

WASTE STREAM	3N12	Gas Circulator LLW
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SITE Hinkley Point B

SITE OWNER EDF Energy Nuclear Generation Ltd (EDFE NGL)

WASTE CUSTODIAN EDF Energy Nuclear Generation Ltd (EDFE NGL)

WASTE TYPE LLW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025 = 27.6			
Future arisings:	1.4.2025 - 31.3.2026 = 14.2			
	1.4.2026 - 31.3.2027 = 14.2			
	1.4.2027 - 31.3.2028 = 14.2			
	1.4.2028 - 31.3.2029 = 14.2			
	1.4.2029 - 31.3.2030 = 14.2			
Total future arisings:	71.0			
Total waste volume:	98.6			

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

Comment on arising rates: Waste volumes will be variable depending on station operating conditions.

Additional information on quantities: -

Uncertainty factors on volumes: Stock (upper): x 1.25 Arisings (upper): x 1.75
Stock (lower): x 0.75 Arisings (lower): x 0.25

WASTE SOURCE The wastes included in this stream are from the Gas Circulator hall and Gas Circulator workshop.

PHYSICAL CHARACTERISTICS

General description: The wastes generated in these areas are mixed wastes ranging from metal items, redundant plant items, general soft trash waste, heavy duty plastic, and rubber waste.

Changes since waste generated: Free liquid: Removed as far as is practicable, and disposed via liquid effluent route. Oil / Grease: Removed or minimised as far as is practicable.

Bulk density (t/m³): ~ 0.78

Comment on density: Density based on raw volume and weight at arising as provided in WCH

CHEMICAL COMPOSITION

General description and components (%wt): Iron metal/alloy (~40%), Plastics (halogenated) (~50%), Rubber (~5%), Wood (~5%)

Chemical state: Neutral

Sheet metal proportion / thickness: Metal thicknesses have not been estimated apart from the drum thickness which will be > 1mm.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	NE	-	
Other ferrous metals.....	NE	-	
Iron.....	~ 40.0	-	
Aluminium.....	NE	-	
Beryllium.....	NE	-	
Cobalt.....	NE	-	
Copper.....	P	-	
Lead.....	NE	-	
Magnox/Magnesium.....	NE	-	
Nickel.....	NE	-	
Titanium.....	NE	-	
Uranium.....	NE	-	
Zinc.....	NE	-	
Zircaloy/Zirconium.....	NE	-	
Other metals.....	NE	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	~ 5.0	-	
Paper, cotton.....	NE	-	
Wood.....	~ 5.0	-	
Halogenated plastics.....	~ 50.0	-	
Total non-halogenated plastics.....	NE	-	
Condensation polymers.....	NE	-	
Others.....	NE	-	
Organic ion exchange materials.....	NE	-	
Total rubber.....	~ 5.0	-	
Halogenated rubber.....	NE	-	
Non-halogenated rubber.....	NE	-	
Hydrocarbons.....	NE	-	
Oil or grease.....	NE	-	
Fuel.....	NE	-	
Asphalt/Tarmac (cont.coal tar).....	NE	-	
Asphalt/Tarmac (no coal tar).....	NE	-	
Bitumen.....	NE	-	
Others.....	NE	-	
Other organics.....	NE	-	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	= 0	-	
Inorganic sludges and flocs.....	= 0	-	
Soil.....	NE	-	
Brick/Stone/Rubble.....	NE	-	
Cementitious material.....	= 0	-	
Sand.....	= 0	-	
Glass/Ceramics.....	-	-	
Graphite.....	= 0	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	= 0	-	
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.....	NE	-
Chloride.....	NE	-
Iodide.....	NE	-
Cyanide.....	NE	-
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.....	= 0	-
Corrosive materials.....	= 0	-
Pyrophoric materials.....	= 0	-
Generating toxic gases.....	= 0	-
Reacting with water.....	= 0	-
Higher activity particles.....	= 0	Not expected
Soluble solids as bulk chemical compounds.....	= 0	-

Hazardous substances / non hazardous pollutants:

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

Complexing agents (%wt):

Yes		
	(%wt)	Type(s) and comment
EDTA.....	NE	-
DPTA.....	NE	-
NTA.....	NE	-
Polycarboxylic acids.....	NE	-
Other organic complexants.....	NE	Not expected to be present but a trace quantity may be present on detailed analysis.
Total complexing agents.....	TR	-

Physical components:

	Number	Type(s) and comment
Sources.....	= 0	-
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)	Off-site	~ 31.3
Incineration	Off-site	~ 37.5
Drying/dewatering/liquid separation		
Tie down/fixatives/strippable coating/painting application		
Decontamination		
Metal treatment	Off-site	~ 31.3
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:

In line with the waste hierarchy, wastes will be treated preferentially by incineration, metal decontamination/melting, supercompaction, optimal packaging in HHISOs or immobilisation by encapsulation where necessary, prior to ultimate disposal at the LLW Repository. These treatments will be carried out off-site under contract with companies such as LLWR Ltd, Cyclife, Tradebe Inutec.

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
	1/2 Height IP-2 Disposal/Re-usable ISO (TC01/TC02)	32.0	91.3	18.3	1	-

Range in container waste loading:

Other information on packaging and conditioning: Waste loading is representative of the raw waste following further planned treatments. Supercompaction assumed to reduce volume to 20% of original. Solidification assumed to increase volume to 300% of original. No treatment results in the same volume.

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)			
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	= 31.0		
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	= 38.0		
Expected to be consigned to a Metal Treatment Facility	= 31.0		
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: Contamination will be main source of activity with possibly some activation of certain reactor or fuel route components.

Uncertainty: Waste mapping is continuously carried out to monitor volumes of waste arising from plant areas to ensure the ongoing accuracy of our fingerprints.

Measurement of radioactivities: Hinkley Point B sampling plan is based on BEG/FORM/SHE/ENVI/017/005 Routine Fingerprint Characterisation Plan.

Chemical form of radionuclides: H-3: Diffused into materials
C-14: As graphite particulate and incorporated into metal particles
Cl-36: Incorporated into steels
Se-79: Not expected to be significant
Tc-99: Not expected to be significant
I-129: Not expected to be significant
Ra: Not expected to be significant
Th: Not expected to be significant
U: Not assessed
Np: Not expected to be significant
Pu: Not assessed

WASTE STREAM		3N12		Gas Circulator LLW					
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	2.04E-05	C C 1	2.04E-05	C C 1	Gd 153				
Be 10					Ho 163				
C 14	2.20E-06	C C 1	2.20E-06	C C 1	Ho 166m				
Na 22					Tm 170				
Al 26					Tm 171				
Cl 36	3.89E-05	C C 1	3.89E-05	C C 1	Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40					Hf 182				
Ca 41					Pt 193				
Mn 53					Tl 204				
Mn 54	4.08E-06	C C 1	4.08E-06	C C 1	Pb 205				
Fe 55	1.49E-04	C C 1	1.49E-04	C C 1	Pb 210				
Co 60	3.62E-05	C C 1	3.62E-05	C C 1	Bi 208				
Ni 59					Bi 210m				
Ni 63	1.18E-05	C C 1	1.18E-05	C C 1	Po 210				
Zn 65	2.27E-06	C C 1	2.27E-06	C C 1	Ra 223				
Se 79					Ra 225				
Kr 81					Ra 226				
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90	1.62E-06	C C 1	1.62E-06	C C 1	Th 227				
Zr 93					Th 228				
Nb 91					Th 229				
Nb 92					Th 230				
Nb 93m					Th 232				
Nb 94	7.71E-08	C C 1	7.71E-08	C C 1	Th 234				
Mo 93					Pa 231				
Tc 97					Pa 233				
Tc 99					U 232				
Ru 106	7.42E-07	C C 1	7.42E-07	C C 1	U 233				
Pd 107					U 234	1.02E-07	C C 1	1.02E-07	C C 1
Ag 108m	6.88E-08	C C 1	6.88E-08	C C 1	U 235	1.63E-09	C C 1	1.63E-09	C C 1
Ag 110m	2.76E-07	C C 1	2.76E-07	C C 1	U 236	2.60E-08	C C 1	2.60E-08	C C 1
Cd 109					U 238	9.85E-08	C C 1	9.85E-08	C C 1
Cd 113m					Np 237				
Sn 119m					Pu 236				
Sn 121m					Pu 238	2.67E-08	C C 1	2.67E-08	C C 1
Sn 123					Pu 239	1.65E-08	C C 1	1.65E-08	C C 1
Sn 126					Pu 240	3.91E-08	C C 1	3.91E-08	C C 1
Sb 125	2.13E-07	C C 1	2.13E-07	C C 1	Pu 241	7.68E-06	C C 1	7.68E-06	C C 1
Sb 126					Pu 242				
Te 125m					Am 241	1.49E-07	C C 1	1.49E-07	C C 1
Te 127m					Am 242m				
I 129	1.51E-12	1	1.51E-12	1	Am 243				
Cs 134	3.12E-07	C C 1	3.12E-07	C C 1	Cm 242	5.17E-08	C C 1	5.17E-08	C C 1
Cs 135					Cm 243	8.13E-10	C C 1	8.13E-10	C C 1
Cs 137	4.80E-06	C C 1	4.80E-06	C C 1	Cm 244	5.14E-08	C C 1	5.14E-08	C C 1
Ba 133	7.99E-08	C C 1	7.99E-08	C C 1	Cm 245				
La 137					Cm 246				
La 138					Cm 248				
Ce 144	2.99E-07	C C 1	2.99E-07	C C 1	Cf 249				
Pm 145					Cf 250				
Pm 147	1.09E-06	C C 1	1.09E-06	C C 1	Cf 251				
Sm 147					Cf 252				
Sm 151					Unsp a				
Eu 152	1.15E-07	C C 1	1.15E-07	C C 1	Unsp b/g	1.06E-03	C C 1	1.06E-03	C C 1
Eu 154	1.72E-07	C C 1	1.72E-07	C C 1	Total a	5.64E-07	*	5.64E-07	*
Eu 155	1.27E-07	C C 1	1.27E-07	C C 1	Total b/g	1.34E-03	*	1.34E-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