

Fukushima Daiichi Nuclear Power Station: Am and Cm analysis result in the soil

1. Analysis result

(Unit: Bq/kg· Dry soil)

Sampling spot (): Distance from the stack of Unit 1, 2	Date of sampling/ Analyses organization	Pu-238 ^{*1}	Pu-239 ^{*1} Pu-240 ^{*1}	U-234 ^{*2}	U-235 ^{*2}	U-238 ^{*2}	Am-241	Cm-242	Cm-243 Cm-244
Playground (west-northwest approx. 500m)	June 20/ Japan Chemical Analysis Center	(1.2 ± 0.12) × 10 ⁻¹	(5.8 ± 0.77) × 10 ⁻²	(1.1 ± 0.058) × 10 ¹	(5.7 ± 0.97) × 10 ⁻¹	(1.2 ± 0.059) × 10 ¹	(2.0 ± 0.45) × 10 ⁻²	(1.4 ± 0.055) × 10 ⁰	(9.5 ± 0.98) × 10 ⁻²
Forest of wild birds (west approx. 500m)		N.D. [< 1.0 × 10 ⁻²]	(2.9 ± 0.56) × 10 ⁻²	(6.4 ± 0.37) × 10 ⁰	(4.0 ± 0.79) × 10 ⁻¹	(6.2 ± 0.35) × 10 ⁰	N.D. [< 9.7 × 10 ⁻³]	N.D. [< 9.5 × 10 ⁻³]	N.D. [< 9.5 × 10 ⁻³]
Adjacent to industrial waste disposal facility (south-southwest approx. 500m)		(1.7 ± 0.15) × 10 ⁻¹	(6.1 ± 0.81) × 10 ⁻²	(5.7 ± 0.33) × 10 ⁰	(2.2 ± 0.55) × 10 ⁻¹	(5.7 ± 0.33) × 10 ⁰	(5.3 ± 0.72) × 10 ⁻²	(2.1 ± 0.079) × 10 ⁰	(1.0 ± 0.11) × 10 ⁻¹
Average nuclide density ratio of fuel in Units 1 to 3 (ratio in case the ratio of Pu-238 is considered as 1) ^{*3}		1	-	-	-	-	0 . 1	1 0	1

*1 : Released on July 8th, 2011 *2 : Released on July 21st, 2011 *3 : Values calculated by ORIGEN Code (round number)

2. Evaluation

Detected Cm is considered to derive from the accident due to following reasons.

- Cm-242, Cm-243 and Cm-244 are nuclides that do not exist in the natural world. In particular, Cm-242 whose half-life is relatively short (approximately 160 days) was detected.
- The density ratio of each nuclides (Am-241/Cm-242/Cm-243,Cm-244) to Pu-238 in the sample and is almost the same as the average nuclide density ratio of fuel in Units 1 to 3.

Pu-238 in the sample : (Am-241/Cm-242/Cm-243,Cm-244) 1 : (0.2/12/0.6)

Pu-238 in the sample : (Am-241/Cm-242/Cm-243,Cm-244) 1 : (0.3/12/0.6)

End