

OResults 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			
	Water	Sediment	Water (Cs)	Water (Sr)	Sediment (Cs)	Sediment (Sr)
A-1	○	○	○	○	○	○
A-2	○	○	-	○	○	-
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	
	Latitude	Longitude	Date	Time (water)	Time (sediment)	Water temperature (degrees C)	Sediment temperature (degrees C)	Property	Color	Contaminants	Water depth (m)	Transparency (cm)
A-1(Surface layer)	37.6210°	140.5218°	2023/6/14	08:40	09:20	22.2	19.9	Silt	5Y3/2	None	5.50	>50 (1.0m)*
A-1(Bottom layer)				09:10		22.3						
A-2	37.5673°	140.3946°		11:10	11:20	18.7	19.6	Silt with sand	2.5Y4/2	None	0.45	11
B-2	37.8121°	140.5058°		15:05	15:20	20.8	21.2	Sand	10YR4/3	None	0.38	29
B-3	37.8182°	140.4679°		13:40	13:50	17.9	18.0	Sand	10YR4/4	None	0.55	>50

* The number in parentheses indicates Secchi disk depth.

<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 (mg/L)	COD (mg/L)	DO (mg/L)	Electric 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 (water)												
A-1(Surface layer)	37.6210°	140.5218°	2023/6/14	08:40	7.4	1.6	6.3	8.4	17.7	0.09	2.6	18	5.7	N.D.(0.0014)	0.036	0.00098
A-1(Bottom layer)				09:10	7.4	1.7	6.5	8.6	17.6	0.09	2.7	22	7.0	0.0020	0.061	-
A-2	37.5673°	140.3946°		11:10	7.2	3.5	17.3	9.4	10.7	0.06	4.1	77	38.0	0.0018	0.083	-
B-2	37.8121°	140.5058°		15:05	7.4	1.4	6.3	9.1	17.4	0.09	2.3	29	12.0	N.D.(0.0014)	0.048	-
B-3	37.8182°	140.4679°		13:40	7.4	0.8	3.2	10.3	8.5	0.05	1.4	4	1.6	N.D.(0.0014)	0.0057	-

Note) N.D. means to be below the detection limit and figures in parentheses show the detection limit.

<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 E _{NHLE} (mV)	Water content (%)	IL (%)	TOC (mg/g-dry)	Soil particle density (g/cm ³)	Grain size distribution								Cs-134 (Bq/kg-dry)	Cs-137 (Bq/kg-dry)	Sr-90 (Bq/kg-dry)
	Latitude	Longitude	Date	Time (sediment)							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 (mm)	Maximum grain diameter (mm)			
A-1	37.6210°	140.5218°	2023/6/14	09:20	7.4	71	49.0	10.3	30.0	2.560	0.0	0.0	1.1	13.5	55.8	29.6	0.018	2.0	13	650	0.37
A-2	37.5673°	140.3946°		11:20	7.2	462	17.7	1.6	4.4	2.740	38.8	28.9	18.4	5.6	5.8	2.5	1.5	9.5	1.3	54	-
B-2	37.8121°	140.5058°		15:20	7.3	513	20.5	1.6	1.3	2.730	11.8	12.9	45.8	23.6	2.4	3.5	0.41	9.5	1.4	67	-
B-3	37.8182°	140.4679°		13:50	7.6	521	20.4	1.5	1.1	2.620	22.9	48.9	20.6	2.5	2.1	3.0	1.2	9.5	0.63	33	-

Note) N.D. means to be below the detection limit and figures in parentheses show the detection limit.

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

Locations	Sampling point	Latitude and longitude of the location		Sampling date	Division	Class	Order	Family	Scientific name	English name	Population	Sample weight (kg-wet)	Note			Radioactive cesium (Bq/kg-wet)			Sr-90 (Bq/kg-wet)
		Latitude	Longitude										Growth stage	Stomach contents	Measurement site	Total	Cs-134	Cs-137	
A-1	The main stream of the Abukuma River	37.6210°	140.5218°	2023/6/6	Algae/plant	-	-	-	-	Sediment deposited on riverbed (Including algae)	-	0.0069	-	-	-	82	N.D.(15)	82	-
					Arthropoda	Malacostraca	Decapoda	Atyidae	<i>Neocaridina</i> sp.	Neocaridina	188	0.054	Juvenile, Imago	-	-	1.6	N.D.(0.94)	1.6	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Pseudaspius hakonensis</i>	Japanese dace	2	0.019	Immature fish	-	-	N.D.	N.D.(2.3)	N.D.(1.9)	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsariichthys platypus</i>	Pale break	7	0.083	Immature fish, Mature fish	-	-	4.6	N.D.(0.60)	4.6	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Pseudogobio esocinus</i>	Pseudogobio	3	0.023	Immature fish	-	-	N.D.	N.D.(1.8)	N.D.(1.6)	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Carassius</i> sp.	Silver crucian carp	1	1.9	Mature fish	Obscure digesta	Viscera removed	2.0	N.D.(0.25)	2.0	0.28
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Barbatula oreas</i>	Stone loach	102	0.40	Immature fish	-	-	1.5	N.D.(0.20)	1.5	-
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Lepomis macrochirus macrochirus</i>	Bluegill	1	0.16	Mature fish	Chironomidae(larva), Dragonfly(larva), Beetles, Neocaridina	Viscera removed	3.6	N.D.(0.38)	3.6	-
					Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	American catfish	4	1.9	Immature fish	Plant pieces	Viscera removed	7.5	N.D.(0.40)	7.5	0.23
					Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	American catfish	1	1.3	Immature fish	Plant pieces	Viscera removed	9.7	N.D.(1.9)	9.7	0.23
					Vertebrata	Amphibia	Anura	-	Amphibia	Frog	37	0.016	Larva(Tadpole)	-	-	84	N.D.(16)	84	-
A-2	Harase River	37.5673°	140.3946°	2023/6/6	Coarse Particulate Organic Matter	-	-	-	-	Water-bottom leaf litter	-	0.24	-	-	-	46	N.D.(1.6)	46	-
					Algae/plant	-	-	-	-	Sediment deposited on riverbed (Including algae)	-	0.011	-	-	-	73	N.D.(14)	73	-
					Arthropoda	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	Dragonfly	68	0.024	Larva (Dragonfly larva)	-	-	11	N.D.(1.9)	11	-
					Arthropoda	Insecta	Odonata	Cordulegastriidae	<i>Anotogaster sieboldii</i>	Jumbo dragonfly									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Meligomphus viridicostus</i>	Dragonfly									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	Dragonfly									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Davidius</i> sp.	Dragonfly									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Shaogomphus postocularis</i>	Dragonfly									
					Arthropoda	Insecta	Odonata	Aeshnidae	<i>Boyeria mactachlani</i>	Jumbo dragonfly									
					Arthropoda	Insecta	Megaloptera	Corydalidae	<i>Protohermes grandis</i>	Dobsonfly	28	0.018	Larva	-	-	3.5	N.D.(2.2)	3.5	-
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish	1	0.012	Imago	-	-	14	N.D.(3.3)	14	-
					Arthropoda	Malacostraca	Decapoda	Atyidae	<i>Neocaridina</i> sp.	Neocaridina	301	0.076	Juvenile, Imago	-	-	3.8	N.D.(0.66)	3.8	-
					Mollusca	Gastropoda	Discopoda	Pleuroceridae	<i>Semisulcospira libertina</i>	Freshwater snail	30	0.021	Juvenile, Imago	-	Molluscos part	8.5	N.D.(1.7)	8.5	-
					Vertebrata	Osteichthyes	Anguilliformes	Anguillidae	<i>Anguilla japonica</i>	Japanese eel	1	0.15	Immature fish	Empty stomach	Viscera removed	4.7	N.D.(0.59)	4.7	-
					Vertebrata	Osteichthyes	Scorpaeniformes	Cottidae	<i>Cottus pollux</i>	Japanese fluvial sculpin	2	0.024	Immature fish	-	-	7.1	N.D.(1.7)	7.1	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Rhynchocypris lagowskii steindachneri</i>	Amur minnow	121	0.86	Immature fish, Mature fish	-	-	4.0	N.D.(1.3)	4.0	0.23
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsariichthys platypus</i>	Pale break	17	0.10	Immature fish	-	-	10	N.D.(1.5)	10	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Pseudogobio esocinus</i>	Pseudogobio	8	0.13	Immature fish, Mature fish	-	-	3.9	N.D.(0.51)	3.9	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Candidia temminckii</i>	Dark chub	34	0.28	Immature fish, Mature fish	-	-	3.6	N.D.(0.63)	3.6	-
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	22	0.14	Immature fish, Mature fish	-	-	5.2	N.D.(0.61)	5.2	-
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Barbatula oreas</i>	Stone loach	145	1.0	Immature fish	-	-	2.8	N.D.(0.32)	2.8	0.16
					Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou masou</i>	Masu salmon	42	1.1	Immature fish	-	-	3.8	N.D.(0.57)	3.8	0.089
					Vertebrata	Amphibia	Anura	-	Amphibia	Frog	64	0.039	Larva(Tadpole)	-	-	46	N.D.(5.3)	46	-
					Vertebrata	Amphibia	Anura	Ranidae	<i>Rana japonica</i>	Japanese brown frog	8	0.057	Imago	-	-	7.8	N.D.(1.1)	7.8	-
					Vertebrata	Amphibia	Anura	Glandirana	<i>Glandirana rugosa</i>	Wrinkled frog									
					Coarse Particulate Organic Matter	-	-	-	-	Water-bottom leaf litter	-	0.21	-	-	-	41	N.D.(1.5)	41	-
B-3	Surikami River	37.8182°	140.4679°	2023/6/6	Algae/plant	-	-	-	-	Sediment deposited on riverbed (Including algae)	-	0.010	-	-	-	13	N.D.(2.9)	13	-
					Algae/plant	Zygnematomphyceae	Zygnematales	Zygnemataceae	<i>Spirogyra</i> sp.	Spirogyra	-	0.34	-	-	-	9.8	N.D.(0.54)	9.8	-
					Arthropoda	Insecta	Trichoptera	Stenopsychidae	<i>Stenopsyche marmorata</i>	Caddisfly	192	0.087	Larva	-	-	7.1	N.D.(0.73)	7.1	-
					Arthropoda	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	Dragonfly	53	0.029	Larva (Dragonfly larva)	-	-	N.D.	N.D.(1.3)	N.D.(1.1)	-
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Meligomphus viridicostus</i>	Dragonfly									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	Dragonfly									
					Arthropoda	Insecta	Megaloptera	Corydalidae	<i>Protohermes grandis</i>	Dobsonfly	20	0.023	Larva	-	-	N.D.	N.D.(2.0)	N.D.(1.8)	-
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish	17	0.14	Juvenile, Imago	-	-	4.8	N.D.(0.51)	4.8	-
					Vertebrata	Osteichthyes	Scorpaeniformes	Cottidae	<i>Cottus pollux</i>	Japanese fluvial sculpin	5	0.043	Immature fish	-	-	2.1	N.D.(0.96)	2.1	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Rhynchocypris lagowskii steindachneri</i>	Amur minnow	51	0.27	Immature fish, Mature fish	-	-	2.5	N.D.(0.31)	2.5	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Pseudaspius hakonensis</i>	Japanese dace	4	0.075	Immature fish, Mature fish	-	-	4.0	N.D.(0.63)	4.0	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	Common carp	1	5.5	Mature fish	Obscure digesta	Viscera removed	6.0	N.D.(1.2)	6.0	0.39
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Barbatula oreas</i>	Stone loach	21	0.29	Immature fish	-	-	1.8	N.D.(0.25)	1.8	-
					Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis altivelis</i>	Ayu sweetfish	228	2.3	Immature fish	-	-	5.2	N.D.(0.66)	5.2	0.15
					Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou masou</i>	Masu salmon	12	0.12	Immature fish	-	-	1.4	N.D.(0.43)	1.4	-
					Vertebrata	Amphibia	Anura	Lithobates	<i>Lithobates catesbeianus</i>	American bullfrog	1	0.014	Larva(Tadpole)	-	-	27	N.D.(3.2)	27	-
					Coarse Particulate Organic Matter	-	-	-	-	Water-bottom leaf litter	-	0.22	-	-	-	10	N.D.(1.3)	10	-

*1: Organisms were collected in or around the targeted water areas.

*2: When multiple types of aquatic organisms were collected, a sample was prepared by mixing them.

*3: For a sample made of multiple types of aquatic organisms, the English name of the dominant one largest in number is underlined.

*4: Basically, measurement was conducted for all organism samples. Viscera (stomach and bowels) were removed for the measurement when possible so that undigested food and sediments, etc. in the digestive system would be excluded.

*5: Plankton (suspended algae) is the residue remaining after the filtration of lake water or seawater with a plankton net (40µm-mesh).

*6: River bottom materials (incl. algae) are algae, etc. that were scratched off stones with a brush, etc. and may include very fine particles such as inorganic silt and clay.

*7: N.D. means to be below the detection limit and figures in parentheses show the detection limit.

*8: Activity concentrations include counting errors, but the details are omitted here.