



CSIRO's Radioactive Waste at Woomera Test Range

CSIRO is working to determine the best options to prepare waste material currently stored on Commonwealth land at the Woomera Test Range in South Australia for transfer and acceptance at the proposed National Radioactive Waste Management Facility (NRWMF).

Where did it come from?

The waste currently stored at the Woomera Test Range came from the clean-up of a former research site in Melbourne in the early 1990s and comprises mainly soil and building materials.



Removal of material from a carpark at Fishermans Bend



How radioactive is it?

Latest testing shows that the material in storage does not present risks to worker safety or the environment. Measurements taken in May 2018 show that radiation levels adjacent to the storage are typical background levels found in the natural environment in Australia, such as rocks and soil.

CSIRO has worked with the Australian Nuclear Science and Technology Organisation (ANSTO) to establish a comprehensive environmental baseline radiation level for the location, including measurements of air and the soil, to check that no contamination has occurred from waste storage.

Further, ARPANSA has conducted independent soil monitoring activities which have verified that there has been no release of radioactivity into the surrounding environment.



Gamma radiation survey for environmental baseline (2018)

Past ANSTO testing

Removal of material from Fishermans Bend (1991): 99% of drums have a surface dose rate less than 5 microsievert per hour ($\mu\text{Sv/h}$), similar to travelling on an international air flight. One per cent had surface dose rates of 5-17 $\mu\text{Sv/h}$, which is less, or only slightly higher, than the permissible level of 10 $\mu\text{Sv/h}$ for radiation workers (based on a 20 millisievert per year limit).

Sample of almost 3,000 drums (1993): 98% of drums had radioactive content low enough to be classified as non-radioactive for transport purposes at that time.

What has CSIRO been doing about it?

CSIRO has been using robots which can travel under and on top of the tightly stacked storage drums to better understand the physical condition and contents. The painted or galvanised drums are just over half way through their expected useful life of around 40 years. The robots are able to travel between the drums to areas which cannot be reached by people, without disturbing the drums themselves, to measure radiation dose and inspect drum condition.

What did you find?

Gamma imaging of the outermost drums conducted by ANSTO indicated very low levels of activity in those drums scanned. The majority of drums showed no dose above background levels of natural radiation.

Robotic work also indicated most drums are not showing above-background levels of radiation, and where radiation was detected it is at low levels at 10 microsievert per hour or less.

Based on this work we expect most of the waste will be so low in radiation that it will not require any controls, and can be disposed of in a landfill. If radiation is below exempt levels, but other contamination such as chemicals or asbestos are present, material can be disposed of in a hazardous waste facility.



ATLAS robot built to take measurements on top of drums



PEABODY robot travelling under drums to take measurements

CSIRO now estimates that the amount of low-level radioactive waste (LLW) is less than 200 drums (in the store of almost 10,000 drums). There is no current indication that there is any intermediate level waste.

The robot's visual inspection of drums indicated that they are intact, appear in good condition and are showing no visible signs of leakage.

Measures will be taken to ensure the material is safely stored to meet ARPANSA regulations until a final disposal pathway has been identified.

What next?

Like other Commonwealth organisations, CSIRO's radioactive waste is independently regulated by ARPANSA and subject to scheduled inspections and regular site visits to ensure all future activities comply with best practice.

CSIRO will develop a plan for a pilot project to verify results from robotic work and trial methods for moving, testing, separating and remediating the waste. This approach will be developed in consultation with the regulator, ARPANSA, and the Department of Defence as landlord, and will require approval by them before any further activity takes place

What does this mean for a NRWMF?

Only after further analysis and separation of material will it be clear how much of the material currently at the Woomera Range will be considered for future disposal (LLW) at the proposed NRWMF.

The waste cannot not be transferred to a NRWMF until its contents are fully known and when it is prepared and packaged to comply with the strict Waste Acceptance Criteria for the Facility. The current storage arrangement at the Woomera Test Range poses no health or environmental threat.

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Contact us

1300 363 400
+61 3 9545 2176
csiroenquiries@csiro.au
csiro.au

For further information

CSIRO Health Safety and Environment
Jen Baxter
+61 7 3833 5521
jenny.baxter@csiro.au