

WASTE STREAM	7A111	Decommissioning Waste PCM ILW
--------------	-------	-------------------------------

SITE AWE Aldermaston

SITE OWNER Ministry of Defence (MOD)

WASTE CUSTODIAN AWE plc

WASTE TYPE ILW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	2226.4		
Future arisings:	1.4.2025 - 31.3.2027	283.5		
	1.4.2028 - 31.3.2030	349.7		
	1.4.2031 - 31.3.2033	332.0		
	1.4.2034 - 31.3.2036	198.0		
	1.4.2037 - 31.3.2039	58.4		
	1.4.2040 - 31.3.2042	13.0		
	1.4.2043 - 31.3.2045	208.0		
	1.4.2046 - 31.3.2048	313.0		
	1.4.2049 - 31.3.2051	313.0		
	1.4.2052 - 31.3.2054	104.0		
	1.4.2055 - 31.3.2080	0		
Total future arisings:		2172.5		
Total waste volume:		4399.0		

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

Comment on arising rates: Stock volumes taken from waste management database. Stock volumes have decreased owing to HAW consignments to the Sellafield site. Future arisings are based on recent waste estimations correct as of February 2025.

Additional information on quantities: The stock volumes supplied are considered to be accurate. The total volume of arisings will depend on the longevity of the AWE site. Estimates are based upon a potential site closure date of 2080, or beyond.

Uncertainty factors on volumes: Stock (upper): x 1.00 Arisings (upper): x 5.00
Stock (lower): x 1.00 Arisings (lower): x 0.30

WASTE SOURCE Decommissioning and size reduction of redundant plant equipment such as glove-boxes, machine tools and legacy wastes.

PHYSICAL CHARACTERISTICS

General description: The 7A111 waste stream contains metals, plastic, glass, etc that arises from contaminated glove-boxes and process equipment.

Changes since waste generated: -

Bulk density (t/m³): ~ 0.35

Comment on density: This figure has been derived using stock data from 2025 (total stream mass divided by the total stream volume).

CHEMICAL COMPOSITION

General description and components (%wt): Metals (67.46%), Organics (31.86%), Other (0.68%)

Chemical state: Neutral

Sheet metal proportion / thickness: Sheet metal of approximately 4mm in thickness will be present arising from glove boxes and sheet metal arising from ductwork that is maybe as thick as 6mm. The average thickness of a box 'base plate' is approximately 25mm.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	~ 5.4	-	
Other ferrous metals.....	~ 53.2	-	
Iron.....	= 0	-	
Aluminium.....	~ 5.1	-	
Beryllium.....	TR	TR by weight percentage in waste stream	
Cobalt.....	-	-	
Copper.....	~ 2.4	Includes cabling and WEEE	
Lead.....	~ 1.3	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....	= 0	-	
Titanium.....	= 0	-	
Uranium.....	~ 0.03	DU counterbalances	
Zinc.....	= 0	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	~ 0.11	Tin 0.01%, Brass 0.02%, Galvanised steel 0.08%	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	~ 2.8	Includes HEPA filter media	
Paper, cotton.....	~ 0.77	-	
Wood.....	~ 1.3	-	
Halogenated plastics.....	~ 7.1	-	
Total non-halogenated plastics.....	~ 18.7	Not segregated on waste records into constituent types.	
Condensation polymers.....	-	-	
Others.....	-	-	
Organic ion exchange materials.....	-	-	
Total rubber.....	~ 1.4	Not segregated on waste records into constituent types.	
Halogenated rubber.....	-	-	
Non-halogenated rubber.....	-	-	
Hydrocarbons.....	~ 1.8	-	
Oil or grease.....	TR	TR by weight percentage in waste stream	
Fuel.....	= 0	-	
Asphalt/Tarmac (cont.coal tar).....	= 0	-	
Asphalt/Tarmac (no coal tar).....	= 0	-	
Bitumen.....	= 0	-	
Others.....	~ 2.1	ALARA 0.22%. Non Haz but not segregated into constituents on waste records	
Other organics.....	= 0	-	

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.....	~ 0.48	-	
Cementitious material.....	= 0	-	
Sand.....	= 0	-	
Glass/Ceramics.....	TR 0	TR by weight percentage in waste stream	
Graphite.....	~ 0.03	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	~ 0.17	-	
Non/low friable.....	0	-	
Moderately friable.....	0	-	
Highly friable.....	0	-	
Free aqueous liquids.....	= 0	-	
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.....	= 0	-
Chloride.....	= 0	-
Iodide.....	= 0	-
Cyanide.....	= 0	-
Carbonate.....	= 0	-
Nitrate.....	= 0	-
Nitrite.....	= 0	-
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.....	= 0	-
Biological etc. materials.....	= 0	-
Biodegradable materials.....	P	-
Putrescible wastes.....	= 0	-
Non-putrescible wastes.....	P	Paper, cotton and wood present
Corrosive materials.....	= 0	-
Pyrophoric materials.....	= 0	-
Generating toxic gases.....	= 0	-
Reacting with water.....	= 0	-
Higher activity particles.....	= 0	-
Soluble solids as bulk chemical compounds.....	= 0	-

Hazardous substances / non hazardous pollutants:

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

Complexing agents (%wt):

Yes		
	(%wt)	Type(s) and comment
EDTA.....	= 0	-
DPTA.....	= 0	-
NTA.....	= 0	-
Polycarboxylic acids.....	TR	-
Other organic complexants.....	TR	-
Total complexing agents.....	TR	-

Physical components:

	Number	Type(s) and comment
Sources.....	= 0	-
Electronic & Electrical Equipment (EEE)		
EEE Type 1.....	NE	EEE unable to be segregated into constituent types
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:

-

Conditioning method:

The proposal is to supercompact the 205L drums and pack five pucks into 500 litre drums.

Conditioning plants:

Plant Name	Location

Likely conditioning matrix:

-

Further information on the conditioning matrix:

Not specified

Waste Packaging:

Likely container type:

Container	Waste packaged (vol%)	Waste loading (m³)	Payload (m³)	Number of packages	Estimated start date for packaging
500 l drum	100.0	1.0	0.50	4399	-

Range in container waste loading:

Five pucks will be packed into a 500 litre drum.

Other information on packaging and conditioning:

There are no detailed conditioning plans.

Conditioned density (t/m³):

~ 2.0

Conditioned density comment:

The conditioned density is an estimate which is subject to change.

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: Plutonium and uranium; blended with depleted, natural and enriched.

Uncertainty: The gross alpha and gross beta activities of the in-stock wastes are accurate. The radionuclide breakdown has been estimated from an average fingerprint of the associated facilities.

Measurement of radioactivities: Fingerprints are generated by assaying whole gloveboxes non-destructively prior to commencing decommissioning. The fingerprint is used with PNCC assay to generate an activity for each drum of waste.

Chemical form of radionuclides: H-3: Not present in Waste Stream
C-14: Not present in Waste Stream
Cl-36: Not present in Waste Stream
Se-79: Not present in Waste Stream
Tc-99: Not present in Waste Stream
I-129: Not present in Waste Stream
Ra: Daughters are likely to be present in waste stream. Oxide form
Th: Daughters are likely to be present in waste stream. Oxide form
U: Present as oxide form in waste stream
Np: Np-237 daughter is likely to be present in waste stream. Oxide form
Pu: Present as oxide form in waste stream

WASTE STREAM		7A111		Decommissioning Waste PCM ILW					
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		5		5	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		5		5
Co 60					Bi 208				
Ni 59					Bi 210m				
Ni 63					Po 210		5		5
Zn 65					Ra 223		5		5
Se 79					Ra 225		5		5
Kr 81					Ra 226		5		5
Kr 85					Ra 228		5		5
Rb 87					Ac 227		5		5
Sr 90					Th 227		5		5
Zr 93					Th 228		5		5
Nb 91					Th 229		5		5
Nb 92					Th 230		5		5
Nb 93m					Th 232		5		5
Nb 94					Th 234		5		5
Mo 93					Pa 231		5		5
Tc 97					Pa 233		5		5
Tc 99					U 232				
Ru 106					U 233		5		5
Pd 107					U 234	~ 2.92E-05	B B 2	= 2.44E-06	C C 2
Ag 108m					U 235	~ 1.19E-06	B B 2	= 8.26E-08	C C 2
Ag 110m					U 236	~ 2.13E-07	B B 2	= 2.35E-08	C C 2
Cd 109					U 238	~ 7.74E-07	B B 2	= 4.59E-07	C C 2
Cd 113m					Np 237		5		5
Sn 119m					Pu 236				
Sn 121m					Pu 238	~ 4.36E-03	B B 2	= 2.79E-03	C C 2
Sn 123					Pu 239	~ 2.93E-02	B B 2	= 7.09E-02	C C 2
Sn 126					Pu 240	~ 1.91E-02	B B 2	= 1.65E-02	C C 2
Sb 125					Pu 241	~ 9.64E-03	B B 2	= 4.83E-03	C C 2
Sb 126					Pu 242	~ 7.71E-06	B B 2	= 1.46E-06	C C 2
Te 125m					Am 241	~ 2.86E-02	B B 2	= 1.93E-02	C C 2
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	8.14E-02	*	1.09E-01	*
Eu 155					Total b/g	9.64E-03	*	4.83E-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