

WASTE STREAM	5C45/C	Encapsulated GLEEP Fuel
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Nickel.....
Titanium.....
Uranium..... 97.5
Zinc..... 0
Zircaloy/Zirconium..... 0
Other metals..... 0

Organics (%wt): -

	(%wt)	Type(s) and comment	% of total C14 activity
Total cellulose.....	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.....	0		
Halogenated rubber	0		
Non-halogenated rubber.....	0		
Hydrocarbons.....			
Oil or grease			
Fuel.....			
Asphalt/Tarmac (cont.coal tar)...			
Asphalt/Tarmac (no coal tar)....			
Bitumen.....			
Others.....			
Other organics.....	0		

Other materials (%wt): -

	(%wt)	Type(s) and comment	% of total C14 activity
Inorganic ion exchange materials..	0		
Inorganic sludges and flocs.....	0		
Soil.....	0		
Brick/Stone/Rubble.....	0		
Cementitious material.....	0		
Sand.....			
Glass/Ceramics.....	0		
Graphite.....	0.01		
Desiccants/Catalysts.....			
Asbestos.....	0		
Non/low friable.....			
Moderately friable.....			

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Highly friable.....
 Free aqueous liquids..... 0
 Free non-aqueous liquids..... 0
 Powder/Ash..... 0

Inorganic anions (%wt): -

	(%wt)	Type(s) and comment
Fluoride.....	0	
Chloride.....	0	
Iodide.....	0	
Cyanide.....	0	
Carbonate.....	0	
Nitrate.....	0	
Nitrite.....	0	
Phosphate.....	0	
Sulphate.....	0	
Sulphide.....	0	

Materials of interest for waste acceptance criteria: Combustible metals comprise uranium.

	(%wt)	Type(s) and comment
Combustible metals.....	97.5	
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: None expected

	(%wt)	Type(s) and comment
Acrylamide.....		
Benzene.....		
Chlorinated solvents.....		
Formaldehyde.....		

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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): No

(%wt) Type(s) and comment

EDTA.....
 DPTA.....
 NTA.....
 Polycarboxylic acids.....
 Other organic complexants.....
 Total complexing agents..... 0

Potential for the waste to contain discrete items: Yes. Grouted drums are considered DI

PACKAGING AND CONDITIONING

Container type:	Container	Waste packaged (%vol)	Waste loading (m ³)	Payload (m ³)	Number of packages
	500 l drum (pre-cast annular)	100.0	0.4	0.4	38

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Container type comment:	-
Range in container waste volume:	Expect minimal variation.
Other information on containers:	316L Stainless Steel with cement annulus
Conditioned density (t/m ³):	3.2
Conditioned density comment:	The volume and mass of waste per package are 0.04 m ³ and 0.668 t. The volume and mass of polymer/grout per package are 0.36 m ³ and 0.52 t.
Other information on conditioning:	-

RADIOACTIVITY

Source:	Fission products from fuel. The fissile material content per package is 4600.5 g U235, 0.9 g Pu239.
Uncertainty:	-
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:	The radionuclide data has been derived from FISPIN. The data represents the average activity of an element and has been derived by multiplying the data by the total number of elements (~11,500).
Other information:	Short-lived daughter products are not included in total alpha and total beta/gamma specific activities.

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Nuclide	Mean radioactivity, TBq/m ³				Nuclide	Mean radioactivity, TBq/m ³			
	Waste at 1.4.2022	Bands and Code	Future arisings	Bands and Code		Waste at 1.4.2022	Bands and Code	Future arisings	Bands and Code
H 3	4.39E-05	BB 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		8			Hf 182		8		
Ca 41		8			Pt 193		8		
Mn 53		8			Tl 204		8		
Mn 54		8			Pb 205		8		
Fe 55		8			Pb 210		8		
Co 60		8			Bi 208		8		
Ni 59		8			Bi 210m		8		
Ni 63		8			Po 210		8		
Zn 65		8			Ra 223	5.27E-07	BB 2		
Se 79	5.36E-07	BB 2			Ra 225		8		
Kr 81		8			Ra 226		8		
Kr 85	1.15E-03	BB 2			Ra 228		8		
Rb 87		8			Ac 227	5.29E-07	BB 2		
Sr 90	5.38E-02	BB 2			Th 227	5.21E-07	BB 2		
Zr 93	5.74E-06	BB 2			Th 228		8		
Nb 91		8			Th 229		8		
Nb 92		8			Th 230	2.07E-10	BB 2		
Nb 93m	1.23E-05	BB 2			Th 232		8		
Nb 94		8			Th 234	1.61E-02	BB 2		
Mo 93		8			Pa 231	9.74E-07	BB 2		
Tc 97		8			Pa 233	1.17E-07	BB 2		
Tc 99	2.43E-05	BB 2			U 232		8		
Ru 106		8			U 233		8		
Pd 107		8			U 234	2.15E-06	BB 2		
Ag 108m		8			U 235	7.42E-04	BB 2		
Ag 110m		8			U 236	6.22E-07	BB 2		
Cd 109		8			U 238	1.61E-02	BB 2		
Cd 113m	1.16E-06	BB 2			Np 237	1.17E-07	BB 2		
Sn 119m		8			Pu 236		8		
Sn 121m	1.22E-05	BB 2			Pu 238	9.7E-08	BB 2		
Sn 123		8			Pu 239	4.09E-03	BB 2		
Sn 126	4.37E-05	BB 2			Pu 240	1.58E-06	BB 2		
Sb 125	5.62E-09	BB 2			Pu 241		8		
Sb 126	6.11E-06	BB 2			Pu 242		8		
Te 125m	1.41E-09	BB 2			Am 241		8		
Te 127m		8			Am 242m		8		
I 129		8			Am 243		8		
Cs 134	1.07E-10	BB 2			Cm 242		8		
Cs 135	1.85E-06	BB 2			Cm 243		8		
Cs 137	5.96E-02	BB 2			Cm 244		8		
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	2.03E-05	BB 2			Cf 251		8		
Sm 147		8			Cf 252		8		
Sm 151	2.99E-03	BB 2			Other a				
Eu 152	3.39E-07	BB 2			Other b/g				
Eu 154	5.92E-08	BB 2			Total a	2.09E-02	BB 2	0	
Eu 155	1.73E-05	BB 2			Total b/g	1.34E-01	BB 2	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