

Particles in the Environment Update for Quarter 1 2016/17

1 Beach Monitoring

1.1 Progress and Areas Monitored

To date, 43.9 ha of beach has been monitored against a programme target of 42 ha. A total of 56 particles and 25 stones have been recovered so far during the 2016/17 financial year, see Table 1.

The programme is on schedule to meet the annual monitoring target of 160 ha agreed with the EA. There were no unusual events (e.g. storms or vehicle breakdowns) to report.

Table 1. Beach finds in 2016/17 (Quarter 1)

Beach location	Area covered (ha)	No. of particles found			No. of stones found			Total Finds
		Alpha rich	Beta Rich	Other	Alpha rich	Beta Rich	Other	
St. Bees	4.4	3	0	0	0	0	0	3
Sellafield	35.1	38	15	0	0	24	1*	78
Seascale	4.5	0	0	0	0	0	0	0
ALL AREAS TOTAL	43.9	41	15	0	0	24	1*	81

Notes: Proportion of particles as % of total finds 70.9%. ²²⁶Ra find unrelated to Sellafield discharges.

Two of the finds detected so far during 2016/17 have exceeded the characterisation triggers set within the intervention criteria or PHE risk assessment.

- A beta rich particle was detected in April 2016 on Sellafield beach with a ¹³⁷Cs activity of 1.01E+05 Bq.
- A beta rich particle was detected in May 2016 on Sellafield beach with a ¹³⁷Cs activity of 1.03E+05 Bq

Both particles were within the range of previous measurements and therefore do not require immediate further consideration and do not challenge the Public Health England risk assessment. However, as they contained more than 1E+05 Bq of ¹³⁷Cs, they will be included within the next batch of samples that are sent for more detailed laboratory analysis.

The Public Health England risk assessment states *“The conclusion, based on the currently available information, is that the overall health risks to beach users are very low and significantly lower than other risks that people accept when using the beaches”*.

1.2 Find rates

Average find rates are compared with find rates over the last three years in Table 2. For clarity of presentation, the find rates in Table 2 are rounded to the nearest whole number.

There has only been sufficient monitoring on Sellafield beach in the programme to date to derive a reliable estimate of find rates. There has been a small reduction in alpha-rich particle find rates this financial year, when compared with the find rates reported in 2015/16. Beta-rich find rates remain broadly similar to previous years.

Similar find rates over time indicate that the numbers of particles present at the surface of the beach at any time does not vary significantly. This provides confidence that the chance of encounter used in the PHE risk assessment is fit for purpose.

Find rates have not exceeded the Environment Agency's proposed intervention trigger levels at any of the monitored beaches.

Table 2. Find per hectare and area monitored for main beach areas

Beach Location	Financial Year	Area covered (ha)	Find category & Type (finds per hectare)			
			Alpha-rich Particle	Beta-rich Particle	Beta-rich Stone	Other Finds
St. Bees	2014/15	38.7	1	<1	<1	<1
	2015/16	21.3	2	<1	<1	<1
	2016/17	4.4	IA	IA	IA	IA
Sellafield	2014/15	38.2	5	<1	<1	<1
	2015/16	83.1	2	<1	<1	<1
	2016/17	35.1	1	<1	<1	<1
Seascale	2014/15	36.8	<1	<1	<1	<1
	2015/16	27.1	<1	<1	<1	<1
	2016/17	4.5	IA	IA	IA	IA

Notes: IA - Insufficient area coverage to estimate finds rates (<10 ha).

1.3 Find activities

The activities of alpha rich and beta rich particle finds are compared to the activities measured over the two preceding financial years in Figure 1. Data covers April 2014 until 31st March 2016 and from 1st April 2016 – 24th June 2016. Maximum particle activity recorded during this time period for ²⁴¹Am is 1.45E+05 Bq (21/05/2015) and for ¹³⁷Cs is 1.74E+05 Bq (02/06/2015).

Similar activities over time indicate that the activity of particles present at the surface of the beach at any time does not vary significantly. This provides confidence that the risks following encounter used in the PHE risk assessment is fit for purpose.

1.4 External Analysis

A further 10 particles were sent to PHE on 26th May 2016 for more detailed analysis. Initial gamma scans have been performed and the finds have been isolated. The radiometric, radiochemical and dosimetric analyses of this batch of particles is scheduled to be completed in December 2016.

1.5 Additional Workstreams

The 2015/16 Particles in the Environment annual report was issued in June 2016 and is available on the Sellafield sites website.

More details including maps showing the areas monitored and the locations of finds can be found at:

<http://sustainability.sellafieldsites.com/environment/environment-page/particles-in-the-environment/>.

Head of Environment, Sellafield Site
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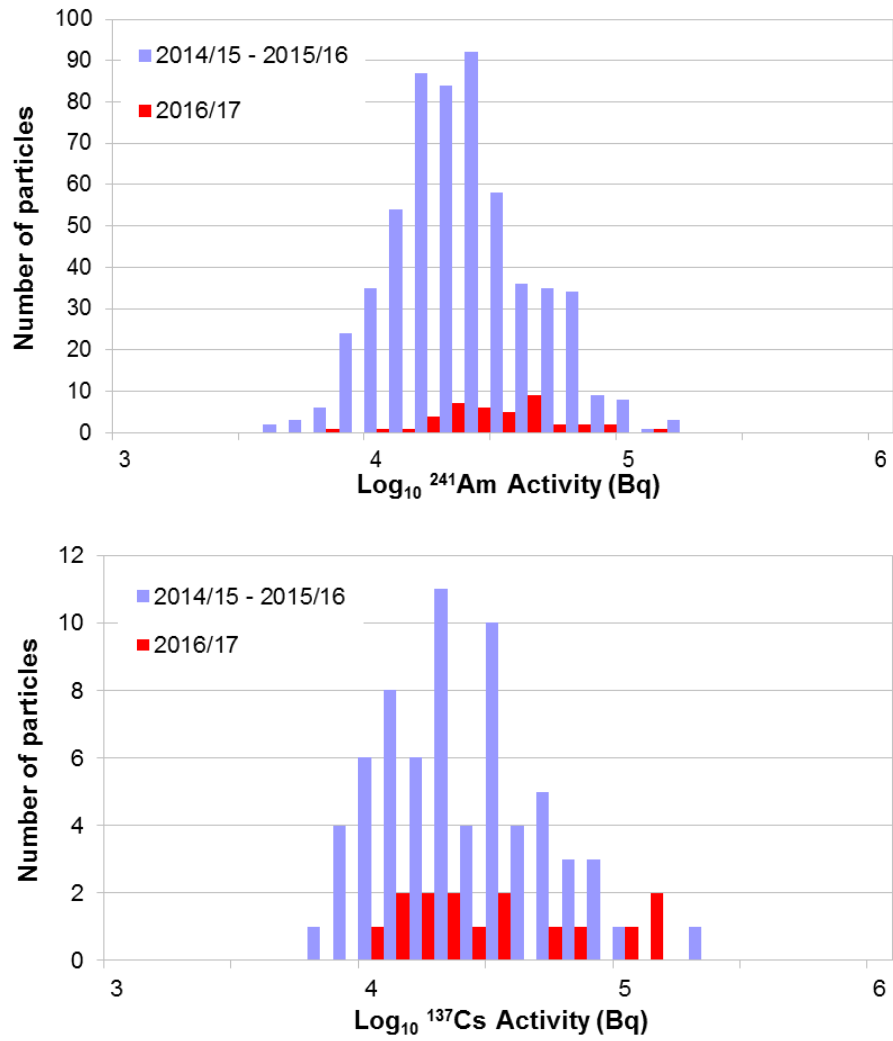


Figure 1: Radioactivity of finds classified as alpha-rich particles (upper) and beta rich particles (lower).