

WASTE STREAM	7A33	Radioactive Contaminated Land
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SITE AWE Aldermaston

SITE OWNER Ministry of Defence (MOD)

WASTE CUSTODIAN AWE plc

WASTE TYPE LLW

WASTE VOLUMES

	Reported (m ³)	OR	Conditioned (m ³)	Packaged (m ³)
Stocks:	At 1.4.2025 ~ 152.0			
Future arisings:	1.4.2025 - 31.3.2080 = 3802.0			
Total future arisings:	3802.0			
Total waste volume:	3954.0			

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

Comment on arising rates: Since the 2022 UK RWI AWE have consigned 17 of 58 skips of soil waste. This waste stream represents two waste types: a). existing stockpiled contaminated soil awaiting disposal and b). areas of known radioactive contaminated soil that will be encountered either during on-going redevelopment of the site or dealt with during the works to achieve the site end state.

Additional information on quantities: It is possible that a significant percentage of the predicted 3802m3 currently accounted, could be sentenced as OOS when full waste characterisation is undertaken, rather than the initial land quality hazard identification information currently available (further investigation required). Only a small percentage of the waste is contaminated with tritium.

Uncertainty factors on volumes: Stock (upper): x 2.00 Arisings (upper): x 30.00
Stock (lower): x 0.50 Arisings (lower): x 0.50

WASTE SOURCE Processes involved with the production, maintenance and decommissioning of the UK's nuclear deterrent.

PHYSICAL CHARACTERISTICS

General description: The waste is composed of soil from the decommissioning of AWE sites. Soils are sand and gravel (glacial fluvial deposits together with Clayey Flint gravel with made ground typically 1 to 2 metres deep)

Changes since waste generated: -

Bulk density (t/m³): = 1.6

Comment on density: This density quoted was calculated by AWE's Contaminated Land Technical Authority in 2019 and this has not changed for the 2022 UKRWI submission.

CHEMICAL COMPOSITION

General description and components (%wt): Chemicals present are those typically found in sand and gravel. Samples indicate that there are no metals, plastics or complexing agents or contamination above trigger levels of interest to Nuclear Waste Services.

Chemical state: Neutral

Sheet metal proportion / thickness: -

Metals and alloys (%wt):

	(%wt)	Type(s) / Grades(s) with proportions	% of total C14 activity
Stainless steel.....	= 0	-	
Other ferrous metals.....	= 0	-	
Iron.....	= 0	-	
Aluminium.....	= 0	-	
Beryllium.....	= 0	-	
Cobalt.....	= 0	-	
Copper.....	= 0	-	
Lead.....	TR	-	
Magnox/Magnesium.....	= 0	-	
Nickel.....	= 0	-	
Titanium.....	= 0	-	
Uranium.....	TR	Present as a contaminant only	
Zinc.....	TR	-	
Zircaloy/Zirconium.....	= 0	-	
Other metals.....	= 0	-	

Organics (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulotics.....	-	-	
Paper, cotton.....	-	-	
Wood.....	-	-	
Halogenated plastics.....	-	-	
Total non-halogenated plastics.....	-	-	
Condensation polymers.....	-	-	
Others.....	-	-	
Organic ion exchange materials.....	-	-	
Total rubber.....	-	-	
Halogenated rubber.....	-	-	
Non-halogenated rubber.....	-	-	
Hydrocarbons.....	-	-	
Oil or grease.....	-	-	
Fuel.....	-	-	
Asphalt/Tarmac (cont.coal tar).....	-	-	
Asphalt/Tarmac (no coal tar).....	-	-	
Bitumen.....	-	-	
Others.....	-	-	
Other organics.....	-	-	

Other materials (%wt):

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials.....	= 0	-	
Inorganic sludges and flocs.....	= 0	-	
Soil.....	= 100.0	-	
Brick/Stone/Rubble.....	NE	-	
Cementitious material.....	= 0	-	
Sand.....	= 0	-	
Glass/Ceramics.....	= 0	-	
Graphite.....	= 0	-	
Desiccants/Catalysts.....	= 0	-	
Asbestos.....	= 0	-	
Non/low friable.....	= 0	-	
Moderately friable.....	= 0	-	
Highly friable.....	= 0	-	
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.....	-	-
Chloride.....	-	-
Iodide.....	-	-
Cyanide.....	-	-
Carbonate.....	-	-
Nitrate.....	-	-
Nitrite.....	-	-
Phosphate.....	-	-
Sulphate.....	-	-
Sulphide.....	-	-

Materials of interest for waste acceptance criteria:

	(%wt)	Type(s) and comment
Combustible metals.....	-	-
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.....	NE	-
Chlorinated solvents.....	= 0	-
Formaldehyde.....	= 0	-
Organometallics.....	= 0	-
Phenol.....	NE	-
Styrene.....	= 0	-
Tri-butyl phosphate.....	NE	-
Other organophosphates.....	= 0	-
Vinyl chloride.....	NE	-
Arsenic.....	NE	-
Barium.....	= 0	-
Boron.....	NE	-
Boron (in Boral).....	NE	-
Boron (non-Boral).....	= 0	-
Cadmium.....	NE	-
Caesium.....	= 0	-
Selenium.....	NE	-
Chromium.....	NE	-
Molybdenum.....	NE	-
Thallium.....	= 0	-
Tin.....	NE	-
Vanadium.....	NE	-
Mercury compounds.....	= 0	-
Others.....	NE	-

Complexing agents (%wt):

No		
	(%wt)	Type(s) and comment
EDTA.....	= 0	-
DPTA.....	= 0	-
NTA.....	= 0	-
Polycarboxylic acids.....	= 0	-
Other organic complexants.....	= 0	Complexing agents are not present in the waste stream
Total complexing agents.....	= 0	-

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	Off-site	~ 100.0

Comments on planned treatments:

Analysis of this waste indicates that most is suitable for disposal at a LA-LLW Permitted Landfill.

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
-	-	-	-	-	-

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			
Expected to be consigned to a Landfill Facility	~ 99.0	~ 1.6	
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	~ 1.0	~ 1.6	

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: Radioactivity arises from contamination due to past operations from refining and processing plutonium and uranium.

Uncertainty: Activity measurements have been carried out on discreet samples taken as part of studies into particular areas on site. Hence, the results reflect a range depending on individual samples.

Measurement of radioactivities: Measurement has been performed using destructive analysis. Decay nuclides with a half-life of less than 3 months have been omitted.

Chemical form of radionuclides: H-3: Present in the waste stream as HTO (principally), HT and organically bound solid
C-14: Not present in Waste Stream
Cl-36: Not present in Waste Stream
Se-79: Not present in Waste Stream
Tc-99: Not present in Waste Stream
I-129: Not present in Waste Stream
Ra: Only daughter products present from uranium in this waste stream. Oxide form
Th: Only daughter products present from uranium in this waste stream. Oxide form
U: Present in this waste stream. Oxide form
Np: Np-237 present in waste stream as oxide form from daughter product of Am-241 alpha decay
Pu: Present in the waste stream in oxide form

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