

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 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°	2022/8/24	08:56	09:20	26.4	24.1	Sand with silt	5Y3/2	None	5.50	>50 (1.2m)*
A-1(Bottom layer)				08:54								
A-2	37.5673°	140.3946°		11:00	11:10	22.1	22.1	Sand with gravel	10YR4/3	None	1.10	>50
B-2	37.8121°	140.5058°		14:25	14:38	25.3	22.3	Sand	10YR4/2	None	0.45	>50
B-3	37.8182°	140.4679°		13:15	13:30	21.1	21.1	Gravel	10YR4/4	None	0.50	>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	COD	DO	Electric conductivity	Salinity	TOC	SS	Turbidity	Cs-134	Cs-137	Sr-90
	Latitude	Longitude	Date	Time (water)		(mg/L)	(mg/L)	(mg/L)	(mS/m)		(mg/L)	(mg/L)	(FNU)	(Bq/L)	(Bq/L)	(Bq/L)
A-1(Surface layer)	37.6210°	140.5218°	2022/8/24	08:56	7.6	1.2	4.2	7.9	17.1	0.09	1.7	10	4.5	N.D.(0.0013)	0.011	0.0010
A-1(Bottom layer)				08:54	7.6	1.1	4.4	8.1	17.1	0.09	1.7	10	4.6	N.D.(0.0024)	0.017	-
A-2	37.5673°	140.3946°		11:00	8.0	0.8	2.9	10.0	10.7	0.06	1.0	3	1.5	N.D.(0.0015)	0.011	-
B-2	37.8121°	140.5058°		14:25	7.8	1.3	3.9	9.6	17.3	0.09	1.5	6	3.2	N.D.(0.0015)	0.011	-
B-3	37.8182°	140.4679°		13:15	7.9	0.7	3.3	9.7	8.9	0.05	1.3	4	1.7	N.D.(0.0012)	0.0042	-

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	Water content	IL	TOC	Soil particle density	Grain size distribution								Cs-134	Cs-137	Sr-90
	Latitude	Longitude	Date	Time (sediment)		ENHLE (mV)	(%)	(%)	(mg/g-dry)	(g/cm ³)	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°	2022/8/24	09:20	7.4	70	35.9	7.3	25.2	2.560	0.1	1.8	19.8	23.6	34.5	20.2	0.059	4.8	12	360	0.30
A-2	37.5673°	140.3946°		11:10	7.3	497	25.1	1.8	2.7	2.660	12.2	46.3	31.3	2.2	3.5	4.5	0.98	9.5	2.4	94	-
B-2	37.8121°	140.5058°		14:38	7.7	493	23.8	1.3	2.3	2.730	0.2	1.5	51.1	35.9	7.3	4.0	0.26	4.8	1.3	66	-
B-3	37.8182°	140.4679°		13:30	7.6	483	22.0	1.0	1.7	2.610	53.0	26.6	7.7	2.9	6.6	3.2	2.1	9.5	1.5	43	-

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°	2022/8/24	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Carassius auratus langsdorfii</i>	<i>Carassius auratus langsdorfii</i>	1	1.5	Mature fish	Obscure digesta	Viscera removed	1.9	N.D.(0.23)	1.9	0.27
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	1	0.46	Mature fish	Empty stomach	Viscera removed	6.1	N.D.(0.86)	6.1	-
					Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	Channel catfish	3	1.3	Immature fish	Drone beetle	Viscera removed	5.4	N.D.(0.83)	5.4	0.19
					Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	Channel catfish	1	1.3	Mature fish	Empty stomach	Viscera removed	8.0	N.D.(1.2)	8.0	0.20
					Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	Channel catfish	1	3.3	Mature fish	Empty stomach	Viscera removed	15	N.D.(1.7)	15	0.34
A-2	Harase River	37.5673°	140.3946°	2022/8/23	Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.013	-	-	-	70	N.D.(15)	70	-
					Arthropoda	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	<i>Macromia amphigena amphigena</i>	25	0.012	Larva (Dragonfly larva)	-	-	3.9	N.D.(3.0)	3.9	-
					Arthropoda	Insecta	Odonata	Cordulegastridae	<i>Anotogaster sieboldii</i>	<i>Anotogaster sieboldii</i>									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	<i>Sieboldius albardae</i>									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Davidius</i> sp.	<i>Davidius</i>									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Asiagomphus melaenops</i>	<i>Asiagomphus melaenops</i>									
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish	2	0.029	Imago	-	-	11	N.D.(1.9)	11	-
					Arthropoda	Malacostraca	Decapoda	Atyidae	<i>Neocaridina</i> sp.	Neocaridina	174	0.036	Juvenile,Imago	-	-	4.0	N.D.(0.89)	4.0	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	Amur minnow	127	0.58	Immature fish, Mature fish	-	-	4.9	N.D.(0.35)	4.9	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	1	0.018	Immature fish	-	-	8.3	N.D.(1.8)	8.3	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsarichthys platypus</i>	Pale chub	16	0.068	Immature fish, Mature fish	-	-	8.5	N.D.(1.3)	8.5	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Pseudogobio esocinus esocinus</i>	<i>Pseudogobio esocinus esocinus</i>	2	0.010	Immature fish	-	-	4.1	N.D.(2.7)	4.1	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Candidia temminckii</i>	Dark chub	25	0.22	Immature fish, Mature fish	-	-	6.5	N.D.(0.37)	6.5	-
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Misgurnus anguillicaudatus</i>	Oriental weatherfish	16	0.079	Immature fish, Mature fish	-	-	4.9	N.D.(0.68)	4.9	-
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Nemacheilus toni</i>	Stone loach	246	1.1	Immature fish	-	-	3.9	N.D.(0.33)	3.9	0.21
					Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou masou</i>	Yamame trout	2	0.023	Immature fish	-	-	5.0	N.D.(1.5)	5.0	-
					Vertebrata	Cephalaspidomorphi	Petromyzontiformes	Petromyzontidae	<i>Lethenteron reissneri</i>	Far eastern brook lamprey	3	0.017	Amimocoetes (larva)	-	-	N.D.	N.D.(1.9)	N.D.(1.8)	-
					Coarse Particulate Organic Matter	-	-	-	-	Bottom fallen leaves	-	0.27	-	-	-	99.8	2.8	97	-
B-2	The main stream of the Abukuma River	37.8121°	140.5058°	2022/8/27	Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Carassius auratus langsdorfii</i>	<i>Carassius auratus langsdorfii</i>	1	0.64	Mature fish	Obscure digesta	Viscera removed	22	N.D.(1.3)	22	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	<i>Hemibarbus barbus</i>	1	1.2	Mature fish	Obscure digesta	Viscera removed	8.7	N.D.(0.79)	8.7	0.47
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	<i>Hemibarbus barbus</i>	1	1.4	Mature fish	Obscure digesta	Viscera removed	7.0	N.D.(0.84)	7.0	0.37
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Hemibarbus barbus</i>	<i>Hemibarbus barbus</i>	1	1.6	Mature fish	Obscure digesta	Viscera removed	2.4	N.D.(0.46)	2.4	0.38
					Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis altivelis</i>	Sweetfish	7	0.42	Mature fish	-	-	5.0	N.D.(0.41)	5.0	-
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus dolomieu</i>	Small mouth bass	7	1.3	Immature fish	Fish	Viscera removed	5.5	N.D.(0.63)	5.5	0.21
					Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	Channel catfish	1	1.6	Mature fish	Empty stomach	Viscera removed	8.9	N.D.(0.66)	8.9	0.19
					Vertebrata	Osteichthyes	Siluriformes	Ictaluridae	<i>Ictalurus punctatus</i>	Channel catfish	1	2.2	Mature fish	Empty stomach	Viscera removed	8.6	N.D.(0.72)	8.6	0.17
B-3	Surikami River	37.8182°	140.4679°	2022/8/23	Algae/plant	-	-	-	-	Riverbed Deposits (Include algae)	-	0.012	-	-	-	24	N.D.(3.0)	24	-
				2022/8/26	Algae/plant	Monocotyledoneae	Najadales	Potamogetonaceae	<i>Potamogeton crispus</i>	Curly-leaf pondweed	-	0.28	-	-	-	3.0	N.D.(0.33)	3.0	-
				2022/8/23	Arthropoda	Insecta	Trichoptera	Stenopsychidae	<i>Stenopsyche marmorata</i>	<i>Stenopsyche marmorata</i>	178	0.045	Larva (Dragonfly larva)	-	-	5.5	N.D.(0.96)	5.5	-
					Arthropoda	Insecta	Odonata	Corduliidae	<i>Macromia amphigena amphigena</i>	<i>Macromia amphigena amphigena</i>									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Meligomphus viridicostus</i>	<i>Meligomphus viridicostus</i>									
					Arthropoda	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	<i>Sieboldius albardae</i>									
					Arthropoda	Malacostraca	Decapoda	Cambaridae	<i>Procambarus clarkii</i>	Red swamp crawfish	4	0.080	Imago	-	-	4.8	N.D.(0.77)	4.8	-
					Vertebrata	Osteichthyes	Anguilliformes	Anguillidae	<i>Anguilla japonica</i>	Japanese eel	2	1.2	Immature fish, Mature fish	Stone loach,Dragonfly(larva)	Viscera removed	4.8	N.D.(0.49)	4.8	0.11
					Vertebrata	Osteichthyes	Scorpaeniformes	Cottidae	<i>Cottus pollux</i>	Japanese fluvial sculpin	29	0.19	Immature fish	-	-	1.8	N.D.(0.32)	1.8	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Phoxinus lagowskii steindachneri</i>	Amur minnow	80	0.44	Immature fish, Mature fish	-	-	3.2	N.D.(0.29)	3.2	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Japanese dace	3	0.024	Immature fish	-	-	3.2	N.D.(1.5)	3.2	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Opsarichthys platypus</i>	Pale chub	6	0.031	Immature fish	-	-	3.1	N.D.(1.2)	3.1	-
					Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	Common carp	1	1.3	Mature fish	Obscure digesta	Viscera removed	1.3	N.D.(0.30)	1.3	0.25
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Cobitis biwa</i>	<i>Cobitis biwa</i>	6	0.014	Mature fish	-	-	4.2	N.D.(2.3)	4.2	-
					Vertebrata	Osteichthyes	Cypriniformes	Cobitidae	<i>Nemacheilus toni</i>	Stone loach	128	1.5	Immature fish	-	-	2.2	N.D.(0.30)	2.2	0.31
					Vertebrata	Osteichthyes	Salmoniformes	Osmeridae	<i>Plecoglossus altivelis altivelis</i>	Sweetfish	13	0.46	Immature fish, Mature fish	-	-	6.6	N.D.(0.70)	6.6	-
					Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou masou</i>	Scema	1	0.67	Immature fish	Empty stomach	Viscera removed	0.48	N.D.(0.26)	0.48	-
					Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou</i>	Yamame trout	12	0.20	Immature fish	-	-	1.6	N.D.(0.29)	1.6	-
					Vertebrata	Osteichthyes	Perciformes	Centrarchidae	<i>Micropterus salmoides</i>	Largemouth bass	2	0.023	Immature fish	-	-	4.3	N.D.(1.4)	4.3	-
					Vertebrata	Osteichthyes	Siluriformes	Bagridae	<i>Tachysurus tokiensis</i>	Cut-tailed bullhead	9	0.012	Immature fish	-	-	2.2	N.D.(1.7)	2.2	-
					Vertebrata	Osteichthyes	Siluriformes	Siluridae	<i>Silurus asotus</i>	Amur catfish	1	1.7	Mature fish	Stone loach	Viscera removed	9.6	N.D.(1.4)	9.6	0.42
					Coarse Particulate Organic Matter	-	-	-	-	Bottom fallen leaves	-	0.28	-	-	-	18	N.D.(1.4)	18	-

*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.