

(News Release)
The Results of Radioactive Material Monitoring of the Surface Water Bodies
within Gunma Prefecture
(October-December Samples)

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In accordance with the Comprehensive Radiation Monitoring Plan determined by the Monitoring Coordination Meeting, the Ministry of the Environment (MOE) is continuing to monitor radioactive materials in water environments (surface water bodies (rivers, lakes and headwaters, and coasts), etc.).

Samples taken from the surface water bodies of Gunma Prefecture during the period of October 1-December 13, 2013 have been measured as part of MOE's efforts to monitor radioactive materials; the results have recently been compiled and are released here.

The monitoring results of radioactive materials in surface water bodies carried out to date can be found at the following web page: <http://www.env.go.jp/jishin/rmp.html#monitoring>

1. Survey Overview

(1) Survey Locations

72 environmental reference points, etc. in the surface water bodies within Gunma Prefecture
(Rivers: 48 locations, Lakes and headwaters: 24 locations)

(2) Survey Method

- Measurement of concentrations of radioactive materials (radioactive cesium (Cs-134 and Cs-137)) in water and sediment
- Measurement of concentrations of radioactive materials and spatial dose-rate in soil in the surrounding environment of water and sediment sample collection points (river terraces, etc.)

2. Outline of Results (* denotes the results of the previous survey: July-September 2013)

(1) Water Quality (Lower detection limit: 1Bq/L)

Cs-134 + Cs-137: Not detectable (ND) at any location (* ND at any location)

<Reference>

Specification and Standards for Food, Food Additives, etc. in accordance with the Food Sanitation Act (Drinking Water) (Ministry of Health, Labour and Welfare Public Notice No.130, March 15, 2012)
Radioactive cesium (total for Cs-134+Cs-137): 10Bq/kg

Target value for radioactive materials in tap water (management target for water supply facilities) (March 5, 2012; 0305 Notice No.1 from the Director of the Water Supply Division, Health Service Bureau, Ministry of Health, Labour and Welfare)

Radioactive cesium (total for Cs-134+Cs-137): 10Bq/kg

(2) Sediment (Lower detection limit: 10Bq/kg (dried mud))

For rivers, levels were 500Bq/kg or below at most locations, and for lakes and headwaters, 1,500Bq/kg or below at most locations. Overall there were some fluctuations, but the levels have generally remained constant or had a declining tendency.

(Rivers)

Cs-134 + Cs-137: ND-1,560Bq/kg (dried mud) (*ND-950Bq/kg (dried mud))

(Lakes and head waters)

Cs-134 + Cs-137: 74-4,300Bq/kg (dried mud) (*110-3,500Bq/kg (dried mud))

<Reference> Number of locations by radioactive cesium concentration (500Bq/kg)

Numbers in () denote results measured on the previous occasion.

	500 or below	501 -1,000	1,001 -1,500	1,501 -2,000	2,001 -2,500	2,501 -3,000	3,001 or more	Total
Rivers	46 (62)	1 (2)	0 (0)	1 (0)	0 (0)	0 (0)	0 (0)	48 (64)
Lakes and headwaters	15 (9)	17 (7)	5 (5)	5 (1)	1 (0)	0 (0)	4 (2)	47 (24)

(3) Surrounding Environment (Lower detection limit: 10Bq/kg (dry))

(Rivers)

Cs-134 + Cs-137: 10-7,500Bq/kg (dry) (*15-12,200Bq/kg (dry))

Spatial dose: 0.04-0.25µSv/h

(Lakes and headwaters)

Cs-134 + Cs-137: 37-7,600Bq/kg (dry) (*138-8,300Bq/kg (dry))

Spatial dose: 0.05-0.26µSv/h

(Annex for details)
(Map attached)

Future Plans

MOE intends to continue to measure radioactive materials in water, sediment, etc. in rivers, lakes, etc., since concentrations of radioactive materials seem to show fluctuations, depending on locations, due to minor differences in sampling points or properties of samples of each survey.

*Way to announce the results of monitoring:

Announcement of the Results of Radioactive Material Monitoring in the form of News Release will end with this news release. From now on, MOE will announce the results in the following website whenever new monitoring results are obtained. So please see the following website from now on:

<http://www.env.go.jp/jishin/rmp.html#monitoring> (MOE website, Radioactive Material Monitoring)

○River: Water Quality Monitoring Results

(Annex)

No.	Sampling point			Sampling date	Weather	Full depth (m)	General items					Radioactive material concentrations (Bq/L)		Remarks	
	Water body	Point	Municipality				Sampling depth (m)	Transparency (cm)	Electrical conductivity (mS/m)	SS (mg/L)	Turbidity	Radioactive cesium			
												Cs-134	Cs-137		
1	Tonegawa River	Tonegawa River	Hirosebash Bridge	Minakamimachi Town	2013/11/15	Cloudy	1.4	0.0	62	4	<1	2	<1	<1	
2		Tsukiyonobashi Bridge			2013/11/6	Sunny	0.6	0.0	86	6	3	3	<1	<1	
3		Akayagawa River	Kosodebashi Bridge		2013/11/6	Sunny	0.6	0.0	>100	8	2	1	<1	<1	
4		Sakuragawa River	In Ooaza Yachi	Kawabamura Village	2013/11/5	Sunny	0.3	0.0	>100	6	<1	0	<1	<1	
5		Katashinagawa River	Kirinokibashi Bridge	Katashinamura Village	2013/11/5	Sunny	0.6	0.0	>100	5	<1	0	<1	<1	
6			Tonemachitakatoya	Numatashi City	2013/11/5	Sunny	0.5	0.0	>100	8	<1	0	<1	<1	
7		Futaebashi Bridge			2013/11/5	Sunny	0.5	0.0	>100	10	1	1	<1	<1	
8		Agatsumagawa River	Shintobashi Bridge	Naganoharamachi Town	2013/11/8	Sunny	0.5	0.0	43	24	14	9	<1	<1	
9		Shirasunagawa River	Shuttatsubashi Bridge	Nakanojomachi Town	2013/11/8	Sunny	0.4	0.0	>100	14	<1	0	<1	<1	
10		Agatsumagawa River	Downstream of Azumabashi Bridge	Higashiagatsumamachi Town	2013/11/8	Sunny	0.5	0.0	>100	25	3	2	<1	<1	
11		Nakutagawa River	Tonodabashi Bridge	Takayamamura Village	2013/11/7	Sunny	0.5	0.0	>100	11	<1	1	<1	<1	
12		Agatsumagawa River	Agatsumabashi Bridge	Shibukawashi City	2013/11/6	Sunny	0.4	0.0	34	20	10	5	<1	<1	
13		Tonegawa River	Taishobashi Bridge			2013/11/5	Sunny	0.7	0.0	82	10	4	2	<1	<1
14		Takizawagawa River	Shintakizawabashi Bridge	Shbukawashi City/Yoshiokamachi Town	2013/11/6	Sunny	0.3	0.0	>100	22	2	1	<1	<1	
15		Tonegawa River	Gunmaohashi Bridge	Maebashishi City	2013/11/11	Sunny	0.4	0.0	61	15	5	3	<1	<1	
16			Fukushimabashi Bridge	Tamamuramachi Town	2013/11/7	Light rain	0.5	0.0	>100	115	3	2	<1	<1	
17	Tonogawa River	Nagaigawa River	Kamigondabashi Bridge	Takasakishi City	2013/11/11	Sunny	0.2	0.0	>100	13	2	1	<1	<1	
18		Karasugawa River	Karasugawabashi Bridge			2013/11/11	Sunny	0.6	0.0	>100	12	1	1	<1	<1
19		Usuigawa River	Nakasebashi Bridge	Annakashi City	2013/11/12	Sunny	0.3	0.0	>100	18	<1	1	<1	<1	
20			Hanatakabashi Bridge	Takasakishi City	2013/11/11	Cloudy	0.7	0.0	54	31	3	2	<1	<1	
21		Kaburagawa River	Tadakawabashi Bridge	Shimonitamachi Town	2013/11/12	Sunny	0.4	0.0	>100	23	4	1	<1	<1	
22			Kaburagawabashi Bridge	Takasakishi City/Fujiokashi City	2013/11/12	Sunny	0.4	0.0	>100	30	3	1	<1	<1	
23		Ogawa River	Kinzanbashi Bridge	Kanramachi Town	2013/11/12	Sunny	0.3	0.0	>100	17	<1	0	<1	<1	
24		Nanmokugawa River	Ozawabashi Bridge	Nanmokumura Village	2013/11/12	Sunny	0.3	0.0	>100	18	<1	1	<1	<1	
25		Someyagawa River	Yakushibashi Bridge	Shintomura Village	2013/11/11	Sunny	0.3	0.0	>100	27	4	2	<1	<1	
26		Inogawa River	Kamakurabashi Bridge	Takasakishi City	2013/11/7	Cloudy	0.5	0.0	>100	113	2	1	<1	<1	
27		Karasugawa River	Iwakurabashi Bridge	Takasakishi City/Tamamuramachi Town	2013/11/14	Sunny	0.6	0.0	>100	36	3	0	<1	<1	
28		Kannagawa River	Shinkanabashi Bridge	Uenomura Village	2013/11/13	Sunny	0.2	0.0	>100	14	<1	0	<1	<1	
29			Moritobashi Bridge	Kannamachi Town	2013/11/13	Sunny	0.5	0.0	>100	15	<1	0	<1	<1	
30			Tobukyo Bridge	Fujiokashi City/Kamisatomachi Town	2013/11/13	Sunny	0.3	0.0	>100	26	<1	1	<1	<1	
31			Kannagawabashi Bridge	Kamisatomachi Town	2013/11/13	Sunny	0.2	0.0	>100	26	<1	1	<1	<1	
32		Ionogawa River	Tonegawa River	Bandoohashi Bridge	Honjoshi City	2013/11/14	Sunny	0.4	0.0	92	27	2	1	<1	<1
33	Akagishirakawa River		In Shimohosomachi Town		2013/11/6	Sunny	0.5	0.0	>100	29	3	1	<1	<1	
34	Momonokigawa River		Utsuboibashi Bridge	Maebashishi City	2013/11/7	Cloudy	0.3	0.0	>100	125	<1	1	<1	<1	
35	Aratogawa River		Okuharabashi Bridge		2013/11/7	Light rain	0.4	0.0	>100	148	10	6	<1	<1	
36	Kasukawa River		Hozumibashi Bridge		2013/11/14	Sunny	0.3	0.0	74	39	2	1	<1	<1	
37	Hirosegawa River		Nakajimabashi Bridge	Isesakishi City	2013/11/14	Sunny	0.3	0.0	>100	30	3	1	<1	<1	
38	Hayakawa River		Hayakawabashi Bridge		2013/11/7	Light rain	0.6	0.0	>100	23	3	1	<1	<1	
39			Maejimabashi Bridge	Otashi City	2013/11/14	Sunny	0.2	0.0	78	44	2	1	<1	<1	
40	Tonegawa River		Toneozeki Weir	Chiyodamachi Town/Gyodashi City	2013/11/14	Sunny	0.5	0.0	>100	29	3	2	<1	<1	
41	Kogurogawa River		Kayanobashi Bridge	Kiryushi City	2013/11/5	Sunny	0.9	0.0	>100	7	<1	0	<1	<1	
42			Takatsudo			2013/11/8	Sunny	0.8	0.0	>100	9	<1	1	<1	<1
43			Watarasegawa River	Intake for Akaiwayosui water channel		2013/11/7	Cloudy	0.5	0.0	>100	10	1	1	<1	<1
44		Tataragawa River	Ejiribashi Bridge	Ouramachi Town	2013/11/6	Sunny	0.4	0.0	95	31	4	2	<1	<1	
45		Kiryugawa River	Kannonbashi Bridge	Kiryushi City	2013/11/8	Sunny	0.4	0.0	>100	7	<1	1	<1	<1	
46			Sakaibashi Bridge	Kiryushi City/Ashikagashi City	2013/11/8	Sunny	0.4	0.0	>100	8	<1	1	<1	<1	
47		Tsuruudagawa River	Jonuma Lake	Tatebayashishi City	2013/11/6	Sunny	1.2	0.0	45	37	11	6	<1	<1	
48		Yatagawa River	Togodabashi Bridge	Meiwamachi Town/Itakuramachi Town	2013/11/6	Sunny	0.5	0.0	>100	56	3	3	<1	<1	

• Sampling points for rivers are listed from north to south, and for different points along the river, from upstream to downstream.

• Radioactive materials concentrations contain some measurement errors but are not noted here.

ORiver: Sediment Monitoring Results

No.	Sampling point				Sampling date	Weather	Full depth (m)	General items			Concentration of radioactive material [Bq/kg (dried mud)]			Remarks
	Water body	Point	Municipality	Mud sampling depth (cm)				Mud content %	Property	Radioactive cesium				
										Cs-134	Cs-137	Total		
1	Tonegawa River	Hirosebash Bridge	Minakamimachi Town	2013/11/15	Cloudy	1.4	5	73	Sand/gravel	14	38	52		
2		Tsukiyonobashi Bridge		2013/11/6	Sunny	0.6	5	78	Sand/gravel	15	45	60		
3		Akayagawa River		Kosodebash Bridge	2013/11/6	Sunny	0.6	5	75	Sand/gravel	<10	13	13	
4		Sakuragawa River	In Ooaza Yachi	Kawabamura Village	2013/11/5	Sunny	0.3	3	73	Gravel/sand	36	93	129	
5		Katashinagawa River	Kirinokibashi Bridge	Katashinamura Village	2013/11/5	Sunny	0.6	5	79	Gravel/sand	<10	17	17	
6			Tonemachitakotoya	Numatashi City	2013/11/5	Sunny	0.5	5	76	Sand/gravel	<10	<10	-	
7		Agatsumagawa River	Futaebashi Bridge	Naganoharamachi Town	2013/11/5	Sunny	0.5	4	77	Sand/gravel	11	28	39	
8			Shintobashi Bridge		2013/11/8	Sunny	0.5	5	79	Sand	<10	<10	-	
9		Shirasunagawa River	Shuttatsubashi Bridge	Nakanomomachi Town	2013/11/8	Sunny	0.4	6	77	Sand	<10	<10	-	
10		Agatsumagawa River	Downstream of Azumabashi B	Higashiagatsumamachi Town	2013/11/8	Sunny	0.5	6	86	Gravel/sand	<10	<10	-	
11		Nakutagawa River	Tonodabashi Bridge	Takayamamura Village	2013/11/7	Sunny	0.5	5	65	Gravel/sand	20	40	60	
12		Agatsumagawa River	Agatsumabashi Bridge	Shibukawashi City	2013/11/6	Sunny	0.4	5	65	Sand/silt	12	34	46	
13		Tonegawa River	Taishobashi Bridge		2013/11/5	Sunny	0.7	5	76	Gravel/sand	<10	15	15	
14		Takizawagawa River	Shintakizawabashi Bridge	Shibukawashi City/Yoshiokamachi Town	2013/11/6	Sunny	0.3	5	76	Gravel/sand	<10	24	24	
15		Tonegawa River	Gunmaohashi Bridge	Maebashishi City	2013/11/11	Sunny	0.4	3	79	Sand	<10	12	12	
16			Fukushimabashi Bridge	Tamamuramachi Town	2013/11/7	Light rain	0.5	6	80	Sand/gravel	<10	<10	-	
17	Karasugawa River	Nagaigawa River	Kamigondabashi Bridge	2013/11/11	Sunny	0.2	5	69	Gravel/sand	37	100	137		
18		Karasugawa River	Karasugawabashi Bridge	Takasakishi City	2013/11/11	Sunny	0.6	5	73	Sand/gravel	<10	19	19	
19		Usuigawa River	Nakasebashi Bridge	Annakashi City	2013/11/12	Sunny	0.3	5	77	Gravel/sand	<10	19	19	
20			Hanatakabashi Bridge	Takasakishi City	2013/11/11	Cloudy	0.7	4	71	Gravel/sand	<10	12	12	
21		Kaburagawa River	Tadakawabashi Bridge	Shimonitama City	2013/11/12	Sunny	0.4	3	78	Gravel/sand	<10	<10	-	
22			Kaburagawabashi Bridge	Takasakishi City/Fujiokashi City	2013/11/12	Sunny	0.4	5	71	Sand/silt	14	36	50	
23		Ogawa River	Kinzanbashi Bridge	Kanramachi Town	2013/11/12	Sunny	0.3	5	76	Sand/gravel	18	45	63	
24		Nanmokugawa River	Ozawabashi Bridge	Nanmokumura Village	2013/11/12	Sunny	0.3	3	84	Gravel/sand	<10	<10	-	
25		Someyagawa River	Yakushibashi Bridge	Shintomura Village	2013/11/11	Sunny	0.3	4	80	Gravel/sand	<10	24	24	
26		Inogawa River	Kamakurabashi Bridge	Takasakishi City	2013/11/7	Cloudy	0.5	8	76	Sand/gravel	<10	23	23	
27	Karasugawa River	Iwakurabashi Bridge	Takasakishi City/Tamamuramachi Town	2013/11/14	Sunny	0.6	5	68	Sand/silt	41	81	122		
28	Kannagawa River	Shinkanabashi Bridge	Uenomura Village	2013/11/13	Sunny	0.2	5	84	Gravel/sand	<10	<10	-		
29		Moritobashi Bridge	Kannamachi Town	2013/11/13	Sunny	0.5	6	97	Gravel/sand	<10	<10	-		
30		Tobukyo Bridge	Fujiokashi City/Kamisatomachi Town	2013/11/13	Sunny	0.3	6	85	Gravel/sand	<10	<10	-		
31		Kannagawabashi Bridge	Kamisatomachi Town	2013/11/13	Sunny	0.2	5	68	Silt/Sand/Sand	16	26	42		
32	Tonegawa River	Bandoobashi Bridge	Honjoshi City	2013/11/14	Sunny	0.4	5	79	Sand/silt	17	49	66		
33	Akagishirakawa River	In Shimohosoimachi Town	Maebashishi City	2013/11/6	Sunny	0.5	5	75	Sand/silt	<10	18	18		
34	Momonokigawa River	Utsuboibashi Bridge		2013/11/7	Cloudy	0.3	5	81	Sand/gravel	<10	<10	-		
35	Aratogawa River	Okuharabashi Bridge		2013/11/7	Light rain	0.4	5	52	Sand/silt	<10	26	26		
36	Kasukawa River	Hozumibashi Bridge		2013/11/14	Sunny	0.3	4	76	Sand/gravel	<10	15	15		
37	Hirosegawa River	Nakajimabashi Bridge	Isesakishi City	2013/11/14	Sunny	0.3	5	77	Sand/gravel	14	43	57		
38	Hayakawa River	Hayakawabashi Bridge	Otashi City	2013/11/7	Light rain	0.6	5	73	Gravel/sand	<10	15	15		
39		Maejimabashi Bridge		2013/11/14	Sunny	0.2	6	67	Sand/gravel	19	48	67		
40	Tonegawa River	Toneozeki Weir	Chiyodamachi Town/Gyodashi City	2013/11/14	Sunny	0.5	6	69	Sand/silt	52	120	172		
41	Kogurogawa River	Kayanobashi Bridge	Kiryushi City	2013/11/5	Sunny	0.9	5	70	Sand/gravel	29	61	90		
42		Takatsudo		2013/11/8	Sunny	0.8	5	79	Sand/gravel	11	25	36		
43	Watarasegawa River	Intake for Akaiwayosui water c		2013/11/7	Cloudy	0.5	10	79	Sand/gravel	13	40	53		
44	Tataragawa River	Ejiribashi Bridge	Ouramachi Town	2013/11/6	Sunny	0.4	3	75	Gravel/sand	36	90	126		
45	Kiryugawa River	Kannonbashi Bridge	Kiryushi City	2013/11/8	Sunny	0.4	4	81	Sand/gravel	28	66	94		
46		Sakaibashi Bridge	Kiryushi City/Ashikagashi City	2013/11/8	Sunny	0.4	5	81	Sand/gravel	52	100	152		
47	Tsuruudagawa River	Jonuma Lake	Tatebayashishi City	2013/11/6	Sunny	1.2	4	20	Silt	460	1,100	1,560		
48	Yatagawa River	Togodabashi Bridge	Meiwamachi Town/Itakuramachi Town	2013/11/6	Sunny	0.5	5	30	Silt	180	370	550		

- Sampling points for rivers are listed from north to south, and for different points along the river, from upstream to downstream.
- Radioactive materials concentrations contain some measurement errors but are not noted here.

ORiver: Surrounding Environment Monitoring Results

No.	Sampling point				Sampling date	Weather	Left bank					Right bank					Remarks
	Water body	Point	Municipality	Property			Concentration of radioactive material [Bq/kg (dry)]				Property	Concentration of radioactive material [Bq/kg (dry)]					
							Radioactive cesium			Air dose (μ Sv/h)		Radioactive cesium			Air dose (μ Sv/h)		
							Cs-134	Cs-137	Total			Cs-134	Cs-137	Total			
1	Tonegawa River	Tonegawa River	Hirosebash Bridge	Minakamimachi Town	2013/11/15	Cloudy	Loamy	740	1,800	2,540	0.23	Loamy	390	980	1,370	0.21	
2		Tonegawa River	Tsukiyonobashi Bridge		2013/11/6	Sunny	Loamy	120	300	420	0.11	Loamy	380	870	1,250	0.10	
3		Akayagawa River	Kosodebash Bridge	2013/11/6	Sunny	Sandy	31	85	116	0.09	Loamy	110	270	380	0.08		
4		Sakuragawa River	In Ooza Yachi	Kawabamura Village	2013/11/5	Sunny	Loamy	1,400	3,200	4,600	0.25	Loamy	2,200	5,300	7,500	0.24	
5		Katashinagawa River	Kirinokibashi Bridge	Katashinamura Village	2013/11/5	Sunny	Loamy	200	420	620	0.10	Loamy	640	1,500	2,140	0.10	
6			Katashinagawa River	Tonemachitakotoya	Numatashi City	2013/11/5	Sunny	Sandy	14	20	34	0.08	Sandy	37	67	104	0.10
7			Katashinagawa River	Futaebashi Bridge		2013/11/5	Sunny	Loamy	520	1,200	1,720	0.09	Loamy	180	420	600	0.09
8		Agatsumagawa River	Shintobashi Bridge	Naganoharamachi Town	2013/11/8	Sunny	Loamy	190	510	700	0.07	Loamy	70	160	230	0.07	
9		Shirasunagawa River	Shuttatsubashi Bridge	Nakanomomachi Town	2013/11/8	Sunny	Loamy	99	280	379	0.06	Loamy	520	1,100	1,620	0.07	
10		Agatsumagawa River	Downstream of Azumabashi Bridge	Higashiagatsumamachi Town	2013/11/8	Sunny	Sandy	<10	10	10	0.06	Loamy	380	930	1,310	0.06	
11		Nakutagawa River	Tonodabashi Bridge	Takayamamura Village	2013/11/7	Sunny	Loamy	210	470	680	0.08	Loamy	90	260	350	0.05	
12		Agatsumagawa River	Agatsumabashi Bridge	Shibukawashi City	2013/11/6	Sunny	Loamy	240	620	860	0.07	Loamy	290	660	950	0.08	
13		Tonegawa River	Taishobashi Bridge		2013/11/5	Sunny	Loamy	390	970	1,360	0.08	Loamy	910	2,100	3,010	0.07	
14		Takizawagawa River	Shintakizawabashi Bridge	Shibukawashi City/Yoshiokamachi Town	2013/11/6	Sunny	Loamy	69	140	209	0.06	Loamy	81	160	241	0.05	
15		Tonegawa River	Gunmaohashi Bridge	Maebashishi City	2013/11/11	Sunny	Loamy	18	51	69	0.09	Loamy	54	120	174	0.06	
16			Tonegawa River	Fukushimabashi Bridge	Tamamuramachi Town	2013/11/7	Light rain	Loamy	100	230	330	0.06	Loamy	63	140	203	0.07
17	Karasugawa River	Nagaigawa River	Kamigondabashi Bridge	Takasakishi City	2013/11/11	Sunny	Loamy	290	660	950	0.09	Loamy	500	1,200	1,700	0.14	
18		Karasugawa River	Karasugawabashi Bridge		2013/11/11	Sunny	Loamy	180	450	630	0.05	Loamy	160	400	560	0.08	
19		Usuigawa River	Nakasebashi Bridge	Annakashi City	2013/11/12	Sunny	Loamy	240	540	780	0.09	Loamy	210	500	710	0.06	
20			Usuigawa River	Hanatakabashi Bridge	Takasakishi City	2013/11/11	Cloudy	Loamy	77	210	287	0.06	Loamy	250	630	880	0.08
21		Kaburagawa River	Tadakawabashi Bridge	Shimonitama Town	2013/11/12	Sunny	Loamy	200	510	710	0.10	Sandy	14	31	45	0.10	
22			Kaburagawa River	Kaburagawabashi Bridge	Takasakishi City/Fujiokashi City	2013/11/12	Sunny	Loamy	38	80	118	0.08	Loamy	39	89	128	0.06
23		Ogawa River	Kinzanbashi Bridge	Kanramachi Town	2013/11/12	Sunny	Loamy	79	190	269	0.12	Loamy	140	340	480	0.10	
24		Nanmokugawa River	Ozawabashi Bridge	Nanmokumura Village	2013/11/12	Sunny	Loamy	310	780	1,090	0.09	Loamy	220	490	710	0.07	
25		Someyagawa River	Yakushibashi Bridge	Shintomura Village	2013/11/11	Sunny	Loamy	87	180	267	0.05	Loamy	89	210	299	0.13	
26		Inogawa River	Kamakurabashi Bridge	Takasakishi City	2013/11/7	Cloudy	Loamy	32	86	118	0.05	Loamy	110	260	370	0.07	
27		Karasugawa River	Iwakurabashi Bridge	Takasakishi City/Tamamuramachi Town	2013/11/14	Sunny	Loamy	46	120	166	0.04	Loamy	38	100	138	0.06	
28		Kannagawa River	Shinkanabashi Bridge	Uenomura Village	2013/11/13	Sunny	Loamy	240	560	800	0.08	Loamy	340	760	1,100	0.10	
29	Kannagawa River		Moritobashi Bridge	Kannamachi Town	2013/11/13	Sunny	Loamy	100	210	310	0.10	Loamy	42	82	124	0.05	
30	Kannagawa River		Tobukyo Bridge	Fujiokashi City/Kamisatomachi Town	2013/11/13	Sunny	Loamy	83	170	253	0.07	Loamy	55	110	165	0.06	
31	Kannagawa River		Kannagawabashi Bridge	Kamisatomachi Town	2013/11/13	Sunny	Loamy	44	110	154	0.09	Loamy	48	100	148	0.06	
32	Tonegawa River	Tonegawa River	Bandoobashi Bridge	Honjoshi City	2013/11/14	Sunny	Loamy	62	150	212	0.05	Loamy	36	77	113	0.08	
33		Akagishirakawa River	In Shimohosomachi Town	Maebashishi City	2013/11/6	Sunny	Loamy	85	190	275	0.06	Loamy	42	99	141	0.05	
34		Momonokigawa River	Utsuboibashi Bridge		2013/11/7	Cloudy	Loamy	35	90	125	0.06	Loamy	67	140	207	0.05	
35		Aratogawa River	Okuharabashi Bridge	2013/11/7	Light rain	Loamy	28	73	101	0.05	Loamy	22	74	96	0.05		
36		Kasukawa River	Hozumibashi Bridge	2013/11/14	Sunny	Loamy	59	120	179	0.06	Loamy	44	130	174	0.06		
37		Hirosegawa River	Nakajimabashi Bridge	Isesakishi City	2013/11/14	Sunny	Loamy	59	140	199	0.05	Loamy	140	380	520	0.07	
38		Hayakawa River	Hayakawabashi Bridge		2013/11/7	Light rain	Loamy	84	180	264	0.06	Loamy	320	750	1,070	0.08	
39		Hayakawa River	Maejimabashi Bridge	Otashi City	2013/11/14	Sunny	Loamy	39	94	133	0.08	Loamy	80	210	290	0.06	
40	Tonegawa River	Toneozeki Weir	Chiyodamachi Town/Gyodashi City	2013/11/14	Sunny	Loamy	110	250	360	0.10	Loamy	82	180	262	0.05		
41	Kogurogawa River	Kogurogawa River	Kayanobashi Bridge	Kiryushi City	2013/11/5	Sunny	Loamy	340	820	1,160	0.15	Loamy	270	640	910	0.11	
42		Watarasegawa River	Takatsudo		2013/11/8	Sunny	Loamy	34	93	127	0.07	Loamy	30	61	91	0.07	
43		Watarasegawa River	Intake for Akaiwayosui water channel	2013/11/7	Cloudy	Loamy	110	300	410	0.08	Loamy	82	180	262	0.08		
44		Tataragawa River	Ejiribashi Bridge	Ouramachi Town	2013/11/6	Sunny	Loamy	310	670	980	0.06	Loamy	52	140	192	0.08	
45		Kiryugawa River	Kannonbashi Bridge	Kiryushi City	2013/11/8	Sunny	Loamy	36	67	103	0.07	Loamy	95	220	315	0.05	
46			Kiryugawa River	Sakaibashi Bridge	Kiryushi City/Ashikagashi City	2013/11/8	Sunny	Loamy	110	260	370	0.06	Loamy	97	220	317	0.08
47		Tsuruudagawa River	Jonuma Lake	Tatebayashishi City	2013/11/6	Sunny	Loamy	180	450	630	0.07	Loamy	290	680	970	0.07	
48		Yatagawa River	Togodabashi Bridge	Meiwamachi Town/Itakuramachi Town	2013/11/6	Sunny	Loamy	70	200	270	0.06	Loamy	87	190	277	0.07	

• Samples for surrounding environment (soil) were generally collected from 5 points in 3m square in the river terrace, etc., and mixed. Depending on the site situation, factors, such as the area of sampling may be much smaller, may cause figures to vary significantly.
 • Sampling points for rivers are listed from north to south, and for different points along the river, from upstream to downstream.
 • Air dose was measured with a survey meter, TCS-172B of Hitachi-Aloka Medical, Ltd.
 • Radioactive materials concentrations contain some measurement errors but are not noted here.

OLake and Headwater: Water Quality Monitoring Results

Sampling point						Sampling date	Weather	Full depth (m)	General items					Radioactive material concentrations (Bq/L)		Remarks
No.	Point				Sampling depth (m)				Secchi disk depth (m)	Electrical conductivity (mS/m)	SS (mg/L)	Turbidity	Radioactive cesium			
													Cs-134	Cs-137		
1		Okutoneko Lake (Yagisawa Dam)	Center		Surface layer	2013/10/7	Sunny	78.4	0.5	2.7	3	2	1	<1	<1	
					Lower layer				77.4		3	9	15	<1	<1	
					Surface layer	2013/11/28	Cloudy	93.2	0.5	2.3	3	2	2	<1	<1	
					Lower layer				92.2		3	11	7	<1	<1	
2		Naramatako Lake (Naramata Dam)	Center	Minakamimachi Town	Surface layer	2013/10/7	Sunny	62.9	0.5	2.8	4	2	2	<1	<1	
					Lower layer				61.9		4	2	2	<1	<1	
					Surface layer	2013/11/28	Cloudy	74.0	0.5	4.8	4	<1	1	<1	<1	
					Lower layer				73.0		2	1	1	<1	<1	
3		Dogenko Lake (Sudagai Dam)	Center		Surface layer	2013/10/8	Sunny	40.9	0.5	1.0	3	6	10	<1	<1	
					Lower layer				39.9		4	26	15	<1	<1	
					Surface layer	2013/12/6	Sunny	46.1	0.5	1.6	3	4	4	<1	<1	
					Lower layer				45.1		3	5	3	<1	<1	
4	T o n e g a w a R i v e r	Marunuma Lake (Marunuma Dam)	Center	Katashinamura Village	Surface layer	2013/10/3	Cloudy	39.7	0.5	4.4	5	1	1	<1	<1	
					Lower layer				38.7		9	2	2	<1	<1	
					Surface layer	2013/12/4	Sunny	42.0	0.5	6.0	6	<1	1	<1	<1	
					Lower layer				41.0		10	4	5	<1	<1	
5		Fujiwarako Lake (Fujiwara Dam)	Center	Minakamimachi Town	Surface layer	2013/10/8	Cloudy	56.3	0.5	2.2	4	4	4	<1	<1	
					Lower layer				55.3		4	4	5	<1	<1	
					Surface layer	2013/12/6	Sunny	52.7	0.5	2.7	4	3	2	<1	<1	
					Lower layer				51.7		4	8	7	<1	<1	
6		Tanbarako Lake (Tanbara Dam)	Center	Numatashi City	Surface layer	2013/10/9	Cloudy	33.7	0.5	3.9	3	<1	1	<1	<1	
					Lower layer				32.7		4	22	11	<1	<1	
					Surface layer	2013/12/2	Sunny	38.6	0.5	5.0	4	2	1	<1	<1	
					Lower layer				37.6		3	1	1	<1	<1	
7		Akayako Lake (Aimata Dam)	Center	Minakamimachi Town	Surface layer	2013/10/9	Cloudy	29.3	0.5	2.2	8	4	4	<1	<1	
					Lower layer				28.3		6	34	24	<1	<1	
					Surface layer	2013/12/2	Sunny	36.4	0.5	3.5	8	3	2	<1	<1	
					Lower layer				35.4		8	5	4	<1	<1	
8		Sonoharako Lake (Sonohara Dam)	Center	Numatashi City	Surface layer	2013/10/4	Cloudy	27.2	0.5	2.6	9	3	2	<1	<1	
					Lower layer				26.2		9	8	5	<1	<1	
					Surface layer	2013/12/3	Sunny	17.9	0.5	4.0	9	1	1	<1	<1	
					Lower layer				16.9		11	1	1	<1	<1	
9		Akagionuma Lake	Center	Maebashishi City	Surface layer	2013/10/3	Sunny	16.1	0.5	3.8	4	1	1	<1	<1	
					Lower layer				15.1		4	7	5	<1	<1	
					Surface layer	2013/12/4	Cloudy	17.2	0.5	4.3	5	1	1	<1	<1	
					Lower layer				16.2		5	2	1	<1	<1	
10	A g a t s u m a g a w a	Okushimako Lake (Shimagawa Dam)	Center		Surface layer	2013/10/10	Cloudy	27.9	0.5	5.1	11	2	3	<1	<1	
					Lower layer				26.9		12	2	5	<1	<1	
					Surface layer	2013/12/13	Sunny	30.6	0.5	10.5	11	2	1	<1	<1	
					Lower layer				29.6		10	<1	1	<1	<1	
11		Shimako Lake (Nakanajo Dam)	Center	Nakanajomachi Town	Surface layer	2013/10/10	Cloudy	8.5	0.5	2.8	22	2	2	<1	<1	
					Lower layer				7.5		17	3	1	<1	<1	
					Surface layer	2013/12/13	Sunny	8.2	0.5	3.5	26	3	1	<1	<1	
					Lower layer				7.2		26	2	1	<1	<1	
12	R i v e r	Tashiroko Lake (Kazawa Dam)	Center	Tsumagoimura Village	Surface layer	2013/10/15	Cloudy	3.3	0.5	0.9	8	5	9	<1	<1	
					Lower layer				2.3		7	9	9	<1	<1	
					Surface layer	2013/11/27	Sunny	3.7	0.5	1.8	8	4	4	<1	<1	
					Lower layer				2.7		7	5	4	<1	<1	

Sampling point					Sampling date	Weather	Full depth (m)	General items					Radioactive material concentrations (Bq/L)		Remarks			
No.	Point							Sampling depth (m)	Secchi disk depth (m)	Electrical conductivity (mS/m)	SS (mg/L)	Turbidity	Radioactive cesium					
													Cs-134	Cs-137				
13	Karasugawa River	Harunako Lake	Center	Takasakishi City	Surface layer	2013/10/24	Cloudy	14.0	0.5	4.0	9	<1	1	<1	<1			
					Lower layer				13.0		10	3	6	<1	<1			
					Surface layer	2013/12/5	Sunny	-	-	-	-	-	-	-	-	-	-	Boat not available, so unable to collect samples
					Lower layer													
14	Karasugawa River	Kirizumiko Lake (Kirizumi Dam)	Center	Annakashi City	Surface layer	2013/10/17	Sunny	3.6	0.5	0.7	10	24	21	<1	<1			
					Lower layer				2.6		10	29	21	<1	<1			
					Surface layer	2013/12/10	Sunny	2.8	0.5	1.3	12	6	7	<1	<1			
					Lower layer				1.8		12	9	3	<1	<1			
15	Karasugawa River	Usuiko Lake (Sakamoto Dam)	Center	Annakashi City	Surface layer	2013/10/17	Sunny	13.0	0.5	1.8	11	3	4	<1	<1			
					Lower layer				12.0		10	7	5	<1	<1			
					Surface layer	2013/12/10	Light rain	13.1	0.5	3.8	11	1	1	<1	<1			
					Lower layer				12.1		11	<1	1	<1	<1			
16	Karasugawa River	Arafuneko Lake (Dodairagawa Dam)	Center	Shimonitamachi Town	Surface layer	2013/10/18	Cloudy	30.9	0.5	0.6	23	13	14	<1	<1			
					Lower layer				29.9		23	9	11	<1	<1			
					Surface layer	2013/12/6	Sunny	33.4	0.5	1.8	23	3	3	<1	<1			
					Lower layer				32.4		23	6	4	<1	<1			
17	Karasugawa River	Oshioke Lake (Oshio Dam)	Center	Tomiokashi City	Surface layer	2013/10/18	Sunny	11.5	0.5	1.6	19	3	4	<1	<1			
					Lower layer				10.5		19	7	8	<1	<1			
					Surface layer	2013/12/6	Sunny	13.3	0.5	2.5	19	1	1	<1	<1			
					Lower layer				12.3		19	1	1	<1	<1			
18	Karasugawa River	Kannako Lake (Shimokubo Dam)	Center	Fujiokashi City	Surface layer	2013/10/21	Sunny	67.2	0.5	2.0	16	3	3	<1	<1			
					Lower layer				66.2		20	7	6	<1	<1			
					Surface layer	2013/12/9	Sunny	80.6	0.5	1.4	14	3	4	<1	<1			
					Lower layer				79.6		15	13	13	<1	<1			
19	Karasugawa River	Hebikamiko Lake (Shiozawa Dam)	Center	Kannamachi Town	Surface layer	2013/10/21	Cloudy	14.6	0.5	0.7	12	10	11	<1	<1			
					Lower layer				13.6		7	10	8	<1	<1			
					Surface layer	2013/12/9	Sunny	14.2	0.5	3.8	15	2	2	<1	<1			
					Lower layer				13.2		15	2	1	<1	<1			
20	Watarasegawa River	Kusakiko Lake (Kusaki Dam)	Center	Midorishi City	Surface layer	2013/10/22	Cloudy	29.4	0.5	4.3	11	<1	2	<1	<1			
					Lower layer				28.4		10	13	5	<1	<1			
					Surface layer	2013/12/11	Sunny	21.9	0.5	3.6	11	2	1	<1	<1			
					Lower layer				20.9		10	2	1	<1	<1			
21	Watarasegawa River	Umedako Lake (Kiryugawa Dam)	Center	Kiryushi City	Surface layer	2013/10/2	Cloudy	27.1	0.5	2.9	7	3	2	<1	<1			
					Lower layer				26.1		8	3	14	<1	<1			
					Surface layer	2013/12/5	Sunny	23.6	0.5	2.6	6	5	2	<1	<1			
					Lower layer				22.6		6	3	2	<1	<1			
22	Nakatsugawa River Water Body	Nozoriko Lake (Nozori Dam)	Center	Nakanojomachi Town	Surface layer	2013/10/23	Cloudy	7.4	0.5	3.5	3	2	2	<1	<1			
					Lower layer				6.4		3	7	4	<1	<1			
					Surface layer	2013/11/27	Sunny	21.6	0.5	4.8	3	<1	1	<1	<1			
					Lower layer				20.6		3	2	2	<1	<1			
23	Watarasegawa River	Jonuma Lake	Center	Tatebayashishi City	Surface layer	2013/10/1	Cloudy	1.3	0.0	0.6	30	15	8	<1	<1			
					Lower layer				-		-	-	-	-	-	collected only from the surface layer due to shallow water		
					Surface layer	2013/12/13	Sunny	1.4	0.0	0.5	35	28	20	<1	<1			
					Lower layer				-		-	-	-	-	-	collected only from the surface layer due to shallow water		
24	Watarasegawa River	Tataranuma Lake	Center	Tatebayashishi City	Surface layer	2013/10/1	Cloudy	5.1	0.5	0.8	23	10	8	<1	<1			
					Lower layer				4.1		23	8	7	<1	<1			
					Surface layer	2013/12/13	Sunny	4.5	0.5	0.6	27	18	14	<1	<1			
					Lower layer				3.5		28	19	13	<1	<1			

• Sampling points are listed from north to south.

• Radioactive materials concentrations contain some measurement errors but are not noted here.

○Lake and Headwater: Sediment and Surrounding Environment (Lake Shore) Monitoring Results

Sampling point				Sampling date	Weather	Full depth (m)	Sediment					Surrounding environment (lake shore)					Remarks	
No.	Point		Municipality				General items			Concentration of radioactive material [Bq/kg (dried mud)]			Property	Soil				
							Mud sampling depth (cm)	Mud content (%)	Property	Radioactive cesium				Concentration of radioactive material [Bq/kg (dry)]				Air dose (μSv/h)
					Cs-134	Cs-137	Total	Radioactive cesium			Cs-134	Cs-137	Total					
1		Okutoneko Lake (Yagisawa Dam)	Center	Minakamimachi Town	2013/10/7	Sunny	78.4	5	38	Silt	410	840	1,250	Loamy	230	500	730	0.19
					2013/11/28	Cloudy	93.2	8	38	Silt	450	1,100	1,550	Loamy	140	340	480	0.18
2		Naramatako Lake (Naramata Dam)	Center	Minakamimachi Town	2013/10/7	Sunny	62.9	5	28	Silt	250	660	910	Loamy	85	200	285	0.21
					2013/11/28	Cloudy	74.0	3	27	Silt	1,100	2,800	3,900	Loamy	220	470	690	0.26
3		Dogenko Lake (Sudagai Dam)	Center	Minakamimachi Town	2013/10/8	Sunny	40.9	7	35	Silt	130	310	440	Loamy	440	1,000	1,440	0.22
					2013/12/6	Sunny	46.1	9	28	Silt	150	390	540	Loamy	210	520	730	0.23
4		Marunuma Lake (Marunuma Dam)	Center	Katashinamura Village	2013/10/3	Cloudy	39.7	5	23	Silt	27	54	81	Loamy	14	23	37	0.11
					2013/12/4	Sunny	42.0	5	21	Silt	18	56	74	Loamy	32	86	118	0.11
5		Fujiwarako Lake (Fujiwara Dam)	Center	Minakamimachi Town	2013/10/8	Cloudy	56.3	9	33	Silt	630	1,500	2,130	Loamy	320	730	1,050	0.07
					2013/12/6	Sunny	52.7	8	37	Silt	990	2,600	3,590	Loamy	250	660	910	0.08
6		Tanbarako Lake (Tanbara Dam)	Center	Numatashi City	2013/10/9	Cloudy	33.7	7	27	Silt	260	630	890	Loamy	170	350	520	0.20
					2013/12/2	Sunny	38.6	8	27	Silt	140	380	520	Loamy	120	250	370	0.23
7		Akayako Lake (Aimata Dam)	Center	Minakamimachi Town	2013/10/9	Cloudy	29.3	7	31	Silt	960	2,300	3,260	Loamy	300	710	1,010	0.13
					2013/12/2	Sunny	36.4	9	41	Silt	220	540	760	Loamy	430	1,100	1,530	0.12
8		Sonoharako Lake (Sonohara Dam)	Center	Numatashi City	2013/10/4	Cloudy	27.2	5	41	Silt	110	270	380	Loamy	97	230	327	0.10
					2013/12/3	Sunny	17.9	6	34	Silt/sand	54	110	164	Loamy	220	500	720	0.11
9		Akagionuma Lake	Center	Maebashishi City	2013/10/3	Sunny	16.1	6	14	Silt	280	700	980	Loamy	180	390	570	0.10
					2013/12/4	Cloudy	17.2	6	14	Silt	310	690	1,000	Loamy	180	420	600	0.10
10		Okushimako Lake (Shimagawa Dam)	Center	Nakanojomachi Town	2013/10/10	Cloudy	27.9	7	33	Silt	1,300	3,000	4,300	Loamy	2,300	5,300	7,600	0.20
					2013/12/13	Sunny	30.6	9	32	Silt	420	1,100	1,520	Loamy	1,100	2,700	3,800	0.23
11		Shimako Lake (Nakanajo Dam)	Center	Tsumagoimura Village	2013/10/10	Cloudy	8.5	7	45	Sand/silt	270	590	860	Loamy	99	220	319	0.10
					2013/12/13	Sunny	8.2	7	53	Silt/sand	78	200	278	Loamy	240	600	840	0.11
12		Tashiroko Lake (Kazawa Dam)	Center	Tsumagoimura Village	2013/10/15	Cloudy	3.3	10	21	Silt	410	850	1,260	Loamy	200	500	700	0.08
					2013/11/27	Sunny	3.7	7	20	Silt	320	840	1,160	Loamy	410	1,000	1,410	0.09
13		Harunako Lake	Center	Takasakishi City	2013/10/24	Cloudy	14.0	8	9	Silt	28	120	148	Loamy	310	720	1,030	0.24
					2013/12/5	Sunny	-	-	-	-	-	-	-	Loamy	280	650	930	0.23
14		Kirizumiko Lake (Kirizumi Dam)	Center	Annakashi City	2013/10/17	Sunny	3.6	7	36	Silt/sand	230	540	770	Loamy	200	450	650	0.10
					2013/12/10	Sunny	2.8	5	39	Silt	130	360	490	Loamy	260	650	910	0.11
15		Usuiko Lake (Sakamoto Dam)	Center	Shimonitamachi Town	2013/10/17	Sunny	13.0	7	29	Silt	400	940	1,340	Loamy	370	870	1,240	0.10
					2013/12/10	Light rain	13.1	6	32	Silt	560	1,400	1,960	Loamy	210	510	720	0.10
16		Arafuneko Lake (Dodairagawa Dam)	Center	Shimonitamachi Town	2013/10/18	Cloudy	30.9	8	38	Silt	180	440	620	Loamy	100	230	330	0.10
					2013/12/6	Sunny	33.4	7	36	Silt	160	370	530	Loamy	160	350	510	0.09
17		Oshioko Lake (Oshio Dam)	Center	Tomiokashi City	2013/10/18	Sunny	11.5	10	30	Silt	110	290	400	Loamy	120	260	380	0.10
					2013/12/6	Sunny	13.3	7	26	Silt	100	220	320	Loamy	310	770	1,080	0.11
18		Kannako Lake (Shimokubo Dam)	Center	Fujiokashi City	2013/10/21	Sunny	67.2	9	44	Silt	130	280	410	Loamy	20	42	62	0.05
					2013/12/9	Sunny	80.6	7	45	Silt	28	65	93	Loamy	100	250	350	0.06
19		Hebikamiko Lake (Shiozawa Dam)	Center	Kannamachi Town	2013/10/21	Cloudy	14.6	7	36	Silt	210	400	610	Loamy	73	170	243	0.09
					2013/12/9	Sunny	14.2	7	40	Silt	220	550	770	Loamy	27	70	97	0.08
20	Watarasegawa River	Kusakiko Lake (Kusaki Dam)	Center	Midorishi City	2013/10/22	Cloudy	29.4	7	40	Silt	210	510	720	Loamy	160	350	510	0.15
					2013/12/11	Sunny	21.9	7	46	Silt	470	1,200	1,670	Loamy	210	520	730	0.12
21		Umedako Lake (Kiryugawa Dam)	Center	Kiryushi City	2013/10/2	Cloudy	27.1	6	24	Silt	230	580	810	Loamy	91	230	321	0.08
					2013/12/5	Sunny	23.6	8	25	Silt	65	180	245	Loamy	150	320	470	0.07
22	Nakatsugawa River	Nozoriko Lake (Nozori Dam)	Center	Nakanojomachi Town	2013/10/23	Cloudy	7.4	7	28	Silt	480	1,100	1,580	Loamy	61	150	211	0.06
					2013/11/27	Sunny	21.6	8	30	Silt	61	120	181	Loamy	240	640	880	0.07
23	Watarasegawa River	Jonuma Lake	Center	Tatebayashishi City	2013/10/1	Cloudy	1.3	6	20	Silt	91	200	291	Loamy	52	130	182	0.05
					2013/12/13	Sunny	1.4	8	17	Silt	230	440	670	Loamy	77	160	237	0.05
24		Tataranuma Lake	Center	Tatebayashishi City	2013/10/1	Cloudy	5.1	7	20	Silt	170	360	530	Loamy	110	250	360	0.07
					2013/12/13	Sunny	4.5	8	18	Silt	370	870	1,240	Loamy	130	340	470	0.07

• Samples for surrounding environment (soil) were generally collected from 5 points in 3m square in the river terrace, etc., and mixed. Depending on the site situation, factors, such as the area of sampling may be much smaller, may cause figures to vary significantly.

• Sampling points for rivers are listed from north to south, and for different points along the river, from upstream to downstream.

• Air dose was measured with a survey meter, TCS-172B of Hitachi-Aloka Medical, Ltd.

• Radioactive materials concentrations contain some measurement errors but are not noted here.

