

Sellafield Particles in the Environment Update (1-Jan to 31-Mar 2022)

1 Progress and areas monitored

During the period 1st January to 31st March 2022 (Q1 2022) a total area of 27 ha of the beaches along the Cumbrian coast were monitored against a programme target of 22 ha. A total of 7 particles and no larger objects¹ were detected, recovered and analysed, see Table 1. The overall target for the 2022 programme is to monitor an area of 105 ha. Further details of the programme can be found in the annual report series².

A strandline survey was conducted between the 22nd – 24th March from Drigg Point to St. Bees Head, excluding the foreshore at Nethertown where vehicle access is not possible. No finds were detected or recovered.

2 Find rates

Average find rates were compared with find rates over the last two calendar years in Table 2 and the last four years in Figure 1. For clarity of presentation, the find rates in Table 2 were rounded to the nearest significant figure.

Table 2 and Figure 1 shows that Alpha-rich particle³, Beta-rich particle and Beta-rich larger object find rates at Sellafield beach were comparable with the average find rates from the previous years. Alpha-rich particle find rates at Northern beaches were lower than those measured at this area in recent years.

Find rates in Q1 2022 did not require any form of intervention through the EA Intervention Protocol⁴.

3 Find activities

Figure 2 shows the activities of Alpha-rich particles were comparable to the activities measured since May 2014 (when the current version of the monitoring equipment was introduced).

None of the finds recovered in Q1 2022 required characterisation through the EA Characterisation Protocol⁴.

4 Summary of programme

Table 3 presents a summary of the beach monitoring programme since it started in 2006. Overall, a total of 2618 ha of beaches have been monitored and 3439 particles and larger objects have been recovered and analysed.

5 Conclusion

The PHE risk assessment for radioactive particles and larger objects on West Cumbrian beaches reported that

- “overall health risks for beach users are very low, and significantly lower than other risks that people accept when using the beaches.”; and that
- “measures to control these risks are not warranted on public health grounds.”

¹ "Particles" are finds < 2 mm in diameter and "larger objects" are finds \geq 2mm in diameter (includes: granules, gravel, pebbles, stones etc.)

² <https://www.gov.uk/government/collections/sellafield-ltd-environmental-and-safety-reports>

³ "Alpha-rich" are finds with ²⁴¹Am activity greater than ¹³⁷Cs activity, "Beta-rich" are finds with ¹³⁷Cs activity greater than ²⁴¹Am activity and "Co-60 rich" are finds with positive ⁶⁰Co activity greater than the ¹³⁷Cs activity.

⁴ <https://www.gov.uk/government/publications/sellafield-radioactive-objects-intervention-plan/sellafield-radioactive-objects-intervention-plan>

Table 1: Beach finds in 2022

Beach location	Area covered (ha)	No. of particles found				No. of larger objects found				Total finds
		Alpha-rich	Beta-rich	Other	Not analysed	Alpha-rich	Beta-rich	Other	Not analysed	
Allonby	0	0	0	0	0	0	0	0	0	0
Northern beaches	11	1	0	0	0	0	0	0	0	1
Sellafield	12	4	0	0	0	0	0	0	0	4
Southern beaches	4	2	0	0	0	0	0	0	0	2
All	27	7	0	0	0	0	0	0	0	7

Note 1: Proportion of particles as % of total finds 100%.

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

Beach location	Year	Area covered (ha)	Find category & Type (finds per hectare)			
			Alpha-rich particle	Beta-rich particle	Beta-rich larger object	Other finds
Allonby	2020	6	0	0	0	0
	2021	5	0	0	0	0
	2022	0	NA	NA	NA	NA
Northern beaches	2020	30	<1	0	0	0
	2021	36	2	0	0	0
	2022	11	<0.1	0	0	0
Sellafield	2020	58	<1	<0.1	<0.1	0
	2021	57	<1	<0.1	<0.1	0
	2022	12	<1	0	0	0
Southern beaches	2020	19	<0.1	0	0	0
	2021	24	<0.1	0	0	0
	2022	4	IA	0	0	0

Note 2: IA - Insufficient area coverage to estimate finds rates (<10 ha).

NA - No monitoring to date.

"<1" denotes values between 0.1 and 0.99.

"<0.1" denotes values between zero and 0.099.

Table 3: Summary of beach monitoring data since programme began in 2006.

Beach location	Area (ha)	Total		Alpha-rich		Beta-rich		Co-60 rich	
		Particle	Larger object	Particle	Larger object	Particle	Larger object	Particle	Larger object
Allonby	118	18	1	16	0	2	1	0	0
Northern beaches	880	868	0	811	0	51	0	6	0
Sellafield	955	1672	720	1336	6	328	712	8	2
Southern beaches	586	134	6	109	0	25	4	0	2
Other beaches	78	19	1	17	0	2	1	0	0
All	2618	2711	728	2289	6	408	718	14	4

Note: Northern beaches are St Bees and Braystones, Southern beaches are Seascale and Drigg. Allonby and Sellafield are included specifically. All other beaches (e.g. Whitehaven, Workington, Silecroft etc.) are incorporated into the "Other beaches" definition.

Note that some Beta-rich particles have been reclassified as larger objects following analysis.

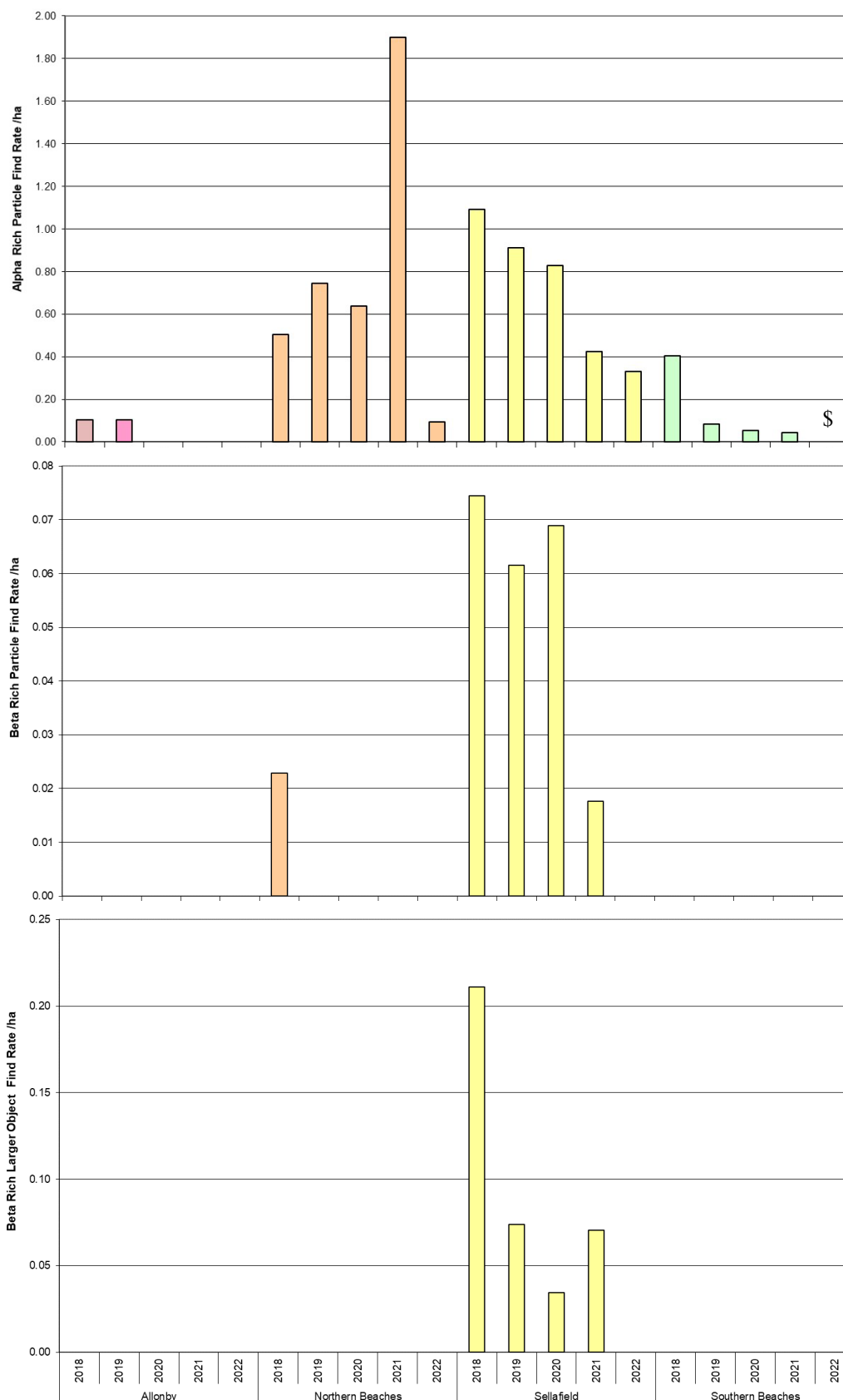
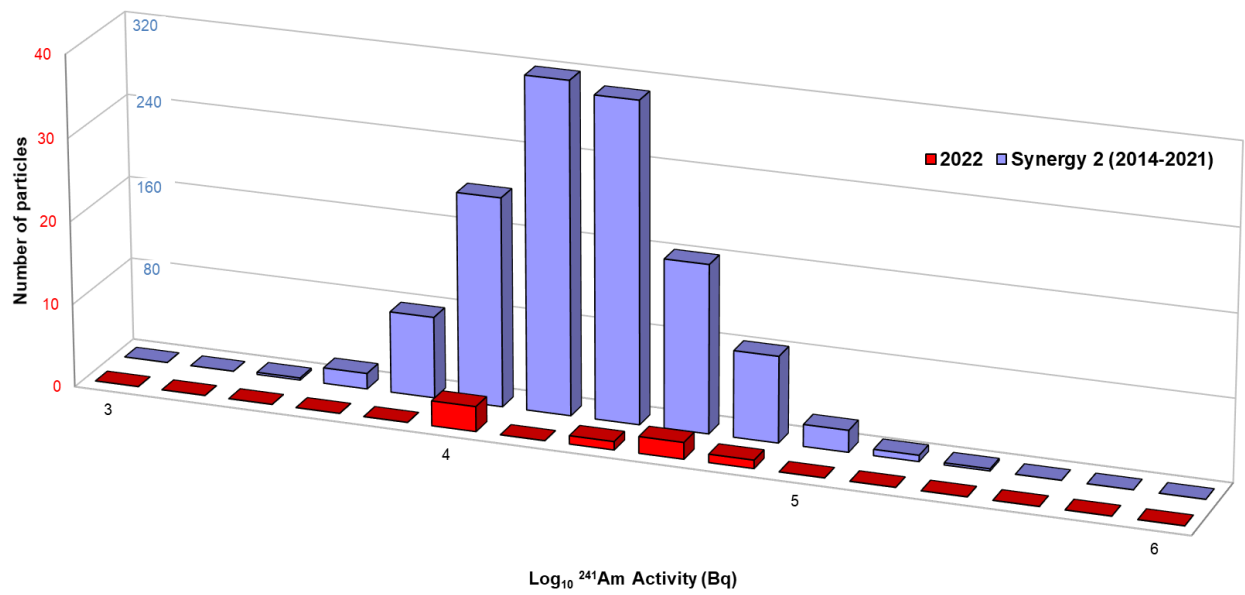


Figure 1: Find rates of Alpha-rich particles (upper), Beta-rich particles (middle) and Beta-rich larger objects (lower) between 2018 - 2022. Note that find rates in 2022 are for finds to date and not the annual rate.

Notes: \$ Find rate not able to be calculated as it corresponds to a very limited amount of monitoring, see Table 1.



Note 3: Different scales used for 2022 and Synergy2 datasets.

Figure 2: Radioactivity of finds classified as Alpha-rich particles between May 2014 - December 2021 (termed "Synergy2" and shown in blue) compared to data from 2022 (termed "2022" and shown in red).