

WASTE STREAM	3J02	Sludge
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SITE Dungeness 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)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	= 8.7		
Future arisings:	1.4.2025 - 31.3.2026	= 0.1		
	1.4.2026 - 31.3.2027	= 0.1		
	1.4.2027 - 31.3.2028	= 0.1		
	1.4.2028 - 31.3.2029	= 0.1		
Total future arisings:		0.4		
Total waste volume:		9.1		

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

WASTE SOURCE Sludge and filter pre-coat material.

PHYSICAL CHARACTERISTICS

General description: Sludge and filter aid materials, e.g. Celite 545. Graphite particulate, corrosion particulate and miscellaneous particulate. Also abrasive materials may be present. There are no large items that may require special handling.

Changes since waste generated: -

Bulk density (t/m³): = 2.0

Comment on density: -

CHEMICAL COMPOSITION

General description and components (%wt): A wide variety of materials including Celite 545 filter aid.

Chemical state: Neutral

Sheet metal proportion / thickness: -

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	NE	-	
Other ferrous metals.....	NE	-	
Iron.....	NE	-	
Aluminium.....	NE	-	
Beryllium.....	NE	-	
Cobalt.....	NE	-	
Copper.....	NE	-	
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.....	NE	-	
Paper, cotton.....	NE	-	
Wood.....	NE	-	
Halogenated plastics.....	TR	-	
Total non-halogenated plastics.....	TR	-	
Condensation polymers.....	TR	-	
Others.....	TR	-	
Organic ion exchange materials.....	= 0	-	
Total rubber.....	= 0	-	
Halogenated rubber.....	= 0	-	
Non-halogenated rubber.....	= 0	-	
Hydrocarbons.....	TR	-	
Oil or grease.....	-	-	
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.....	= 100.0	-	
Soil.....	= 0	-	
Brick/Stone/Rubble.....	= 0	-	
Cementitious material.....	= 0	-	
Sand.....	NE	-	
Glass/Ceramics.....	-	-	
Graphite.....	NE	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	= 0	-	
Non/low friable.....	-	-	
Moderately friable.....	-	-	
Highly friable.....	-	-	
Free aqueous liquids.....	P	-	
Free non-aqueous liquids.....	P	-	
Powder/Ash.....	= 0	-	

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

Inorganic anions (%wt):

	(%wt)	Type(s) and comment
Fluoride.....	NE	-
Chloride.....	~ 0.02	-
Iodide.....	NE	-
Cyanide.....	NE	-
Carbonate.....	~ 2.8	-
Nitrate.....	NE	-
Nitrite.....	NE	-
Phosphate.....	NE	-
Sulphate.....	~ 0.55	-
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.....	TR	-
Biodegradable materials.....	TR	-
Putrescible wastes.....	-	-
Non-putrescible wastes.....	= 0	-
Corrosive materials.....	= 0	-
Pyrophoric materials.....	= 0	-
Generating toxic gases.....	NE	-
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).....		-
Boron (non-Boral).....		-
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	Expect only trace quantities, if any.
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) 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	On-site	~ 100.0

Comments on planned treatments:

-

Conditioning method:

-

Conditioning plants:

Plant Name	Location
Dungeness B Operational Waste Processing Facility (OWPF)	Dungeness B

Likely conditioning matrix:

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Further information on the conditioning matrix:

The matrix is expected to be 9:1 BFS/OPC.

Waste Packaging:

Likely container type:	Container	Waste packaged (vol%)	Waste loading (m³)	Payload (m³)	Number of packages	Estimated start date for packaging
	500 l drum	100.0	0.33	0.47	28	-

Range in container waste loading:

Other information on packaging and conditioning: Appropriate plant to be provided at the Station in accordance with strategy.

Conditioned density (t/m³): ~ 1.8
 Conditioned density comment: Density range of 1.68 - 1.84 t/m³.

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		
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:

Opportunities for alternative disposal routing: No

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

RADIOACTIVITY

Source: Contaminated sludge. Contamination by activation products will be the main source of activity.

Uncertainty: The values quoted were based upon theoretical assessments which assume higher activity than is anticipated during early operation. The activities indicate a maximum based upon limited operating experience and assume oxide spalling.

Measurement of radioactivities: Theoretical assessments.

Chemical form of radionuclides: H-3: As Tritiated Water
 C-14: Some contaminated by activated graphite may be expected
 Cl-36: Not expected to be significant
 Se-79: Not assessed
 Tc-99: Not assessed
 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		3J02		Sludge					
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	<	2.00E-05	C 3	2.00E-05	C 3	Gd 153			
Be 10			8		8	Ho 163			
C 14			8		8	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-02	C C 2		5.00E-01	C C 2	Pb 205			
Fe 55	2.00E-01	C C 2		1.00E+00	C C 2	Pb 210	8		8
Co 60	4.00E-02	C C 2		1.00E-01	C C 2	Bi 208			
Ni 59	1.00E-03	C C 2		1.00E-03	C C 2	Bi 210m			
Ni 63	1.00E-01	C C 2		1.00E-01	C C 2	Po 210	8		8
Zn 65	6.00E-04	C C 2		1.00E-02	C C 2	Ra 223			
Se 79	1.21E-09	C C 2		1.21E-09	C C 2	Ra 225			
Kr 81						Ra 226	8		8
Kr 85						Ra 228			
Rb 87						Ac 227			
Sr 90	2.00E-03	C C 2		2.00E-03	C C 2	Th 227			
Zr 93	6.00E-08	C C 2		6.00E-08	C C 2	Th 228			
Nb 91						Th 229	8		8
Nb 92						Th 230	8		8
Nb 93m		8			8	Th 232	8		8
Nb 94	1.00E-06	C C 2		1.00E-06	C C 2	Th 234			
Mo 93		8			8	Pa 231	8		8
Tc 97						Pa 233			
Tc 99	3.00E-07	C C 2		3.00E-07	C C 2	U 232			
Ru 106	8.00E-05	C C 2		1.00E-03	C C 2	U 233	8		8
Pd 107		8			8	U 234	2.00E-07	C C 2	2.00E-07
Ag 108m		8			8	U 235	5.00E-09	C C 2	5.00E-09
Ag 110m	2.00E-04	C C 2		3.00E-03	C C 2	U 236	4.00E-08	C C 2	4.00E-08
Cd 109						U 238	7.00E-08	C C 2	7.00E-08
Cd 113m						Np 237	3.00E-08	C C 2	3.00E-08
Sn 119m						Pu 236			
Sn 121m		8			8	Pu 238	1.00E-04	C C 2	1.00E-04
Sn 123						Pu 239	4.00E-05	C C 2	4.00E-05
Sn 126	4.35E-09	C C 2		4.35E-09	C C 2	Pu 240	8.00E-05	C C 2	8.00E-05
Sb 125	9.00E-05	C C 2		4.00E-04	C C 2	Pu 241	7.00E-03	C C 2	1.00E-02
Sb 126						Pu 242	2.00E-07	C C 2	2.00E-07
Te 125m						Am 241	1.00E-04	C C 2	7.00E-05
Te 127m						Am 242m	1.00E-06	C C 2	1.00E-06
I 129		8			8	Am 243	7.00E-07	C C 2	7.00E-07
Cs 134	3.00E-04	C C 2		2.00E-03	C C 2	Cm 242	3.00E-06	C C 2	6.00E-05
Cs 135	9.00E-09	C C 2		9.00E-09	C C 2	Cm 243	8.00E-07	C C 2	1.00E-06
Cs 137	2.00E-03	C C 2		2.00E-03	C C 2	Cm 244	3.00E-05	C C 2	4.00E-05
Ba 133						Cm 245		8	8
La 137						Cm 246		8	8
La 138						Cm 248			
Ce 144	7.00E-05	C C 2		9.00E-04	C C 2	Cf 249			
Pm 145						Cf 250			
Pm 147	4.00E-04	C C 2		2.00E-03	C C 2	Cf 251			
Sm 147						Cf 252			
Sm 151	3.00E-06	C C 2		3.00E-06	C C 2	Unsp a		8	8
Eu 152		8			8	Unsp b/g	2.00E-02	C C 2	1.00E+01
Eu 154	3.00E-04	C C 2		6.00E-04	C C 2	Total a	3.55E-04	*	3.92E-04
Eu 155	1.00E-04	C C 2		4.00E-04	C C 2	Total b/g	4.14E-01	*	1.17E+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