

WASTE STREAM	9G121	Active Drains (Final Delay Tank)
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SITE Trawsfynydd

SITE OWNER Nuclear Decommissioning Authority

WASTE CUSTODIAN Nuclear Restoration Services Ltd (NRS)

WASTE TYPE LLW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025	~ 0		
Future arisings:	1.4.2025 - 31.3.2028	= 8.7		
Total future arisings:		8.7		
Total waste volume:		8.7		

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

WASTE SOURCE The Active Drains are a system across the active site areas (i.e. reactor buildings and Ponds complex), designed to collect spillages, surface waters and other contaminated effluent and route it, via the Active Drains Tank (ADT), to the Active Effluent Treatment Plant (AETP) for treatment prior to discharge to Llyn Trawsfynydd. The Active Drains have collected effluents over the generating, defueling and decommissioning phases and thus have a spectrum of contamination including activation and fission products. This waste stream was created to capture waste associated with "System 3" consisting of the manholes and connections associated with the pipework between the Final Delay Tank (FDT) and discharge point at manhole MH430.

PHYSICAL CHARACTERISTICS

General description: The waste consists of silt and sludge, oil (diesel and lubricate), contaminated plastic and steel pipework, tooling, tanks(tanks will be size reduced and nominally weighing less than 25 kg), agitators, bitumen tank top, approximately 1,400kg concrete/ rubble and associated soft waste, 8 x vacuum bags (close weave glass fibre bags) containing approximately 8kg each of concrete, plaster and paint dust. Vacuum bags weight 115g when empty.

Changes since waste generated: -

Bulk density (t/m³): = 1.1

Comment on density: -

CHEMICAL COMPOSITION

General description and components (%wt): Metal (82%), Concrete / rubble (4%), Plastic pipework from active drains system (2%), Rubber (1%) other organic including sludge and silt (10%), others (1%)

Chemical state: -

Sheet metal proportion / thickness: -

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	~ 11.4	Tanks, pipework and agitators	
Other ferrous metals.....	~ 71.2	Tanks, pipework and agitators	
Iron.....	-	-	
Aluminium.....	-	-	
Beryllium.....	-	-	
Cobalt.....	-	-	
Copper.....	-	-	
Lead.....	TR	10kg of paint dust containing 1% (0.1kg of lead) .	
Magnox/Magnesium.....	-	-	
Nickel.....	-	-	
Titanium.....	-	-	
Uranium.....	-	-	
Zinc.....	-	-	
Zircaloy/Zirconium.....	-	-	
Other metals.....	-	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	0	-	
Paper, cotton.....	-	-	
Wood.....	-	-	
Halogenated plastics.....	= 0.32	Plastic pipework, agitator, sheeting	
Total non-halogenated plastics.....	0.32	-	
Condensation polymers.....	-	-	
Others.....	~ 0.32	Soft waste, PPE, visqueen	
Organic ion exchange materials.....	-	-	
Total rubber.....	0	-	
Halogenated rubber.....	-	-	
Non-halogenated rubber.....	-	-	
Hydrocarbons.....	-	-	
Oil or grease.....	= 0.44	Lubricating oil (0.41%), Mineral oil (0.03%)	
Fuel.....	-	-	
Asphalt/Tarmac (cont.coal tar).....	-	-	
Asphalt/Tarmac (no coal tar).....	-	-	
Bitumen.....	~ 1.4	Tank top cover	
Others.....	-	-	
Other organics.....	-	-	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	-	-	
Inorganic sludges and flocs.....	~ 9.7	Sludge/silt from de-planting operations	
Soil.....	-	-	
Brick/Stone/Rubble.....	= 4.0	-	
Cementitious material.....	-	-	
Sand.....	-	-	
Glass/Ceramics.....	= 0.43	MMMF - Contaminated material, gratings, cements, insulation covers.	
Graphite.....	-	-	
Desiccants/Catalysts.....	-	-	
Asbestos.....	= 0.43	-	
Non/low friable.....	= 0.43	Asbestos contaminated material, gratings, cements, insulation covers. Equal portions of white, brown and blue asbestos assumed.	
Moderately friable.....	= 0		
Highly friable.....	= 0		
Free aqueous liquids.....	-		
Free non-aqueous liquids.....	-	-	
Powder/Ash.....	~ 0.15	Concrete dust (0.08%), plaster dust (0.04%), paint dust (0.03%)	

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

Inorganic anions (%wt):

	(%wt)	Type(s) and comment
Fluoride.....	-	-
Chloride.....	-	-
Iodide.....	-	-
Cyanide.....	-	-
Carbonate.....	-	-
Nitrate.....	-	-
Nitrite.....	-	-
Phosphate.....	-	-
Sulphate.....	-	-
Sulphide.....	-	-

Materials of interest for waste acceptance criteria:

	(%wt)	Type(s) and comment
Combustible metals.....	0	-
Low flash point liquids.....		-
Explosive materials.....		-
Phosphorus.....		-
Hydrides.....		-
Biological etc. materials.....		-
Biodegradable materials.....		-
Putrescible wastes.....		-
Non-putrescible wastes.....		-
Corrosive materials.....		-
Pyrophoric materials.....		-
Generating toxic gases.....		-
Reacting with water.....		-
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.....	= 0.08	-
DPTA.....		-
NTA.....		-
Polycarboxylic acids.....		-
Other organic complexants.....		Decon-90
Total complexing agents.....	= 0.08	-

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	Off-site	= 12.8
Decay storage		
Low force compaction		
Supercompaction (HFC)		
Incineration		
Drying/dewatering/liquid separation	Off-site	= 30.3
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		= 56.9

Comments on planned treatments:

54.48% VLLW landfill disposal.

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)	2.4	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)	= 2.4 = 54.5	1.1 1.1	
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	= 12.8 = 30.3	0.40 1.4	
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:

13 02 08*, 17 02 03, 17 04 05

Opportunities for alternative disposal routing: No

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

RADIOACTIVITY

Source: -

Uncertainty: -

Measurement of radioactivities: -

Chemical form of radionuclides: H-3: -
C-14: -
Cl-36: -
Se-79: -
Tc-99: -
I-129: -
Ra: -
Th: -
U: -
Np: -
Pu: -

WASTE STREAM		9G121		Active Drains (Final Delay Tank)					
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			2.47E-04	C C 2	Gd 153				8
Be 10				8	Ho 163				8
C 14				8	Ho 166m				8
Na 22				8	Tm 170				8
Al 26				8	Tm 171				8
Cl 36				8	Lu 174				8
Ar 39				8	Lu 176				8
Ar 42				8	Hf 178n				8
K 40			1.10E-05	C C 2	Hf 182				8
Ca 41				8	Pt 193				8
Mn 53				8	Tl 204				8
Mn 54				8	Pb 205				8
Fe 55			1.15E-07	C C 2	Pb 210				8
Co 60			2.25E-07	C C 2	Bi 208				8
Ni 59				8	Bi 210m				8
Ni 63			5.84E-07	C C 2	Po 210				8
Zn 65				8	Ra 223				8
Se 79				8	Ra 225				8
Kr 81				8	Ra 226				8
Kr 85				8	Ra 228				8
Rb 87				8	Ac 227				8
Sr 90			3.45E-06	C C 2	Th 227				8
Zr 93				8	Th 228				8
Nb 91				8	Th 229				8
Nb 92				8	Th 230				8
Nb 93m				8	Th 232				8
Nb 94				8	Th 234			3.03E-09	C C 2
Mo 93				8	Pa 231				8
Tc 97				8	Pa 233				8
Tc 99				8	U 232				8
Ru 106				8	U 233				8
Pd 107				8	U 234			1.55E-09	C C 2
Ag 108m				8	U 235				8
Ag 110m				8	U 236				8
Cd 109				8	U 238			3.03E-09	C C 2
Cd 113m				8	Np 237				8
Sn 119m				8	Pu 236				8
Sn 121m				8	Pu 238			2.21E-06	C C 2
Sn 123				8	Pu 239			2.92E-06	C C 2
Sn 126				8	Pu 240			3.76E-06	C C 2
Sb 125				8	Pu 241			5.38E-05	C C 2
Sb 126				8	Pu 242				8
Te 125m				8	Am 241			9.95E-06	C C 2
Te 127m				8	Am 242m				8
I 129				8	Am 243				8
Cs 134				8	Cm 242				8
Cs 135				8	Cm 243			1.39E-07	C C 2
Cs 137			3.00E-05	C C 2	Cm 244			2.05E-06	C C 2
Ba 133				8	Cm 245				8
La 137				8	Cm 246				8
La 138				8	Cm 248				8
Ce 144				8	Cf 249				8
Pm 145				8	Cf 250				8
Pm 147			3.14E-07	C C 2	Cf 251				8
Sm 147				8	Cf 252				8
Sm 151				8	Unsp a				
Eu 152			9.43E-07	C C 2	Unsp b/g				
Eu 154				8	Total a	0	*	2.10E-05	*
Eu 155				8	Total b/g	0	*	3.47E-04	*

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