

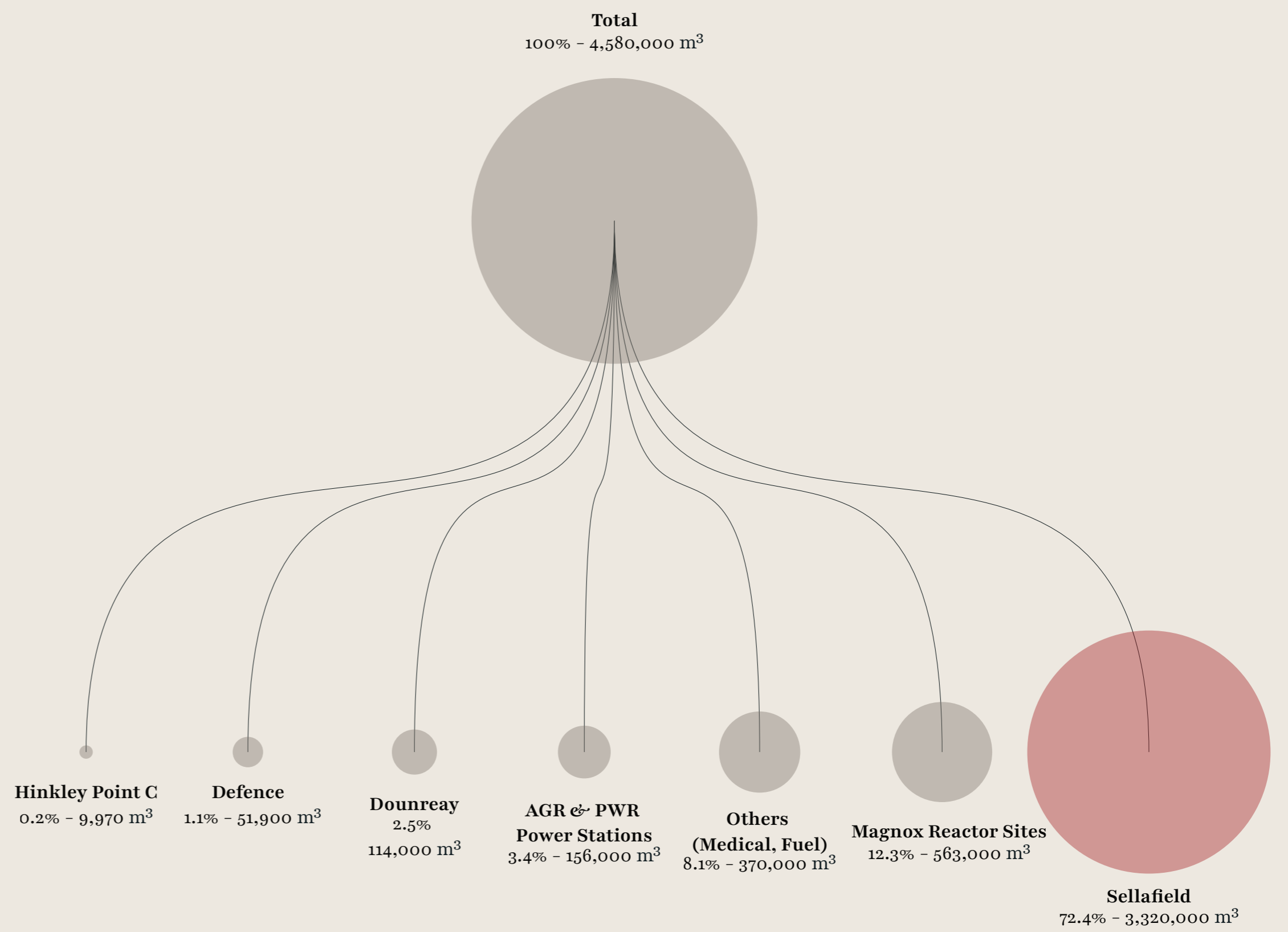
Britain's Nuclear Waste

UK radioactive waste by where it comes from, what it is and where it ends up.

Nuclear energy looks more defensible than most people expect — lower carbon than almost any other source, less land-use per unit of energy, fewer deaths per terawatt-hour than fossil fuels and most renewables. Waste is the question those findings don't answer. It is the objection that survives the others, and the hesitation isn't irrational. Britain has been producing radioactive material for nearly eighty years and still has no permanent place to put the most dangerous of it. A storage silo at Sellafield has been leaking into the ground since 2018; the cleanup bill runs to £136 billion and grows every time it is recalculated. The country that built the world's first commercial reactor still has nowhere permanent to put what came out of it.

Where Does Nuclear Waste Come From?

UK radioactive waste by producer, % of 4,580,000 m³ total



Legend

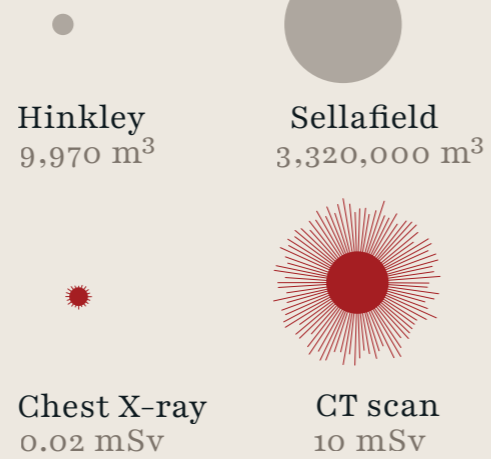
Three kinds of forms carry the data on this poster:

Producer circles
sized by waste volume (m³)

Waste-category forms
size = volume; density = radioactivity

Radiation dose bubbles
size = effective dose (mSv)

Volumes from the NDA's UK Radioactive Waste Inventory 2022. Doses in millisieverts (mSv). Dose bubbles are area-proportional on a logarithmic scale; all other forms are linear.

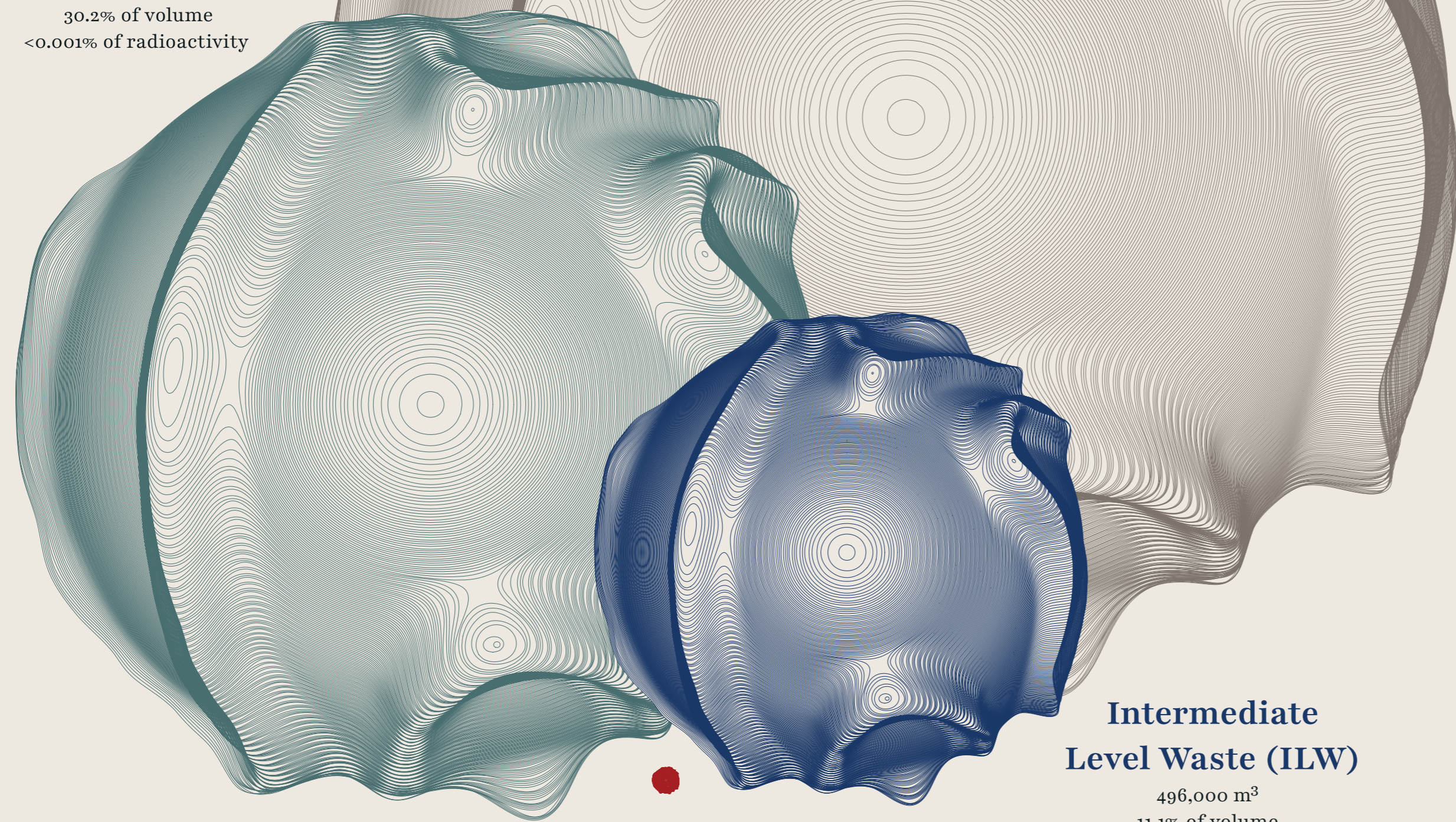


Methodology

Waste volumes reported from the NDA's 2022 UK Radioactive Waste Inventory, Radiation doses from UK Health Security Agency and IAEA reference values; the dose-bubble scale is logarithmic to fit nine orders of magnitude on one canvas. The Geological Disposal Facility shown bottom-right has been planned in various forms since the 1970s, but no site has yet been chosen — the disposal route exists in policy, not yet on the ground.

Low Level Waste (LLW)

1,340,000 m³
30.2% of volume
<0.001% of radioactivity



Intermediate Level Waste (ILW)
496,000 m³
11.1% of volume
4.4% of radioactivity

High Level Waste (HLW)

1,470 m³
<0.1% of volume
95.6% of radioactivity

Very Low Level Waste (VLLW)

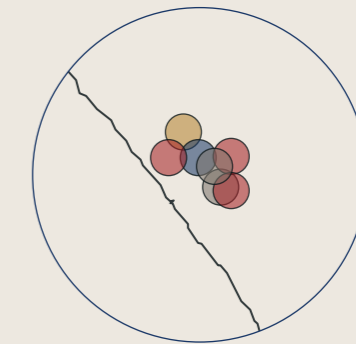
2,610,000 m³
58.6% of volume
<0.001% of radioactivity

What's Happening In Sellafield?

72.4% of the UK's radioactive waste lives on a single 6km² site in Cumbria.

A former plutonium factory for Britain's weapons programme, Sellafield ran civil reprocessing from the 1960s until July 2022. The site is now a storage and cleanup operation.

The Magnox Swarf Storage Silo has been leaking radioactive water into the ground since 2018 — roughly an Olympic swimming pool every three years. The NDA describes it as "the most hazardous building in the UK."



Sellafield / Moorside
7 reactors, none operating

£136 bn cleanup cost, running to 2125

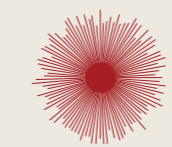
£2.7 bn spent in 2023–24

~140 t separated civil plutonium stockpile

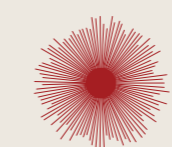
What A Dose Of Radiation Actually Is

Everyday radiation doses, in millisieverts, against the doses from shielded nuclear waste packages.

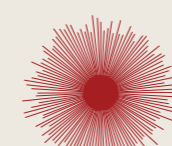
- Living 1km from a UK reactor for 1 year 0.003 mSv
- A dental x-ray 0.005 mSv
- A chest x-ray 0.02 mSv
- 1 hour next to a LLW drum 0.05 mSv
- A transatlantic flight 0.08 mSv



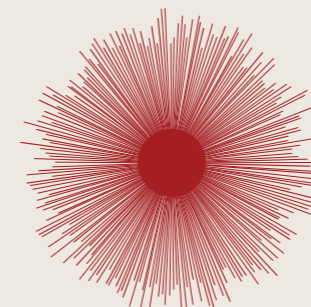
1 hour next to an ILW package 2 mSv



1 hour next to a HLW transport flask 2 mSv



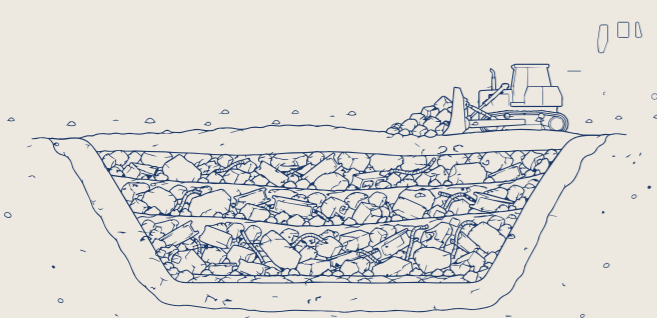
Annual UK background radiation 2.7 mSv



A CT scan of the abdomen 10 mSv

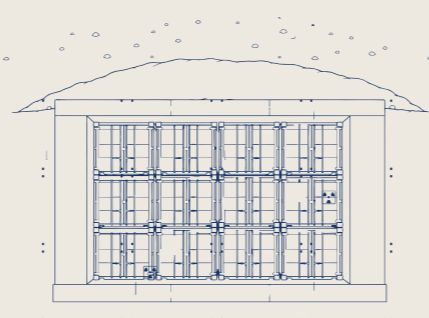
At the top: one minute next to unshielded vitrified HLW = 1,000 mSv — 100x a CT scan, enough to cause acute radiation syndrome within hours. Disposal facilities are engineered specifically to prevent this. At the bottom: eating a banana delivers 0.0001 mSv, too small for a visible bubble.

For further reference, eating a banana delivers ~0.0001 mSv — a bubble too small to draw at the scale.



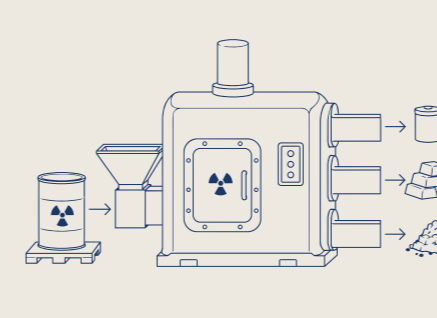
Landfill

3,340,000 m³
LLW & VLLW at authorised sites



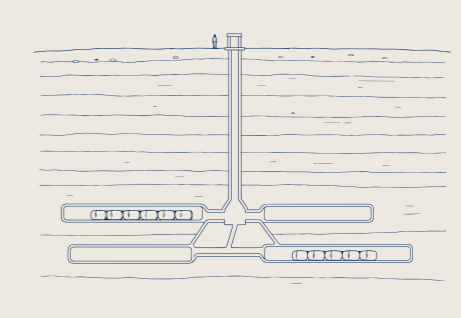
Near-Surface Vaults

255,000 m³
LLWR (Cumbria) & Dounreay



Treatment & Recycling

440,000 m³
Recycled, incinerated, or released below threshold



Geological Disposal Facility

499,000 m³
Site not yet selected