

WASTE STREAM	9G124	Loose Particulate Waste North and South FED vaults
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SITE Trawsfynydd

SITE OWNER Nuclear Decommissioning Authority

WASTE CUSTODIAN Nuclear Restoration Services Ltd (NRS)

WASTE TYPE ILW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	= 2.1		
Future arisings:				
Total future arisings:		0.0		
Total waste volume:		2.1		

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

Comment on arising rates: -

Additional information on quantities: -

Uncertainty factors on volumes:

Stock (upper):	x 1.20	Arisings (upper):	x -
Stock (lower):	x 0.80	Arisings (lower):	x -

WASTE SOURCE This waste arises from the 32 FED vaults (16 North and 16 South) and is FED dust from the base of the vault.

PHYSICAL CHARACTERISTICS

General description: A major component of the LPW in the Trawsfynydd FED vaults is expected to be loose corrosion products from the FED stored in the vaults. Trawsfynydd FED is made up largely of splitters, braces and top end fittings removed from spent fuel elements.

Changes since waste generated: -

Bulk density (t/m³): = 1.1

Comment on density: Bulk Density in the range of 0.96-1.31 t/m³ with a mean density of 1.13 t/m³.

CHEMICAL COMPOSITION

General description and components (%wt): -

Chemical state: Neutral

Sheet metal proportion / thickness: -

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	P	-	
Other ferrous metals.....	P	present as bolts, wire, chain, rust, tools	
Iron.....		-	
Aluminium.....	P	present as scaffolding poles	
Beryllium.....		-	
Cobalt.....		-	
Copper.....		-	
Lead.....		-	
Magnox/Magnesium.....	P	present as FED, FED corrosion products and surface contamination	
Nickel.....		-	
Titanium.....		-	
Uranium.....	P	Present as fuel fragments	
Zinc.....		-	
Zircaloy/Zirconium.....		-	
Other metals.....	NE	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	0	-	
Paper, cotton.....	P	Cardboard	
Wood.....		-	
Halogenated plastics.....		-	
Total non-halogenated plastics.....	0	-	
Condensation polymers.....		-	
Others.....	P	cable ties, tape	
Organic ion exchange materials.....		-	
Total rubber.....	0	-	
Halogenated rubber.....		-	
Non-halogenated rubber.....		-	
Hydrocarbons.....		-	
Oil or grease.....		-	
Fuel.....		-	
Asphalt/Tarmac (cont.coal tar).....		-	
Asphalt/Tarmac (no coal tar).....		-	
Bitumen.....		-	
Others.....		-	
Other organics.....	P	paint flakes	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....		-	
Inorganic sludges and flocs.....	P	Present as dried pond sludge	
Soil.....		-	
Brick/Stone/Rubble.....	P	Present as gravel	
Cementitious material.....	P	Present as concrete rebar, concrete dust, concrete fragments	
Sand.....		-	
Glass/Ceramics.....		-	
Graphite.....		-	
Desiccants/Catalysts.....		-	
Asbestos.....	0	-	
Non/low friable.....		-	
Moderately friable.....		-	
Highly friable.....		-	
Free aqueous liquids.....		-	
Free non-aqueous liquids.....		-	
Powder/Ash.....		-	

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

Inorganic anions (%wt):

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

Materials of interest for waste acceptance criteria:

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

Hazardous substances / non hazardous pollutants:

	(%wt)	Type(s) and comment
Acrylamide.....	0	-
Benzene.....		-
Chlorinated solvents.....		-
Formaldehyde.....		-
Organometallics.....		-
Phenol.....		-
Styrene.....		-
Tri-butyl phosphate.....		-
Other organophosphates.....		-
Vinyl chloride.....		-
Arsenic.....		-
Barium.....		-
Boron.....		-
Boron (in Boral).....		-
Boron (non-Boral).....		-
Cadmium.....		-
Caesium.....		-
Selenium.....		-
Chromium.....		-
Molybdenum.....		-
Thallium.....		-
Tin.....		-
Vanadium.....		-
Mercury compounds.....		-
Others.....		-

Complexing agents (%wt):

No		
	(%wt)	Type(s) and comment
EDTA.....		-
DPTA.....		-
NTA.....		-
Polycarboxylic acids.....		-
Other organic complexants.....		-
Total complexing agents.....		-

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 Decay storage Low force compaction Supercompaction (HFC) Incineration Drying/dewatering/liquid separation Tie down/fixatives/strippable coating/painting application Decontamination Metal treatment Recycling / reuse Thermal treatment, including vitrification Encapsulation Polymer encapsulation Other physical treatment Other chemical treatment Containerisation Treatment not yet determined None	On-site	100.0

Comments on planned treatments:

-

Conditioning method:

Revised volume of ILW for encapsulation using the Drum Roller equipment. New scope utilising exiting technology/equipment within the AWW to encapsulate the ILW into 135 litre drums for loading into 3m3 boxes and entombment within the FEP facility within SS2 basement.

Conditioning plants:

Plant Name	Location
TRW Grout Plant	Trawsfynydd

Likely conditioning matrix:

Unknown

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
	3 m³ box (side lifting)	100.0	0.72	2.9	3	-

Range in container waste loading: -

Other information on packaging and conditioning: -

Conditioned density (t/m³): -

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: No

Baseline Management Route	Opportunity Management Route	Stream volume (%)	Opportunity Confidence	Comment
-	-	-	-	-

RADIOACTIVITY

Source: -

Uncertainty: -

Measurement of radioactivities: -

Chemical form of radionuclides: H-3: -
C-14: -
Cl-36: -
Se-79: -
Tc-99: -
I-129: -
Ra: -
Th: -
U: -
Np: -
Pu: -

WASTE STREAM 9G124 Loose Particulate Waste North and South FED vaults									
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	7.92E-02	B B 2			Gd 153			8	
Be 10					Ho 163			8	
C 14	6.63E-03	B B 2			Ho 166m			8	
Na 22					Tm 170			8	
Al 26					Tm 171			8	
Cl 36	8.52E-05	B B 2			Lu 174			8	
Ar 39					Lu 176			8	
Ar 42					Hf 178n			8	
K 40					Hf 182			8	
Ca 41					Pt 193			8	
Mn 53					Ti 204			8	
Mn 54					Pb 205			8	
Fe 55	1.05E-02	B B 2			Pb 210			8	
Co 60	8.43E-03	C C 2			Bi 208			8	
Ni 59					Bi 210m			8	
Ni 63	2.05E-02	C C 2			Po 210			8	
Zn 65					Ra 223			8	
Se 79	7.13E-07	D D 2			Ra 225			8	
Kr 81					Ra 226			8	
Kr 85					Ra 228			8	
Rb 87					Ac 227			8	
Sr 90	2.50E-01	C C 2			Th 227			8	
Zr 93					Th 228			8	
Nb 91					Th 229			8	
Nb 92					Th 230	3.08E-09	C C 2		
Nb 93m					Th 232			8	
Nb 94	2.78E-04	C C 2			Th 234	3.67E-05	C C 2		
Mo 93					Pa 231			8	
Tc 97					Pa 233	3.51E-07	B B 2		
Tc 99	3.08E-05	D D 2			U 232			8	
Ru 106					U 233			8	
Pd 107					U 234	3.06E-05	C C 2		
Ag 108m	2.92E-05	B B 2			U 235	8.33E-07	C C 2		
Ag 110m					U 236	8.58E-09	B B 2		
Cd 109					U 238	3.67E-05	C C 2		
Cd 113m					Np 237	3.55E-07	B B 2		
Sn 119m					Pu 236			8	
Sn 121m					Pu 238	1.26E-02	B B 2		
Sn 123					Pu 239	2.02E-02	B B 2		
Sn 126					Pu 240	2.63E-02	B B 2		
Sb 125	3.25E-06	C C 2			Pu 241	1.93E-01	C C 2		
Sb 126					Pu 242			8	
Te 125m	8.14E-07	C C 2			Am 241	1.01E-01	B B 2		
Te 127m					Am 242m			8	
I 129	1.02E-07	C C 2			Am 243	2.36E-09	B B 2		
Cs 134	3.45E-07	B B 2			Cm 242			8	
Cs 135					Cm 243	8.34E-04	B B 2		
Cs 137	1.29E-01	C C 2			Cm 244	7.19E-04	B B 2		
Ba 133	5.26E-05	C C 2			Cm 245			8	
La 137					Cm 246			8	
La 138					Cm 248			8	
Ce 144					Cf 249			8	
Pm 145					Cf 250			8	
Pm 147	4.32E-05	B B 2			Cf 251			8	
Sm 147					Cf 252			8	
Sm 151					Unsp a				
Eu 152	1.71E-05	D D 2			Unsp b/g				
Eu 154	1.63E-03	B B 2			Total a	1.61E-01	*	0	*
Eu 155	1.78E-04	B B 2			Total b/g	7.00E-01	*	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