

WASTE STREAM	2D96.2	FGMSP Non Fuel Bearing Materials
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SITE Sellafield

SITE OWNER Nuclear Decommissioning Authority

WASTE CUSTODIAN Sellafield Ltd

WASTE TYPE ILW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	= 1901.0		
Future arisings:				
Total future arisings:		0.0		
Total waste volume:		1901.0		

Number of waste packages in stock: At 1.4.2025..... - packages

Comment on arising rates: No future arisings are expected. The pond is no longer an operational plant.

Additional information on quantities: This waste stream includes all miscellaneous beta/gamma waste in the Magnox Fuel Storage Pond, Wet Bays, Dry Decannery and Inlet/Export building.

Uncertainty factors on volumes:

Stock (upper):	x 1.30	Arisings (upper):	x -
Stock (lower):	x 0.70	Arisings (lower):	x -

WASTE SOURCE Redundant equipment and other debris resulting from operations in the Magnox fuel storage and decanning facility.

PHYSICAL CHARACTERISTICS

General description: The waste consists of redundant equipment and other debris, such as redundant pumps, plant items, cobalt cartridges and Wyfya lugs. Quantities of irradiated fuel rods and end crops are also present. A full breakdown of the physical constituents is not available as a detailed inventory is not yet known.

Changes since waste generated: -

Bulk density (t/m³): = 2.0

Comment on density: The density range is from 1.5 t/m³ to approximately 3 t/m³.

CHEMICAL COMPOSITION

General description and components (%wt): Includes steel, magnesium alloy, cobalt, PVC. Traces of oil may be present. Fuel bits and end crops are also present in debris.

Chemical state: Neutral

Sheet metal proportion / thickness: Pumps are steel with dimensions of 510mm high x 280mm diameter. Wyfya lugs are the fin sections of Magnox casings. Other waste is in the form of sheet metal and pipes.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	P	Nickel will be present in stainless steel.	
Other ferrous metals.....	P	-	
Iron.....	-	-	
Aluminium.....	TR	-	
Beryllium.....	-	-	
Cobalt.....	P	-	
Copper.....	TR	-	
Lead.....	TR	-	
Magnox/Magnesium.....	P	-	
Nickel.....	P	-	
Titanium.....	-	-	
Uranium.....	-	-	
Zinc.....	TR	-	
Zircaloy/Zirconium.....	TR	-	
Other metals.....	-	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulotics.....	P	-	
Paper, cotton.....	= 0	-	
Wood.....	P	-	
Halogenated plastics.....	P	Present as reinforced PVC hose pipe.	
Total non-halogenated plastics.....	= 0	-	
Condensation polymers.....	= 0	-	
Others.....	= 0	-	
Organic ion exchange materials.....	= 0	-	
Total rubber.....	= 0	-	
Halogenated rubber.....	= 0	-	
Non-halogenated rubber.....	= 0	-	
Hydrocarbons.....			
Oil or grease.....	P	-	
Fuel.....		-	
Asphalt/Tarmac (cont.coal tar).....		-	
Asphalt/Tarmac (no coal tar).....		-	
Bitumen.....		-	
Others.....		-	
Other organics.....	P	Some low density, reinforced PVC piping present.	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	= 0	-	
Inorganic sludges and flocs.....	TR	-	
Soil.....	= 0	-	
Brick/Stone/Rubble.....	= 0	-	
Cementitious material.....	TR	-	
Sand.....	TR	-	
Glass/Ceramics.....	NE	-	
Graphite.....	= 0	-	
Desiccants/Catalysts.....		-	
Asbestos.....	= 0	-	
Non/low friable.....		-	
Moderately friable.....		-	
Highly friable.....		-	
Free aqueous liquids.....	= 0	-	
Free non-aqueous liquids.....	P	-	
Powder/Ash.....	= 0	-	

COMPONENTS OF MATERIALS, WASTE PROPERTIES, MATERIALS NOT CONTRIBUTING TO MASS

Inorganic anions (%wt):

	(%wt)	Type(s) and comment
Fluoride.....	= 0	-
Chloride.....	= 0	-
Iodide.....	= 0	-
Cyanide.....		-
Carbonate.....	= 0	-
Nitrate.....	= 0	-
Nitrite.....		-
Phosphate.....	= 0	-
Sulphate.....	= 0	-
Sulphide.....	= 0	-

Materials of interest for waste acceptance criteria:

	(%wt)	Type(s) and comment
Combustible metals.....	= 0	-
Low flash point liquids.....	= 0	-
Explosive materials.....	= 0	-
Phosphorus.....	= 0	-
Hydrides.....		-
Biological etc. materials.....	= 0	-
Biodegradable materials.....	= 0	-
Putrescible wastes.....	= 0	-
Non-putrescible wastes.....	= 0	-
Corrosive materials.....	= 0	-
Pyrophoric materials.....		-
Generating toxic gases.....	= 0	-
Reacting with water.....	= 0	-
Higher activity particles.....	NE	-
Soluble solids as bulk chemical compounds.....	NE	-

Hazardous substances / non hazardous pollutants:

	(%wt)	Type(s) and comment
Acrylamide.....	NE	-
Benzene.....		-
Chlorinated solvents.....		-
Formaldehyde.....		-
Organometallics.....	NE	-
Phenol.....		-
Styrene.....		-
Tri-butyl phosphate.....		-
Other organophosphates.....	NE	-
Vinyl chloride.....		-
Arsenic.....		-
Barium.....		-
Boron.....	NE	-
Boron (in Boral).....		-
Boron (non-Boral).....		-
Cadmium.....		-
Caesium.....	NE	-
Selenium.....		-
Chromium.....		-
Molybdenum.....		-
Thallium.....	NE	-
Tin.....		-
Vanadium.....		-
Mercury compounds.....		-
Others.....	NE	-

Complexing agents (%wt):

Yes		
	(%wt)	Type(s) and comment
EDTA.....	TR	-
DPTA.....		-
NTA.....		-
Polycarboxylic acids.....		-
Other organic complexants.....		-
Total complexing agents.....	TR	The items have been underwater for many years and decontamination chemicals will have been diluted to negligible concentrations.

Physical components:

	Number	Type(s) and comment
Sources.....		-
Electronic & Electrical Equipment (EEE)		-
EEE Type 1.....		-
EEE Type 2.....		-
EEE Type 3.....		-
EEE Type 4.....		-
EEE Type 5.....		-

TREATMENT, PACKAGING AND DISPOSAL

Planned on-site / off-site treatment(s):

Treatment	On-site / Off-site	Stream volume %
Size reduction	On-site	P
Decay storage		
Low force compaction		
Supercompaction (HFC)		
Incineration	On-site	P
Drying/dewatering/liquid separation		
Tie down/fixatives/strippable coating/painting application		
Decontamination		
Metal treatment	On-site	P
Recycling / reuse		
Thermal treatment, including vitrification		
Encapsulation		
Polymer encapsulation	On-site	P
Other physical treatment		
Other chemical treatment		
Containerisation		
Treatment not yet determined	On-site	P
None		

Comments on planned treatments:

Waste may be washed and/or drained as appropriate prior to transfer to BEP.

Conditioning method:

The skips will be loaded into 3 m³ boxes. Loose waste will be transported in a liner to BEP.

Conditioning plants:

Plant Name	Location
Box Encapsulation Plant (BEP)	Sellafield

Likely conditioning matrix:

-

Further information on the conditioning matrix: -

Waste Packaging:

Likely container type:	Container	Waste packaged (vol%)	Waste loading (m³)	Payload (m³)	Number of packages	Estimated start date for packaging
	Sellafield 3 m³ box	38.6	2.3	2.7	317	-
	Not yet determined	61.4	-	-	-	-

Range in container waste loading: Assume 50% packing.

Other information on packaging and conditioning: It is expected that 38.6% of the waste will go to BEP in 3m³ boxes. The remainder will go to LLWR in PacTec bags or Dolav boxes, to WAGR in PacTec bags or Dolav boxes, or to MBGWS in PacTec bags, Dolav boxes, or 416 liners.

Conditioned density (t/m³): NE
Conditioned density comment: -

Management Routes:

Disposal Route	Stream volume %	Raw density t/m³	Start date
Expected to be consigned to a Near Site, Near Surface Disposal Facility (Scotland)	= 100.0		
Expected to be Non-NSD HAW managed under Scottish Government's policy			
Expected to be disposed to LLW Vaults NRS Dounreay			
Expected to be consigned to the Geological Disposal Facility			
Expected to be consigned to a Near Surface Disposal Facility			
Expected to be consigned to the LLW Repository			
Expected to be consigned to a Landfill Facility			
Expected to be disposed On-Site			
Expected to be managed by In-Situ Disposal			
Expected to be consigned to an Incineration Facility			
Expected to be consigned to a Metal Treatment Facility			
Expected to be Out of Scope			
Expected to be recycled / reused			
Disposal route not known			

Classification codes for waste expected to be consigned to a landfill facility:

Opportunities for alternative disposal routing: Yes

Baseline Management Route	Opportunity Management Route	Stream volume (%)	Opportunity Confidence	Comment
GDF	LLWR	30.0	AMBER	Potential for up to 30% to be recategorised as LLW

RADIOACTIVITY

Source: -

Uncertainty: Radionuclide fingerprint to be confirmed.

Measurement of radioactivities: -

Chemical form of radionuclides:

- H-3: -
- C-14: -
- Cl-36: -
- Se-79: -
- Tc-99: -
- I-129: -
- Ra: Present in trace amounts in fuel.
- Th: -
- U: Present in metallic and reacted forms (e.g. oxides and possibly hydrides).
- Np: -
- Pu: Present in metallic and reacted forms (e.g. oxides and possibly hydrides).

WASTE STREAM		2D96.2		FGMSP Non Fuel Bearing Materials					
Nuclide	Mean radioactivity, TBq/m³				Nuclide	Mean radioactivity, TBq/m³			
	Waste at 1.4.2025	Bands and Code	Future Arisings	Bands and Code		Waste at 1.4.2025	Bands and Code	Future Arisings	Bands and Code
H 3					Gd 153				
Be 10					Ho 163				
C 14					Ho 166m				
Na 22					Tm 170				
Al 26					Tm 171				
Cl 36					Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40					Hf 182				
Ca 41					Pt 193				
Mn 53					Tl 204				
Mn 54					Pb 205				
Fe 55					Pb 210				
Co 60					Bi 208				
Ni 59					Bi 210m				
Ni 63					Po 210				
Zn 65					Ra 223				
Se 79					Ra 225				
Kr 81					Ra 226				
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90					Th 227				
Zr 93					Th 228				
Nb 91					Th 229				
Nb 92					Th 230				
Nb 93m					Th 232				
Nb 94					Th 234				
Mo 93					Pa 231				
Tc 97					Pa 233				
Tc 99					U 232				
Ru 106					U 233				
Pd 107					U 234				
Ag 108m					U 235				
Ag 110m					U 236				
Cd 109					U 238				
Cd 113m					Np 237				
Sn 119m					Pu 236				
Sn 121m					Pu 238				
Sn 123					Pu 239				
Sn 126					Pu 240				
Sb 125					Pu 241				
Sb 126					Pu 242				
Te 125m					Am 241				
Te 127m					Am 242m				
I 129					Am 243				
Cs 134					Cm 242				
Cs 135					Cm 243				
Cs 137					Cm 244				
Ba 133					Cm 245				
La 137					Cm 246				
La 138					Cm 248				
Ce 144					Cf 249				
Pm 145					Cf 250				
Pm 147					Cf 251				
Sm 147					Cf 252				
Sm 151					Unsp a				
Eu 152					Unsp b/g				
Eu 154					Total a	0	*	0	*
Eu 155					Total b/g	0	*	0	*

Bands (Upper and Lower)

A a factor of 1.5
B a factor of 3
C a factor of 10
D a factor of 100
E a factor of 1000

Note: Bands quantify uncertainty in the mean radioactivity.

Code

1 Measured activity
2 Derived activity (best estimate)
3 Derived activity (upper limit)
4 Not present
5 Present but not significant
6 Likely to be present but not assessed
7 Present in significant quantities but not determined
8 Not expected to be present in significant quantity
* Total calculated from the 114 declared radionuclides