

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

< Locations A and B along the Abakuma River- Samples collected >

Items	General items		Radioactive materials			
	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 Abakuma River- Site measurement item >

Items	Latitude and longitude of the location		Survey date and time			Water		Sediment				Other	
	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)	37.620733°	140.522083°	2013/8/20	9:52	10:03	27.9	27.4	Sediment with sand	5Y4/1	Faint hydrogen sulfide	Leaves	6.1	>50 (2.0m)*
A-1 (Deep layer)	37.620733°	140.522083°		9:42	—	27.5							
A-2	37.567300°	140.394567°	2013/8/20	13:55	14:12	22.3	21.6	Sediment with sand	10YR4/3	Sediment smell	Roots	0.62	32
B-1	37.784467°	140.492183°		16:03	16:15	27.1							
B-2	37.812017°	140.505800°	2013/8/21	10:26	10:37	24.6	24.3	Sand	2.5Y4/4	None	Pebbles	0.73	>50
B-3	37.816583°	140.471500°		9:17	9:27	19.9							

* The numbers in () indicates the degree of transparency

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

Items	Latitude and longitude of the location		Survey date and time		pH	BOD (mg/L)	COD (mg/L)	DO (mg/L)	Electrical conductivity (mS/m)	Salinity	TOC (mg/L)	SS (mg/L)	Turbidity (FNU)	Cs-134 (Bq/L)	Cs-137 (Bq/L)	Sr-90 (Bq/L)
	Latitude	Longitude	Date	Time												
A-1 (Surface layer)	37.620733°	140.522083°	2013/8/20	9:52	7.4	1.1	4.3	8.0	18.5	0.10	2.1	4	1.8	0.025	0.057	0.0013
A-1 (Deep layer)	37.620733°	140.522083°		9:42	7.5	1.2	4.5	8.9	18.8	0.10	2.2	5	1.6	0.053	0.11	—
A-2	37.567300°	140.394567°	2013/8/20	13:55	7.1	1.4	7.2	8.5	12.4	0.09	3.1	20	7.1	0.064	0.14	—
B-1	37.784467°	140.492183°		16:03	7.4	1.2	5.6	8.5	16.5	0.09	2.8	20	6.6	0.12	0.27	—
B-2	37.812017°	140.505800°	2013/8/21	10:26	7.4	1.0	5.2	8.8	15.3	0.08	2.4	10	4.0	0.031	0.068	—
B-3	37.816583°	140.471500°		9:17	7.4	0.8	4.0	9.8	7.5	0.04	1.7	5	2.3	0.017	0.034	—

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

Items	Latitude and longitude of the location		Survey date and time		pH	Redox potential E _{NHE} (mV)	Water content (%)	IL (%)	TOC (mg/g-dry)	Soil particle density (g/cm ³)	Grain size distribution						Medium grain diameter (mm)	Maximum grain diameter (mm)	Cs-134 (Bq/kg-dry)	Cs-137 (Bq/kg-dry)	Sr-90 (Bq/kg-dry)
	Latitude	Longitude	Date	Time							Gravel (2-75mm) (%)	Coarse sand (0.85-2mm) (%)	Medium sand (0.35-0.85mm) (%)	Fine sand (0.075-0.25mm) (%)	Silt (0.005-0.075mm) (%)	Clay (Less than 0.005mm) (%)					
A-1	37.620733°	140.522083°	2013/8/20	10:03	6.6	211	27.1	2.6	3	2.700	21	27.5	31.3	16.2	0.7	3.2	0.82	19	170	360	N.D.(<0.18)
A-2	37.567300°	140.394567°		14:12	7.0	26	46.1	7.2	10	2.657	4.5	9.5	28.0	18.4	13.9	25.7	0.17	9.5	520	1,100	—
B-1	37.784467°	140.492183°	2013/8/21	16:15	7.2	11	41.2	5.9	8	2.699	17.5	5.3	6.7	30.8	20.4	19.3	0.12	19	480	1,100	—
B-2	37.812017°	140.505800°		10:27	7.0	168	28.5	2.1	1	2.754	0.4	2.1	43.2	48.1	2.3	5.9	0.24	4.75	170	310	—
B-3	37.816583°	140.471500°	9:27	7.3	156	22.1	2.0	1	2.666	31.8	34.0	26.8	5.4	0.4	1.6	1.3	19	120	270	—	

Note) N.D. means to be below the detection limit.

< 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 (Bq/kg-wet)	Cs-137 (Bq/kg-wet)	Sr-90 (Bq/kg-wet)			
	Latitude	Longitude										Growth stage	Stomach contents						
A-1	37.620733°	140.522083°	2013/9/17	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	Hemibarbus barbus	3	0.46	2-year-old fish	—	4	1	—			
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Zacco platypus</i>	Zacco platypus	5	0.057	Mature fish	Some (details unknown)	5	11	—			
				Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	1	0.49	Mature fish	—	12	26	—			
A-2 (Harase River)	37.567300°	140.394567°	2013/8/24	Algae/plant	—	—	—	—	Attached algae	—	0.063	—	—	140	320	—			
				Arthropod	Insecta	Trichoptera	Stenopodidae	<i>Stenopsyche marmorata</i>	<i>Stenopsyche marmorata</i>	46	0.013	—	—	—	42	89	—		
				Arthropod	Insecta	Trichoptera	Stenopodidae	<i>Stenopsyche sauteri</i>	<i>Parastenopsyche sauteri</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	<i>Macromia amphigena</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Cordulegastridae	<i>Anotogaster sieboldii</i>	<i>Anotogaster sieboldii</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Gomphidae	<i>Asiatogomphus melanops</i>	<i>Asiatogomphus melanops</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Gomphidae	<i>Davidius nanus</i>	<i>Davidius nanus</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Gomphidae	<i>Davidius sp.</i>	<i>Davidius</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Gomphidae	<i>Onychogomphus viridicostus</i>	<i>Onychogomphus viridicostus</i>	141	0.059	Larva	—	—	—	15	29	—	
				Arthropod	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	<i>Sieboldius albardae</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Aeshnidae	<i>Anax nigrofasciatus nigrofasciatus</i>	<i>Anax nigrofasciatus nigrofasciatus</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Aeshnidae	<i>Anax parthenope julius</i>	<i>Anax parthenope</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Aeshnidae	<i>Boyeria maclachlani</i>	<i>Boyeria maclachlani</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Aeshnidae	<i>Planaeschna milnei</i>	<i>Planaeschna milnei</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Odonata	Anisoptera	<i>Sympetrum sp.</i>	<i>Sympetrum</i>	—	—	—	—	—	—	—	—		
				Arthropod	Malacostraca	Malacostraca	Atyidae	<i>Neocaridina sp.</i>	<i>Neocaridina</i>	725	0.094	Imago	—	—	—	13	27	—	
				Mollusca	Gastropoda	Sorbococoncha	Pleuroceridae	<i>Semisalcospira libertina</i>	<i>Semisalcospira libertina</i>	26	0.043	Imago	—	—	—	4.6	11	—	
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	<i>Phoxinus lagowskii steindachneri</i>	15	0.046	More than 1 year old	Some (details unknown)	—	—	5.8	13	—	
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	<i>Japanese dace</i>	15	0.29	2-year-old fish	Some (details unknown)	—	—	21	48	—	
				Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	<i>Oriental weatherfish</i>	94	0.069	Yearling fish	—	—	—	5.7	13	—	
Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou</i>	<i>Yamame trout</i>	3	0.10	Yearling fish	Insects, small prawns	—	—	13	28	—					
Vertebrata	Amphibia	Anura	Ranidae	<i>Rana porosa porosa</i>	<i>Daruma pond frog</i>	23	0.12	Imago	—	—	—	22	47	—					
Vertebrata	Amphibia	Anura	—	—	<i>Tadpole</i>	27	0.023	Larva	—	—	—	99	200	—					
Vertebrata	Amphibia	Caudata	Salamandridae	<i>Cynops pyrrhogaster</i>	<i>Cynops pyrrhogaster</i>	4	0.027	Imago	—	—	—	6.7	15	—					
B-2	37.812017°	140.505800°	2013/8/10	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Zacco platypus</i>	<i>Zacco platypus</i>	5	0.079	mature fish	—	11	21	—			
				Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	<i>Small mouth bass (small)</i>	2	0.25	Immature fish	—	—	14	32	—		
				Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	<i>Small mouth bass (medium)</i>	1	0.52	2-year-old fish	—	—	28	61	—		
				Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	<i>Small mouth bass (large)</i>	1	1.9	7-year-old fish	Aquatic insects, small fish	—	—	46	98	0.22	
				2013/8/11	Vertebrata	Osteichthyes	Siluriformes	Siluridae	<i>Silurus asotus</i>	<i>Amur catfish</i>	1	1.2	Mature fish	Small fish	—	—	52	110	—
				2013/8/20	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	<i>Common carp</i>	1	1.5	12-year-old fish	Some (details unknown)	—	—	24	48	0.44
				2013/8/27	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	<i>Hemibarbus barbus</i>	2	2.6	5-year-old fish	Some (details unknown)	—	—	33	71	0.43
				2013/8/29	Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	<i>Channel catfish</i>	3	3.4	Mature fish	—	—	—	27	60	0.17
				2013/8/30	Vertebrata	Osteichthyes	Osmeniformes	Osmenidae	<i>Plecoglossus altivelis</i>	<i>Sweetfish (natural upstream)</i>	30	1.4	Yearling fish	Some (details unknown)	—	—	11	25	—
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	<i>Japanese dace (medium)</i>	2	0.50	Mature fish	—	—	—	18	38	—	
B-3 (Surikami River)	37.816583°	140.471500°	2013/8/20	Algae/plant	—	—	—	—	Attached algae	—	0.044	—	—	51	120	—			
				Arthropod	Insecta	Trichoptera	Stenopodidae	<i>Stenopsyche marmorata</i>	<i>Stenopsyche marmorata</i>	613	0.13	—	—	—	—	39	85	—	
				Arthropod	Insecta	Trichoptera	Stenopodidae	<i>Stenopsyche sauteri</i>	<i>Parastenopsyche sauteri</i>	—	—	—	—	—	—	—	—		
				Arthropod	Insecta	Megaloptera	Corydalidae	<i>Prosthermes grandis</i>	<i>Prosthermes grandis</i>	132	0.092	Larva	—	—	—	3.7	6.8	—	
				Arthropod	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	<i>Sieboldius albardae</i>	113	0.047	Larva	—	—	—	6.4	14	—	
				Arthropod	Malacostraca	Decapoda	Procambarus	<i>Procambarus clarkii</i>	<i>Red swamp crayfish</i>	2	0.037	Imago	—	—	—	20	44	—	
				Vertebrata	Osteichthyes	Osmeniformes	Osmenidae	<i>Plecoglossus altivelis</i>	<i>Sweetfish (natural upstream)</i>	21	1.1	Yearling fish	Some (details unknown)	—	—	9.8	21	—	
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	<i>Japanese dace (small)</i>	14	0.16	More than 1 year old	Some (details unknown)	—	—	8	17	—	
				Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	<i>Oriental weatherfish</i>	14	0.061	—	—	—	—	13	26	—	
				Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou</i>	<i>Yamame trout (small)</i>	9	0.17	Yearling fish	Some (details unknown)	—	—	4.7	11	—	
				Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou</i>	<i>Yamame trout (medium)</i>	3	0.14	More than 1 year old	Insects	—	—	5.9	12	—	
				Vertebrata	Amphibia	Ranidae	Ranidae	<i>Rana rugosa</i>	<i>Wrinkled frog</i>	5	0.019	Imago	—	—	—	22	46	—	
				Vertebrata	Amphibia	Anura	—	—	<i>Tadpole</i>	21	0.017	Larva	—	—	—	96	200	—	
Coarse particulate organic matters	—	—	—	—	CPOMs (fallen leaves)	—	0.14	—	—	—	—	64	140	—					

Note 1) When multiple types of aquatic organisms were collected, a sample was prepared by mixing them.

Note 2) For species with stomach contents as indicated in the note column, all stomach contents were removed for conducting the analysis.

Note 3) Underlined names in the English name column indicate species largest in number in the respective samples.

Note 4) A statement in red in the "Growth stage" column shows the age assessed based on squama or otolith.

Note 5) N.D. means to be below the detection limit.