WASTE STREAM 8A01 Feed Filter Material

SITE	Capenhurst
SITE OWNER	Urenco
WASTE CUSTODIAN	URENCO
WASTE TYPE	ILW; SPD1
Is the waste subject to Scottish Policy:	No

WASTE VOLUMES

		Reported
Stocks:	At 1.4.2022.....	0.7 m³
Future arisings -	1.4.2022 - 31.3.2023.....	0.1 m³
	1.4.2023 - 31.3.2024.....	0.1 m³
	1.4.2024 - 31.3.2025.....	0.1 m³
	1.4.2025 - 31.3.2037.....	1.5 m³
Total future arisings:		1.8 m³
Total waste volume:		2.5 m³

Comment on volumes: -

Uncertainty factors on volumes:

Stock (upper):	x 1.0	Arisings (upper)	x 1.0
Stock (lower):	x 1.0	Arisings (lower)	x 1.0

WASTE SOURCE Recycled Uranium contains fission products. The feed filters would be used on the feed system on the enrichment plant to filter out these fission products.

PHYSICAL CHARACTERISTICS

General description:	Current stocks comprise of six traps removed from the centrifuge plant and a small quantity of pilot plant material. No items require special handling.
Physical components (%wt):	Contaminated granules (100%)
Sealed sources:	The waste does not contain sealed sources.
Bulk density (t/m³):	~~0.9
Comment on density:	The mean density has been measured at 0.9 t/m³, and refers to the bulk density of the raw material.

CHEMICAL COMPOSITION

General description and components (%wt):	Magnesium fluoride (95%), uranium (5%), technetium, ruthenium and neptunium (trace).
Chemical state:	Neutral
Chemical form of radionuclides:	Tc-99: Present in the form of Tc(IV) as TcO2 and Tc(VII) as the pertechnate ion. Th: Only present as daughter products of uranium. U: Uranyl fluoride (100%). Np: Present as the NpO2 2+ion.
Metals and alloys (%wt):	-

	(%wt)	Type(s) / Grade(s) with proportions	% of total C14 activity
Stainless steel.....			
Other ferrous metals.....			
Iron.....			
Aluminium.....			
Beryllium.....			
Cobalt.....			
Copper.....			
Lead.....			
Magnox/Magnesium.....			

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Nickel.....			
Titanium.....			
Uranium.....	<0.10		
Zinc.....			
Zircaloy/Zirconium.....			
Other metals.....			

Organics (%wt): -

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

Other materials (%wt): -

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials..			
Inorganic sludges and flocs.....			
Soil.....			
Brick/Stone/Rubble.....			
Cementitious material.....			
Sand.....			
Glass/Ceramics.....			
Graphite.....			
Desiccants/Catalysts.....	>99.9	Granules	
Asbestos.....			
Non/low friable.....			
Moderately friable.....			

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Highly friable.....

Free aqueous liquids.....

Free non-aqueous liquids.....

Powder/Ash.....

Inorganic anions (%wt): -

	(%wt)	Type(s) and comment
Fluoride.....	60.9	
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.....		
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.....		
Benzene.....		
Chlorinated solvents.....		
Formaldehyde.....		

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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.....

Electronic Electrical Equipment (EEE)

EEE Type 1.....

EEE Type 2.....

EEE Type 3.....

EEE Type 4.....

EEE Type 5.....

Complexing agents (%wt): No

	(%wt)	Type(s) and comment
EDTA.....		
DPTA.....		
NTA.....		
Polycarboxylic acids…….		
Other organic complexants.....		
Total complexing agents.....		

Potential for the waste to contain discrete items: No.

PACKAGING AND CONDITIONING

Conditioning method: No information on conditioning method at present as it has not yet been determined. Exact conditioning method will be determined in a future BAT assessment that will consider all options.

Plant Name: -

Location: -

Plant startup date: -

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Total capacity (m^3/y incoming waste): -

Target start date for packaging this stream: -

Throughput for this stream (m^3/y incoming waste): -

Other information: -

Likely container type:

Container	Waste packaged (%vol)	Waste loading (m^3)	Payload (m^3)	Number of packages

Likely container type comment: -

Range in container waste volume: -

Other information on containers: -

Likely conditioning matrix:

Other information: -

Conditioned density (t/m^3): -

Conditioned density comment: -

Other information on conditioning: -

Opportunities for alternative disposal routing: -

Baseline Management Route	Opportunity Management Route	Stream volume (%)	Estimated Date that Opportunity will be realised	Opportunity Confidence	Comment
-	-	-	-	-	-

RADIOACTIVITY

Source: The main source of activity will be Tc-99 and some uranium at natural enrichment. There may be trace quantities of Np-237 and Ru-106.

Uncertainty: Analytical results used in the 2004 Inventory gave an accuracy of 3 on the range of activities analysed to date. The Decay Calculation Tool in Brims was used to estimate the specific activities for stocks held in 2007; these were decayed by 6 years for stocks held in 2013. No further work completed since 2013.

Definition of total alpha and total beta/gamma: Other beta/gamma are uranium daughter products

Measurement of radioactivities: The specific activities for future arisings have been cautiously assumed to be those quoted in the 2007 Waste Inventory.

Other information: -

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Nuclide	Mean radioactivity, TBq/m³				Nuclide	Mean radioactivity, TBq/m³			
	Waste at 1.4.2022	Bands and Code	Future arisings	Bands and Code		Waste at 1.4.2022	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	2.4E-04	B B 2	2.4E-04	B B 2
Mo 93					Pa 231				
Tc 97					Pa 233				
Tc 99	8.2E-02	B B 2	1E-01	A C 2	U 232				
Ru 106	2.85E-07	B B 2	1E-03	A C 2	U 233				
Pd 107					U 234	2.4E-04	B B 2	2.4E-04	B B 2
Ag 108m					U 235	5E-06	B B 2	5E-06	B B 2
Ag 110m					U 236				
Cd 109					U 238	2.4E-04	B B 2	2.4E-04	B B 2
Cd 113m					Np 237	2E-04	B B 2	2.4E-04	B B 2
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					Other a				
Eu 152					Other b/g				
Eu 154					**Total a**	**6.85E-04**	**B B 2**	**7.25E-04**	**B B 2**
Eu 155					**Total b/g**	**8.22E-02**	**B B 2**	**1.01E-01**	**B B 2**

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 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