



**WASTE STREAM**

**7J25 Luminised Waste**

proportion of metals are in the form of boxes typically 20cm x 30cm x 15cm (average), typical thicknesses are about 3 mm with Metal (80%) and other materials (20%)

	Stainless steel.....	7.0	
	Other ferrous metals.....	<1.0	Mild steel (<1%)
	Iron.....	0	
	Aluminium.....	70.0	Cast (50%), Dural (20%)
	Beryllium.....	0	
	Cobalt.....	0	
	Copper.....	<1.0	Copper brass (each less than 1%)
	Lead.....	<1.0	
	Magnox/Magnesium.....	0	
	Nickel.....	0	
	Titanium.....	0	
	Uranium.....	0	
	Zinc.....	0	
	Zircaloy/Zirconium.....	0	
	Other metals.....	0	
Organics (%wt):	-		
	Total cellulosics.....	~4.0	
	Paper, cotton.....	<3.0	Paper (2 %), cotton (1%)
	Wood.....	<1.0	Soft woods boxes such as pine
	Halogenated plastics .....	2.0	PVC from electrical components
	Total non-halogenated plastics.....	0	
	Condensation polymers.....	0	
	Others.....	0	
	Organic ion exchange materials....	0	
	Total rubber.....	2.0	
	Halogenated rubber .....	0	
	Non-halogenated rubber.....	2.0	Latex (2%)
	Hydrocarbons.....	0	
	Oil or grease .....	0	
	Fuel.....	0	
	Asphalt/Tarmac (cont.coal tar)...	0	
	Asphalt/Tarmac (no coal tar)....	0	
	Bitumen.....	0	
	Others.....	0	
	Other organics.....	0	
Other materials (%wt):	-		
	Inorganic ion exchange materials.	0	
	Inorganic sludges and flocs.....	0	
	Soil.....	7.0	Samples
	Brick/Stone/Rubble.....	0	
	Cementitious material.....	0	

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	Sand.....	<2.0	Samples
	Glass/Ceramics.....	3.0	Glass (2%), ceramics (1%)
	Graphite.....	0	
	Desiccants/Catalysts.....	0	
	Asbestos.....	0	
	Non/low friable.....	0	
	Moderately friable.....	0	
	Highly friable.....	0	
	Free aqueous liquids.....	0	
	Free non-aqueous liquids.....	0	
	Powder/Ash.....	0	
Inorganic anions (%wt):	No inorganic anions are present.		
	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:	Combustable tissues and smear papers from sampling, clean up and units		
	Combustible metals.....	40.0	Glass 37%, Paper 3% by weight
	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.....	0	
	Corrosive materials.....	0	
	Pyrophoric materials.....	0	
	Generating toxic gases.....	0	
	Reacting with water.....	0	
	Active particles.....	0	
	Soluble solids as bulk chemical compounds.....	0	

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Hazardous substances /  
non hazardous pollutants:

-

Acrylamide.....	0
Benzene.....	0
Chlorinated solvents.....	0
Formaldehyde.....	0
Organometallics.....	0
Phenol.....	0
Styrene.....	0
Tri-butyl phosphate.....	0
Other organophosphates.....	0
Vinyl chloride.....	0
Arsenic.....	0
Barium.....	0
Boron.....	0
Cadmium.....	0
Caesium.....	0
Selenium.....	0
Chromium.....	0
Molybdenum.....	0
Thallium.....	0
Tin.....	0
Vanadium.....	0
Mercury compounds.....	0
Others.....	0

Electronic Electrical Equipment (EEE)

EEE Type 1.....	40.0
EEE Type 2.....	0
EEE Type 3.....	20.0
EEE Type 4.....	0
EEE Type 5.....	0

Radios

Military vehicle instruments

Complexing agents (%wt):

No

EDTA.....	0
DPTA.....	0
NTA.....	0
Polycarboxylic acids.....	0
Other organic complexants.....	0
Total complexing agents.....	0

**WASTE STREAM****7J25****Luminised Waste****LAW TREATMENT, PACKAGING AND DISPOSAL**

**Waste that is currently ILW:** For H3 and Pm147, the items will be stored until they have been decayed sufficiently to fall below the LLW threshold. For Ra226 items are to be treated (incineration) and encapsulated to become LLW. This can not be done onsite so this will form part of any disposal contract. Radionuclides for decay storage will be reclassified as LLW 5 years after declassification for Pm147 and 15 years for H3

Planned on-site / off-site treatments(s):

Treatment	On-site / Off site	Stream volume %
Low force compaction Supercompaction (HFC) Incineration Solidification Decontamination Metal treatment Size reduction Decay storage Recycling / reuse Other / various None	Off-site	<<60.0
	On-site	<40.0

Comment on planned treatments:

There are no plans or strategy, even tentative, for the use of any packaging or conditioning plant.

**Disposal Routes:**

Disposal Route	Stream volume %
Expected to be consigned to the LLW Repository Expected to be consigned to a Landfill Facility Expected to be consigned to an On-Site Disposal Facility Expected to be consigned to an Incineration Facility Expected to be consigned to a Metal Treatment Facility Expected to be consigned as Out of Scope Expected to be recycled / reused Disposal route not known	100.0

**Upcoming (2019/20-2021/22) waste routing (if expected to change from above)**

Disposal Route	Stream volume %		
	2019/20	2020/21	2021/22
Expected to be consigned to the LLW Repository Expected to be consigned to a Landfill Facility Expected to be consigned to an On-Site Disposal Facility Expected to be consigned to an Incineration Facility Expected to be consigned to a Metal Treatment Facility Expected to be consigned as Out of Scope Expected to be recycled / reused Disposal route not known			

**Waste Packaging for Disposal:** (Not applicable to this waste stream)

Container	Stream volume %	Waste loading m <sup>3</sup>	Number of packages
1/3 Height IP-1 ISO 2/3 Height IP-2 ISO 1/2 Height WAMAC IP-2 ISO 1/2 Height IP-2 Disposal/Re-usable ISO 2m box (no shielding) 4m box (no shielding) Other			

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Other information: 100% of the waste is consigned to an authorised disposal contractor. The contractor will determine the quantity that requires routing as radioactive waste and consign it as appropriate to the LLWR, metal decontamination, incineration, recycling/ reuse, out of scope etc.

**Waste Consigned to the LLW Repository:**

Container voidage: -

Waste Characterisation Form (WCH): -

Waste consigned for disposal to LLWR in year of generation: -

Potential for the waste to contain discrete items: -

**Non-Containerised Waste for In-Vault Grouting:** (Not applicable to this waste stream)

Stream volume (%): -

Waste stream variation: -

Bounding cuboidal volume:

Inaccessible voidage: -

Other information: -

**RADIOACTIVITY**

Source: Luminised wastes that contain or have been contaminated with H-3, Pm-147 or Ra-226 luminising compounds. Principally processed metal shells, TCB, SPT shells / metal boxes in a raw state that may contain Ra-226 or Pm-147 painted indicators or dials.

Uncertainty: The accuracy of the specific activity data is within +/- 10%.

Definition of total alpha and total beta/gamma: Where totals are shown on the table of radionuclide activities they are the sums of the listed alpha or beta/gamma emitting radionuclides plus 'other alpha' or 'other beta/gamma'.

Measurement of radioactivities: Samples of all 7J25 'type' material is sent to DSTL (DRPS) NAMAS accredited lab for assay to ensure quantitative activities are representative with holdings as declared.

Other information: There are no other waste activity or radionuclides that have not been listed on the radionuclide table.

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Nuclide	Mean radioactivity, TBq/m <sup>3</sup>				Nuclide	Mean radioactivity, TBq/m <sup>3</sup>			
	Waste at 1.4.2019	Bands and Code	Future arisings	Bands and Code		Waste at 1.4.2019	Bands and Code	Future arisings	Bands and Code
H 3	5.4E+01	AA 2	2.1E-03	AA 2	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	3.25E-04	BB 2	1E-05	BB 2
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				
Mo 93					Pa 231				
Tc 97					Pa 233				
Tc 99					U 232				
Ru 106					U 233				
Pd 107					U 234				
Ag 108m					U 235				
Ag 110m					U 236				
Cd 109					U 238				
Cd 113m					Np 237				
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	6.16E-02	AA 2			Cf 251				
Sm 147					Cf 252				
Sm 151					Other a				
Eu 152					Other b/g				
Eu 154					<b>Total a</b>	<b>3.25E-04</b>	<b>BB 2</b>	<b>1E-05</b>	<b>BB 2</b>
Eu 155					<b>Total b/g</b>	<b>5.41E+01</b>	<b>BB 2</b>	<b>2.1E-03</b>	<b>BB 2</b>

**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