

WASTE STREAM	1A07	ILW
SITE	Amersham	
SITE OWNER	GE Healthcare	
WASTE CUSTODIAN	GE Healthcare Limited	
WASTE TYPE	ILW	
WASTE VOLUMES		
Stocks:	At 1.4.2025	Reported (m ³) = 147.0
Future arisings:	1.4.2025 - 31.3.2030	~ 41.5
Total future arisings:	41.5	
Total waste volume:	188.5	
Number of waste packages in stock:	At 1.4.2025.....	- packages
Comment on arising rates:	The rate of arisings are due to an ongoing decommissioning programme as well as changes in the processes designed to reduce ILW production. All manufacturing processes have ceased on site, and a number of decommissioning programmes have been completed. Stock reduced since 2022 due to reclassification and disposal of ILW in store and on stores receipts.	
Additional information on quantities:	Volume is total volume of ILW containers in our Materials Handling Centre and on stores receipts in legacy waste building. Future volumes decreased due to Annual review of liabilities and assessment of volume of ILW from decommissioning programme - however activity associated with this waste has not been determined.	
Uncertainty factors on volumes:	Stock (upper): x 1.50 Stock (lower): x 0.50	Arisings (upper): x 1.50 Arisings (lower): x 0.50
WASTE SOURCE	Decommissioning of small scale radiopharmaceutical and radiochemical preparations and radiation source production facilities. Returned sealed sources.	
PHYSICAL CHARACTERISTICS		
General description:	The waste consists of solid and absorbed liquid wastes within steel cans or fibreboard drums as primary containment, all contained in sealed PVC bags. (Wastes arising from 1990 onwards are dry). Solids include metals, glassware, rubber gloves, paper tissue, chromatography papers and small items of redundant laboratory equipment. Absorbed liquids comprise aqueous solutions, very little tritiated water and small quantities of a wide range of organic and inorganic chemical salts. The waste contains returned sealed sources (formerly 1A11). These sources are normally encapsulated in welded stainless steel capsules. Volume is small compared to wastestream volume (4l in 1471311) so will have no impact on material composition.	
Changes since waste generated:	The waste will have undergone radioactive decay.	
Bulk density (t/m ³):	~ 0.35	
Comment on density:	The mean density is 0.35 t/m ³ .	
CHEMICAL COMPOSITION		
General description and components (%wt):	The waste consists mainly of glass, plastics, cellulose, some metal and a wide range of principally inorganic chemicals. Glassware (10%), cellulose (21%), absorbed liquids (5%), metals (27%), rubber (3%), plastics (33%), minor components (<1%)	
Chemical state:	Neutral	
Sheet metal proportion / thickness:	Sheet metal: 20 wt% typical thickness 1 mm. Bulk items: 80 wt% typical size 0.1 litre.	

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	~ 10.0	-	5.0
Other ferrous metals.....	~ 12.0	-	
Iron.....	-	-	
Aluminium.....	< 1.0	-	
Beryllium.....	TR	-	
Cobalt.....	= 0	-	
Copper.....	< 1.0	-	
Lead.....	< 2.0	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....	= 0	-	
Titanium.....	= 0	-	
Uranium.....	= 0	-	
Zinc.....	< 1.0	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	= 0	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulotics.....	~ 21.0	-	20.0
Paper, cotton.....	~ 20.0	-	
Wood.....	~ 1.0	-	
Halogenated plastics.....	~ 17.0	PVC	
Total non-halogenated plastics.....	~ 16.0	Polyethylene / Polystyrene	
Condensation polymers.....	~ 9.5	-	
Others.....	~ 6.5	-	
Organic ion exchange materials.....	TR	-	
Total rubber.....	~ 3.0	-	
Halogenated rubber.....	~ 2.0	Hypalon/neoprene gloves/gaitors	
Non-halogenated rubber.....	< 1.0	Latex gloves	
Hydrocarbons.....	-	-	
Oil or grease.....	-	-	
Fuel.....	-	-	
Asphalt/Tarmac (cont.coal tar).....	-	-	
Asphalt/Tarmac (no coal tar).....	-	-	
Bitumen.....	-	-	
Others.....	-	-	
Other organics.....	= 0	-	20.0

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	~~ 5.0	Absorbed liquid on vermiculite	35.0
Inorganic sludges and flocs.....	= 0	-	
Soil.....	= 0	-	
Brick/Stone/Rubble.....	= 0	-	
Cementitious material.....	= 0	-	
Sand.....	= 0	-	
Glass/Ceramics.....	~~ 11.0	-	
Graphite.....	= 0	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	TR	-	
Non/low friable.....	-	-	
Moderately friable.....	-	-	
Highly friable.....	-	-	
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.....	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.....	= 0	-
Biodegradable materials.....	= 20.0	-
Putrescible wastes.....	= 0	-
Non-putrescible wastes.....	= 20.0	Paper / cotton.
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.....	= 0	-
Chlorinated solvents.....	= 0	-
Formaldehyde.....	= 0	-
Organometallics.....	= 0	-
Phenol.....	= 0	-
Styrene.....	= 0	-
Tri-butyl phosphate.....	= 0	-
Other organophosphates.....	= 0	-
Vinyl chloride.....	= 17.0	sheeting
Arsenic.....	= 0	-
Barium.....	= 0	-
Boron.....	~~ 0.08	-
Boron (in Boral).....		-
Boron (non-Boral).....	~~ 0.08	Borosilicate glass
Cadmium.....	= 0	-
Caesium.....	= 0	-
Selenium.....	= 0	-
Chromium.....	= 0	-
Molybdenum.....	= 0	-
Thallium.....	= 0	-
Tin.....	= 0	-
Vanadium.....	= 0	-
Mercury compounds.....	= 0	-
Others.....	= 0	-

Complexing agents (%wt):

Yes

	(%wt)	Type(s) and comment
EDTA.....		-
DPTA.....		-
NTA.....		-
Polycarboxylic acids.....		-
Other organic complexants.....	< 0.01	There may be minute amounts of EDTA present on swabs.
Total complexing agents.....	<< 0.01	-

Physical components:

	Number	Type(s) and comment
Sources.....		1650
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		

Comments on planned treatments:

-

Conditioning method:

Not determined

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):

NE

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) 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	= 100.0		2052

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: This waste was generated as a result of manufacturing and developing radio-pharmaceuticals, bio-science products, and sealed sources, and from the site decommissioning programme. All manufacturing processes have ceased on site with longer lived nuclides only being present in the decommissioning waste. A number of manufacturing operations with shorter lived nuclides have also ceased on site resulting in a number of these nuclides no longer being present in this waste stream.

Uncertainty: The accuracy of the data is from +10% to -50% (i.e. generally overestimated).

Measurement of radioactivities: Specific activity data has been calculated from records of waste holdings.

Chemical form of radionuclides: H-3: Organic
C-14: Organic, sources present in resin
Cl-36: Impurity from S35 production
Se-79: -
Tc-99: -
I-129: sodium iodide, sources organic ion exchange resin bead (styrene based)
Ra: Sources - Sulphate
Th: not yet determined
U: Oxide
Np: not yet determined
Pu: Oxide, nitrates, sources - ceramic

WASTE STREAM 1A07 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	~ 4.58E-04	A A 2			Gd 153				
Be 10					Ho 163				
C 14	~ 7.16E-03	A A 2			Ho 166m				
Na 22	~ 1.90E-07	A A 2			Tm 170				
Al 26					Tm 171				
Cl 36	~ 1.60E-03	A A 2			Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40					Hf 182				
Ca 41					Pt 193				
Mn 53					Ti 204	~ 1.93E-06	A A 2		
Mn 54	~ 1.36E-11	A A 2		5	Pb 205				
Fe 55	~ 3.80E-06	A A 2			Pb 210	~ 5.67E-05	A A 2		
Co 60	~ 8.63E-04	A A 2			Bi 208				
Ni 59					Bi 210m				
Ni 63	~ 9.22E-03	A A 2			Po 210				
Zn 65	~ 1.63E-10	A A 2		5	Ra 223				
Se 79					Ra 225				
Kr 81					Ra 226	~ 3.09E-05	A A 2		
Kr 85	~ 5.99E-05	A A 2			Ra 228				
Rb 87					Ac 227	~ 9.27E-04	A A 2		
Sr 90	~ 2.60E+00	A A 2		7	Th 227				
Zr 93					Th 228				
Nb 91					Th 229				
Nb 92					Th 230				
Nb 93m					Th 232	~ 9.31E-09	A A 2		
Nb 94					Th 234				
Mo 93					Pa 231				
Tc 97					Pa 233				
Tc 99	~ 3.78E-05	A A 2			U 232				
Ru 106	~ 6.80E-12	A A 2			U 233				
Pd 107					U 234				
Ag 108m					U 235				
Ag 110m					U 236				
Cd 109	~ 2.41E-09	A A 2			U 238	~ 1.14E-07	A A 2		
Cd 113m					Np 237	~ 3.65E-07	A A 2		
Sn 119m					Pu 236				
Sn 121m					Pu 238	~ 1.64E-03	A A 2		5
Sn 123					Pu 239	~ 6.96E-08	A A 2		
Sn 126					Pu 240				5
Sb 125	~ 2.51E-10	A A 2			Pu 241	~ 7.80E-09	A A 2		
Sb 126					Pu 242				
Te 125m					Am 241	~ 5.55E-01	A A 2		7
Te 127m					Am 242m				
I 129	~ 3.58E-06	A A 2			Am 243				
Cs 134	~ 2.39E-08	A A 2		5	Cm 242				
Cs 135					Cm 243				
Cs 137	~ 2.26E+00	A A 2		7	Cm 244	~ 1.24E-02	A A 2		7
Ba 133	~ 2.22E-05	A A 2		5	Cm 245				
La 137					Cm 246				
La 138					Cm 248				
Ce 144					Cf 249				
Pm 145					Cf 250				
Pm 147	~ 1.19E-05	A A 2			Cf 251				
Sm 147					Cf 252	~ 3.38E-07	A A 2		
Sm 151	~ 2.79E-02	A A 2			Unsp a				
Eu 152	~ 1.23E-04	A A 2			Unsp b/g	~ 1.11E-07	A A 2		5
Eu 154					Total a	5.69E-01	*	0	*
Eu 155					Total b/g	4.91E+00	*	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