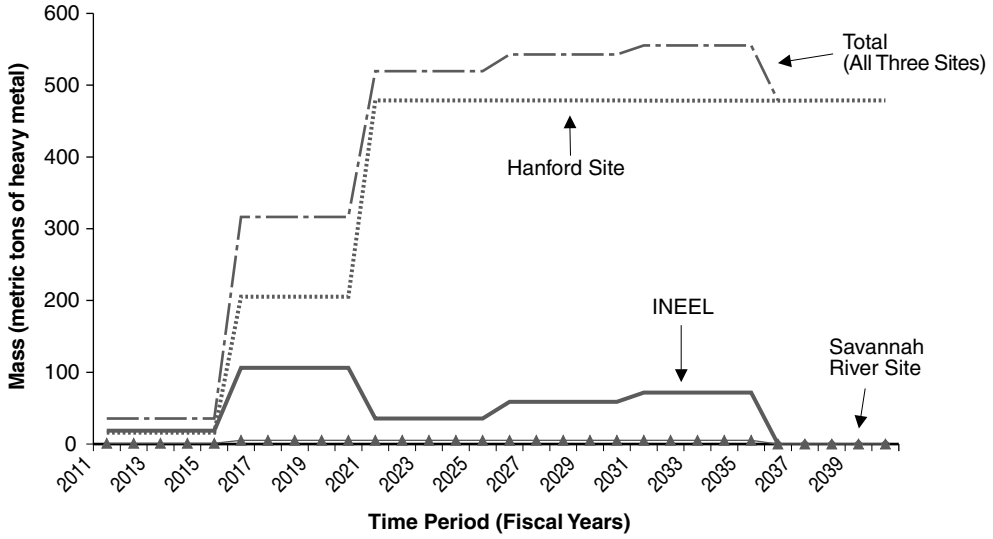
In metric tons of heavy metal

Site	Site Code	FY 2011-2015	FY 2016-2020	FY 2021-2025	FY 2026-2030	FY 2031-2035	FY 2036-2040	Total
Geologic Repository Disposal	GRD	35.5	316.5	519.5	542.8	555.3	478.7	2,448.3

Notes:
• The Geologic Repository for Disposal (GRD) is the only site where DOE will dispose of SNF.

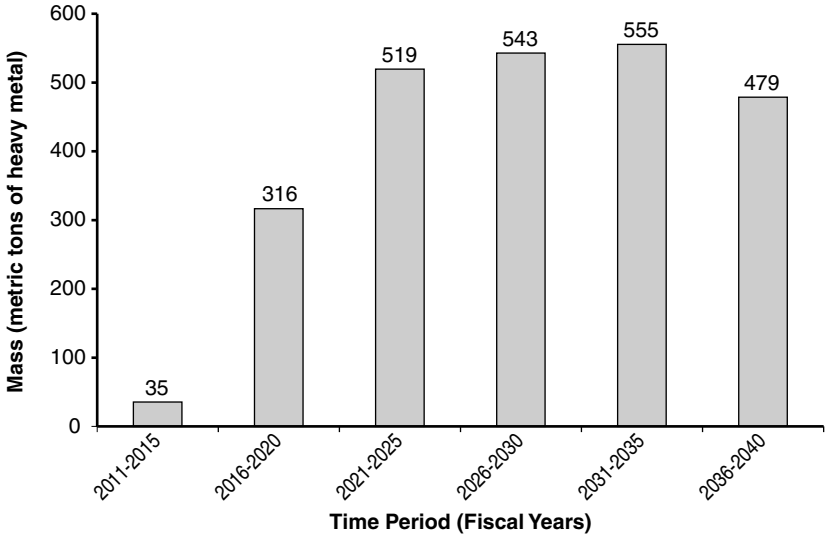
[a] All disposal operations of DOE SNF are anticipated to be complete by FY 2040.

Figure 3-11
Sites' Contributions to Total Projected Mass of SNF Disposal as Reported by Sites:
FY 2011 - FY 2070[a]



Note:
[a] DOE sites did not report any SNF disposal after FY 2040.

Figure 3-12
Total Mass of Projected SNF Disposal as Reported by Sites: FY 2011 - FY 2070[a]



Note:
[a] DOE sites did not report any SNF disposal after FY 2040.