Results of Radioactive Material Monitoring of Aquatic Organisms (Locations A and B along the Abukuma River)

< Locations A and B along the Abukuma River: Samples collected>

Items	General items		Radioactive materials			
Locations	Water	Sediment	Water(Cs)	Water(Sr)	Sediment(Cs)	Sediment(Sr)
A-1	○	○	○	○	○	○
A-2	○	○	○	—	○	—
B-1	○	○	○	—	○	—
B-2	○	○	○	—	○	—
B-3	○	○	○	—	○	—

＜Locations A and B along the Abukuma River:Site measurement item＞

Items	Survey date and time			Latitude and longitude of the location		Water	Sediment					Other	
Locations	Date	Time(Water)	Time(Sediment)	Latitude	Longitude	Water temperature (degrees C)	Sediment temperature (degrees C)	Property	Color	Odor	Contaminants	Water depth (m)	Transparency (cm)
A-1 (Surface layer)	2012/12/3	9:23	9:45	37.621000°	140.521783°	5.0	5.0	Sand/sediment	2.5Y-3/2	Faint hydrogen sulfide	Plant	7.0	>50
A-1 (Deep layer)		—	—			4.8	—	—	—	—	—	—	—
A-2	2012/12/3	7:57	8:04	37.567333°	140.394567°	5.2	5.5	Sand gravel	10YR-2/3	Sediment smell	Leaves	0.5	>50
B-1	2012/12/3	12:00	12:07	37.784333°	140.492417°	7.0	7.0	Sand/sediment	2.5Y-3/3	Sediment smell	Plant	0.2	>50
B-2	2012/12/3	13:55	14:05	37.812100°	140.505783°	7.0	7.1	Fine sand	2.5Y-4/4	None	None	0.7	>50
B-3	2012/12/3	14:48	14:59	37.818200°	140.467883°	8.3	8.0	Sand gravel	5Y-4/2	None	Pebbles	0.4	>50

＜Locations A and B along the Abukuma River:General survey items/Analysis of radioactive materials　Water＞

Items	Survey date and time		Latitude and longitude of the location		pH	BOD	COD	DO	Electrical conductivity	Salinity	TOC	SS	Turbidity	Cs-134	Cs-137	Sr-90
Locations	Date	Time	Latitude	Longitude		(mg/L)	(mg/L)	(mg/L)	(mS/m)		(mg/L)	(mg/L)	(FNU)	(Bq/L)	(Bq/L)	(Bq/L)
A-1 (Surface layer)	2012/12/3	9:23	37.621000°	140.521783°	7.5	2.0	3.8	13.1	19.9	0.10	1.4	3	2.5	0.066	0.11	0.0013
A-1 (Deep layer)		—			7.5	2.1	4.2	12.9	20.2	0.10	1.4	4	2.4	0.017	0.036	—
A-2	2012/12/3	7:57	37.567333°	140.394567°	7.5	0.6	2.3	12.9	10.4	0.05	0.6	1	0.8	0.011	0.020	—
B-1	2012/12/3	12:00	37.784333°	140.492417°	8.1	1.6	3.7	15.0	21.6	0.11	1.4	4	2.5	0.023	0.039	—
B-2	2012/12/3	13:55	37.812100°	140.505783°	8.2	1.3	3.6	14.6	20.1	0.10	1.3	6	3.2	0.023	0.041	—
B-3	2012/12/3	14:48	37.818200°	140.467883°	8.6	0.9	3.5	12.9	10.9	0.05	1.0	1	0.9	0.0056	0.0093	—

＜Locations A and B along the Abukuma River:General survey items/Analysis of radioactive materials　Sediment＞

Items	Survey date and time		Latitude and longitude of the location		pH	Redox potential E_{NHE}	Water content	IL	TOC	Soil particle density	Grain size distribution								Cs-134	Cs-137	Sr-90
											Gravel (2-75mm)	Coarse sand (0.85-2mm)	Medium sand (0.25-0.85mm)	Fine sand (0.075-0.25mm)	Silt (0.005-0.075mm)	Clay (Less than 0.005mm)	Median grain diameter	Maximum grain diameter			
Locations	Date	Time	Latitude	Longitude		(mV)	(%)	(%)	mg/g-dry	(g/cm3)	(%)	(%)	(%)	(%)	(%)	(%)	(mm)	(mm)	(Bq/kg-dry)	(Bq/kg-dry)	(Bq/kg-dry)
A-1	2012/12/3	9:45	37.621000°	140.521783°	7.6	68	48.7	5.8	12	2.647	—	0.1	26.2	40.8	18.9	14.0	0.170	2.00	1,200	2,100	0.44
A-2	2012/12/3	8:04	37.567333°	140.394567°	7.0	106	31.7	4.5	6	2.722	17.1	15.5	40.9	9.6	6.3	10.6	0.520	26.50	590	1,100	—
B-1	2012/12/3	12:07	37.784333°	140.492417°	7.6	169	35.4	2.7	3	2.707	10.2	4.3	29.8	36.0	9.8	9.9	0.230	19.00	500	810	—
B-2	2012/12/3	14:05	37.812100°	140.505783°	7.4	238	29.8	1.7	1	2.671	0.8	4.7	73.3	18.2	1.5	1.5	0.370	9.50	240	460	—
B-3	2012/12/3	14:59	37.818200°	140.467883°	7.2	267	16.4	1.0	<1	2.645	52.6	26.1	16.8	2.0	0.8	1.7	2.200	19.00	78	130	—

＜Locations A and B along the Abukuma River:Survey items Aquatic organisms＞

Location	Sampling Date	Latitude and longitude of the location		Division	Class	Order	Family	Species name	English name	Population	Sample weight (kg-wet)	Cs-134 (Bq/kg-wet)	Cs-137 (Bq/kg-wet)	Sr-90 (Bq/kg-wet)	Note	
		Latitude	Longitude												Growth stage	Stomach contents
A-2 (Harase River)	2012/12/5	37.567333°	140.394567°	Streptophyta	Zygnematophyceae	Zygnematales	Zygnematales	*Spirogyra sp.*	Spirogyra	–	0.27	N.D.(<0.83)	N.D.(<0.77)	–	–	–
				Arthropod	Insecta	Odonata	Odonata	*Macromia amphigena amphigena*	Macromia amphigena	109	0.048	26	41	–	Larva	–
				Arthropod	Insecta	Odonata	Odonata	*Anotogaster sieboldii*	Anotogaster sieboldii							
				Arthropod	Insecta	Odonata	Odonata	*Calopteryx atrata*	Calopteryx atrata							
				Arthropoda	Insecta	Odonata	Calopterygidae	*Calopteryx sp.*	Calopteryx							
				Arthropod	Insecta	Odonata	Odonata	*Mnais costalis*	Mnais costalis							
				Arthropod	Insecta	Odonata	Odonata	*Asiagomphus melaenops*	Asiagomphus melaenops							
				Arthropod	Insecta	Odonata	Odonata	*Davidius nanus*	Davidius nanus							
				Arthropod	Insecta	Odonata	Odonata	*Davidius sp.*	Davidius							
				Arthropod	Insecta	Odonata	Odonata	*Onychogomphus viridicostus*	Onychogomphus viridicostus							
				Arthropod	Insecta	Odonata	Odonata	*Sieboldius albardae*	Sieboldius albardae							
				Arthropod	Insecta	Trichoptera	Trichoptera	*Stenopsyche marmorata*	Stenopsyche marmorata	405	0.076	60	110	–	Larva	–
				Arthropod	Malacostraca	Decapoda	Decapoda	*Atyidae*	Freshwater shrimp	1,760	0.16	22	36	–	Adult	–
				Vertebrata	Osteichthyes	Cypriniformes	Cypriniformes	*Phoxinus lagowskii steindachneri*	Amur Minnow	37	0.14	16	28	–	Mature fish	–
				Vertebrata	Osteichthyes	Cypriniformes	Cypriniformes	*Nipponocypris temminckii*	Dark chub	35	0.65	32	56	–	Mature fish	–
				Vertebrata	Osteichthyes	Cypriniformes	Cypriniformes	*Misgurnus anguillicaudatus*	Oriental weatherfish	20	0.041	19	33	–	Mature fish	–
				Vertebrata	Osteichthyes	Salmoniformes	Salmoniformes	*Oncorhynchus masou*	Yamame trout	8	0.26	28	50	–	Mature fish	–
				Vertebrata	Amphibia	Anura	Anura	–	Tadpole	20	0.015	48	92	–	Larva	–
				Vertebrata	Amphibia	Caudata	Caudata	*Cynops pyrrhogaster*	Cynops pyrrhogaster	19	0.12	21	37	–	Adult	–
				–	–	–	–	–	CPOM (litter)	–	0.76	140	240	–	–	–
B-2 (Abukuma River)	2012/12/14	37.812100°	140.505783°	Vertebrata	Osteichthyes	Cypriniformes	Cypriniformes	*Cyprinus carpio*	Common carp	1	3.1	36	61	0.29	Mature fish	Some (details unknown)
				Vertebrata	Osteichthyes	Cypriniformes	Cypriniformes	*Hemibarbus barbus*	Hemibarbus barbus	4	5.6	60	110	0.41	Mature fish	Some (details unknown)
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	*Tribolodon sp.*	Tribolodon	3	0.97	40	69	–	Mature fish	Some (details unknown)
B-3 (Surikami River)	2012/12/6	37.818200°	140.467883°	Streptophyta	Zygnematophyceae	Zygnematales	Zygnematales	*Spirogyra sp.*	Spirogyra	–	0.056	7.2	12	–	–	–
				Arthropod	Insecta	Odonata	Odonata	*Macromia amphigena amphigena*	Macromia amphigena	134	0.027	13	25	–	Larva	–
				Arthropod	Insecta	Odonata	Odonata	*Anotogaster sieboldii*	Anotogaster sieboldii							
				Arthropod	Insecta	Odonata	Odonata	*Calopteryx atrata*	Calopteryx atrata							
				Arthropoda	Insecta	Odonata	Calopterygidae	*Calopteryx sp.*	Calopteryx							
				Arthropod	Insecta	Odonata	Odonata	*Anisogomphus maacki*	Anisogomphus maacki							
				Arthropod	Insecta	Odonata	Odonata	*Davidius nanus*	Davidius nanus							
				Arthropod	Insecta	Odonata	Odonata	*Davidius sp.*	Davidius							
				Arthropod	Insecta	Odonata	Odonata	*Onychogomphus viridicostus*	Onychogomphus viridicostus							
				Arthropod	Insecta	Odonata	Odonata	*Sieboldius albardae*	Sieboldius albardae							
				Arthropod	Insecta	Trichoptera	Trichoptera	*Stenopsyche marmorata*	Stenopsyche marmorata	554	0.15	48	84	–	Larva	–
				Arthropod	Insecta	Trichoptera	Trichoptera	*Stenopsyche sauteri*	Parastenopsyche sauteri							
				Arthropod	Insecta	Megaloptera	Megaloptera	*Protohermes grandis*	Protohermes grandis	53	0.019	9.8	16	–	Larva	–
				Mollusca	Gastropoda	Sorbeoconcha	Sorbeoconcha	*Semisulcospira libertina*	Semisulcospira libertina	246	0.13	23	40	–	Adult / non-adult	–
				Vertebrata	Osteichthyes	Cypriniformes	Cypriniformes	*Phoxinus lagowskii steindachneri*	Amur Minnow	20	0.066	14	21	–	Mature fish	–
				Vertebrata	Osteichthyes	Cypriniformes	Cypriniformes	*Nipponocypris temminckii*	Dark chub	10	0.10	20	36	–	Mature fish	–
				Vertebrata	Osteichthyes	Cypriniformes	Cypriniformes	*Tribolodon hakonensis*	Japanese dace	21	0.074	20	36	–	Immature fish	–
				Vertebrata	Osteichthyes	Cypriniformes	Cypriniformes	*Noemacheilus barbatulus*	Stone loach	18	0.18	14	26	–	Mature fish	–
				Vertebrata	Amphibia	Anura	Anura	*Rana rugosa*	Wrinkled Frog	12	0.085	30	52	–	Adult	–
				–	–	–	–	–	CPOM (litter)	–	1.0	85	150	–	–	–

Note) Underlined names in the English name column indicate species largest in number in the respective samples.