

Corporate report: Radioactive particles in the environment around Dounreay

Updated: Attached new information leaflet 'Monitoring of beaches near Dounreay'

Particles are fragments of irradiated nuclear fuel discharged to sea as a result of historic practices in reprocessing.

Used fuel from the reactors on site and other research reactors in Britain and abroad was recycled in the site's reprocessing facilities.

The swarf produced during the procedure was discharged from fuel ponds with the water and were released to sea.

It is not known how many particles were released but extensive research suggests that the bulk were released between 1958 and 1984.

The most hazardous fragments are located close to an old discharge point on the seabed.

Their disintegration is believed to be the source of smaller, less hazardous particles detected on local beaches since the early 1980s.

Health risks

Expert laboratory research into the potential health effects of different particles has been carried out by the Health Protection Agency for Scottish Environment Protection Agency (SEPA), and studied by the independent Dounreay Particles Advisory Group (DPAG). The work looked at the likely health effects of different particles being swallowed, inhaled or coming into skin contact.

DPAG concluded that only those particles in the significant category pose a realistic potential to cause harm to members of the public, and that the probability of the most frequent beach-users at Sandside coming into contact with a relevant particle is one in 80 million.

A number of studies on the potential effects of particles have been completed by independent bodies.

Explanations of the hazards and risks can be found at:

- SEPA
- Committee on Medical Aspects of Radiation in the Environment (COMARE)
- Food Standards Agency (FSA)

Monitoring

Beach monitoring continues and forms part of the RSA authorisation granted to the site by SEPA. Monitoring of land owned by third parties is subject to agreements on access.

During 2003-2008 an extensive consultation programme was established to identify the best practicable environmental option (BPEO). The consultation led to recommendations to Government bodies on the way forward which is environmentally and publicly acceptable.

This process recognised that recovery of every particle was impractical but that it was feasible to seek recovery of larger, more hazardous particles that pose a significant health risk and which had settled in the sediment close to Dounreay. That, along with on-shore monitoring specifically at Dounreay foreshore and Sandside beach, was identified as the preferred way forward.

Underwater clean-up started in August 2008, targeted at a 60-hectare area of seabed known as the "plume" where the most hazardous particles were located. This work continued each summer until 2012.

This programme was guided by the independent expert Particles Recovery Advisory Group (Dounreay), PRAG(D), which advises both DSRL and SEPA.

All particles recovered from the seabed were returned to Dounreay.

The Dounreay foreshore and Sandside beach in the bay adjacent to the site are monitored on a regular basis. Strathy beach and Murkle beach act as 'gatekeepers' and are monitored twice a year to ensure that the offshore work has not adversely impacted the surrounding beaches.

When a particle is detected, it is retrieved and taken to Dounreay for analysis. The regulator is informed, and the find is reported publicly via this website. Any unusual finds are treated in the same manner.

In the 1990s extensive additional surveys of the site were carried out. This included roadside verges, cliff top land and drainage systems. By 2009, these surveys had yielded 89 particles.

Detailed investigations identified a number of areas of the site where more particles could be expected to be found during decommissioning.

The effectiveness of the clean-up is reported by Dounreay to SEPA, PRAG(D) and other interested parties, including the site stakeholder group.