

WASTE STREAM	7E101	LLW Site and Facilities Decommissioning Waste - Steel and Building Rubble
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SITE Rosyth Royal Dockyard

SITE OWNER Ministry of Defence (MOD)

WASTE CUSTODIAN Ministry of Defence (MOD)

WASTE TYPE LLW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	0		
Future arisings:	1.4.2025 - 31.3.2026	0		
	1.4.2026 - 31.3.2027	0		
	1.4.2027 - 31.3.2028	0		
	1.4.2028 - 31.3.2100	~~ 50.0		
Total future arisings:		50.0		
Total waste volume:		50.0		

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

Comment on arising rates: Arisings expected at the time of decommissioning of facilities that have been used in support of the submarine dismantling project. Rough estimates have been provided for volume, an increase has been included on the previous submission as additional buildings are to be constructed. Limited information is available at this stage for decommissioning plans including dates and volumes.

Additional information on quantities: Limited information is available at this stage - rough estimates have been provided.

Uncertainty factors on volumes: Stock (upper): x - Arisings (upper): x 2.00
Stock (lower): x - Arisings (lower): x 0.20

WASTE SOURCE Decommissioning of site facilities such as active ventilation systems, waste store building structure and portable effluent treatment facility.

PHYSICAL CHARACTERISTICS

General description: Scrap steel, spoil, building rubble.

Changes since waste generated: -

Bulk density (t/m³): = 2.0

Comment on density: The bulk density of the raw waste is 2 t/m³.

CHEMICAL COMPOSITION

General description and components (%wt): The waste is expected to be composed of metals, spoil, building rubble, brick and concrete. The composition by weight has been estimated at 8% mild steel, 26% stainless steel, 33% spoil and 33% building rubble, brick and concrete.

Chemical state: Neutral

Sheet metal proportion / thickness: Mild steel contaminated metal expected to be present as sheet (ex-ventilation trunking), typical thickness up to 5mm.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	~~ 26.0	-	
Other ferrous metals.....	~~ 8.0	-	
Iron.....		-	
Aluminium.....		-	
Beryllium.....		-	
Cobalt.....		-	
Copper.....		-	
Lead.....		-	
Magnox/Magnesium.....		-	
Nickel.....		-	
Titanium.....		-	
Uranium.....		-	
Zinc.....		-	
Zircaloy/Zirconium.....		-	
Other metals.....		-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	-	-	-
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.....	~ 33.0	-	-
Brick/Stone/Rubble.....	~ 33.0	-	-
Cementitious material.....	-	-	-
Sand.....	-	-	-
Glass/Ceramics.....	-	-	-
Graphite.....	-	-	-
Desiccants/Catalysts.....	-	-	-
Asbestos.....	-	-	-
Non/low friable.....	-	-	-
Moderately friable.....	-	-	-
Highly friable.....	-	-	-
Free aqueous liquids.....	-	-	-
Free non-aqueous liquids.....	-	-	-
Powder/Ash.....	-	-	-

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

Inorganic anions (%wt):

	(%wt)	Type(s) and comment
Fluoride.....	-	-
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.....	-	-
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.....	-	-
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		= 100.0

Comments on planned treatments:

-

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	~ 2.0	
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: 17 01 01, 17 01 02, 17 01 07, 17 04 07

Opportunities for alternative disposal routing: No

Baseline Management Route	Opportunity Management Route	Stream volume (%)	Opportunity Confidence	Comment
-	-	-	-	-

RADIOACTIVITY

Source: Activation products, principally cobalt-60.

Uncertainty: The specific activity data presented in the data sheet is the mean radioactivity contents of three HHISO containers packed with 7E101 waste disposed of previously to the LLWR. This is estimated to be representative of the radioactivity content of future disposals, taking radioactive decay into account.

Measurement of radioactivities: Based on information for previous consignments of this type of waste.

Chemical form of radionuclides: H-3: May be present but chemical form has not been determined.
 C-14: May be present but chemical form has not been determined.
 Cl-36: -
 Se-79: -
 Tc-99: -
 I-129: -
 Ra: May be present but chemical form has not been determined.
 Th: May be present but chemical form has not been determined.
 U: May be present but chemical form has not been determined.
 Np: -
 Pu: -

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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			~ 1.57E-05	A A 1	Gd 153												
Be 10											Ho 163						
C 14											~ 2.66E-05	A A 1	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											~ 1.64E-07	A A 1	Pb 210				
Co 60											~ 2.08E-06	A A 1	Bi 208				
Ni 59															Bi 210m		
Ni 63															~ 2.62E-07	A A 1	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														
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	~ 2.69E-08	A A 1	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					~ 1.44E-08	A A 1	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	0	*	0	*												
Eu 155	Total b/g	0	*	4.48E-05	*												

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