

WASTE STREAM	9J52	Desiccant
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SITE Hunterston A

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	= 6.5		
Future arisings:				
Total future arisings:		0.0		
Total waste volume:		6.5		

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

Comment on arising rates: -

Additional information on quantities: No future arisings expected.

Uncertainty factors on volumes: Stock (upper): x 1.10 Arisings (upper): x -
Stock (lower): x 0.90 Arisings (lower): x -

WASTE SOURCE Desiccant is from the reactor's humidifiers, used for removing moisture from the reactor coolant.

PHYSICAL CHARACTERISTICS

General description: The desiccant is aluminium oxide in pelletised form. There are no large items.

Changes since waste generated: -

Bulk density (t/m³): ~ 1.2

Comment on density: Density estimate for damp drained bulk alumina.

CHEMICAL COMPOSITION

General description and components (%wt): Aluminium oxide 100%.

Chemical state: Neutral

Sheet metal proportion / thickness: There are no large or bulk metal items.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	= 0	-	
Other ferrous metals.....	= 0	-	
Iron.....		-	
Aluminium.....	= 0	-	
Beryllium.....	0	-	
Cobalt.....		-	
Copper.....	= 0	-	
Lead.....	= 0	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....		-	
Titanium.....		-	
Uranium.....		-	
Zinc.....	= 0	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	= 0	There are no "other" metals.	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose...	= 0	-	
Paper, cotton...	= 0	-	
Wood...	= 0	-	
Halogenated plastics...	= 0	-	
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...		-	
Fuel...		-	
Asphalt/Tarmac (cont.coal tar)...		-	
Asphalt/Tarmac (no coal tar)...		-	
Bitumen...		-	
Others...		-	
Other organics...	TR	-	

Other materials (%wt):

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

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

Inorganic anions (%wt):

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

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...	= 0	-
Biodegradable materials...	0	-
Putrescible wastes...	= 0	-
Non-putrescible wastes...		-
Corrosive materials...	= 0	-
Pyrophoric materials...	= 0	-
Generating toxic gases...	= 0	-
Reacting with water...	= 0	-
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.....	= 0	-
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	Off-site	= 100.0

Comments on planned treatments:

Waste will be washed and incinerated.

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/m³	Start date
Expected to be consigned to a Near Site, Near Surface Disposal Facility (Scotland)	= 100.0	1.2	
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: Tritium in water retained by desiccant.

Uncertainty: The values quoted are indicative of the activities that might be expected.

Measurement of radioactivities: Activities have been estimated from available information.

Chemical form of radionuclides:

- H-3: The chemical form of tritium will be as adsorbed tritiated water.
- C-14: Carbon 14 will probably be present as graphite dust.
- Cl-36: Chlorine 36 will probably be present in graphite dust contamination.
- Se-79: The chemical form of selenium has not been determined.
- Tc-99: The chemical form of technetium has not been determined.
- I-129: -
- Ra: The radium isotope content is insignificant.
- Th: The thorium isotope content is insignificant.
- U: The uranium isotope content is insignificant.
- Np: The neptunium content is insignificant.
- Pu: The chemical form of plutonium isotopes has not been assessed.

WASTE STREAM			9J52		Desiccant				
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	1.29E-01	C C 2			Gd 153		8		
Be 10					Ho 163		8		
C 14	2.00E-04	C C 2			Ho 166m		8		
Na 22					Tm 170		8		
Al 26					Tm 171		8		
Cl 36	< 4.00E-04	C 3			Lu 174		8		
Ar 39					Lu 176		8		
Ar 42					Hf 178n		8		
K 40					Hf 182		8		
Ca 41	< 4.00E-04	C 3			Pt 193		8		
Mn 53					Tl 204		8		
Mn 54					Pb 205		8		
Fe 55	< 8.84E-09	C 3			Pb 210		8		
Co 60	9.74E-07	C C 2			Bi 208		8		
Ni 59	< 3.00E-04	C 3			Bi 210m		8		
Ni 63	< 2.70E-04	C 3			Po 210		8		
Zn 65					Ra 223		8		
Se 79	< 5.17E-05	C 3			Ra 225		8		
Kr 81					Ra 226		8		
Kr 85					Ra 228		8		
Rb 87					Ac 227		8		
Sr 90	< 2.10E-04	C 3			Th 227		8		
Zr 93					Th 228		8		
Nb 91					Th 229		8		
Nb 92					Th 230		8		
Nb 93m					Th 232		8		
Nb 94	< 9.00E-08	C 3			Th 234		8		
Mo 93					Pa 231		8		
Tc 97					Pa 233		8		
Tc 99	< 3.00E-04	C 3			U 232		8		
Ru 106					U 233		8		
Pd 107					U 234		8		
Ag 108m	< 4.89E-08	C 3			U 235		8		
Ag 110m					U 236		8		
Cd 109					U 238		8		
Cd 113m					Np 237		8		
Sn 119m					Pu 236		8		
Sn 121m					Pu 238	< 3.56E-05	C 3		
Sn 123					Pu 239	< 4.00E-05	C 3		
Sn 126	< 3.04E-07	C 3			Pu 240	< 4.00E-05	C 3		
Sb 125					Pu 241	1.46E-04	C C 2		
Sb 126	4.26E-08	C C 2			Pu 242		8		
Te 125m					Am 241	< 9.96E-06	C 3		
Te 127m					Am 242m		8		
I 129					Am 243		8		
Cs 134					Cm 242		8		
Cs 135	< 3.00E-04	C 3			Cm 243		8		
Cs 137	4.96E-07	C C 2			Cm 244		8		
Ba 133	< 7.48E-09	C 3			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	< 7.59E-08	C 3			Cf 251		8		
Sm 147					Cf 252		8		
Sm 151					Unsp a				
Eu 152	1.39E-07	C C 2			Unsp b/g				
Eu 154	1.20E-08	C C 2			Total a	1.26E-04	*	0	*
Eu 155	< 2.35E-09	C 3			Total b/g	1.32E-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