

PARTICLES PROGRESS REPORT AS END OF OCTOBER 2007

1. BEST PRACTICAL ENVIRONMENTAL OPTION (BPEO) PROCESS

The final stage of consultation for cleaning up particles was launched on 3rd October. The preliminary BPEO was issued for final comment and outlined a programme of work for the clean-up operation. This could potentially see the off-shore cleanup, which would be focused on the area where the largest number of higher activity particles lie, complete within seven years. The closing date for final comment is 12th December 2007.

See: <http://www.ukaea.org.uk/news/2007/03-10-07.html>

After considering feedback received the BPEO will be finalised and made publicly available. It is expected that this will be presented to SEPA in January 2008. The criteria for the achievement of the aims of the project will be agreed with the Nuclear Decommissioning Authority (NDA) which would fund the implementation.

Meanwhile, selected papers from a particles conference held in 2005 have been revised and published in a special edition of the Journal of Radiological Protection. Vol 27 Number 3A, September 2007. See www.iop.org/journals/jrp

The Dounreay Particles Advisory Group (DPAG) an independent body set by UKAEA and the Scottish Environment Protection Agency (SEPA) in May 2000 to provide independent scientific advice. In its Third report DPAG classified the particles according to health effects.

Significant:	Caesium-137 activity greater than 10^6 Becquerels (Bq) (1,000,000 Bq)
Relevant:	Caesium-137 activity between 10^5 and 10^6 Bq (100,000 and 1,000,000 Bq)
Minor:	Caesium-137 activity less than 10^5 Bq (100,000 Bq)

2. OFFSHORE WORK

(a) Remotely Operated Vehicle (ROV) offshore mapping

A report is now available on the website which provides information obtained from the surveys in 2007 which lend support for the emerging picture of a limited spread of high-activity particles (*significant* category), a wider but more diffuse spread of lower-activity particles (*relevant* and *minor* category) north-eastwards, with a population of lower activity particles moving west into Sandside bay. There also seems to be a seaward limit to the detected contamination at about the 30 metre water depth. Further surveys in a limited area at the headland at Brims Ness did not find particles which had been predicted by a computer model but were consistent



with surveys conducted in 2006. The full report is available: http://www.ukaea.org.uk/downloads/dounreay/LRP_07_P025_Issue%202.pdf.

(b) Remote particle retrieval offshore

Following a period of competitive dialogue, one company has been awarded a contract to deploy and demonstrate a remote particle retrieval system offshore of Dounreay; the work is expected to take place in November 2007 subject to workable weather conditions. A second company is carrying out pre-trials of their own remote particle detection capability in late October 2007. If results of these tests are successful, they will also be awarded a contract to carry out trials to demonstrate their remote particle retrieval system offshore of Dounreay; given this companies' lead time for deployment, this work is not expected to take place before January 2008.

(c) Investigations at Old Diffuser structure



Diffuser Chamber – Constructed in 1956, 23m below seabed, 600m from shore at the end of the effluent tunnel.

To increase the understanding of the condition of the rock mass above the old diffuser chamber access to one of the risers was attempted. Access was gained down Riser 1 after finding a number of other risers blocked by sediment.

Following removal of the plug from the riser a second lead plug, expected to be in place below was not found. A camera was lowered down the riser to approximately 23m below the seabed where the second lead plug was found lodged, obstructing further progress. Radiation dosimeters were attached to the camera and also on the cable 10m from the camera. Information on the radioactivity on the seabed and around natural fissures, close to the diffuser, was also obtained at this time.

A second investigation of the Old Diffuser is planned for November/December 2007. Information gathered will assist in considering the options for remediation.

3. DOUNREAY PARTICLES ADVISORY GROUP (DPAG) MEETING

The next DPAG meeting will be held on 6th/7th November. UKAEA have been providing supporting information and reports to allow DPAG members to begin preparation of draft chapters for their Fourth Report. This report is expected by summer 2008 at which time SEPA and UKAEA will consider whether there is further useful work for DPAG to undertake.

(a) Testing for particle dissolution

UKAEA have completed the dissolution tests on 151 particles and issued report LRP(07)P028 to DPAG in early October for discussion. The report concludes that none of the *significant* or *relevant* particles showed significant evidence of dissolution in the test solutions. Only three *minor* particles showed some evidence for dissolution but the evidence was not persuasive and further work on the three filtrates is being carried out. For full report see:

http://www.ukaea.org.uk/downloads/dounreay/Report_on_dissolution_tests_LRP_07_P028.pdf

(b) **Particle density measurements**

Results for 17 samples were presented in UKAEA report LRP(07)P024, provided to DPAG/SEPA on 17th July. The significance of the results in terms of particle transport is being considered by DPAG who will decide if any further measurements will be of benefit. For full report see [http://www.ukaea.org.uk/downloads/dounreay/LRP\(07\)P024.pdf](http://www.ukaea.org.uk/downloads/dounreay/LRP(07)P024.pdf).

(c) **Dounreay foreshore rock investigation**



UKAEA with two geology experts from DPAG conducted testing of the rock structures on the Dounreay foreshore predicted to be of the same rock sequence as that between the seabed and the diffusion chamber. This work will be incorporated into a decision for remediation of the diffuser.

4. COMARE BEACH TRIALS

COMARE presented at the 41st DPAG meeting in September a draft report of the trials of the upgraded beach monitoring system, carried out on Dunnet beach on 22-23 June 2007. The report comments on the significant improvement in the detection capabilities of the upgraded system, which exceed the operational requirements set by SEPA. A final report will be posted on the COMARE web site.

5. DOUNREAY PARTICLES: EDINBURGH MEETING

The next Scottish Government meeting with all key agencies will take place on 20th November 2007. Minutes of these meetings are publicly available via the website http://www.ukaea.org.uk/sites/dounreay_part_consulting.html.

6. MONITORING OF BEACHES

(a) **Dounreay Foreshore**

Foreshore surveys recommenced in September following the prescribed lay-off due to nesting birds. Two particles have been recovered in the September and October fortnightly surveys - one in the minor category. The particle detected on 30th October was a significant particle. Four contaminated stones were also recovered.

(b) **Sandside**

Since the end of July, monitoring of beaches has continued at Sandside. From end of July to end of October 9 particles



were detected and removed - 2 were in the relevant category while the rest fell into the minor category.

Beach height data continues to be acquired during routine monthly surveys. An interim report on the changes in beach height at particle locations is being prepared for the next DPAG meeting in November.

UKAEA have also commissioned BGS to carry out a survey of beach volume by combination of laser survey of surface elevation and measurements of depth to bedrock. This work was carried out in October.

The survey of the Reay Golf course continues and is expected to be completed at the end of November 2007 – no particles have been found to date.

An update on the unusual plastic item found on Sandside beach on the 15th December is available on the website http://www.ukaea.org.uk/sites/dounreay_part_part_finds.html.

(c) Other beaches

No particles have been detected on any other beaches in this period.

7. KEY DATES

Date	Description
6 November 2007	DPAG meeting
20 November 2007	Scottish Government meeting
November 2007	Trials for ROV retrieval system
12 December 2007	COMARE meeting
12 December 2007	Close of final stage of consultation
Jan/Feb 2008	Publication of final BPEO.
January 2008	Trials for ROV retrieval system
May 2008	Confirmation of BPEO
Summer 2008	DPAG Fourth Report
Summer 2008	Off-shore clean-up commences

UKAEA, Dounreay
12th November 2007