

WASTE STREAM	3J03	Miscellaneous Contaminated Items
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SITE Dungeness B

SITE OWNER EDFE NGL

WASTE CUSTODIAN EDFE NGL

WASTE TYPE ILW; SPD1

WASTE VOLUMES

		Reported
Stocks:	At 1.4.2019.....	0 m ³
Future arisings -	1.4.2019 - 31.3.2028.....	0.9 m ³
	1.4.2028 - 31.3.2030.....	4.0 m ³
Total future arisings:		4.9 m ³
Total waste volume:		4.9 m ³

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

Uncertainty factors on volumes: Stock (upper): x Arisings (upper) x 1.5
 Stock (lower): x Arisings (lower) x 0.5

WASTE SOURCE Redundant contaminated plant items and other materials contaminated beyond the limits for LLW.

PHYSICAL CHARACTERISTICS

General description: Primarily metallic items such as candle filters.

Physical components (%vol): ~50% Stainless Steel, ~50% Mild Steel

Sealed sources: The waste does not contain sealed sources.

Bulk density (t/m³): ~1.5

Comment on density: As cut for packaging. Density is expected to lie between 1t/m³ and 2t/m³

CHEMICAL COMPOSITION

General description and components (%wt): ~50% Stainless Steel, ~50% Mild Steel, other materials not assessed. The waste is expected to be principally steel but may include other components. Organic material may be present in small quantities e.g. traces of oil. Fission products, actinides and other activation products will be present as contaminants.

Chemical state: Neutral

Chemical form of radionuclides: H-3: Diffused into materials
 C-14: Graphite
 Cl-36: Not Assessed
 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 Assessed
 Pu: Not Assessed

Metals and alloys (%wt):

Stainless steel.....	~50.0
Other ferrous metals.....	~50.0
Iron.....	
Aluminium.....	NE
Beryllium.....	NE
Cobalt.....	NE
Copper.....	NE
Lead.....	NE
Magnox/Magnesium.....	0

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	Nickel.....	NE
	Titanium.....	NE
	Uranium.....	NE
	Zinc.....	NE
	Zircaloy/Zirconium.....	0
	Other metals.....	NE
Organics (%wt):	There may be traces of oil. Note that items may be wrapped in polythene.	
	Total cellulosics.....	NE
	Paper, cotton.....	NE
	Wood.....	NE
	Halogenated plastics	NE
	Total non-halogenated plastics.....	NE
	Condensation polymers.....	NE
	Others.....	NE
	Organic ion exchange materials....	0
	Total rubber.....	NE
	Halogenated rubber	NE
	Non-halogenated rubber.....	NE
	Hydrocarbons.....	
	Oil or grease	
	Fuel.....	
	Asphalt/Tarmac (cont.coal tar)...	
	Asphalt/Tarmac (no coal tar)....	
	Bitumen.....	
	Others.....	
	Other organics.....	TR
Other materials (%wt):	-	
	Inorganic ion exchange materials.	0
	Inorganic sludges and flocs.....	0
	Soil.....	0
	Brick/Stone/Rubble.....	0
	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

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Inorganic anions (%wt): None of the listed inorganic anions are expected to be present at greater than 1%.

Fluoride.....	<1.0
Chloride.....	<1.0
Iodide.....	<1.0
Cyanide.....	NE
Carbonate.....	<1.0
Nitrate.....	<1.0
Nitrite.....	NE
Phosphate.....	<1.0
Sulphate.....	<1.0
Sulphide.....	<1.0

Materials of interest for waste acceptance criteria: Materials likely to present a fire hazard or non-radioactive hazard are not anticipated.

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
Active particles.....	P
Soluble solids as bulk chemical compounds.....	0

May be present

Hazardous substances / non hazardous pollutants:

Acrylamide.....	
Benzene.....	NE
Chlorinated solvents.....	
Formaldehyde.....	
Organometallics.....	
Phenol.....	NE
Styrene.....	
Tri-butyl phosphate.....	NE
Other organophosphates.....	
Vinyl chloride.....	NE
Arsenic.....	NE
Barium.....	

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Boron..... NE
 Cadmium..... NE
 Caesium.....
 Selenium..... NE
 Chromium..... NE
 Molybdenum..... NE
 Thallium.....
 Tin..... NE
 Vanadium..... NE
 Mercury compounds.....
 Others..... NE
 Electronic Electrical Equipment (EEE)
 EEE Type 1.....
 EEE Type 2.....
 EEE Type 3.....
 EEE Type 4.....
 EEE Type 5.....

Complexing agents (%wt): Not yet determined
 EDTA.....
 DPTA.....
 NTA.....
 Polycarboxylic acids..... NE
 Other organic complexants..... NE
 Total complexing agents..... NE

May be present in trace quantities.

PACKAGING AND CONDITIONING

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

Plant Name: None.

Location: Dungeness B Power Station.

Plant startup date: Between 2028 and 2033.

Total capacity (m³/y incoming waste): ~500.0

Target start date for packaging this stream: -

Throughput for this stream (m³/y incoming waste): ~

Other information: All the waste will be retrieved when a conditioning campaign is undertaken. There may be more than one campaign.

Likely container type:	Container	Waste packaged (%vol)	Waste loading (m ³)	Payload (m ³)	Number of packages
	500 l drum	100.0	~0.24	0.47	21

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Likely container type comment: -

Range in container waste volume: -

Other information on containers: Waste will be packaged in 500L drums with a conditioning factor of ~2.0

Likely conditioning matrix: BFS/OPC
Other information: PFA/OPC is another matrix that may be adopted.

Conditioned density (t/m³): ~3.0
Conditioned density comment: Expected to be between 2 and 4 t/m³. The maximum density of the conditioned waste will be less than 7.5 t/m³.

Other information on 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.

Opportunities for alternative disposal routing: No

Treatment	Stream volume (%)	Comment
-	-	-

RADIOACTIVITY

Source: Redundant contaminated plant items and materials, contaminated beyond the limits for LLW.

Uncertainty: The values quoted are indicative of the activities that might be expected.

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: -

Other information: Estimates have been based on theoretical assessments. Other beta/gamma nuclides of arisings and stocks (in TBq/m³) include S35 (2E-2, 1E-16); Ca45 (8E-4, 9E-12); Cr51 (1E-3, 0); Co58 (2E-4, 0); Sr89 (6E-9, 0); Y91 (5E-8, 0); Zr95 (2E-4, 0); Nb95 (1E-4, 0); Ru103 (3E-4, 0); Ta182 (7E-3, 7E-14); Sc46 (2E-5, <1E-17); Fe59 (4E-5, <2E-24); Se75 (6E-4, 2E-14) and Sb124 (2E-5, <1E-20).

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Nuclide	Mean radioactivity, TBq/m ³				Nuclide	Mean radioactivity, TBq/m ³			
	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			9E-03	DD 2	Gd 153				
Be 10				8	Ho 163				
C 14			6E-04	DD 2	Ho 166m				
Na 22				4	Tm 170				
Al 26				4	Tm 171				
Cl 36			7E-03	DD 2	Lu 174				
Ar 39					Lu 176				
Ar 42					Hf 178n				
K 40					Hf 182				
Ca 41				8	Pt 193				
Mn 53					Tl 204				
Mn 54			3E-03	DD 2	Pb 205				
Fe 55			4E-02	DD 2	Pb 210				8
Co 60			1E-02	DD 2	Bi 208				
Ni 59			<1E-04	D 3	Bi 210m				
Ni 63			3E-03	DD 2	Po 210				8
Zn 65			3E-04	DD 2	Ra 223				
Se 79			6.9E-10	DD 2	Ra 225				
Kr 81					Ra 226				8
Kr 85					Ra 228				
Rb 87					Ac 227				
Sr 90			4E-04	DD 2	Th 227				
Zr 93			3E-08	DD 2	Th 228				
Nb 91					Th 229				8
Nb 92					Th 230				8
Nb 93m			3E-09	DD 2	Th 232				8
Nb 94			<4E-06	D 3	Th 234				
Mo 93				8	Pa 231				8
Tc 97					Pa 233				
Tc 99			1E-07	DD 2	U 232				
Ru 106			1E-03	DD 2	U 233				8
Pd 107				8	U 234		6E-08	DD 2	
Ag 108m			<8E-06	D 3	U 235		1E-09	DD 2	
Ag 110m			2E-04	DD 2	U 236		1E-08	DD 2	
Cd 109					U 238		2E-08	DD 2	
Cd 113m					Np 237		9E-09	DD 2	
Sn 119m					Pu 236				
Sn 121m				8	Pu 238		4E-06	DD 2	
Sn 123					Pu 239		5E-06	DD 2	
Sn 126			2.61E-09	DD 2	Pu 240		8E-06	DD 2	
Sb 125			6E-06	DD 2	Pu 241		4E-04	DD 2	
Sb 126					Pu 242		<5E-08	D 3	
Te 125m					Am 241		2E-05	DD 2	
Te 127m					Am 242m		3E-07	DD 2	
I 129				8	Am 243		2E-07	DD 2	
Cs 134			6E-04	DD 2	Cm 242		1E-06	DD 2	
Cs 135			5E-09	DD 2	Cm 243		2E-08	DD 2	
Cs 137			1E-03	DD 2	Cm 244		9E-07	DD 2	
Ba 133			2E-05	DD 2	Cm 245				8
La 137					Cm 246				8
La 138					Cm 248				
Ce 144			9E-07	DD 2	Cf 249				
Pm 145					Cf 250				
Pm 147			<8E-04	D 3	Cf 251				
Sm 147					Cf 252				
Sm 151			<1E-06	D 3	Other a				8
Eu 152			2E-06	DD 2	Other b/g		3E-02	DD 2	
Eu 154			4E-06	DD 2	Total a	0	3.93E-05	DD 2	
Eu 155			7E-06	DD 2	Total b/g	0	1.08E-01	DD 2	

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