

WASTE STREAM	3L16	Active Effluent Filtration Sludges
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SITE Heysham 1

SITE OWNER EDF Energy Nuclear Generation Ltd (EDFE NGL)

WASTE CUSTODIAN EDF Energy Nuclear Generation Ltd (EDFE NGL)

WASTE TYPE LLW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	= 39.4		
Future arisings:	1.4.2025 - 31.3.2026	= 2.0		
	1.4.2026 - 31.3.2027	= 2.7		
Total future arisings:		4.7		
Total waste volume:		44.1		

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

Comment on arising rates: Waste volumes will be variable depending on station operating conditions.

Additional information on quantities: Rate of arisings changed to reflect recent operational experience.

Uncertainty factors on volumes: Stock (upper): x 1.25 Arisings (upper): x 2.00
Stock (lower): x 0.75 Arisings (lower): x 0.50

WASTE SOURCE Filtration of effluent waters.

PHYSICAL CHARACTERISTICS

General description: Sludge, sand and pre-coat materials. There are no large items that may require special handling.

Changes since waste generated: -

Bulk density (t/m³): ~ 1.6

Comment on density: -

CHEMICAL COMPOSITION

General description and components (%wt): A wide variety of materials including filter precoat material and sand.

Chemical state: Neutral

Sheet metal proportion / thickness: Traces of metal as particulate may be present.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	TR	-	
Other ferrous metals.....	TR	-	
Iron.....	TR	-	
Aluminium.....	TR	-	
Beryllium.....	NE	-	
Cobalt.....	NE	-	
Copper.....	TR	-	
Lead.....	TR	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....	NE	-	
Titanium.....	NE	-	
Uranium.....	NE	-	
Zinc.....	TR	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	NE	-	

Organics (%wt):

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

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	= 0	-	
Inorganic sludges and flocs.....	~ 100.0	-	
Soil.....	= 0	-	
Brick/Stone/Rubble.....	= 0	-	
Cementitious material.....	= 0	-	
Sand.....	~ 0	-	
Glass/Ceramics.....	= 0	-	
Graphite.....	= 0	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	= 0	-	
Non/low friable.....	-	-	
Moderately friable.....	-	-	
Highly friable.....	-	-	
Free aqueous liquids.....	P	-	
Free non-aqueous liquids.....	= 0	-	
Powder/Ash.....	= 0	-	

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

Inorganic anions (%wt):

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

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.....	= 0	-
Biological etc. materials.....	-	-
Biodegradable materials.....	-	-
Putrescible wastes.....	-	-
Non-putrescible wastes.....	= 0	-
Corrosive materials.....	= 0	-
Pyrophoric materials.....	= 0	-
Generating toxic gases.....	-	-
Reacting with water.....	= 0	-
Higher activity particles.....	= 0	Not expected
Soluble solids as bulk chemical compounds.....	= 0	-

Hazardous substances / non hazardous pollutants:

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

Complexing agents (%wt):

Not yet determined		
	(%wt)	Type(s) and comment
EDTA.....	NE	-
DPTA.....	NE	-
NTA.....	NE	-
Polycarboxylic acids.....	NE	-
Other organic complexants.....	NE	Expect only trace quantities, if any.
Total complexing agents.....	NE	-

Physical components:

	Number	Type(s) and comment
Sources.....	= 0	-
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	Off-site	= 100.0

Comments on planned treatments:

Waste is stored pending decommissioning stage 1. However, campaigns to retrieve the waste have occurred in the past with latest treatment by incineration.

Conditioning method:

-

Conditioning plants:

Plant Name	Location

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
	-	-	-	-	-	-

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/m ³	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: Contaminated sludge. Contamination by activation products will be the main source of activity.

Uncertainty: The values quoted were based upon theoretical assessment and limited tank sampling.

Measurement of radioactivities: Theoretical estimates and limited tank sampling (K40).

Chemical form of radionuclides:

- H-3: Tritiated water
- C-14: -
- Cl-36: -
- Se-79: -
- Tc-99: -
- I-129: -
- Ra: -
- Th: -
- U: -
- Np: -
- Pu: -

WASTE STREAM		3L16		Active Effluent Filtration Sludges					
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	1.63E-03	C C 1	1.63E-03	C C 1	Gd 153				
Be 10					Ho 163				
C 14	3.95E-06	C C 1	3.95E-06	C C 1	Ho 166m				
Na 22					Tm 170				
Al 26					Tm 171				
Cl 36	< 4.48E-08	C 1	< 4.48E-08	C 1	Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40	< 1.38E-06	C 1	< 1.38E-06	C 1	Hf 182				
Ca 41					Pt 193				
Mn 53					Tl 204				
Mn 54	3.09E-06	C C 1	3.09E-06	C C 1	Pb 205				
Fe 55	2.56E-05	C C 1	2.56E-05	C C 1	Pb 210	< 1.15E-06	C 1	< 1.15E-06	C 1
Co 60	4.42E-06	C C 1	4.42E-06	C C 1	Bi 208				
Ni 59					Bi 210m				
Ni 63	9.34E-06	C C 1	9.34E-06	C C 1	Po 210				
Zn 65	< 1.92E-07	C 1	< 1.92E-07	C 1	Ra 223				
Se 79					Ra 225				
Kr 81					Ra 226	< 5.28E-06	C 1	< 5.28E-06	C 1
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90	4.35E-07	C C 1	4.35E-07	C C 1	Th 227				
Zr 93					Th 228				
Nb 91					Th 229				
Nb 92					Th 230				
Nb 93m					Th 232				
Nb 94	< 1.14E-07	C 1	< 1.14E-07	C 1	Th 234	< 1.39E-06	C 1	< 1.39E-06	C 1
Mo 93					Pa 231				
Tc 97					Pa 233	< 9.44E-07	C 1	< 9.44E-07	C 1
Tc 99					U 232	< 3.52E-10	C 1	< 3.52E-10	C 1
Ru 106	< 7.04E-07	C 1	< 7.04E-07	C 1	U 233	< 6.88E-10	C 1	< 6.88E-10	C 1
Pd 107					U 234	2.98E-08	C C 1	2.98E-08	C C 1
Ag 108m					U 235	1.17E-09	C C 1	1.17E-09	C C 1
Ag 110m	< 1.92E-07	C 1	< 1.92E-07	C 1	U 236	1.78E-10	C C 1	1.78E-10	C C 1
Cd 109					U 238	2.64E-08	C C 1	2.64E-08	C C 1
Cd 113m					Np 237	< 1.01E-06	C 1	< 1.01E-06	C 1
Sn 119m					Pu 236				
Sn 121m					Pu 238	7.34E-07	C C 1	7.34E-07	C C 1
Sn 123					Pu 239	7.18E-07	C C 1	7.18E-07	C C 1
Sn 126					Pu 240	7.18E-07	C C 1	7.18E-07	C C 1
Sb 125	< 1.02E-06	C 1	< 1.02E-06	C 1	Pu 241	4.29E-05	C C 1	4.29E-05	C C 1
Sb 126					Pu 242	< 3.68E-09	C 1	< 3.68E-09	C 1
Te 125m					Am 241	2.51E-06	C C 1	2.51E-06	C C 1
Te 127m					Am 242m				
I 129					Am 243				
Cs 134	2.72E-06	C C 1	2.72E-06	C C 1	Cm 242	1.06E-07	C C 1	1.06E-07	C C 1
Cs 135					Cm 243	< 7.52E-09	C 1	< 7.52E-09	C 1
Cs 137	3.13E-04	C C 1	3.13E-04	C C 1	Cm 244	< 7.52E-09	C 1	< 7.52E-09	C 1
Ba 133					Cm 245				
La 137					Cm 246				
La 138					Cm 248				
Ce 144	< 8.00E-07	C 1	< 8.00E-07	C 1	Cf 249				
Pm 145					Cf 250				
Pm 147	7.20E-07	C C 1	7.20E-07	C C 1	Cf 251				
Sm 147					Cf 252				
Sm 151	3.89E-07	C C 1	3.89E-07	C C 1	Unsp a				
Eu 152	< 7.36E-07	C 1	< 7.36E-07	C 1	Unsp b/g	2.36E-05	C C 1	2.36E-05	C C 1
Eu 154	4.16E-07	C C 1	4.16E-07	C C 1	Total a	1.12E-05	*	1.12E-05	*
Eu 155	< 5.12E-07	C 1	< 5.12E-07	C 1	Total b/g	2.07E-03	*	2.07E-03	*

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