WASTE STREAM 9C44 Fuel Skips in Pond

SITE	Dungeness A
SITE OWNER	Nuclear Decommissioning Authority
WASTE CUSTODIAN	Magnox Limited
WASTE TYPE	ILW

WASTE VOLUMES

		Reported
Stocks:	At 1.4.2019.....	71.2 m³
Total future arisings:		0 m³
Total waste volume:		71.2 m³

Comment on volumes: Volumes are based on the number of skips and their dimensions assuming 1.397m3 per skip (51off)

Uncertainty factors on volumes:

Stock (upper):	x 1.2	Arisings (upper)	x
Stock (lower):	x 0.8	Arisings (lower)	x

WASTE SOURCE Contamination from pond and plant operations.

PHYSICAL CHARACTERISTICS

General description: 51 skips with a raw volume of 1.397m3 each which give a total raw volume of 71.247m3. The waste is contaminated skips. Waste has been size reduced underwater and is currently located in 35 baskets.

Physical components (%vol): Pond skips are made of mild steel and are coated in UPC paint.

Sealed sources: -

Bulk density (t/m³): ~0.3

Comment on density: This has been calculated based on a skip weight of 425kg.

CHEMICAL COMPOSITION

General description and components (%wt): Steel and small amount of UPC paint. Fission products, actinides and other activation products will be present as contaminants.

Chemical state: Neutral

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

Metals and alloys (%wt): The long skips present have dimensions of 1.357 m x 1 m x 1.029 m. and constructed from 3.2 mm 10 gauge steel plate. The short pond skips present have dimensions of 1.17 m x 0.47 m x 0.68 m

Stainless steel.....	0	
Other ferrous metals.....	~99.0	Constructed from 3.2 mm 10 gauge steel plate.
Iron.....		
Aluminium.....	0	
Beryllium.....		
Cobalt.....		
Copper.....	0	
Lead.....	0	
Magnox/Magnesium.....	0	
Nickel.....		
Titanium.....		
Uranium.....		
Zinc.....	0	
Zircaloy/Zirconium.....	0	

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	Other metals	0
Organics (%wt):	The paint coating from the skip	
	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	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	<1.0
Other materials (%wt):	-	
	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
	Desiccants/Catalysts	
	Asbestos	0
	Non/low friable	
	Moderately friable	
	Highly friable	
	Free aqueous liquids	0
	Free non-aqueous liquids	0
	Powder/Ash	0
Inorganic anions (%wt):	-	

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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: No materials likely to pose a fire or other non-radiological hazard have been identified.

Combustible metals	0
Low flash point liquids	0
Explosive materials	0
Phosphorus	0
Hydrides	0
Biological etc. materials	0
Biodegradable materials	
Putrescible wastes	0
Non-putrescible wastes	
Corrosive materials	0
Pyrophoric materials	0
Generating toxic gases	0
Reacting with water	0
Active particles	
Soluble solids as bulk chemical compounds	

Hazardous substances / non hazardous pollutants: -

Acrylamide	
Benzene	
Chlorinated solvents	
Formaldehyde	
Organometallics	
Phenol	
Styrene	
Tri-butyl phosphate	
Other organophosphates	
Vinyl chloride	
Arsenic	
Barium	
Boron	

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):

EDTA.....

DPTA.....

NTA.....

Polycarboxylic acids……

Other organic complexants.....

Total complexing agents..... NE

PACKAGING AND CONDITIONING

Conditioning method: This waste has been size reduced at the site of origin into 35 baskets and will be transferred to Hinkley Point A for packaging and storage.

Plant Name: -

Location: Hinkley Point 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: Waste will be co-disposed with 9E61 from Oldbury.

Likely container type:

Container	Waste packaged (%vol)	Waste loading (m^3)	Payload (m^3)	Number of packages
6m^3 concrete box (SD)	100.0	5.94	5.8	12

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Likely container type comment:	It is assumed that there will be 3 baskets per 6m3 box along with one basket from Oldbury stream 9E61 (Waste will be co-disposed).
Range in container waste volume:	-
Other information on containers:	-
Likely conditioning matrix:	
Other information:	-
Conditioned density (t/m³):	-
Conditioned density comment:	-
Other information on conditioning:	-
Opportunities for alternative disposal routing:	

Treatment	Stream volume (%)	Comment
-	-	-

RADIOACTIVITY

Source:	Contamination from pond operations and plant operation.
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:	Skip activities are based upon measurement of Hinkley Point A fuel skips.
Other information:	-

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Nuclide	Mean radioactivity, TBq/m³ Waste at 1.4.2019	Bands and Code	Future arisings	Bands and Code	Nuclide	Mean radioactivity, TBq/m³ Waste at 1.4.2019	Bands and Code	Future arisings	Bands and Code
H 3	7.15E-05	C C 2			Gd 153		8		
Be 10		8			Ho 163		8		
C 14	3.01E-05	C C 2			Ho 166m		8		
Na 22		8			Tm 170		8		
Al 26		8			Tm 171		8		
Cl 36	1.03E-07	C C 2			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	5.58E-09	C C 2			Pb 205		8		
Fe 55	3.64E-06	C C 2			Pb 210		8		
Co 60	9.67E-06	C C 2			Bi 208		8		
Ni 59		8			Bi 210m		8		
Ni 63	5.84E-06	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	1.26E-02	C C 2			Th 227		8		
Zr 93		8			Th 228	6.59E-08	C C 2		
Nb 91		8			Th 229		8		
Nb 92		8			Th 230		8		
Nb 93m		8			Th 232		8		
Nb 94		8			Th 234	1.55E-07	C C 2		
Mo 93		8			Pa 231		8		
Tc 97		8			Pa 233		8		
Tc 99	3.23E-06	C C 2			U 232	7.29E-08	C C 2		
Ru 106	2.33E-07	C C 2			U 233		8		
Pd 107		8			U 234	1.57E-07	C C 2		
Ag 108m		8			U 235		8		
Ag 110m		8			U 236		8		
Cd 109		8			U 238	1.55E-07	C C 2		
Cd 113m		8			Np 237		8		
Sn 119m		8			Pu 236		8		
Sn 121m		8			Pu 238	8.40E-05	C C 2		
Sn 123		8			Pu 239	5.26E-05	C C 2		
Sn 126		8			Pu 240	6.47E-05	C C 2		
Sb 125	1.8E-06	C C 2			Pu 241	3.07E-03	C C 2		
Sb 126		8			Pu 242	5.17E-08	C C 2		
Te 125m	4.51E-07	C C 2			Am 241	4.89E-04	C C 2		
Te 127m		8			Am 242m		8		
I 129		8			Am 243		8		
Cs 134	3.90E-06	C C 2			Cm 242		8		
Cs 135		8			Cm 243	8.97E-08	C C 2		
Cs 137	5.28E-03	C C 2			Cm 244	2.07E-06	C C 2		
Ba 133		8			Cm 245		8		
La 137		8			Cm 246		8		
La 138		8			Cm 248		8		
Ce 144	3.25E-08	C C 2			Cf 249		8		
Pm 145		8			Cf 250		8		
Pm 147	2.01E-05	C C 2			Cf 251		8		
Sm 147		8			Cf 252		8		
Sm 151	6.13E-05	C C 2			Other a				
Eu 152	7.02E-07	C C 2			Other b/g	4.25E-09	C C 2		
Eu 154	2.20E-05	C C 2			**Total a**	**6.93E-04**	**C C 2**	**0**	
Eu 155	6.06E-06	C C 2			**Total b/g**	**2.12E-02**	**C C 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