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	Latitude and longitude of the location		Survey date and time			Water	Sediment					Other	
Locations	Latitude	Longitude	Date	Time (water)	Time (sediment)	Water temperature (degrees C)	Sediment temperature (degrees C)	Property	Color	Odor	Contaminants	Water depth (m)	Transparency (cm)
A-1 (Surface layer)	37.620967°	140.522150°	2013/7/9	9:09	9:16	24.6	24.9	Sand/sediment	2.5Y3/1	Sediment smell	None	7.1	14.0
A-1 (Deep layer)				8:55	—								(0.4m)*
A-2	37.567300°	140.394567°	2013/7/9	11:25	11:32	23.5	20.8	Sand gravel	10YR3/1	Sediment smell	Leaves, roots	0.60	35.0
B-1	37.784233°	140.492133°	2013/7/9	16:23	16:15	27.0	26.5	Fine sand	2.5Y3/1	Faint hydrogen sulfide	None	0.30	40.0
B-2	37.812083°	140.505917°	2013/7/9	14:35	15:10	26.0	25.4	Fine sand	2.5Y4/3	None	Leaves, roots	0.50	40.0
B-3	37.816700°	140.471417°	2013/7/9	13:54	13:59	22.3	23.4	Sand gravel	5Y4/3	Sediment smell	Leaves, roots	0.50	>50.0

* The numbers in ( ) indicates the degree of transparency

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

Items	Latitude and longitude of the location		Survey date and time		pH	BOD	COD	DO	Electrical conductivity	Salinity	TOC	SS	Turbidity	Cs-134	Cs-137	Sr-90
Locations	Latitude	Longitude	Date	Time		(mg/L)	(mg/L)	(mg/L)	(mS/m)		(mg/L)	(mg/L)	(FNU)	(Bq/L)	(Bq/L)	(Bq/L)
A-1 (Surface layer)	37.620967°	140.522150°	2013/7/9	9:09	7.4	1.5	6.5	8.7	16.8	0.09	3.0	19	11.7	0.13	0.27	0.0013
A-1 (Deep layer)				8:55	7.4	1.6	8.0	8.3	16.7	0.09	3.1	39	15.5	0.28	0.56	—
A-2	37.567300°	140.394567°	2013/7/9	11:25	7.4	0.9	5.2	8.8	15.7	0.08	1.8	12	5.0	0.054	0.12	—
B-1	37.784233°	140.492133°	2013/7/9	16:23	7.5	1.3	4.9	9.3	18.8	0.10	2.9	17	10.6	0.11	0.23	—
B-2	37.812083°	140.505917°	2013/7/9	14:35	7.5	1.1	5.7	8.4	17.1	0.09	2.5	14	7.8	0.079	0.16	—
B-3	37.816700°	140.471417°	2013/7/9	13:54	7.6	0.9	5.5	9.5	10.2	0.06	1.9	6	3.8	0.019	0.037	—

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

Items	Latitude and longitude of the location		Survey date and time		pH	Redox potential	Water content	IL	TOC	Soil particle density	Grain size distribution								Cs-134	Cs-137	Sr-90
											Gravel	Coarse sand	Medium sand	Fine sand	Silt	Clay	Median grain diameter	Maximum grain diameter			
Locations	Latitude	Longitude	Date	Time		E_{NHE} (mV)	(%)	(%)	(mg/g-dry)	(g/cm3)	(2-75mm) (%)	(0.85-2mm) (%)	(0.25-0.85mm) (%)	(0.075-0.25mm) (%)	(0.005-0.075mm) (%)	(Less than 0.005mm) (%)	(mm)	(mm)	(Bq/kg-dry)	(Bq/kg-dry)	(Bq/kg-dry)
A-1	37.620967°	140.522150°	2013/7/9	9:16	6.8	320	27.8	3.0	2	2.761	0	1.3	40.9	39.6	7.4	10.8	0.22	2	5.8	12	N.D.(<0.19)
A-2	37.567300°	140.394567°	2013/7/9	11:32	6.9	81	33.6	2.9	6	2.632	49.3	27.2	8.8	3.5	4.7	6.5	2.0	19	320	720	—
B-1	37.784233°	140.492133°	2013/7/9	16:15	7.2	274	39.1	3.2	6	2.737	1.7	2.1	31.0	45.3	9.1	10.8	0.20	4.75	520	1,000	—
B-2	37.812083°	140.505917°	2013/7/9	15:10	7.0	247	27.3	3.4	4	2.695	19.7	6.6	41.1	25.4	3.1	4.1	0.36	19	280	600	—
B-3	37.816700°	140.471417°	2013/7/9	13:59	6.9	263	18.6	1.1	<1	2.692	51.3	32.3	13.8	1.5	0.2	0.9	2.1	19	52	110	—

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

Location	Latitude and longitude of the location		Sampling Date	Division	Class	Order	Family	Species name	English name	Population	Sample weight (kg-wet)	Note		Cs-134	Cs-137	Sr-90
	Latitude	Longitude										Growth stage	Stomach contents	(Bq/kg-wet)	(Bq/kg-wet)	(Bq/kg-wet)
A-2 (Harase River)	37.567300°	140.394567°	2013/7/10	Algae/plant	–	–	–	–	Attached algae	–	0.044	–	–	230	500	–
				Arthropod	Insecta	Trichoptera	Stenopsychidae	*Stenopsyche marmorata*	Stenopsyche marmorata	103	0.029	Larva	–	62	140	–
				Arthropod	Insecta	Odonata	Corduliidae	*Macromia amphigena amphigena*	Macromia amphigena	244	0.12	Larva	–	13	26	–
				Arthropod	Insecta	Odonata	Cordulegastridae	*Anotogaster sieboldii*	Anotogester sieboldii							
				Arthropod	Insecta	Odonata	Gomphidae	*Asiagomphus melaenops*	Asiagomphus melaenops							
				Arthropod	Insecta	Odonata	Gomphidae	*Davidius sp.*	Davidius							
				Arthropod	Insecta	Odonata	Gomphidae	*Nihonogomphus viridis*	Nihonogomphus viridis							
				Arthropod	Insecta	Odonata	Gomphidae	*Onychogomphus viridicostus*	Onychogomphus viridicostus							
				Arthropod	Insecta	Odonata	Gomphidae	*Sieboldius albardae*	Sieboldius albardae							
				Arthropod	Insecta	Odonata	Libellulidae	*Orthetrum albistylum speciosum*	Common skimmer							
				Arthropod	Insecta	Odonata	Libellulidae	*Sympetrum sp.*	Sympetrum							
				Arthropod	Malacostraca	Malacostraca	Atyidae	*Neocaridina sp.*	Neocaridina sp.	998	0.15	Imago	–	24	52	–
				Mollusca	Gastropoda	Sorbeoconcha	Pleuroceridae	*Semisulcospira libertina*	Semisulcospira libertina	39	0.056	Imago	–	8.5	19	–
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	*Phoxinus lagowskii steindachneri*	Amur Minnow	101	0.46	More than 1 year old	–	13	24	–
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	*Tribolodon hakonensis*	Japanese dace	11	0.13	2-year-old fish	–	14	28	–
				Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	*Misgurnus anguillicaudatus*	Oriental weatherfish	63	0.076	More than 1 year old	–	11	21	–
				Vertebrata	Amphibia	Anura	Ranidae	*Rana porosa porosa*	Daruma pond frog	19	0.11	Imago	–	16	33	–
				Vertebrata	Amphibia	Anura	–	–	Tadpole	156	0.15	Larva	–	110	220	–
				Vertebrata	Amphibia	Caudata	Salamandridae	*Cynops pyrrhogaster*	Cynops pyrrhogaster	4	0.035	Imago	–	22	45	–
				Coarse particulate organic matters (CPOMs)	–	–	–	–	CPOMs (fallen leaves)	–	0.73	–	–	270	560	–
B-2	37.812083°	140.505917°	2013/7/11	Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	*Ictalurus punctatus*	Channel catfish(large)	2	4.1	3-year-old fish	Small fish (Pale chub)	33	75	0.25
				Vertebrata	Osteichthyes	Siluriformes	Siluridae	*Silurus asotus*	Amur catfish	1	1.1	Yearling fish	Crustacea (Procambarus clarkii)	84	190	–
			2013/7/14	Vertebrata	Osteichthyes	Osmeriformes	Osmeridae	*Plecoglossus altivelis*	Sweetfish (natural upstream)	33	1.1	Mature fish	Some (details unknown)	18	35	–
			2013/7/20	Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	*Ictalurus punctatus*	Channel catfish(medium)	4	0.28	1-year-old fish	Aquatic insects (larva)	5.3	11	–
B-3 (Surikami River)	37.816700°	140.471417°	2013/7/9	Algae/plant	–	–	–	–	Attached algae	–	0.052	–	–	140	310	–
				Streptophyta	Zygnematophyceae	Zygnematales	Zygnemataceae	*Spirogyra sp.*	Spirogyra	–	0.029	–	–	N.D.(<1.5)	N.D.(<1.2)	–
				Arthropod	Insecta	Trichoptera	Stenopsychidae	*Stenopsyche marmorata*	Stenopsyche marmorata	295	0.0078	Young larva	–	68	130	–
				Arthropod	Insecta	Trichoptera	Stenopsychidae	*Stenopsyche marmorata*	Stenopsyche marmorata	621	0.21	Oldest larva	–	44	88	–
				Arthropod	Insecta	Megaloptera	Corydalidae	*Parachauliodes continentalis*	Parachauliodes continentalis Weele	95	0.068	Larva	–	4.4	11	–
				Arthropod	Insecta	Megaloptera	Corydalidae	*Protohermes grandis*	Protohermes grandis							
				Arthropod	Insecta	Odonata	Corduliidae	*Macromia amphigena amphigena*	Macromia amphigena	77	0.037	Larva	–	7.8	15	–
				Arthropod	Insecta	Odonata	Cordulegastridae	*Anotogaster sieboldii*	Anotogester sieboldii							
				Arthropod	Insecta	Odonata	Gomphidae	*Anisogomphus maacki*	Anisogomphus maacki							
				Arthropod	Insecta	Odonata	Gomphidae	*Davidius sp.*	Davidius							
				Arthropod	Insecta	Odonata	Gomphidae	*Onychogomphus viridicostus*	Onychogomphus viridicostus							
				Arthropod	Insecta	Odonata	Gomphidae	*Sieboldius albardae*	Sieboldius albardae							
				Arthropod	Insecta	Odonata	Libellulidae	*Orthetrum albistylum speciosum*	Common skimmer							
				Arthropod	Malacostraca	Decapoda	Procambarus	*Procambarus clarkii*	Red swamp crawfish	21	0.37	Imago	–	20	42	–
				Mollusca	Gastropoda	Sorbeoconcha	Pleuroceridae	*Semisulcospira libertina*	Semisulcospira libertina	142	0.058	Imago	–	39	81	–
				Vertebrata	Osteichthyes	Osmeriformes	Osmeridae	*Plecoglossus altivelis*	Sweetfish (natural upstream)	7	0.14	Yearling fish	–	12	26	–
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	*Tribolodon hakonensis*	Japanese dace	25	0.22	1 and 2-year-old fish	–	14	29	–
				Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	*Misgurnus anguillicaudatus*	Oriental weatherfish	14	0.066	More than 1 year old	–	15	31	–
				Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	*Oncorhynchus masou*	Seema	3	0.96	2-year-old fish	Insects	5.5	12	–
				Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	*Oncorhynchus masou*	Yamame trout (small)	12	0.16	Yearling fish	Insects	5.3	11	–
				Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	*Oncorhynchus masou*	Yamame trout (medium)	2	0.072	1-year-old fish	Insects	4.4	9.9	–
				Vertebrata	Amphibia	Anura	Ranidae	*Rana rugosa*	Wrinkled Frog	12	0.035	Imago	–	16	33	–
				Vertebrata	Amphibia	Anura	–	–	Tadpole	7	0.011	Larva	–	180	370	–
				Coarse particulate organic matters (CPOMs)	–	–	–	–	CPOMs (fallen leaves)	–	0.26	–	–	55	110	–

Note 1) Underlined names in the English name column indicate species largest in number in the respective samples.
Note 2) A statement in red in the “Growth stage” column shows the age assessed based on squama or otolith.
Note 3) N.D. means to be below the detection limit.