

|                     |              |                                           |
|---------------------|--------------|-------------------------------------------|
| <b>WASTE STREAM</b> | <b>5B345</b> | <b>Service Corridor and Tank Farm LLW</b> |
|---------------------|--------------|-------------------------------------------|

**SITE** Dounreay

**SITE OWNER** Nuclear Decommissioning Authority

**WASTE CUSTODIAN** Nuclear Restoration Services Ltd (NRS)

**WASTE TYPE** LLW

**WASTE VOLUMES**

|                        | Reported (m <sup>3</sup> ) | OR           | Conditioned (m <sup>3</sup> ) | Packaged (m <sup>3</sup> ) |
|------------------------|----------------------------|--------------|-------------------------------|----------------------------|
| Stocks:                | At 1.4.2025                | = 0          |                               |                            |
| Future arisings:       | 1.4.2025 - 31.3.2026       | = 1.9        |                               |                            |
|                        | 1.4.2026 - 31.3.2027       | = 1.9        |                               |                            |
|                        | 1.4.2027 - 31.3.2028       | = 1.9        |                               |                            |
|                        | 1.4.2028 - 31.3.2029       | = 1.9        |                               |                            |
|                        | 1.4.2029 - 31.3.2030       | = 1.9        |                               |                            |
|                        | 1.4.2030 - 31.3.2031       | = 1.9        |                               |                            |
|                        | 1.4.2031 - 31.3.2032       | = 1.9        |                               |                            |
|                        | 1.4.2032 - 31.3.2033       | = 1.9        |                               |                            |
|                        | 1.4.2033 - 31.3.2034       | = 1.9        |                               |                            |
|                        | 1.4.2034 - 31.3.2035       | = 1.9        |                               |                            |
|                        | 1.4.2035 - 31.3.2036       | = 1.9        |                               |                            |
|                        | 1.4.2036 - 31.3.2037       | = 1.9        |                               |                            |
|                        | 1.4.2037 - 31.3.2038       | = 1.9        |                               |                            |
|                        | 1.4.2038 - 31.3.2039       | = 1.9        |                               |                            |
|                        | 1.4.2039 - 31.3.2040       | = 1.9        |                               |                            |
|                        | 1.4.2040 - 31.3.2041       | = 1.9        |                               |                            |
|                        | 1.4.2041 - 31.3.2042       | = 1.9        |                               |                            |
|                        | 1.4.2042 - 31.3.2043       | = 1.9        |                               |                            |
|                        | 1.4.2043 - 31.3.2044       | = 1.9        |                               |                            |
|                        | 1.4.2044 - 31.3.2045       | = 1.9        |                               |                            |
|                        | 1.4.2045 - 31.3.2046       | = 1.9        |                               |                            |
|                        | 1.4.2046 - 31.3.2047       | = 1.9        |                               |                            |
|                        | 1.4.2047 - 31.3.2048       | = 1.9        |                               |                            |
|                        | 1.4.2048 - 31.3.2049       | = 1.9        |                               |                            |
|                        | 1.4.2049 - 31.3.2050       | = 1.9        |                               |                            |
|                        | 1.4.2050 - 31.3.2051       | = 1.9        |                               |                            |
|                        | 1.4.2051 - 31.3.2052       | = 1.9        |                               |                            |
|                        | 1.4.2052 - 31.3.2053       | = 1.9        |                               |                            |
|                        | 1.4.2053 - 31.3.2054       | = 1.9        |                               |                            |
|                        | 1.4.2054 - 31.3.2055       | = 1.9        |                               |                            |
|                        | 1.4.2055 - 31.3.2056       | = 1.9        |                               |                            |
|                        | 1.4.2056 - 31.3.2057       | = 1.9        |                               |                            |
|                        | 1.4.2057 - 31.3.2058       | = 1.9        |                               |                            |
|                        | 1.4.2058 - 31.3.2059       | = 1.9        |                               |                            |
|                        | 1.4.2059 - 31.3.2060       | = 1.9        |                               |                            |
|                        | 1.4.2060 - 31.3.2061       | = 1.9        |                               |                            |
|                        | 1.4.2061 - 31.3.2062       | = 1.9        |                               |                            |
|                        | 1.4.2062 - 31.3.2063       | = 1.9        |                               |                            |
|                        | 1.4.2063 - 31.3.2064       | = 1.9        |                               |                            |
|                        | 1.4.2064 - 31.3.2065       | = 1.9        |                               |                            |
|                        | 1.4.2065 - 31.3.2066       | = 1.9        |                               |                            |
|                        | 1.4.2066 - 31.3.2067       | = 1.9        |                               |                            |
|                        | 1.4.2067 - 31.3.2068       | = 1.9        |                               |                            |
|                        | 1.4.2068 - 31.3.2069       | = 2.3        |                               |                            |
|                        | 1.4.2069 - 31.3.2070       | = 24.8       |                               |                            |
|                        | 1.4.2070 - 31.3.2071       | = 221.0      |                               |                            |
| Total future arisings: |                            | <b>328.3</b> |                               |                            |
| Total waste volume:    |                            | <b>328.3</b> |                               |                            |

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

Comment on arising rates: Arisings dates are based on NRS Dounreay's Lifetime Plan 2024 as generated at December 2023.

Additional information on quantities: -

Uncertainty factors on volumes: Stock (upper): x - Arisings (upper): x 1.20  
Stock (lower): x - Arisings (lower): x 0.80

**WASTE SOURCE** Decommissioning of Link Corridor and Tank Farm.

**PHYSICAL CHARACTERISTICS**

General description: The waste will consist of sample transfer system pipework and diverters.

Changes since waste generated: -

Bulk density (t/m³): = 0.26

Comment on density: Based on actuals data from Dounreay's waste consignment system. Data considered acceptable for 2025 submission.

#### CHEMICAL COMPOSITION

General description and components (%wt): Asphalt (2.48%), Brick/Rubble (1.09%), Cementitious material (e.g. concrete) (45.70%), Mild Steel (26.26%), Other (0.31%), Other metal (TR), Paper (12.78%), Plastic (8.45%), Rubber (2.94%).

Chemical state: Neutral

Sheet metal proportion / thickness: 0.23% by wt of all metals will be sheet from ventilation and ducting. Assumed sheet metal thickness is of a range between 1.6-2.5mm.

Metals and alloys (%wt):

|                           | (%wt)  | Type(s) / Grades(s) with proportions | % of total C14 activity |
|---------------------------|--------|--------------------------------------|-------------------------|
| Stainless steel.....      | = 0    | M316                                 |                         |
| Other ferrous metals..... | = 26.3 | -                                    |                         |
| Iron.....                 | = 0    | -                                    |                         |
| Aluminium.....            | = 0    | -                                    |                         |
| Beryllium.....            | = 0    | -                                    |                         |
| Cobalt.....               | = 0    | -                                    |                         |
| Copper.....               | = 0    | -                                    |                         |
| Lead.....                 | = 0    | -                                    |                         |
| Magnox/Magnesium.....     | = 0    | -                                    |                         |
| Nickel.....               | = 0    | -                                    |                         |
| Titanium.....             | = 0    | -                                    |                         |
| Uranium.....              | = 0    | -                                    |                         |
| Zinc.....                 | = 0    | -                                    |                         |
| Zircaloy/Zirconium.....   | = 0    | -                                    |                         |
| Other metals.....         | < 0.01 | Other metal TR                       |                         |

Organics (%wt):

|                                     | (%wt)  | Type(s) and comment | % of total C14 activity |
|-------------------------------------|--------|---------------------|-------------------------|
| Total cellulose.....                | = 12.8 | -                   |                         |
| Paper, cotton.....                  | = 12.8 | -                   |                         |
| Wood.....                           | = 0    | -                   |                         |
| Halogenated plastics.....           | = 4.2  | PVC                 |                         |
| Total non-halogenated plastics..... | = 4.2  | -                   |                         |
| Condensation polymers.....          | NE     | -                   |                         |
| Others.....                         | NE     | -                   |                         |
| Organic ion exchange materials..... | = 0    | -                   |                         |
| Total rubber.....                   | = 2.9  | -                   |                         |
| Halogenated rubber.....             | NE     | -                   |                         |
| Non-halogenated rubber.....         | NE     | -                   |                         |
| Hydrocarbons.....                   | = 2.5  | -                   |                         |
| Oil or grease.....                  | = 0    | -                   |                         |
| Fuel.....                           | NE     | -                   |                         |
| Asphalt/Tarmac (cont.coal tar)..... | = 0    | -                   |                         |
| Asphalt/Tarmac (no coal tar).....   | = 2.5  | -                   |                         |
| Bitumen.....                        | = 0    | -                   |                         |
| Others.....                         | NE     | -                   |                         |
| Other organics.....                 | = 0.31 | Other 0.31%,        |                         |

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.....               | = 1.1  | -                   |                         |
| Cementitious material.....            | = 45.7 | -                   |                         |
| Sand.....                             | = 0    | -                   |                         |
| Glass/Ceramics.....                   | = 0    | -                   |                         |
| Graphite.....                         | = 0    | -                   |                         |
| Desiccants/Catalysts.....             | = 0    | -                   |                         |
| Asbestos.....                         | = 0    | -                   |                         |
| Non/low friable.....                  | NE     | -                   |                         |
| Moderately friable.....               | NE     | -                   |                         |
| Highly friable.....                   | NE     | -                   |                         |
| 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.....  | = 0   | -                   |
| Chloride.....  | NE    | -                   |
| Iodide.....    | NE    | -                   |
| Cyanide.....   | = 0   | -                   |
| Carbonate..... | NE    | -                   |
| Nitrate.....   | NE    | -                   |
| Nitrite.....   | NE    | -                   |
| Phosphate..... | = 0   | -                   |
| Sulphate.....  | = 0   | -                   |
| Sulphide.....  | NE    | -                   |

Materials of interest for waste acceptance criteria:

|                                                | (%wt) | Type(s) and comment |
|------------------------------------------------|-------|---------------------|
| Combustible metals.....                        | NE    | -                   |
| Low flash point liquids.....                   | NE    | -                   |
| Explosive materials.....                       | NE    | -                   |
| Phosphorus.....                                | NE    | -                   |
| Hydrides.....                                  | NE    | -                   |
| Biological etc. materials.....                 | NE    | -                   |
| Biodegradable materials.....                   | = 0   | -                   |
| Putrescible wastes.....                        | NE    | -                   |
| Non-putrescible wastes.....                    | NE    | -                   |
| Corrosive materials.....                       | NE    | -                   |
| Pyrophoric materials.....                      | NE    | -                   |
| Generating toxic gases.....                    | NE    | -                   |
| Reacting with water.....                       | = 0   | -                   |
| Higher activity particles.....                 | NE    | -                   |
| Soluble solids as bulk chemical compounds..... | NE    | -                   |

Hazardous substances / non hazardous pollutants:

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

Complexing agents (%wt):

| Not yet determined             |       |                     |
|--------------------------------|-------|---------------------|
|                                | (%wt) | Type(s) and comment |
| EDTA.....                      | NE    | -                   |
| DPTA.....                      | NE    | -                   |
| NTA.....                       | NE    | -                   |
| Polycarboxylic acids.....      | NE    | -                   |
| Other organic complexants..... | NE    | -                   |
| Total complexing agents.....   | NE    | -                   |

Physical components:

|                                         | Number | Type(s) and comment |
|-----------------------------------------|--------|---------------------|
| Sources.....                            | = 0    | -                   |
| 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                                             | On-site            | = 26.0          |
| Decay storage                                              |                    |                 |
| Low force compaction                                       |                    |                 |
| Supercompaction (HFC)                                      |                    |                 |
| Incineration                                               |                    |                 |
| Drying/dewatering/liquid separation                        | On-site            | = 100.0         |
| 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                                                       |                    |                 |

Comments on planned treatments:

26 % of 200L drums will be supercompacted before being placed in HHISOs. HHISOs filled with bulk waste, compacted drums, or a mix of both will be encapsulated before final disposal.

NRS Dounreay is investigating the feasibility of alternative waste treatment routes in particular Metal Treatment for Tritiated steel but no decision has been made on their use yet.

Conditioning method:

LLW will be grouted into non IP rated HHISOs through a dedicated grouting facility.

Conditioning plants:

| Plant Name | Location |
|------------|----------|
|            |          |

Likely conditioning matrix:

Non-standard

Further information on the conditioning matrix:

3:1 PFA:OPC with w/s 35% and plasticiser

### Waste Packaging:

Likely container type:

| Container                            | Waste packaged (vol%) | Waste loading (m³) | Payload (m³) | Number of packages | Estimated start date for packaging |
|--------------------------------------|-----------------------|--------------------|--------------|--------------------|------------------------------------|
| Non IP-2 rated 1/2 Height ISO (DC02) | 100.0                 | 9.7                | 15.6         | 34                 | -                                  |

Range in container waste loading:

The waste loading value is a rough average using previously consigned waste data. Waste loading per ISO can vary significantly, based on how the container is loaded. In general, bulk items leads to a lower waste loading value where as compactable leads to a higher one. Most containers contain a mix of the two.

Other information on packaging and conditioning:

The waste will consist of large uncompactable items and 200 litre drums that have already been compacted. The waste will be loaded into alternative non-IP2 rated LLW Disposal HHISO for transfer to the NRS Dounreay LLW Disposal Facility. Each HHISO may have other LLW items in the final HHISO.

Conditioned density (t/m³):

~ 2.0

Conditioned density comment:

This value is the midpoint between a range of densities going from 1.49-2.47. These were taken from HHISOs disposed of in NRSD LLW Disposal Vaults.

**Management Routes:**

| Disposal Route                                                                     | Stream volume % | Raw density t/m <sup>3</sup> | Start date |
|------------------------------------------------------------------------------------|-----------------|------------------------------|------------|
| Expected to be consigned to a Near Site, Near Surface Disposal Facility (Scotland) | = 100.0         |                              |            |
| 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                                    |                 |                              |            |
| 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                                                           |                 |                              |            |

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

Opportunities for alternative disposal routing: Yes

| Baseline Management Route | Opportunity Management Route | Stream volume (%) | Opportunity Confidence | Comment                                                                                                                                                                                                                                                                                                                          |
|---------------------------|------------------------------|-------------------|------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Dounreay LLWDV            | Metal treatment facility     | P                 | RED                    | Trial is currently underway to open the Metal Treatment Route. The metallic waste treatment route % remains indicative and is subject to further review and characterisation by NRS Dounreay.                                                                                                                                    |
| Dounreay LLWDV            | Incineration facility        | < 26.0            | GREEN                  | This opportunity is still at an early stage of development. A small scale trial has taken place. This can potentially divert up to all compactable LLW. The incinerables waste route 26% is theoretical maximum based on 100% drummed LLW being suitable for incineration. The 26% is subject to further review by NRS Dounreay. |
| Dounreay LLWDV            | Landfill                     | P                 | RED                    | Cementitious materials and brickwork potentially available for offsite diversion to landfill. Further characterisation of the waste is required to ensure suitability for this wasteroute.                                                                                                                                       |

**RADIOACTIVITY**

Source: -

Uncertainty: Within a factor of 10.

Measurement of radioactivities: Radionuclide profile based on operational arisings. Total alpha and beta/gamma derived from consignor's records for waste consigned from the facility.

Chemical form of radionuclides: H-3: -  
C-14: -  
Cl-36: Not likely to be present.  
Se-79: -  
Tc-99: -  
I-129: Not likely to be present.  
Ra: -  
Th: -  
U: May be present as oxide.  
Np: -  
Pu: -

| WASTE STREAM 5B345 Service Corridor and Tank Farm LLW |                                        |                |                 |                |                  |                                        |                |                 |                |
|-------------------------------------------------------|----------------------------------------|----------------|-----------------|----------------|------------------|----------------------------------------|----------------|-----------------|----------------|
| Nuclide                                               | Mean radioactivity, TBq/m <sup>3</sup> |                |                 |                | Nuclide          | Mean radioactivity, TBq/m <sup>3</sup> |                |                 |                |
|                                                       | Waste at 1.4.2025                      | Bands and Code | Future Arisings | Bands and Code |                  | Waste at 1.4.2025                      | Bands and Code | Future Arisings | Bands and Code |
| H 3                                                   |                                        |                |                 |                | Gd 153           |                                        |                |                 |                |
| Be 10                                                 |                                        |                |                 |                | Ho 163           |                                        |                |                 |                |
| C 14                                                  |                                        |                | = 9.89E-08      | C C 2          | Ho 166m          |                                        |                |                 |                |
| Na 22                                                 |                                        |                |                 |                | Tm 170           |                                        |                |                 |                |
| Al 26                                                 |                                        |                |                 |                | Tm 171           |                                        |                |                 |                |
| Cl 36                                                 |                                        |                |                 |                | Lu 174           |                                        |                |                 |                |
| Ar 39                                                 |                                        |                |                 |                | Lu 176           |                                        |                |                 |                |
| Ar 42                                                 |                                        |                |                 |                | Hf 178n          |                                        |                |                 |                |
| K 40                                                  |                                        |                |                 |                | Hf 182           |                                        |                |                 |                |
| Ca 41                                                 |                                        |                |                 |                | Pt 193           |                                        |                |                 |                |
| Mn 53                                                 |                                        |                |                 |                | Ti 204           |                                        |                |                 |                |
| Mn 54                                                 |                                        |                |                 |                | Pb 205           |                                        |                |                 |                |
| Fe 55                                                 |                                        |                |                 |                | Pb 210           |                                        |                | = 2.56E-14      | C C 2          |
| Co 60                                                 |                                        |                | = 1.10E-07      | C C 2          | Bi 208           |                                        |                |                 |                |
| Ni 59                                                 |                                        |                |                 |                | Bi 210m          |                                        |                |                 |                |
| Ni 63                                                 |                                        |                | = 3.09E-08      | C C 2          | Po 210           |                                        |                | = 2.32E-14      | C C 2          |
| Zn 65                                                 |                                        |                |                 |                | Ra 223           |                                        |                | = 4.22E-14      | C C 2          |
| Se 79                                                 |                                        |                |                 |                | Ra 225           |                                        |                | = 7.02E-22      | C C 2          |
| Kr 81                                                 |                                        |                |                 |                | Ra 226           |                                        |                | = 1.57E-13      | C C 2          |
| Kr 85                                                 |                                        |                |                 |                | Ra 228           |                                        |                | = 4.60E-19      | C C 2          |
| Rb 87                                                 |                                        |                |                 |                | Ac 227           |                                        |                | = 4.39E-14      | C C 2          |
| Sr 90                                                 |                                        |                | = 1.84E-06      | C C 2          | Th 227           |                                        |                | = 4.22E-14      | C C 2          |
| Zr 93                                                 |                                        |                |                 |                | Th 228           |                                        |                | = 6.78E-09      | C C 2          |
| Nb 91                                                 |                                        |                |                 |                | Th 229           |                                        |                | = 7.20E-22      | C C 2          |
| Nb 92                                                 |                                        |                |                 |                | Th 230           |                                        |                | = 8.84E-12      | C C 2          |
| Nb 93m                                                |                                        |                | = 6.10E-10      | C C 2          | Th 232           |                                        |                | = 1.60E-18      | C C 2          |
| Nb 94                                                 |                                        |                |                 |                | Th 234           |                                        |                | = 2.87E-09      | C C 2          |
| Mo 93                                                 |                                        |                | = 6.26E-10      | C C 2          | Pa 231           |                                        |                | = 4.89E-13      | C C 2          |
| Tc 97                                                 |                                        |                |                 |                | Pa 233           |                                        |                | = 2.31E-13      | C C 2          |
| Tc 99                                                 |                                        |                | = 5.07E-12      | C C 2          | U 232            |                                        |                | = 7.50E-09      | C C 2          |
| Ru 106                                                |                                        |                |                 |                | U 233            |                                        |                | = 3.57E-18      | C C 2          |
| Pd 107                                                |                                        |                |                 |                | U 234            |                                        |                | = 1.60E-07      | C C 2          |
| Ag 108m                                               |                                        |                |                 |                | U 235            |                                        |                | = 3.85E-09      | C C 2          |
| Ag 110m                                               |                                        |                |                 |                | U 236            |                                        |                | = 5.39E-09      | C C 2          |
| Cd 109                                                |                                        |                |                 |                | U 238            |                                        |                | = 2.87E-09      | C C 2          |
| Cd 113m                                               |                                        |                |                 |                | Np 237           |                                        |                | = 2.34E-13      | C C 2          |
| Sn 119m                                               |                                        |                |                 |                | Pu 236           |                                        |                |                 |                |
| Sn 121m                                               |                                        |                | = 4.70E-12      | C C 2          | Pu 238           |                                        |                | = 2.61E-08      | C C 2          |
| Sn 123                                                |                                        |                |                 |                | Pu 239           |                                        |                | = 7.24E-08      | C C 2          |
| Sn 126                                                |                                        |                |                 |                | Pu 240           |                                        |                | = 7.35E-08      | C C 2          |
| Sb 125                                                |                                        |                | = 5.51E-11      | C C 2          | Pu 241           |                                        |                | = 3.21E-07      | C C 2          |
| Sb 126                                                |                                        |                |                 |                | Pu 242           |                                        |                | = 1.78E-16      | C C 2          |
| Te 125m                                               |                                        |                | = 1.30E-11      | C C 2          | Am 241           |                                        |                | = 1.03E-07      | C C 2          |
| Te 127m                                               |                                        |                |                 |                | Am 242m          |                                        |                | = 9.38E-11      | C C 2          |
| I 129                                                 |                                        |                |                 |                | Am 243           |                                        |                | = 6.20E-13      | C C 2          |
| Cs 134                                                |                                        |                | = 1.77E-10      | C C 2          | Cm 242           |                                        |                | = 7.83E-11      | C C 2          |
| Cs 135                                                |                                        |                |                 |                | Cm 243           |                                        |                | = 3.75E-12      | C C 2          |
| Cs 137                                                |                                        |                | = 2.43E-06      | C C 2          | Cm 244           |                                        |                | = 1.63E-09      | C C 2          |
| Ba 133                                                |                                        |                | = 2.81E-09      | C C 2          | Cm 245           |                                        |                |                 |                |
| La 137                                                |                                        |                |                 |                | Cm 246           |                                        |                |                 |                |
| La 138                                                |                                        |                |                 |                | Cm 248           |                                        |                |                 |                |
| Ce 144                                                |                                        |                |                 |                | Cf 249           |                                        |                |                 |                |
| Pm 145                                                |                                        |                |                 |                | Cf 250           |                                        |                |                 |                |
| Pm 147                                                |                                        |                | = 2.54E-09      | C C 2          | Cf 251           |                                        |                |                 |                |
| Sm 147                                                |                                        |                | = 2.44E-19      | C C 2          | Cf 252           |                                        |                |                 |                |
| Sm 151                                                |                                        |                | = 1.55E-08      | C C 2          | Unsp a           |                                        |                |                 |                |
| Eu 152                                                |                                        |                | = 2.47E-09      | C C 2          | Unsp b/g         |                                        |                |                 |                |
| Eu 154                                                |                                        |                | = 1.26E-09      | C C 2          | <b>Total a</b>   | <b>0</b>                               | <b>*</b>       | <b>4.63E-07</b> | <b>*</b>       |
| Eu 155                                                |                                        |                | = 8.91E-10      | C C 2          | <b>Total b/g</b> | <b>0</b>                               | <b>*</b>       | <b>4.86E-06</b> | <b>*</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 the 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  
\* Total calculated from the 114 declared radionuclides