



## PARTICLES PROGRESS REPORT

August to November 2009

### 1 BEST PRACTICAL ENVIRONMENTAL OPTION (BPEO) PROCESS

The BPEO sets out the proposals for seabed clean-up with a targeted seabed area, where most significant and relevant particles are believed to be located following examination of available data by DPAG, of 60 hectares. Performance during implementation will be assessed on the activity detected, rate of coverage and efficiency of particle retrieval.

The initial recovery work undertaken in 2008 helped to determine the area targeted for 2009/10. The information gained this year has helped to clarify the extent of the particle plume, the spatial density of particles present, the burial depths of the different categories of particles and the makeup of the seabed in various areas within the predicted plume. Information was also gained on the operational abilities of the existing ROV and this compared against the requirements for operations in future years. This comparison indicated that the existing ROV would face significant challenges in meeting the required scope, so the information gained was used to develop a specification for a new or modified system that would be required. As a result, we are currently in the process of assessing tenders from the two contractors on the existing framework contract with a view to awarding a contract for the provision of a suitable ROV and three years of operations.

### 2 OFFSHORE WORK

#### 2.1 Off-shore particle retrieval

Monitoring and retrieval of particles offshore at Dounreay was completed on 3<sup>rd</sup> August 2009. Further analysis of the data, detailed in the previous Particles Progress Report, resulted in the reclassification of one Relevant particle as Significant and the total activity of the 115 particles recovered was increased to  $5.2\text{E}+08$  Bq of caesium-137.



All results of the work have been forwarded to the Particles Retrieval Advisory Group (Dounreay) PRAG(D). This expert group makes recommendations to SEPA and DSRL about how best to manage particle contamination in the environment. PRAG(D) indicated that initial impressions of the work completed in 2009 gave improved confidence on the applicability of the remote retrieval technique. They should be able to provide statistical assessment of the plume figures once around 20 Ha of the area have been monitored. Minutes from PRAG(D) meetings can be found at the following link:  
[http://www.sepa.org.uk/radioactive\\_substances/decommissioning/dounreay/particles\\_advisory\\_group.aspx](http://www.sepa.org.uk/radioactive_substances/decommissioning/dounreay/particles_advisory_group.aspx)

### 3 THE OLD EFFLUENT DISCHARGE SYSTEM

An Environmental Safety Case for the remediation of the Old Liquid Effluent Discharge System (OLED) has been written. The outcome of the safety case has determined that, taking all relevant factors into account, that with minimal intervention in the form of targeted grouting, the OLED will remain passively stable for 100,000 years.

A strategy document has been produced and accepted by DSRL management that outlines the proposals for decommissioning of the OLED. In summary, this proposes grouting of the diffuser risers and associated fractured rock, as far as is reasonably practicable, in 2011. In 2020, when the new effluent discharge system is no longer required, the discharge pipelines for both the old and new systems will be grouted down to the low water mark, thus isolating them from human interaction.

With regard to the RSA Variation request:

*The Authorisation Holder shall undertake an investigation to identify the engineering options for sealing the redundant diffusion chamber, and any surrounding fissured/fractured rock, and shall submit a report to SEPA detailing these options and identifying the Authorisation Holders preferred option(s) together with a detailed engineering design specification and environmental safety case for the preferred option(s)....*

Work is ongoing to respond officially to SEPA by the end of December 2009.

### 4 DOUNREAY PARTICLES: PRAG(D)

The results of this years offshore work has been provided to PRAG(D). Discussion of the results indicated that additional confidence has been gained in the application of the remote work. DSRL have used the experience to generate a contract specification to allow the placement of a contract for the rest of the significant particle plume. PRAG(D) had assessed the detector performance against theoretical performance and have concluded that the detector will provide the necessary detection capability for the duty planned.

### 5 MONITORING OF BEACHES



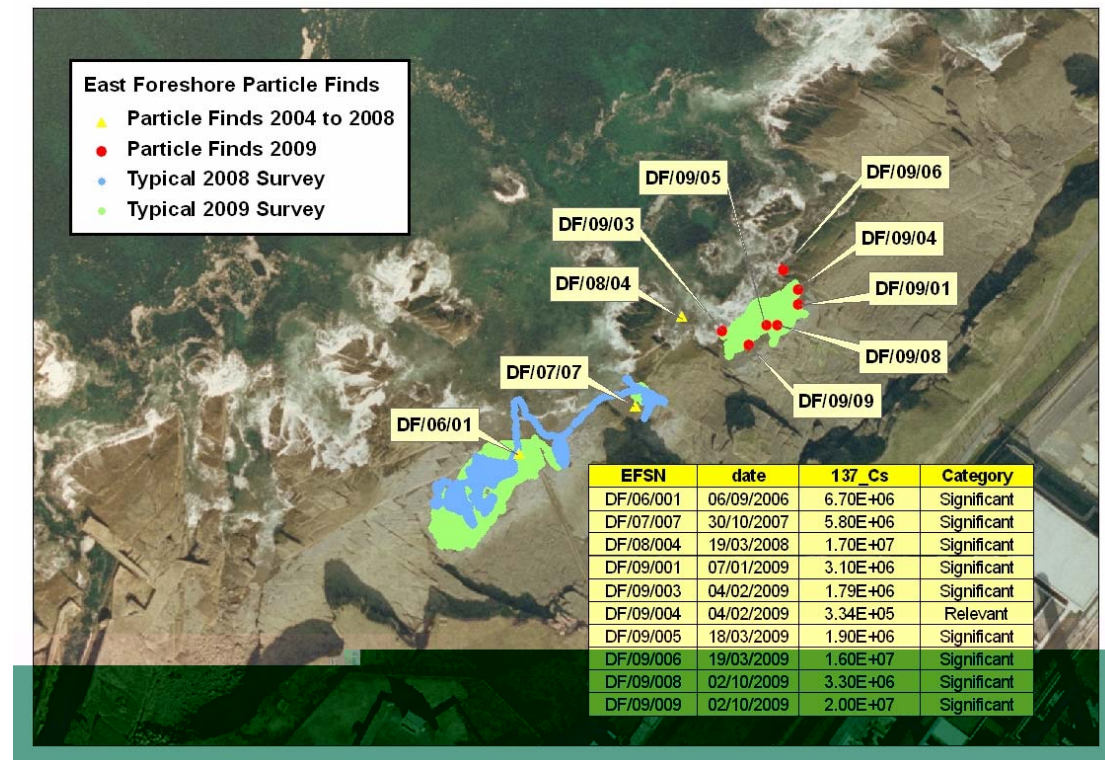
The statutory beach monitoring programme continues as per the SEPA Authorisation requirements.

#### 5.1 Dounreay Foreshore

The statutory programme for Dounreay Foreshore beach monitoring recommenced at the start of September. This takes the form of weekly surveys, alternating between the East and West foreshores. From the beginning of September to the end of November, five particles have been detected and recovered. Of these, three were Relevant category particles on the West foreshore and two were Significant category particles on the East.

Analysis of the East Foreshore survey data and particle finds have highlighted that a 'new' area of survey material is becoming established. The East Foreshore survey area is determined by the coordinates supplied by SEPA in the RSA Authorisation, and although this 'new' area is within these coordinates, there has only been infrequent presence of

sediments in this area until the beginning of 2009. Summary notes below refer to the following map.



### Summary

- The map illustrates two typical surveys. The blue area shows coverage from a survey during 2008, with the green illustrating a 2009 survey. The 2009 example clearly shows the new area.
- Analysis of the survey data shows that every survey in 2009 (when material was available) had coverage in the new area. In 2008 there was only material in the new area on two occasions, i.e. 15<sup>th</sup> October and 19<sup>th</sup> March. Note – a particle was also detected and recovered during the survey of 19<sup>th</sup> March 2008, DF/08/004 refers.
- Particle finds from 2004 to 2008 are shown by the yellow triangles. A total of 3 finds.
- Particle finds in 2009 are shown by the red dots. A total of 7 for 2009 (to date). All in the new area.

This information was presented at the PRAG (D) meeting in November.

### **5.2 Sandside Beach**

Access permission had been withdrawn on the 16<sup>th</sup> June. Access permission was granted for beach monitoring to resume on 9<sup>th</sup> November 2009. The aim for the November survey was to complete as large a beach footprint as possible. During the November survey a total of six Minor particles were detected and recovered. The total number of particles recovered from Sandside Beach is now 142.

The public information was updated to the end of November.

### **5.3 Dunnet beaches**

A Dunnet strandline survey was completed in September. Targeted areas below the access points to the beach were also surveyed at this time. The target areas will continue to be surveyed, along with the strandlines, until SEPA complete their habit survey of the beach. The data gained from the habit survey will form part of SEPA's review of beach monitoring.

## 6 KEY DATES

Date	Description
31 Dec 09	Report to SEPA detailing the proposed methodology for decommissioning the OLE
17 Feb 10	PRAG(D) meeting
31 March 10	Revised ROV system built and dry tested
01 June 10	Commence offshore recovery operations

Particles Project Team  
Dounreay Site Restoration Ltd (DSRL)  
08<sup>th</sup> December 2009

### Dounreay Particles Advisory Group (DPAG) – classification of particles

<b>Significant</b>	Caesium 137 activity greater than 1,000,000 Bq	Likely to cause serious ulceration (visible after 1-2 weeks). This may take several weeks to heal along with the associated risk of infection which might require medical treatment.
<b>Relevant</b>	Caesium 137 activity between 100,000 and 1,000,000 Bq	Would require a minimum of 7 hours stationary contact with the skin to have any discernable effect. Indeed, time periods of 1-2 days would be required for any reddening with small lesion of the skin to be observed. The affected area of skin would be expected to heal completely within 2-4 weeks without further problems. Anyone coming into contact with this type of particle is unlikely to experience any observable effects.
<b>Minor</b>	Caesium 137 activity less than 100,000 Bq	Will not cause discernable health effects.