

WASTE STREAM

9A50

FED Stainless Steel

| | | |
|---------------------------|-------|---|
| Stainless steel..... | ~99.0 | |
| Other ferrous metals..... | 0 | |
| Iron..... | | |
| Aluminium..... | 0 | |
| Beryllium..... | 0 | |
| Cobalt..... | | |
| Copper..... | 0 | |
| Lead..... | 0 | |
| Magnox/Magnesium..... | 0 | |
| Nickel..... | ~0.75 | Nimonic. |
| Titanium..... | | |
| Uranium..... | | |
| Zinc..... | 0 | |
| Zircaloy/Zirconium..... | 0 | |
| Other metals..... | 0 | No "other" metals have been identified. |

Organics (%wt):

The stainless steel may be contaminated with trace quantities of organic material.

| | |
|-------------------------------------|----|
| 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..... | TR |

Other materials (%wt):

| | |
|-----------------------------------|---|
| Graphite contamination. | |
| Inorganic ion exchange materials. | 0 |
| Inorganic sludges and flocs..... | 0 |
| Soil..... | 0 |
| Brick/Stone/Rubble..... | 0 |
| Cementitious material..... | 0 |
| Sand..... | |

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Glass/Ceramics..... 0
 Graphite..... TR
 Desiccants/Catalysts.....
 Asbestos..... 0
 Non/low friable.....
 Moderately friable.....
 Highly friable.....
 Free aqueous liquids..... TR
 Free non-aqueous liquids..... 0
 Powder/Ash..... P

Inorganic anions (%wt):

None of the inorganic anions listed in the table is expected to be present at greater than trace concentration.
 Fluoride..... TR
 Chloride..... TR
 Iodide..... 0
 Cyanide..... 0
 Carbonate..... TR
 Nitrate..... TR
 Nitrite..... TR
 Phosphate..... TR
 Sulphate..... TR
 Sulphide..... 0

Materials of interest for waste acceptance criteria:

There are no identified materials likely to represent a fire or other non-radiological hazard.

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:

None expected.

Acrylamide.....
 Benzene.....

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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): Yes
 EDTA.....
 DPTA.....
 NTA.....
 Polycarboxylic acids.....
 Other organic complexants.....
 Total complexing agents..... TR

PACKAGING AND CONDITIONING

Conditioning method: This stream is to be co-packaged with 9A63, 9A64, 9A83, 9A84, 9A33, 9A34, 9A35, 9A41, 9A42, 9A43, 9A49, 9A51, 9A54, 9A55, 9A56, 9A74. Packages are assigned to 9A33/C, 9A34, 9A74.
 Plant Name: -
 Location: Berkeley Site
 Plant startup date: -
 Total capacity (m³/y incoming waste): -

| | | |
|---------------------|-------------|----------------------------|
| WASTE STREAM | 9A50 | FED Stainless Steel |
|---------------------|-------------|----------------------------|

Target start date for packaging this stream: -

Throughput for this stream (m³/y incoming waste): -

Other information: -

| | | | | | |
|------------------------|-----------|-----------------------|---------------------------------|---------------------------|--------------------|
| Likely container type: | Container | Waste packaged (%vol) | Waste loading (m ³) | Payload (m ³) | Number of packages |
| | | | | | |

Likely container type comment: -

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: Activation when the associated fuel elements were irradiated, of nuclides incorporated into the stainless steel. Contamination by fission products and actinides when the fuel elements were in the fuel pond.

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: Specific activity is a function of Station operating history. Values were derived from calculations of induced activity and estimates of likely contamination.

Other information: -

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| Nuclide | Mean radioactivity, TBq/m ³ | | | | Nuclide | Mean radioactivity, TBq/m ³ | | | |
|---------|--|----------------|-----------------|----------------|------------------|--|----------------|-----------------|----------------|
| | Waste at 1.4.2019 | Bands and Code | Future arisings | Bands and Code | | Waste at 1.4.2019 | Bands and Code | Future arisings | Bands and Code |
| H 3 | 1.53E-03 | CC 2 | | | Gd 153 | | 8 | | |
| Be 10 | | 8 | | | Ho 163 | | 8 | | |
| C 14 | 6.00E-01 | CC 2 | | | Ho 166m | | 8 | | |
| Na 22 | | 8 | | | Tm 170 | | 8 | | |
| Al 26 | 3E-06 | CC 2 | | | Tm 171 | | 8 | | |
| Cl 36 | 7E-07 | CC 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 | 2.39E-08 | CC 2 | | | Pb 205 | | 8 | | |
| Fe 55 | 4.22E+00 | CC 2 | | | Pb 210 | | 8 | | |
| Co 60 | <1.44E+01 | C 3 | | | Bi 208 | | 8 | | |
| Ni 59 | 1E+00 | CC 2 | | | Bi 210m | | 8 | | |
| Ni 63 | 1.84E+02 | CC 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 | 5.26E-05 | CC 2 | | | Th 227 | | 8 | | |
| Zr 93 | 4E-09 | CC 2 | | | Th 228 | | 8 | | |
| Nb 91 | | 8 | | | Th 229 | | 8 | | |
| Nb 92 | 1E-07 | CC 2 | | | Th 230 | | 8 | | |
| Nb 93m | 1.80E+00 | CC 2 | | | Th 232 | | 8 | | |
| Nb 94 | 7.00E-03 | CC 2 | | | Th 234 | <5E-08 | C 3 | | |
| Mo 93 | 7.00E-03 | CC 2 | | | Pa 231 | | 8 | | |
| Tc 97 | | 8 | | | Pa 233 | <6.29E-09 | C 3 | | |
| Tc 99 | 1E-03 | CC 2 | | | U 232 | | 8 | | |
| Ru 106 | | 8 | | | U 233 | | 8 | | |
| Pd 107 | | 8 | | | U 234 | 5.08E-08 | CC 2 | | |
| Ag 108m | 1.96E-02 | CC 2 | | | U 235 | 1E-09 | CC 2 | | |
| Ag 110m | | 8 | | | U 236 | 7.00E-09 | CC 2 | | |
| Cd 109 | | 8 | | | U 238 | 5E-08 | CC 2 | | |
| Cd 113m | 3.85E-09 | CC 2 | | | Np 237 | 6.29E-09 | CC 2 | | |
| Sn 119m | | 8 | | | Pu 236 | | 8 | | |
| Sn 121m | | 8 | | | Pu 238 | 1.82E-05 | CC 2 | | |
| Sn 123 | | 8 | | | Pu 239 | 2E-05 | CC 2 | | |
| Sn 126 | | 8 | | | Pu 240 | 3.00E-05 | CC 2 | | |
| Sb 125 | 1.93E-09 | CC 2 | | | Pu 241 | 1.13E-03 | CC 2 | | |
| Sb 126 | | 8 | | | Pu 242 | 2E-08 | CC 2 | | |
| Te 125m | | 8 | | | Am 241 | 8.77E-05 | CC 2 | | |
| Te 127m | | 8 | | | Am 242m | 1.88E-07 | CC 2 | | |
| I 129 | | 8 | | | Am 243 | 5.00E-08 | CC 2 | | |
| Cs 134 | 1.78E-09 | CC 2 | | | Cm 242 | 1.55E-07 | CC 2 | | |
| Cs 135 | | 8 | | | Cm 243 | 4.55E-08 | CC 2 | | |
| Cs 137 | 5.30E-05 | CC 2 | | | Cm 244 | 3.79E-07 | CC 2 | | |
| Ba 133 | 2.27E-06 | CC 2 | | | 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 | 8.42E-08 | CC 2 | | | Cf 251 | | 8 | | |
| Sm 147 | | 8 | | | Cf 252 | | 8 | | |
| Sm 151 | 1.82E-07 | CC 2 | | | Other a | | | | |
| Eu 152 | 1.62E-09 | CC 2 | | | Other b/g | | CC 2 | | |
| Eu 154 | 1.91E-07 | CC 2 | | | Total a | 1.57E-04 | CC 2 | 0 | |
| Eu 155 | 1.83E-08 | CC 2 | | | Total b/g | 2.06E+02 | CC 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