

**WASTE STREAM****9D48****Miscellaneous Contaminated Items**

**SITE** Hinkley Point A  
**SITE OWNER** Nuclear Decommissioning Authority

**WASTE CUSTODIAN** Magnox Limited

**WASTE TYPE** LLW

Is the waste subject to Scottish Policy: No

**WASTE VOLUMES**

|                        |                  |                    |
|------------------------|------------------|--------------------|
|                        |                  | Reported           |
| Stocks:                | At 1.4.2022..... | 6.7 m <sup>3</sup> |
| Total future arisings: |                  | 0 m <sup>3</sup>   |
| Total waste volume:    |                  | 6.7 m <sup>3</sup> |

Comment on volumes: There will be no further arisings of this waste stream.

|                                 |                |       |                  |   |
|---------------------------------|----------------|-------|------------------|---|
| Uncertainty factors on volumes: | Stock (upper): | x 1.1 | Arisings (upper) | x |
|                                 | Stock (lower): | x 0.5 | Arisings (lower) | x |

**WASTE SOURCE** The waste results from scrapping of a sand pressure filter from the sludge canning building.

**PHYSICAL CHARACTERISTICS**

General description: The waste is a scrapped sand pressure filter held in a transportable concrete cell/shield box. The filter cell measures 3.5 m x 3.5 m x 4.5 m and weighs 20 t including the filter.

Physical components (%wt): Redundant sand pressure filter in concrete cell (100% vol). Other Ferrous Metals (~50%wt) Rubble (~20%wt) Glass (~2%wt) Rubber (~3%wt) Other Organics (~ 20%wt) Paper (~5%wt).

Sealed sources: The waste does not contain sealed sources.

Bulk density (t/m<sup>3</sup>): ~1

Comment on density: The assumption of 1 t/m<sup>3</sup> as the average bulk density may be subject to revision.

**CHEMICAL COMPOSITION**

General description and components (%wt): The waste is principally steel and concrete, percentage breakdown is not assessed. The filter sand is accounted for in stream 9D32. Fission products, actinides and other activation products will be present as contaminants.

Chemical state: Neutral

Chemical form of radionuclides: H-3: The chemical form of tritium has not been assessed.  
 C-14: The chemical form of carbon 14 has not been assessed.  
 Cl-36: The chemical form of chlorine 36 has not been assessed.  
 Se-79: The chemical form of selenium has not been determined.  
 Tc-99: The chemical form of technetium has not been determined.  
 Ra: Radium isotopes content is insignificant.  
 Th: The thorium content is insignificant.  
 U: The chemical form of uranium isotopes has not been determined but may be uranium oxides.  
 Np: The chemical form of neptunium has not been determined.  
 Pu: The chemical form of plutonium isotopes has not been determined but may be plutonium oxides.

Metals and alloys (%wt): The waste is predominantly a bulk metal item contained in a concrete cell. Dimensions are 3.5m x 3.5m x 4.5m.

|                           | (%wt) | Type(s) / Grade(s) with proportions                | % of total C14 activity |
|---------------------------|-------|--|-------------------------|
| Stainless steel.....      | NE    |  |                         |
| Other ferrous metals..... | ~50.0 | The metals are mainly carbon and low alloy steels. |                         |
| Iron.....                 |       |  |                         |
| Aluminium.....            | NE    |  |                         |
| Beryllium.....            | NE    |  |                         |

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|                         |    |                     |
|-------------------------|----|---------------------|
| Cobalt.....             |    |                     |
| Copper.....             | NE |                     |
| Lead.....               | NE |                     |
| Magnox/Magnesium.....   | NE |                     |
| Nickel.....             |    |                     |
| Titanium.....           |    |                     |
| Uranium.....            |    |                     |
| Zinc.....               | NE |                     |
| Zircaloy/Zirconium..... | NE |                     |
| Other metals.....       | NE | Not fully assessed. |

Organics (%wt):                      There may be traces of oil and grease. Halogenated plastics and rubbers are not anticipated.

|                                     | (%wt) | Type(s) and comment | % of total C14 activity |
|-------------------------------------|-------|---------------------|-------------------------|
| Total cellulose.....                | ~5.0  |                     |                         |
| Paper, cotton.....                  | ~5.0  |                     |                         |
| Wood.....                           | 0     |                     |                         |
| Halogenated plastics .....          | 0     |                     |                         |
| Total non-halogenated plastics..... | 0     |                     |                         |
| Condensation polymers.....          | 0     |                     |                         |
| Others.....                         | 0     |                     |                         |
| Organic ion exchange materials....  | 0     |                     |                         |
| Total rubber.....                   | ~3.0  |                     |                         |
| Halogenated rubber .....            | NE    |                     |                         |
| Non-halogenated rubber.....         | ~3.0  |                     |                         |
| Hydrocarbons.....                   |       |                     |                         |
| Oil or grease .....                 |       |                     |                         |
| Fuel.....                           |       |                     |                         |
| Asphalt/Tarmac (cont.coal tar)...   |       |                     |                         |
| Asphalt/Tarmac (no coal tar)....    |       |                     |                         |
| Bitumen.....                        |       |                     |                         |
| Others.....                         |       |                     |                         |
| Other organics.....                 | ~20.0 |                     |                         |

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.....            | ~20.0 |                     |                         |
| Cementitious material.....         |       |                     |                         |
| Sand.....                          | NE    |                     |                         |
| Glass/Ceramics.....                | ~2.0  |                     |                         |
| Graphite.....                      | 0     |                     |                         |

|                     |             |   |
|---------------------|-------------|---|
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|---------------------|-------------|---|

|                               |   |
|-------------------------------|---|
| Desiccants/Catalysts.....     |   |
| Asbestos.....                 | 0 |
| Non/low friable.....          |   |
| Moderately friable.....       |   |
| Highly friable.....           |   |
| Free aqueous liquids.....     | 0 |
| Free non-aqueous liquids..... | 0 |
| Powder/Ash.....               | P |

Inorganic anions (%wt):      Not fully assessed.

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

Materials of interest for waste acceptance criteria:      No materials likely to pose a fire or other non-radiological hazard have been identified.

|  | (%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..... |       |                     |

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Hazardous substances /  
non hazardous pollutants: -

|                                       | (%wt) | Type(s) and comment |
|---------------------------------------|-------|---------------------|
| Acrylamide.....                       |       |                     |
| Benzene.....                          |       |                     |
| 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): Yes

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

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Potential for the waste to contain discrete items:

No. In &amp; of itself not a DI; waste stream may include DIs (notably any stainless steel components)

**TREATMENT, PACKAGING AND DISPOSAL**

Planned on-site / off-site treatment(s):

| Treatment  | On-site / Off site | Stream volume % |
|--|--------------------|-----------------|
| Low force compaction<br>Supercompaction (HFC)<br>Incineration<br>Solidification<br>Decontamination<br>Metal treatment<br>Size reduction<br>Decay storage<br>Recycling / reuse<br>Other / various<br>None |                    | 100.0           |

Comment on planned treatments:

-

**Disposal Routes:**

| Disposal Route  | Stream volume % | Disposal density t/m3 |
|---|-----------------|-----------------------|
| Expected to be consigned to the LLW Repository<br>Expected to be consigned to a Landfill Facility<br>Expected to be consigned to an On-Site Disposal Facility<br>Expected to be consigned to an Incineration Facility<br>Expected to be consigned to a Metal Treatment Facility<br>Expected to be consigned as Out of Scope<br>Expected to be recycled / reused<br>Disposal route not known | 100.0           | 1.0                   |

Classification codes for waste expected to be consigned to a landfill facility:

-

**Upcoming (2022/23-2024/25) Waste Routing (if expected to change from above):**

| Disposal Route  | Stream volume % |         |         |
|---|-----------------|---------|---------|
|   | 2022/23         | 2023/24 | 2024/25 |
| Expected to be consigned to the LLW Repository<br>Expected to be consigned to a Landfill Facility<br>Expected to be consigned to an On-Site Disposal Facility<br>Expected to be consigned to an Incineration Facility<br>Expected to be consigned to a Metal Treatment Facility<br>Expected to be consigned as Out of Scope<br>Expected to be recycled / reused<br>Disposal route not known |                 |         |         |

**Opportunities for alternative disposal routing:**

-

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

**Waste Packaging for Disposal:**

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| Container  | Stream volume % | Waste loading m <sup>3</sup> | Number of packages |
|--|-----------------|------------------------------|--------------------|
| 1/3 Height IP-1 ISO<br>2/3 Height IP-2 ISO<br>1/2 Height WAMAC IP-2 ISO<br>1/2 Height IP-2 Disposal/Re-usable ISO<br>2m box (no shielding)<br>4m box (no shielding)<br>Other | 100.0           | 10                           | < 1                |

Other information: Data have been presented as though the waste will be in dedicated containers. It is likely that this waste will be placed in containers with other LLW.

**Waste Planned for Disposal at the LLW Repository:**

Container voidage: The waste is expected to be grouted in the disposal. Inaccessible voidage is not expected.

Waste Characterisation Form (WCH): The waste meets the LLWR's Waste Acceptance Criteria (WAC). The waste does not have a current WCH.

Waste consigned for disposal to LLWR in year of generation: No. Waste will be disposed when plant is decommissioned

**Non-Containerised Waste for In-Vault Grouting:** (Not applicable to this waste stream)

Stream volume (%): -

Waste stream variation: -

Bounding cuboidal volume:

Inaccessible voidage: Inaccessible voidage is not expected.

Other information: -

**RADIOACTIVITY**

Source: Contamination from the filtration of fuel pond water.

Uncertainty: The values quoted are indicative of the activities that might be expected.

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: Indicative estimate.

Other information: Specific activity is a function of Station operating history.

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| Nuclide | Mean radioactivity, TBq/m <sup>3</sup> |                |                 |                | Nuclide          | Mean radioactivity, TBq/m <sup>3</sup> |                |                 |                |
|---------|--|----------------|-----------------|----------------|------------------|--|----------------|-----------------|----------------|
|         | 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     | 8.63E-05                               | CD 2           |                 |                | Gd 153           |  | 8              |                 |                |
| Be 10   |  | 8              |                 |                | Ho 163           |  | 8              |                 |                |
| C 14    | 9.99E-07                               | CD 2           |                 |                | Ho 166m          |  | 8              |                 |                |
| Na 22   |  | 8              |                 |                | Tm 170           |  | 8              |                 |                |
| Al 26   |  | 8              |                 |                | Tm 171           |  | 8              |                 |                |
| Cl 36   | 8E-05                                  | CD 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   |  | 8              |                 |                | Pb 205           |  | 8              |                 |                |
| Fe 55   | 2.19E-07                               | CD 2           |                 |                | Pb 210           |  | 8              |                 |                |
| Co 60   | 4.19E-06                               | CD 2           |                 |                | Bi 208           |  | 8              |                 |                |
| Ni 59   | 1E-07                                  | CD 2           |                 |                | Bi 210m          |  | 8              |                 |                |
| Ni 63   | 8.10E-06                               | CD 2           |                 |                | Po 210           |  | 8              |                 |                |
| Zn 65   |  | 8              |                 |                | Ra 223           |  | 8              |                 |                |
| Se 79   | 1.21E-09                               | CD 2           |                 |                | Ra 225           |  | 8              |                 |                |
| Kr 81   |  | 8              |                 |                | Ra 226           |  | 8              |                 |                |
| Kr 85   |  | 8              |                 |                | Ra 228           |  | 8              |                 |                |
| Rb 87   |  | 8              |                 |                | Ac 227           |  | 8              |                 |                |
| Sr 90   | 4.89E-04                               | CD 2           |                 |                | Th 227           |  | 8              |                 |                |
| Zr 93   | 6E-08                                  | CD 2           |                 |                | Th 228           |  | 8              |                 |                |
| Nb 91   |  | 8              |                 |                | Th 229           |  | 8              |                 |                |
| Nb 92   |  | 8              |                 |                | Th 230           |  | 8              |                 |                |
| Nb 93m  | 3.32E-08                               | CD 2           |                 |                | Th 232           |  | 8              |                 |                |
| Nb 94   |  | 8              |                 |                | Th 234           | 3E-08                                  | CD 2           |                 |                |
| Mo 93   |  | 8              |                 |                | Pa 231           |  | 8              |                 |                |
| Tc 97   |  | 8              |                 |                | Pa 233           | 4.16E-09                               | CD 2           |                 |                |
| Tc 99   | 3E-07                                  | CD 2           |                 |                | U 232            |  | 8              |                 |                |
| Ru 106  |  | 8              |                 |                | U 233            |  | 8              |                 |                |
| Pd 107  |  | 8              |                 |                | U 234            | 3.09E-08                               | CD 2           |                 |                |
| Ag 108m | <2.94E-07                              | D 3            |                 |                | U 235            |  | 8              |                 |                |
| Ag 110m |  | 8              |                 |                | U 236            | 4.00E-09                               | CD 2           |                 |                |
| Cd 109  |  | 8              |                 |                | U 238            | 3E-08                                  | CD 2           |                 |                |
| Cd 113m |  | 8              |                 |                | Np 237           | 4.16E-09                               | CD 2           |                 |                |
| Sn 119m |  | 8              |                 |                | Pu 236           |  | 8              |                 |                |
| Sn 121m |  | 8              |                 |                | Pu 238           | 1.78E-05                               | CD 2           |                 |                |
| Sn 123  |  | 8              |                 |                | Pu 239           | 1.00E-05                               | CD 2           |                 |                |
| Sn 126  | 4.35E-09                               | CD 2           |                 |                | Pu 240           | 2.00E-05                               | CD 2           |                 |                |
| Sb 125  |  | 8              |                 |                | Pu 241           | 1.45E-04                               | CD 2           |                 |                |
| Sb 126  |  | 8              |                 |                | Pu 242           | 1E-08                                  | CD 2           |                 |                |
| Te 125m |  | 8              |                 |                | Am 241           | 3.44E-05                               | CD 2           |                 |                |
| Te 127m |  | 8              |                 |                | Am 242m          | 8.36E-08                               | CD 2           |                 |                |
| I 129   |  | 8              |                 |                | Am 243           | 3.00E-08                               | CD 2           |                 |                |
| Cs 134  |  | 8              |                 |                | Cm 242           | 6.90E-08                               | CD 2           |                 |                |
| Cs 135  | 1E-08                                  | CD 2           |                 |                | Cm 243           | 1.41E-08                               | CD 2           |                 |                |
| Cs 137  | 4.96E-04                               | CD 2           |                 |                | Cm 244           | 1.69E-07                               | CD 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  | 9.44E-09                               | CD 2           |                 |                | Cf 251           |  | 8              |                 |                |
| Sm 147  |  | 8              |                 |                | Cf 252           |  | 8              |                 |                |
| Sm 151  | 2.67E-06                               | CD 2           |                 |                | Other a          |  |                |                 |                |
| Eu 152  | 9.19E-09                               | CD 2           |                 |                | Other b/g        |  |                |                 |                |
| Eu 154  | 8.93E-07                               | CD 2           |                 |                | <b>Total a</b>   | <b>8.25E-05</b>                        | <b>CD 2</b>    | <b>0</b>        |                |
| Eu 155  | 5.94E-08                               | CD 2           |                 |                | <b>Total b/g</b> | <b>1.31E-03</b>                        | <b>CD 2</b>    | <b>0</b>        |                |

**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