WASTE STREAM	3S05	Miscellaneous Contaminated Items

SITE Sizewell B

SITE OWNER EDF Energy Nuclear Generation Ltd (EDFE NGL)

WASTE CUSTODIAN EDF Energy Nuclear Generation Ltd (EDFE NGL)

WASTE TYPE ILW

WASTE VOLUMES

		Reported (m^3)
Stocks:	At 1.4.2025	= 30.1
Future arisings:	1.4.2025 - 31.3.2026	= 1.7
	1.4.2026 - 31.3.2027	= 1.7
	1.4.2027 - 31.3.2028	= 1.7
	1.4.2028 - 31.3.2035	= 11.9
	1.4.2035 - 31.3.2043	= 27.2
Total future arisings:		**44.2**
Total waste volume:		**74.3**

OR

Conditioned (m^3)	Packaged (m^3)

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. Following planned shutdown in 2035 and defuelling operations, the fuel storage ponds and associated plant will continue in operation for a number of years before plant clear out. The current plan shows this commencing in 2040/1.

Additional information on quantities: -

Uncertainty factors on volumes:

Stock (upper):	x 1.25	Arisings (upper):	x 1.50
Stock (lower):	x 0.75	Arisings (lower):	x 0.50

WASTE SOURCE Redundant equipment and material contaminated beyond the limits for LLW.

PHYSICAL CHARACTERISTICS

General description: The waste will be redundant contaminated equipment and material contaminated beyond the limits for LLW. Metallic items are expected to make up a large quantity of this waste (expected to be >50% but not currently assessed).

Changes since waste generated: -

Bulk density (t/m^3): ~ 1.5

Comment on density: As cut for packaging. Density is expected to lie between $1t/m^3$ and $2t/m^3$.

CHEMICAL COMPOSITION

General description and components (%wt): The waste is expected to be principally steel and other metallic items. Other components have not been assessed. Fission products, actinides and other activation products will be present as contaminants.

Chemical state: Neutral

Sheet metal proportion / thickness: The form, size and thickness is not assessed as no particular constituents of this stream have been identified.

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel……	~ 50.0	-	
Other ferrous metals……	~ 50.0	-	
Iron……	NE	-	
Aluminium……	NE	-	
Beryllium……	NE	-	
Cobalt……	P	-	
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 cellulosics	NE	-	
Paper, cotton	NE	-	
Wood	NE	-	
Halogenated plastics	= 0	-	
Total non-halogenated plastics	NE	-	
Condensation polymers	NE	-	
Others	NE	-	
Organic ion exchange materials	= 0	-	
Total rubber	NE	-	
Halogenated rubber	= 0	-	
Non-halogenated rubber	NE	-	
Hydrocarbons	NE	-	
Oil or grease	NE	-	
Fuel		-	
Asphalt/Tarmac (cont.coal tar)		-	
Asphalt/Tarmac (no coal tar)		-	
Bitumen		-	
Others		-	
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	NE	-	
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	P	May be present.
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): Not yet determined

	(%wt)	Type(s) and comment
EDTA	NE	-
DPTA	NE	-
NTA	NE	-
Polycarboxylic acids	NE	-
Other organic complexants	NE	May be present in trace quantities.
Total complexing agents	NE	-

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)		
Incineration		
Drying/dewatering/liquid separation		
Tie down/fixatives/strippable coating/painting application		
Decontamination		
Metal treatment		
Recycling / reuse		
Thermal treatment, including vitrification		
Encapsulation	On-site	= 100.0
Polymer encapsulation		
Other physical treatment		
Other chemical treatment		
Containerisation		
Treatment not yet determined		
None		

Comments on planned treatments: -

Conditioning method: The waste is expected to be encapsulated without being supercompacted. Decontamination and cutting to reduce volumes may be appropriate for some wastes.

Conditioning plants:

Plant Name	Location
Sizewell B Modified Radioactive Waste Building (MRWB)	Sizewell B

Likely conditioning matrix: -

Further information on the conditioning matrix: BFS/OPC is likely conditioning matrix, although PFA/OPC is another matrix that may be adopted.

Waste Packaging:

Likely container type:

Container	Waste packaged (vol%)	Waste loading (m^3)	Payload (m^3)	Number of packages	Estimated start date for packaging
500 l drum	100.0	0.24	0.47	317	-

Range in container waste loading: Majority of waste will be packaged in 500L drums with a conditioning factor of ~2.0.

Other information on packaging and conditioning: Appropriate plant will be provided at the Station in accordance with EDF Energy strategy. Decontamination followed by cutting to reduce volumes may be appropriate for some wastes.

Conditioned density (t/m^3): ~ 3.0
Conditioned density comment: Expected to be between 2 and 4 t/m^3. The maximum density of the conditioned waste will be less than 7.5 t/m^3.

Management Routes:

Disposal Route	Stream volume %	Raw density t/m^3	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	= 100.0		
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: Redundant contaminated equipment and materials.

Uncertainty: The values quoted are indicative of the activities that may be expected. Indicative of the order of magnitude.

Measurement of radioactivities: Theoretical assessment.

Chemical form of radionuclides:

H-3: As tritiated water.
C-14: Not expected to be present in any measurable quantity.
Cl-36: Not expected to be present in any measurable quantity.
Se-79: Not assessed.
Tc-99: Not expected to be present in any measurable quantity.
I-129: Not expected to be present in any measurable quantity.
Ra: Not expected to be present in any measurable quantity.
Th: Not expected to be present in any measurable quantity.
U: Trace (value unknown, but not thought to be significant), probably as oxide.
Np: Not expected to be present in any measurable quantity.
Pu: Trace (value unknown, but not thought to be significant), probably as oxide.

WASTE STREAM **3S05** **Miscellaneous Contaminated Items**

Nuclide	Mean radioactivity, TBq/m³ Waste at 1.4.2025	Bands and Code	Future Arisings	Bands and Code	Nuclide	Mean radioactivity, TBq/m³ Waste at 1.4.2025	Bands and Code	Future Arisings	Bands and Code
H 3	2.00E-04	C C 2	2.00E-04	C C 2	Gd 153				
Be 10		8		8	Ho 163				
C 14	1.00E-05	C 3	1.00E-05	C 3	Ho 166m				
Na 22		4		4	Tm 170				
Al 26		4		4	Tm 171				
Cl 36		6		6	Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40					Hf 182				
Ca 41		8		8	Pt 193				
Mn 53					Tl 204				
Mn 54	4.00E-04	C C 2	2.00E-02	C C 2	Pb 205				
Fe 55	5.00E-03	C C 2	2.00E-02	C C 2	Pb 210		8		8
Co 60	7.00E-03	C C 2	2.00E-02	C C 2	Bi 208				
Ni 59	2.00E-06	C C 2	2.00E-06	C C 2	Bi 210m				
Ni 63	2.00E-04	C C 2	2.00E-04	C C 2	Po 210		8		8
Zn 65	4.00E-06	C C 2	1.00E-03	C C 2	Ra 223				
Se 79	6.90E-10	C C 2	6.90E-10	C C 2	Ra 225				
Kr 81					Ra 226		8		8
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90	2.00E-04	C C 2	2.00E-04	C C 2	Th 227				
Zr 93	1.00E-08	C C 2	1.00E-08	C C 2	Th 228				
Nb 91					Th 229		8		8
Nb 92					Th 230		8		8
Nb 93m		8			Th 232		8		8
Nb 94	2.00E-07	C C 2	2.00E-07	C C 2	Th 234				
Mo 93	2.00E-07	C C 2	2.00E-07	C C 2	Pa 231		8		8
Tc 97					Pa 233				
Tc 99		8			U 232				
Ru 106	6.00E-05	C C 2	2.00E-03	C C 2	U 233		8		8
Pd 107		8			U 234		8		8
Ag 108m		8			U 235		8		8
Ag 110m	3.00E-06	C C 2	5.00E-04	C C 2	U 236		8		8
Cd 109					U 238		8		8
Cd 113m					Np 237		8		8
Sn 119m					Pu 236				
Sn 121m		8		8	Pu 238	1.00E-06	C C 2	1.00E-06	C C 2
Sn 123					Pu 239	5.00E-07	C C 2	5.00E-07	C C 2
Sn 126		8		8	Pu 240	5.00E-07	C C 2	5.00E-07	C C 2
Sb 125	5.00E-04	C C 2	2.00E-03	C C 2	Pu 241	8.00E-05	C C 2	1.00E-04	C C 2
Sb 126			7.00E-03	C C 2	Pu 242	2.00E-09	C C 2	2.00E-09	C C 2
Te 125m	5.00E-04	C C 2	2.00E-05	C C 2	Am 241	1.00E-06	C C 2	2.00E-07	C C 2
Te 127m					Am 242m	9.00E-09	C C 2	9.00E-09	C C 2
I 129		8		8	Am 243	3.00E-08	C C 2	3.00E-08	C C 2
Cs 134	2.00E-03	C C 2	1.00E-02	C C 2	Cm 242	1.00E-08	C C 2	3.00E-06	C C 2
Cs 135	4.00E-08	C C 2	4.00E-08	C C 2	Cm 243	2.00E-09	C C 2	2.00E-09	C C 2
Cs 137	8.00E-03	C C 2	1.00E-02	C C 2	Cm 244	3.00E-07	C C 2	3.00E-07	C C 2
Ba 133					Cm 245		8		8
La 137					Cm 246		8		8
La 138					Cm 248				
Ce 144	2.00E-05	C C 2	2.00E-03	C C 2	Cf 249				
Pm 145					Cf 250				
Pm 147	5.00E-05	C C 2	2.00E-04	C C 2	Cf 251				
Sm 147					Cf 252				
Sm 151	3.00E-07	C C 2	3.00E-07	C C 2	Unsp a		8		8
Eu 152	3.00E-09	C C 2	5.00E-09	C C 2	Unsp b/g	4.44E-03	C C 2	1.09E-01	C C 2
Eu 154	2.00E-05	C C 2	2.00E-05	C C 2	**Total a**	**3.35E-06**	*	**5.54E-06**	*
Eu 155	5.00E-06	C C 2	1.00E-05	C C 2	**Total b/g**	**2.87E-02**	*	**2.04E-01**	*

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