WASTE STREAM 9F33 Ion Siv Unit Filters

SITE	Sizewell A
SITE OWNER	Nuclear Decommissioning Authority
WASTE CUSTODIAN	Magnox Limited
WASTE TYPE	ILW
Is the waste subject to Scottish Policy:	No

WASTE VOLUMES

		Reported
Stocks:	At 1.4.2022.....	0.4 m^3
Total future arisings:		0 m^3
Total waste volume:		0.4 m^3

Comment on volumes: Based on the latest data each filter is assessed at 0.054m3, with a density of 0.486te/m3. Therefore there are 7 spent filters in stock (7x0.054m3 = 0.378m3)

Uncertainty factors on volumes:

Stock (upper):	x 1.1	Arisings (upper)	x
Stock (lower):	x 0.9	Arisings (lower)	x

WASTE SOURCE Filtration of cooling pond water.

PHYSICAL CHARACTERISTICS

General description:	Spent filters that form part of the submersible caesium removal unit. The size of the filters will not influence the choice of treatment process or disposal container.
Physical components (%wt):	pre and post filters (100%).
Sealed sources:	The waste does not contain sealed sources.
Bulk density (t/m^3):	~0.49
Comment on density:	-

CHEMICAL COMPOSITION

General description and components (%wt): The waste is spent pre and post filters, which are composed principally of stainless steel supports with stainless steel filter media and some organic materials. Filters will typically hold a minimal volume of sludge. Stainless steel (~92%), sludge (<8%) and EPDM seal material (<1%). (EPDM is ethylene diene terpolymer).

Chemical state: Neutral

Chemical form of radionuclides:
H-3: Any tritium is likely to be present as water.
C-14: The carbon 14 content is insignificant.
Cl-36: The chlorine 36 content is insignificant.
Se-79: The selenium content is insignificant.
Tc-99: The technetium content is insignificant.
Ra: The radium isotope content is insignificant.
Th: The thorium isotope content is insignificant.
U: The uranium isotope content is insignificant.
Np: The neptunium isotope content is insignificant.
Pu: The chemical form of plutonium isotopes may be plutonium oxides.

Metals and alloys (%wt): -

	(%wt)	Type(s) / Grade(s) with proportions	% of total C14 activity
Stainless steel.....	~92.0		
Other ferrous metals.....	NE		
Iron.....			
Aluminium.....	NE		
Beryllium.....	TR		
Cobalt.....			
Copper.....	NE		

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Lead	NE
Magnox/Magnesium	NE
Nickel	
Titanium	
Uranium	
Zinc	NE
Zircaloy/Zirconium	NE
Other metals	

Organics (%wt): EPDM seal material (<1%wt) is present. Halogenated plastics and rubbers are not expected in the waste.

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulosics	0		
Paper, cotton	0		
Wood	0		
Halogenated plastics	0		
Total non-halogenated plastics	0		
Condensation polymers	0		
Others	0		
Organic ion exchange materials	0		
Total rubber	<1.0		
Halogenated rubber	0		
Non-halogenated rubber	<1.0	EPDM seal material	
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	0		
Inorganic sludges and flocs	~8.0		
Soil	0		
Brick/Stone/Rubble	0		
Cementitious material	0		
Sand			
Glass/Ceramics	0		
Graphite	0		
Desiccants/Catalysts			
Asbestos	0		

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Non/low friable.....	
Moderately friable.....	
Highly friable.....	
Free aqueous liquids.....	NE
Free non-aqueous liquids.....	0
Powder/Ash.....	0

Inorganic anions (%wt): The inorganic anion content of the waste has not been assessed.

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

Materials of interest for waste acceptance criteria: Free water may be associated with any retained IONSIV material.

	(%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: If any, present in trace quantities only.

	(%wt)	Type(s) and comment
Acrylamide.....		
Benzene.....		

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Chlorinated solvents.....	
Formaldehyde.....	
Organometallics.....	
Phenol.....	
Styrene.....	
Tri-butyl phosphate.....	
Other organophosphates.....	
Vinyl chloride.....	
Arsenic.....	
Barium.....	
Boron.....	0
Boron (in Boral).....	
Boron (non-Boral).....	
Cadmium.....	
Caesium.....	
Selenium.....	
Chromium.....	
Molybdenum.....	
Thallium.....	
Tin.....	
Vanadium.....	
Mercury compounds.....	
Others.....	
Electronic Electrical Equipment (EEE)	
EEE Type 1.....	
EEE Type 2.....	
EEE Type 3.....	
EEE Type 4.....	
EEE Type 5.....	

Complexing agents (%wt):

	(%wt)	Type(s) and comment
EDTA.....		
DPTA.....		
NTA.....		
Polycarboxylic acids…….		
Other organic complexants.....		
Total complexing agents.....	NE	

Potential for the waste to contain discrete items: Yes. Stainless Steel so DI by definition.

PACKAGING AND CONDITIONING

Conditioning method: The waste is not expected to be encapsulated for disposal. The waste will be dried for passivation and possibly super-compacted to reduce volume in DCIC.

Plant Name: AVDS

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Location:	Sizewell A
Plant startup date:	-
Total capacity (m^3/y incoming waste):	-
Target start date for packaging this stream:	-
Throughput for this stream (m^3/y incoming waste):	-
Other information:	It is possible that waste filters will be supercompacted prior to drying into DCICs

Likely container type:

Container	Waste packaged (%vol)	Waste loading (m^3)	Payload (m^3)	Number of packages
3m^3 RS box	100.0	2.5	2.5	< 1

Likely container type comment:	-
Range in container waste volume:	-
Other information on containers:	The DCIC material is expected to be ductile cast iron.
Likely conditioning matrix:	Not specified
Other information:	-
Conditioned density (t/m^3):	~0.49
Conditioned density comment:	-
Other information on conditioning:	-
Opportunities for alternative disposal routing:	-

Baseline Management Route	Opportunity Management Route	Stream volume (%)	Estimated Date that Opportunity will be realised	Opportunity Confidence	Comment
-	-	-	-	-	-

RADIOACTIVITY

Source:	Contamination sludge. Contamination by fission products, actinides and activation products.
Uncertainty:	Specific activity is a function of Station operating history. The values quoted are those provided by radiochemical analysis.
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:	Specific activitiy has been calculated for each individual filter and average across the entire inventory to identify the ILW route.
Other information:	-

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Nuclide	Mean radioactivity, TBq/m³ Waste at 1.4.2022	Bands and Code	Future arisings	Bands and Code	Nuclide	Mean radioactivity, TBq/m³ Waste at 1.4.2022	Bands and Code	Future arisings	Bands and Code
H 3	1.76E-04	C C 1			Gd 153		8		
Be 10		8			Ho 163		8		
C 14	5.01E-05	C C 1			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				
K 40		8			Hf 182		8		
Ca 41		8			Pt 193		8		
Mn 53		8			Tl 204		8		
Mn 54		8			Pb 205		8		
Fe 55	1.36E-05	C C 1			Pb 210		8		
Co 60	1.98E-05	C C 1			Bi 208		8		
Ni 59		8			Bi 210m		8		
Ni 63	6.25E-05	C C 1			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	2.16E-02	C C 1			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		8		
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	2.25E-09	C C 1		
Ag 108m		8			U 235		8		
Ag 110m		8			U 236		8		
Cd 109		8			U 238		8		
Cd 113m		8			Np 237		8		
Sn 119m		8			Pu 236		8		
Sn 121m		8			Pu 238	1.30E-04	C C 1		
Sn 123		8			Pu 239	1.25E-04	C C 1		
Sn 126		8			Pu 240	1.25E-04	C C 1		
Sb 125		8			Pu 241	4.23E-03	C C 1		
Sb 126		8			Pu 242		8		
Te 125m		8			Am 241	2.09E-04	C C 1		
Te 127m		8			Am 242m		8		
I 129		8			Am 243		8		
Cs 134	3.38E-05	C C 1			Cm 242		8		
Cs 135		8			Cm 243	1.89E-06	C C 1		
Cs 137	3.76E-02	C C 1			Cm 244	1.73E-06	C C 1		
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	1.05E-05	C C 1			Cf 251		8		
Sm 147		8			Cf 252		8		
Sm 151	1.97E-05	C C 1			Other a				
Eu 152		8			Other b/g				
Eu 154	1.19E-05	C C 1			**Total a**	**5.92E-04**	**C C 1**	**0**	
Eu 155	1.75E-06	C C 1			**Total b/g**	**6.38E-02**	**C C 1**	**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 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