

**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 Locations	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 Locations	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°	2018/9/20	10:10	10:28	21.3	21.6	Silt	2.5Y3/2	Plant pieces	7.60	>50 (1.5m)*
A-1(Bottom layer)				09:56		21.2						
A-2	37.5673°	140.3946°		12:10	12:25	18.9	19.0	Sand	2.5Y4/3	None	0.86	>50
B-2	37.8121°	140.5058°		15:52	15:58	21.2	20.0	Sand	2.5Y4/4	None	0.60	>50
B-3	37.8182°	140.4679°		14:30	14:40	19.3	19.7	Sand	2.5Y3/3	None	0.47	>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 Locations	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°	2018/9/20	10:10	7.5	1.4	4.2	8.5	16.9	0.10	1.8	7	4.0	N.D.(0.0014)	0.013	0.0014
A-1(Bottom layer)				09:56	7.5	1.4	4.4	8.7	17.8	0.10	1.8	8	4.3	0.0018	0.018	-
A-2	37.5673°	140.3946°		12:10	7.6	0.6	2.4	10.2	12.4	0.07	1.0	2	1.4	N.D.(0.0012)	0.0081	-
B-2	37.8121°	140.5058°		15:52	7.6	0.9	3.6	9.7	16.5	0.09	1.5	6	3.7	0.0020	0.017	-
B-3	37.8182°	140.4679°		14:30	7.8	0.7	3.4	10.7	8.4	0.05	1.4	2	1.3	N.D.(0.0012)	0.0035	-

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 Locations	Latitude and longitude of the location		Survey date and time		pH	Redox potential E <sub>h</sub> (mV)	Water content (%)	IL (%)	TOC (mg/g-dry)	Soil particle density (g/cm <sup>3</sup> )	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°	2018/9/20	10:28	7.0	86	49.7	6.7	20.0	2.652	5.8	1.6	23.6	17.8	26.3	24.9	0.068	19	63	630	0.31
A-2	37.5673°	140.3946°		12:25	6.7	308	19.7	2.0	3.0	2.727	20.4	42.5	26.2	6.4	1.2	3.3	1.1	9.5	14	150	-
B-2	37.8121°	140.5058°		15:58	7.3	259	22.8	1.8	2.6	2.730	0.8	5.6	65.4	24.1	2.2	1.9	0.34	4.8	14	160	-
B-3	37.8182°	140.4679°		14:40	7.3	282	19.7	1.5	2.2	2.677	29.6	42.0	24.0	3.4	1.0	1.4	9.5	8.6	98	-	

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°	2018/8/21	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	8	0.15	Immature fish	-	-	6.30	0.60	5.7	-					
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Oparichthys platypus</i>	Pale chub	4	0.049	Immature fish, Mature fish	-	-	9.6	1.1	8.5	-					
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Gnathopogon elongatus elongatus</i>	Gnathopogon elongatus elongatus	19	0.10	Immature fish, Mature fish	-	-	5.2	N.D.(0.67)	5.2	-					
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Nemacheilus toni</i>	Stone loach	11	0.025	Immature fish	-	-	2.1	N.D.(2.0)	2.1	-					
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus salmoides</i>	Largemouth bass	1	0.0062	Immature fish	-	-	N.D.	N.D.(7.2)	N.D.(6.6)	-					
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	2	0.0087	Immature fish	-	-	4.4	N.D.(3.7)	4.4	-					
A-2	Harase River	37.5673°	140.3946°	2018/8/22	Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.030	-	-	-	75.9	8.9	67	-					
					Algae/plant	Zygnematales	Zygnematales	Zygnematales	<i>Spirogyra sp.</i>	Spirogyra	-	0.093	-	-	-	9.7	N.D.(3.7)	9.7	-					
					Arthropoda	Insecta	Trichoptera	Stenopsychidae	<i>Stenopsyche marmorata</i>	Stenopsyche marmorata	94	0.022	Larva	-	-	-	19	N.D.(2.4)	19	-				
					Arthropoda	Insecta	Odonata	Cordulegastriidae	<i>Anotogaster sieboldii</i>	Anotogaster sieboldii	-	-	-	-	-	-	-	-	-	-	-			
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Melligomphus viridicostus</i>	Melligomphus viridicostus	30	0.014	Larva(Dragonfly larva)	-	-	-	10	N.D.(3.2)	10	-				
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	Sieboldius albardae	-	-	-	-	-	-	-	-	-	-				
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Asiagomphus melanocephalus</i>	Asiagomphus melanocephalus	-	-	-	-	-	-	-	-	-	-				
					Arthropoda	Insecta	Megaloptera	Corydalidae	<i>Prothemis grandis</i>	Prothemis grandis	16	0.0095	Larva	-	-	-	6.8	N.D.(4.3)	6.8	-				
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crayfish	8	0.024	Imagino, Imago	-	-	-	16	N.D.(2.6)	16	-				
					Arthropoda	Malacostraca	Decapoda	Atyidae	<i>Neocaridina sp.</i>	Neocaridina	658	0.075	Imagino, Imago	-	-	-	15.6	1.6	14	-				
					Mollusca	Gastropoda	Discopoda	Pleuroceridae	<i>Semisulcospira libertina</i>	Semisulcospira libertina	30	0.023	Imago	-	-	-	14	N.D.(8.9)	14	-				
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	Amur Minnow	11	0.052	Immature fish, Mature fish	-	-	-	7.6	1.3	6.3	-				
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	3	0.085	Immature fish, Mature fish	-	-	-	14.3	1.3	13	-				
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Pseudogobio esocinus esocinus</i>	Pseudogobio esocinus esocinus	2	0.017	Immature fish	-	-	-	7.0	N.D.(2.8)	7.0	-				
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Candidia temminckii</i>	Dark chub	92	0.91	Immature fish, Mature fish	-	-	-	8.0	1.1	6.9	0.29				
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	25	0.026	Immature fish	-	-	-	5.3	N.D.(2.1)	5.3	-				
					Coarse Particulate Organic Matter	-	-	-	-	-	-	-	-	Bottom fallen leaves	-	-	-	-	-	3.9	N.D.(2.8)	3.9	-	
					B-2	The main stream of the Abukuma River	37.8121°	140.5058°	2018/8/20	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	4	1.2	Mature fish	Obscure digesta	Viscera removed	8.86	0.66	8.2	0.18
										Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	Hemibarbus barbus	3	3.7	Mature fish	Obscure digesta	Viscera removed	5.93	0.53	5.4	0.49
										Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis altivelis</i>	Sweetfish	62	2.2	Immature fish, Mature fish	-	-	19.0	2.0	17	0.13
Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>						Small mouth bass	6	1.3	Immature fish, Mature fish	Stone loach, Shrimp	Viscera removed	10.05	0.95	9.1	0.16					
Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>						Channel catfish	4	2.9	Immature fish, Mature fish	Sweetfish, Spaghnum	Viscera removed	17.7	1.7	16	0.31					
Vertebrata	Osteichthyes	Siluriformes	Bagridae	<i>Tachysurus tokiensis</i>						Cut-tailed bullhead	1	0.12	Mature fish	Platambus fimbriatus, Common prawn	Viscera removed	4.3	N.D.(0.73)	4.3	-					
B-3	Surikami River	37.8182°	140.4679°	2018/8/22	Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.017	-	-	-	23.1	2.1	21	-					
					Arthropoda	Insecta	Trichoptera	Stenopsychidae	<i>Stenopsyche marmorata</i>	Stenopsyche marmorata	185	0.058	Larva	-	-	-	14.3	1.3	13	-				
					Arthropoda	Insecta	Odonata	Cordulidae	<i>Macromia amphigena amphigena</i>	Macromia amphigena	-	-	-	-	-	-	-	-	-	-				
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Melligomphus viridicostus</i>	Melligomphus viridicostus	18	0.0088	Larva(Dragonfly larva)	-	-	-	N.D.	N.D.(4.7)	N.D.(4.5)	-				
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	Sieboldius albardae	-	-	-	-	-	-	-	-	-	-				
					Arthropoda	Insecta	Megaloptera	Corydalidae	<i>Prothemis grandis</i>	Prothemis grandis	43	0.029	Larva	-	-	-	1.9	N.D.(1.8)	1.9	-				
					Mollusca	Gastropoda	Discopoda	Pleuroceridae	<i>Semisulcospira libertina</i>	Semisulcospira libertina	30	0.0092	Imago	-	-	-	6.0	N.D.(4.0)	6.0	-				
					Vertebrata	Osteichthyes	Scorpaeniformes	Cottidae	<i>Cottus pollux</i>	Japanese fluvial sculpin	40	0.30	Immature fish	-	-	-	3.21	0.41	2.8	-				
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	Amur Minnow	36	0.18	Immature fish, Mature fish	-	-	-	3.9	N.D.(0.43)	3.9	-				
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Candidia temminckii</i>	Dark chub	2	0.028	Immature fish, Mature fish	-	-	-	7.6	N.D.(1.5)	7.6	-				
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	Common carp	1	2.2	Mature fish	Obscure digesta	Viscera removed	9.31	0.71	8.6	0.70					
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	19	0.046	Immature fish, Mature fish	-	-	-	7.5	1.1	6.4	-				
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Nemacheilus toni</i>	Stone loach	57	0.46	Immature fish	-	-	-	4.62	0.42	4.2	-				
					Vertebrata	Osteichthyes	Siluriformes	Bagridae	<i>Tachysurus tokiensis</i>	Cut-tailed bullhead	2	0.039	Immature fish, Mature fish	-	-	-	7.2	N.D.(1.7)	7.2	-				
					Vertebrata	Osteichthyes	Siluriformes	Siluridae	<i>Silurus asotus</i>	Amur catfish	1	2.5	Mature fish	Fish	Viscera removed	19.7	1.7	18	0.18					
					Vertebrata	Amphibia	Anura	Glandirana	<i>Glandirana rugosa</i>	Wrinkled Frog	6	0.043	Imago	-	-	-	5.8	N.D.(1.5)	5.8	-				
					Coarse Particulate Organic Matter	-	-	-	-	-	-	-	-	Bottom fallen leaves	-	0.14	-	-	-	3.0	N.D.(2.2)	3.0	-	

\*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 organisms 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, 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.