



**Country Waste Profile Report for
GERMANY
Reporting Year: 2013**

*For guidance on reading Country Waste Profile Reports,
please refer to the following internet based document:*

<http://www-newmdb.iaea.org/help/profiles9/guide.pdf>

*For further information, please contact the Responsible Officer via e-mail:
NEWMDB@IAEA.org*

Waste Classification Schemes

Country: GERMANY

Reporting Year: 2013

Waste Class Matrix: **IAEA Def.**

This country does use the IAEA Scheme: No

Description: The Agency's standard matrix

Waste Class Name	Distribution %			
	VLLW	LLW	ILW	HLW
VLLW	100.0	0.0	0.0	0.0
LLW	0.0	100.0	0.0	0.0
ILW	0.0	0.0	100.0	0.0
HLW	0.0	0.0	0.0	100.0

Waste Class Matrix: **GER**

Yes

Description: All types of radioactive waste has to be disposed of in deep geological formations. This makes it unnecessary to differentiate between waste containing radionuclides with comparatively short and long half-lives. Waste is initially subjected to a basic subdivision into Waste with Negligible Heat Generation (NHGW) and Heat Generating Waste (HGW).

Waste Class Name	Distribution %			
	VLLW	LLW	ILW	HLW
NHGW	0.0	90.0	10.0	0.0
HGW (in m3)	0.0	0.0	25.0	75.0
HGW (in MTHM)	0.0	0.0	0.0	100.0

Comment **# 29674: Basics for the classification scheme**

The percentages in the matrix for NHGW are based upon waste characteristics including radionuclide inventory and estimated annual arisings provided by the waste generators (Internal BfS-report ET-IB-52). The characteristics were compared with the limits for long-lived nuclides and heat generation specified for the IAEA's waste classification scheme.

The ratio for HGW in Kubikmeters is based on the current amount of waste from reprocessing returned to Germany and other HGW. The ratio will change in the future.

The ratio of HGW in Metric Tons of Heavy Metal includes Spent Fuel that is HLW. Note: If SF assemblies will be conditioned (depending on the disposal concept) then it could generate ILW (e.g. structural parts). In conclusion, SF assemblies including HLW (spent fuel) and ILW (structural parts). The ratio refers only to spent fuel ("MTHM").

Definition of «unprocessed waste» and «processed waste»:

This country uses the following definitions:

	as-generated waste	processed for handling	processed for storage	processed for disposal
Unprocessed means:	x	x	x	
Processed means:				x

Comment **# 12227: Definitions for Unprocessed Waste and Processed W**

Germany usually uses the term "conditioned" for waste that needs no more physical or chemical treatment for disposal.

Groups Overview

Country: GERMANY

Reporting Year: 2013

Reporting Group:	DISPOSAL
Inventory Reporting Date:	December 2013
Waste Matrix Used:	GER
Description:	Disposal facilities for radioactive waste.

Site Name	Facility Name	Facilities Defined		
ASSE	ASSE			disposal
KONRAD	KONRAD			disposal
MORSLEBEN	ERAM			disposal

Reporting Group:	REPORT STRUCTURE
Inventory Reporting Date:	December 2013
Waste Matrix Used:	GER
Description:	Structure for entering the amount of radioactive waste and spent fuel.

Site Name	Facility Name	Facilities Defined		
SF&RW	RADWASTE		storage	
	SPENTFUEL		storage	

Site (Data) : ASSE

Stock of waste as at December 2013

Country: GERMANY

Reporting Year: 2013

Site Name: ASSE

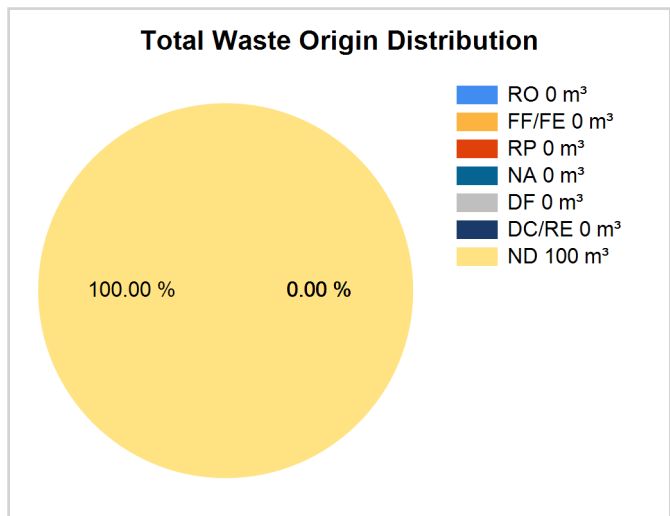
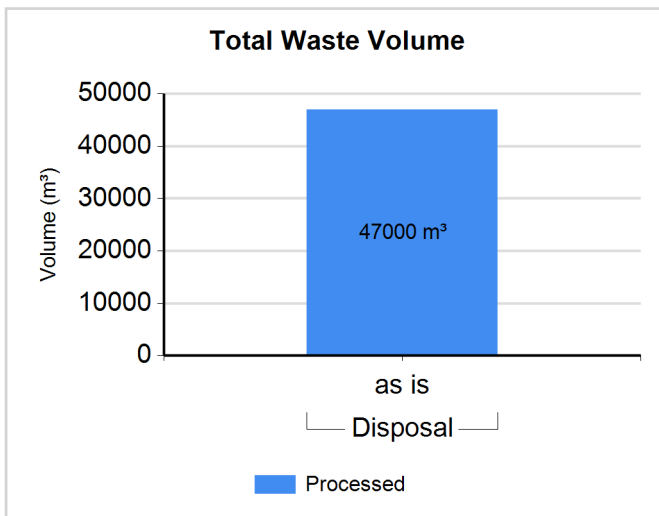
Full Name: Schachtanlage Asse II

Inventory Reporting Date: December 2013

Waste Matrix Used: GER

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined



Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

Waste Class: NHGW

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
NHGW	Disposal	Y	N	47000.000	47000.000	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Site (Data) : ASSE

Stock of waste as at December 2013

Country: GERMANY

Reporting Year: 2013

RadioNuclide Inventory in Disposal

RadioNuclide	Activity (GBq)
Americium (Am-241)	240000
Carbon (C-14)	2600
Cesium (Cs-137)	360000
Cesium (Cs-135)	3.2
Chlorine (Cl-36)	7.2
Cobalt (Co-60)	11000
Curium (Cm-244)	800
Hydrogen (H-3)	430
Neptunium (Np-237)	3.7
Nickel (Ni-59)	1800
Nickel (Ni-63)	260000
Niobium (Nb-94)	180
Plutonium (Pu-240)	51000
Plutonium (Pu-242)	91
Plutonium (Pu-239)	45000
Plutonium (Pu-241)	1300000
Radium (Ra-226)	200
Samarium (Sm-151)	3400
Selenium (Se-79)	3.4
Strontium (Sr-90)	200000
Technetium (Tc-99)	110
Thorium (Th-232)	330
Tin (Sn-126)	4.6
Uranium (U-238)	1300
Uranium (U-235)	53
Uranium (U-236)	24
Uranium (U-234)	1400
Zirconium (Zr-93)	550

Site (Data) : KONRAD

Stock of waste as at December 2013

Country: GERMANY

Reporting Year: 2013

Site Name: KONRAD

Full Name: Konrad repository

Inventory Reporting Date: December 2013

Waste Matrix Used: GER

Site (Data) : MORSLEBEN

Stock of waste as at December 2013

Country: GERMANY

Reporting Year: 2013

Site Name: MORSLEBEN

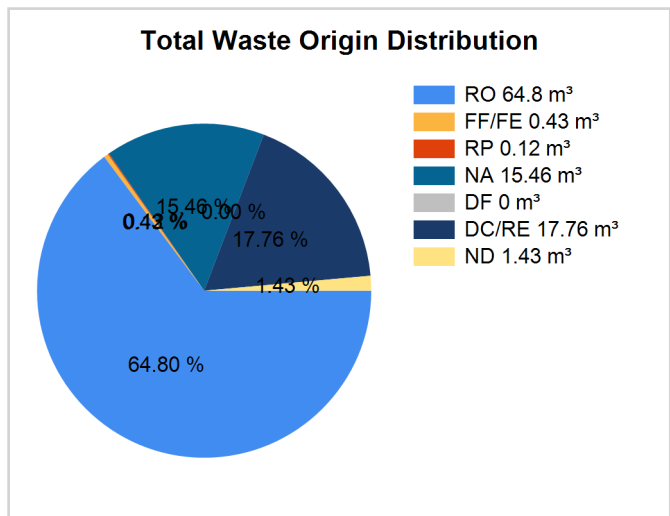
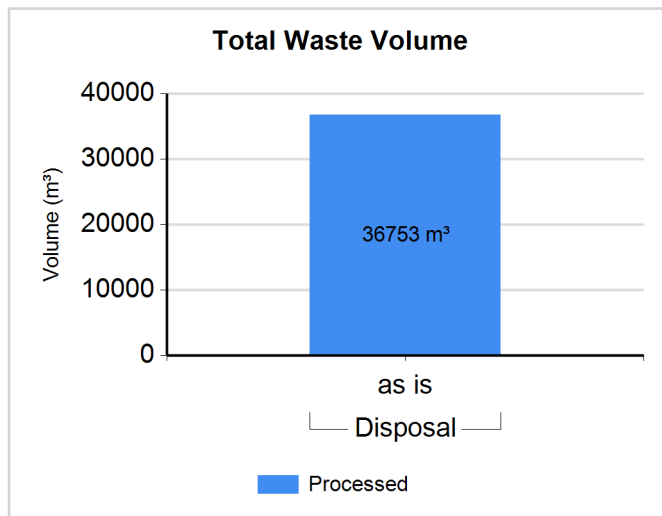
Full Name: Morsleben repository

Inventory Reporting Date: December 2013

Waste Matrix Used: GER

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined



Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

Waste Class: NHGW

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
NHGW	Disposal	Y	N	36753.000	36753.000	64.80	0.43	0.12	15.46	0.00	17.76	1.43

RadioNuclide Inventory in Disposal

Total Alpha Activity (GBq):	472
Total Beta/Gamma Activity (GBq):	94787

RadioNuclide	Activity (GBq)
Americium (Am-241)	230
Antimony (Sb-125)	8.5
Cadmium (Cd-113m)	6.5
Carbon (C-14)	3200
Cesium (Cs-137)	63000
Cesium (Cs-134)	9.4
Chlorine (Cl-36)	3.9
Cobalt (Co-60)	5400

Site (Data) : MORSLEBEN

Stock of waste as at December 2013

Country: GERMANY

Reporting Year: 2013

Curium (Cm-244)	4.8
Europium (Eu-152)	210
Europium (Eu-155)	21
Europium (Eu-154)	190
Hydrogen (H-3)	2000
Iron (Fe-55)	140
Krypton (Kr-85)	210
Lead (Pb-210)	12
Nickel (Ni-59)	180
Nickel (Ni-63)	14000
Niobium (Nb-94)	27
Plutonium (Pu-240)	66
Plutonium (Pu-239)	69
Plutonium (Pu-238)	78
Plutonium (Pu-241)	900
Potassium (K-40)	23
Promethium (Pm-147)	11
Radium (Ra-226)	23
Samarium (Sm-151)	260
Silver (Ag-108m)	65
Strontium (Sr-90)	4800
Technetium (Tc-99)	100
Uranium (U-234)	1.1
Zirconium (Zr-93)	9.3

Site (Data) : SF&RW

Stock of waste as at December 2013

Country: GERMANY

Reporting Year: 2013

Site Name: SF&RW

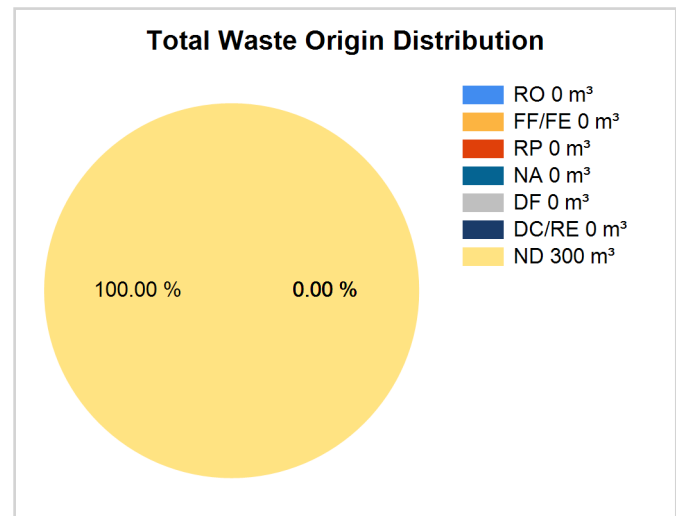
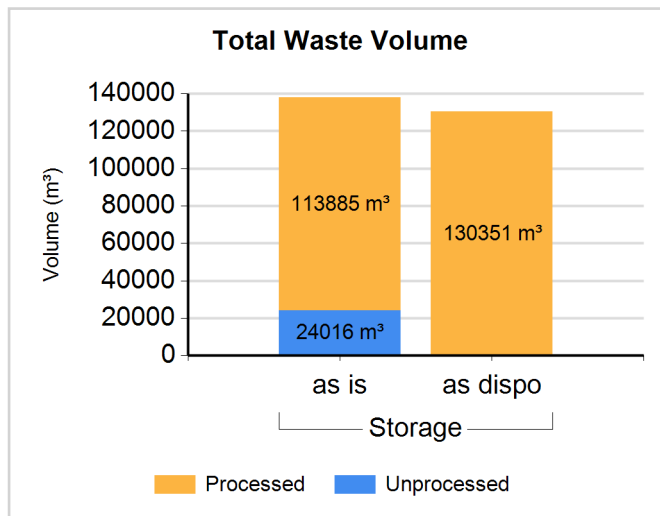
Full Name: Structure for entering the amount of waste.

Inventory Reporting Date: December 2013

Waste Matrix Used: GER

Waste Inventory

Est=distribution is an estimate, Proc.=Is the waste processed (Yes/No)? RO=Reactor Operations, FF/FE=Fuel Fabrication/Fuel Enrichment, RP=Reprocessing, NA=Nuclear Applications,DF=Defence, DC/RE=Decommissioning/Remediation, ND=Not Determined



Note: where volume "as dispo" is provided, volume "as is" is used in the graph instead.

Waste Class: NHGW

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
NHGW	Storage	N	N	23295.000	23295.000	0.00	0.00	0.00	0.00	0.00	0.00	100.00
NHGW	Storage	Y	N	113885.000	130351.000	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Comment # 27947: Assumptions

The unit the unprocessed waste is measured is in metric tons. A theoretical conversion factor of 1 ton per cubic meter is used to convert the unit of this value to cubic meter. Assumptions for "as disposed" volume are not reliable for unprocessed waste.

The volume of processed waste as disposed is calculated as follows: Processed waste in Konrad container: 97,419 cubic meter; Processed waste in inner container: 16,466 cubic meter; A theoretical conversion factor of 2 is used to convert the volume of an inner container to a theoretical volume of a Konrad container. (factor range: approx. 1.6 to 4.4)

Waste Class: HGW (in m3)

Waste Class Name	Location / Facility	Proc	Est.	Volume "as is" (m³)	Volume "as dispo" (m³)	RO %	FF/FE %	RP %	NA %	DF %	DC/RE %	ND %
HGW (in m3)	Storage	N	N	721.000	721.000	0.00	0.00	0.00	0.00	0.00	0.00	100.00

Comment # 29675:

Assumptions for the disposal volume is not reliable for unprocessed waste.

Site (Data) : SF&RW

Stock of waste as at December 2013

Country: GERMANY

Reporting Year: 2013

Spent Fuel in Storage

Spent Fuel "domestic" (tHM):	8226
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Comment # 27948: Description of foreign spent fuel

"Nuclear Power Reactors" As at 31 December 2013, there was a total of about 14,886 Mg HM in the form of spent fuel. Of these, a total of approx. 8,216 Mg HM are in stored at the NPP sites, i.e. in the fuel pools, or in the centralised and local dry storage facilities. 6,343 Mg HM were reprocessed mostly in other European countries, and 327 Mg HM were otherwise disposed of.

"Demonstration Reactors": Eight experimental and demonstration reactors were operated in the Federal Republic of Germany, which are all under decommissioning or have already completely been dismantled. Their operation generated 190 Mg HM of which approx. 180 Mg HM were reprocessed or were otherwise disposed of.

Regulators

Country: GERMANY

Reporting Year: 2013

Name:	BMUB
Full Name:	Federal Minister for the Environment, Nature Conservation, Building and Nuclear Safety (Bundesministerium fuer Umwelt, Naturschutz und Reaktorsicherheit - BMU)
Divison:	Department RS, Safety of Nuclear Installations, Radiological Protection, Nuclear Fuel Cycle and Waste Management
City or Town:	D-53048 Bonn
Main Website:	

Regulations / Laws

Country: GERMANY

Reporting Year: 2013

Name:	AtG	
Title or Name:	Atomic Energy Act (Atomgesetz)	
Reference Number:		
Date Promulgated or Proclaimed:	12/23/1959	Law

Name:	StrISchV	
Title or Name:	Radiation Protection Ordinance (Strahlenschutzverordnung)	
Reference Number:		
Date Promulgated or Proclaimed:	7/20/2001	Regulation

Name:	UVPG	
Title or Name:	Act on the Assessment of Environmental Impact (Gesetz über die Umweltverträglichkeitsprüfung)	
Reference Number:		
Date Promulgated or Proclaimed:	2/24/2010	Law

Name:	BBergG	
Title or Name:	Federal Mining Act (Bundesberggesetz)	
Reference Number:		
Date Promulgated or Proclaimed:	8/13/1980	Law

Name:	StrVG	
Title or Name:	Act on the Precautionary Protection of the Population against Radiation Exposure (Strahlenschutzvorsorgegesetz)	
Reference Number:		
Date Promulgated or Proclaimed:	12/19/1986	Law

Name:	GG	
Title or Name:	Basic Law (Grundgesetz)	
Reference Number:	BGBl. I S. 1478 (11. July 2012) §§ 20a, 73, 85, 87	
Date Promulgated or Proclaimed:	5/23/1949	Law

Regulations / Laws

Country: GERMANY

Reporting Year: 2013

Name:	EndlageVIV		
Title or Name:	Repository Prepayment Ordinance (Endlagervorausleistungsverordnung)		
Reference Number:			
Date Promulgated or Proclaimed:	4/28/1982	Regulation	

Name:	AtAV		
Title or Name:	Nuclear Waste Shipment Ordinance (Atomrechtliche Abfallverbringungsverordnung)		
Reference Number:			
Date Promulgated or Proclaimed:	4/30/2009	Regulation	

Name:	AtKostV		
Title or Name:	Cost Ordinance under the Atomic Energy Act (Kostenverordnung zum Atomgesetz)		
Reference Number:			
Date Promulgated or Proclaimed:	12/17/1981	Regulation	

Name:	AtVfV		
Title or Name:	Nuclear Licensing Procedure Ordinance (Atomrechtliche Verfahrensverordnung)		
Reference Number:			
Date Promulgated or Proclaimed:	2/3/1995	Regulation	

Name:	AtZüV		
Title or Name:	Nuclear Reliability Assessment Ordinance (Atomrechtliche Zuverlässigkeitsüberprüfungs-Verordnung)		
Reference Number:			
Date Promulgated or Proclaimed:	7/1/1999	Regulation	

Name:	AtDeckV		
Title or Name:	Nuclear Financial Security Ordinance (Atomrechtliche Deckungsvorsorge-Verordnung)		
Reference Number:			
Date Promulgated or Proclaimed:	1/25/1977	Regulation	

Regulations / Laws

Country: GERMANY

Reporting Year: 2013

Name:	StandAG		
Title or Name:	Site Selection Act (Standortauswahlgesetz)		
Reference Number:			
Date Promulgated or Proclaimed:	7/23/2013		Law

Radionuclide Inventory by Waste Class

Country: GERMANY

Reporting Year: 2013

No data available.

Spent Fuel Inventory

Country: GERMANY

Reporting Year: 2013

Spent Fuel **in Storage**