

WASTE STREAM	9C52	Contaminated Sand
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SITE Dungeness A

SITE OWNER Nuclear Decommissioning Authority

WASTE CUSTODIAN Nuclear Restoration Services Ltd (NRS)

WASTE TYPE LLW

WASTE VOLUMES

	At 1.4.2025	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:		= 1.9			
Future arisings:					
Total future arisings:		0.0			
Total waste volume:		1.9			

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

Comment on arising rates: -

Additional information on quantities: -

Uncertainty factors on volumes:

Stock (upper):	x 1.20	Arisings (upper):	x -
Stock (lower):	x 0.80	Arisings (lower):	x -

WASTE SOURCE Sand from the sandfilter in the Magnox Dissolution plant.

PHYSICAL CHARACTERISTICS

General description: Sand from the sandfilter in the Magnox Dissolution plant stored in 200l drums. The drums are only half filled with the sand.

Changes since waste generated: -

Bulk density (t/m³): = 2.5

Comment on density: The density varies between 2.3 and 2.7 t/m³.

CHEMICAL COMPOSITION

General description and components (%wt): Sand (100%wt).

Chemical state: Neutral

Sheet metal proportion / thickness: -

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	TR	-	
Other ferrous metals.....	TR	-	
Iron.....		-	
Aluminium.....	TR	-	
Beryllium.....		-	
Cobalt.....		-	
Copper.....	TR	-	
Lead.....	TR	-	
Magnox/Magnesium.....	TR	-	
Nickel.....		-	
Titanium.....		-	
Uranium.....		-	
Zinc.....	TR	-	
Zircaloy/Zirconium.....	TR	-	
Other metals.....	TR	Not fully assessed.	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	NE	-	
Paper, cotton.....	NE	-	
Wood.....	NE	-	
Halogenated plastics.....	NE	-	
Total non-halogenated plastics.....	= 0	-	
Condensation polymers.....	= 0	-	
Others.....	= 0	-	
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.....	NE	-	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	TR	-	
Inorganic sludges and flocs.....	= 0	-	
Soil.....	= 0	-	
Brick/Stone/Rubble.....	= 0	-	
Cementitious material.....	= 0	-	
Sand.....	~ 100.0	-	
Glass/Ceramics.....	= 0	-	
Graphite.....	TR	-	
Desiccants/Catalysts.....		-	
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.....	= 0	-
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.....		-
Corrosive materials.....	= 0	-
Pyrophoric materials.....	= 0	-
Generating toxic gases.....	= 0	-
Reacting with water.....	= 0	-
Higher activity particles.....		-
Soluble solids as bulk chemical compounds.....		-

Hazardous substances / non hazardous pollutants:

	(%wt)	Type(s) and comment
Acrylamide.....	0	-
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):

Yes		
	(%wt)	Type(s) and comment
EDTA.....	TR	-
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		= 87.0

Comments on planned treatments:

13% of this waste stream is expected to be sent to Landfill as VLLW.

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)	87.0	10.0	18.3	1	-

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)			
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	= 87.0	2.5	
Expected to be consigned to a Landfill Facility	= 13.0	2.5	
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 05 04

Opportunities for alternative disposal routing: No

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

RADIOACTIVITY

Source: Sand from the Magnox Dissolution Plant sandfilter, contaminated with activation and fission products.

Uncertainty: -

Measurement of radioactivities: Activities have been estimated from measurements of the sand and application of the relevant waste stream fingerprint.

Chemical form of radionuclides:

H-3: The chemical form of tritium has not been assessed.

C-14: The chemical form of carbon-14 has not been assessed.

Cl-36: -

Se-79: -

Tc-99: -

I-129: -

Ra: -

Th: -

U: The chemical form of uranium isotopes may be uranium oxides.

Np: -

Pu: The chemical form of plutonium isotopes may be plutonium oxides.

WASTE STREAM 9C52 Contaminated Sand									
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	7.29E-04	C C 2			Gd 153			8	
Be 10					Ho 163			8	
C 14	6.00E-05	C C 2			Ho 166m			8	
Na 22					Tm 170			8	
Al 26					Tm 171			8	
Cl 36	2.00E-05	C C 2			Lu 174			8	
Ar 39					Lu 176			8	
Ar 42					Hf 178n			8	
K 40					Hf 182			8	
Ca 41					Pt 193			8	
Mn 53					Tl 204			8	
Mn 54					Pb 205			8	
Fe 55	1.02E-06	C C 2			Pb 210			8	
Co 60	9.36E-06	C C 2			Bi 208			8	
Ni 59					Bi 210m			8	
Ni 63	3.53E-04	C C 2			Po 210			8	
Zn 65					Ra 223			8	
Se 79					Ra 225			8	
Kr 81					Ra 226			8	
Kr 85					Ra 228			8	
Rb 87					Ac 227			8	
Sr 90	5.85E-05	C C 2			Th 227			8	
Zr 93					Th 228			8	
Nb 91					Th 229			8	
Nb 92					Th 230			8	
Nb 93m					Th 232			8	
Nb 94					Th 234	4.00E-07	C C 2		
Mo 93					Pa 231			8	
Tc 97					Pa 233			8	
Tc 99					U 232			8	
Ru 106					U 233			8	
Pd 107					U 234	4.00E-07	C C 2		
Ag 108m	4.87E-06	C C 2			U 235	1.00E-08	C C 2		
Ag 110m					U 236			8	
Cd 109					U 238	4.00E-07	C C 2		
Cd 113m					Np 237			8	
Sn 119m					Pu 236			8	
Sn 121m					Pu 238	4.36E-06	C C 2		
Sn 123					Pu 239	8.00E-06	C C 2		
Sn 126					Pu 240	9.99E-06	C C 2		
Sb 125	2.14E-09	C C 2			Pu 241	1.68E-04	C C 2		
Sb 126					Pu 242			8	
Te 125m					Am 241	4.64E-05	C C 2		
Te 127m					Am 242m			8	
I 129					Am 243			8	
Cs 134	7.07E-09	C C 2			Cm 242			8	
Cs 135					Cm 243	1.99E-08	C C 2		
Cs 137	1.32E-04	C C 2			Cm 244	3.51E-07	C C 2		
Ba 133	1.84E-07	C C 2			Cm 245			8	
La 137					Cm 246			8	
La 138					Cm 248			8	
Ce 144					Cf 249			8	
Pm 145					Cf 250			8	
Pm 147	8.60E-08	C C 2			Cf 251			8	
Sm 147					Cf 252			8	
Sm 151					Unsp a				
Eu 152	1.19E-07	C C 2			Unsp b/g				
Eu 154	4.67E-07	C C 2			Total a	7.00E-05	*	0	*
Eu 155	3.12E-08	C C 2			Total b/g	1.54E-03	*	0	*

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