

•Results of Radioactive Material Monitoring of Aquatic Organisms (Location D along the Mano River)

< Location D along the Mano River : Samples collected >

Items	General items		Radioactive materials			
	Water	Sediment	Water (Cs)	Water (Sr)	Sediment (Cs)	Sediment (Sr)
D-1	○	○	○	○	○	○
D-2	○	○	○	○	○	○
D-3	○	○	○	○	○	○
D-4a	○	○	○	○	○	○
D-4b	○	○	○	○	○	○
D-5	○	○	○	○	○	○

< Location D along the Mano 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)
D-1	37.733217°	140.925250°	2013/7/11	10:32	10:40	22.4	22.4	Sand	2.5V3/2	None	None	0.27	>50.0
D-2	37.709467°	140.956500°	2013/7/11	12:56	13:04	23.4	23.3	Sand gravel	2.5V4/3	None	Pebbles	0.26	>50.0
D-3	37.704950°	140.962117°	2013/7/11	13:45	13:53	22.3	22.7	Sand gravel	2.5V4/3	None	Pebbles	0.60	>50.0
D-4a	37.730933°	140.907800°	2013/7/11	9:31	9:37	19.6	20.4	Sand gravel	2.5V4/3	None	Pebbles	0.39	>50.0
D-4b	37.731100°	140.909000°	2013/7/11	9:01	9:01	19.9	—	—	—	—	—	0.23	>50.0
D-5	37.721567°	140.889400°	2013/7/11	8:00	8:08	19.3	20.1	Sand	2.5V4/3	None	None	0.61	>50.0

< Location D along the Mano 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												
D-1	37.733217°	140.925250°	2013/7/11	10:32	8.1	0.5	3.3	12.1	11.2	0.06	1.3	<1	0.7	0.025	0.049	0.0019
D-2	37.709467°	140.956500°	2013/7/11	12:56	7.2	0.9	3.9	8.7	12.1	0.07	1.5	3	1.4	0.019	0.038	—
D-3	37.704950°	140.962117°	2013/7/11	13:45	7.0	0.7	3.4	10.6	13.2	0.07	1.4	2	1.4	0.021	0.042	—
D-4a	37.730933°	140.907800°	2013/7/11	9:31	7.2	0.6	3.0	9.2	11.1	0.06	1.3	2	1.2	0.034	0.066	—
D-4b	37.731100°	140.909000°	2013/7/11	9:01	7.3	0.7	2.7	9.3	11.1	0.06	1.1	1	1.1	0.031	0.064	—
D-5	37.721567°	140.889400°	2013/7/11	8:00	7.4	0.7	3.5	9.7	9.3	0.05	1.5	1	1.1	0.047	0.092	—

< Location D along the Mano 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/cm3)	Grain size distribution						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 (0.25-0.85mm) (%)	Fine sand (0.075-0.25mm) (%)	Silt (0.005-0.075mm) (%)	Clay (Less than 0.005mm) (%)				Median grain diameter (mm)	Maximum grain diameter (mm)
D-1	37.733217°	140.925250°	2013/7/11	10:40	7.1	302	17.3	2.1	8	2.722	42.3	37.3	17.3	2.3	0.2	0.6	1.7	19	400	900	0.87
D-2	37.709467°	140.956500°	2013/7/11	13:04	7.1	342	16.2	1.7	18	2.724	41.2	30.7	19.8	5.4	1.3	1.6	1.6	19	220	450	—
D-3	37.704950°	140.962117°	2013/7/11	13:53	7.0	312	15.5	1.5	1	2.697	55.1	29.1	13.9	1.0	0.3	0.6	2.4	19	130	270	—
D-4a	37.730933°	140.907800°	2013/7/11	9:37	7.3	286	21.5	2.7	22	2.734	39.2	26.4	27.8	4.7	0.8	1.1	1.4	19	640	1,300	—
D-5	37.721567°	140.889400°	2013/7/11	8:08	7.0	191	22.3	2.7	<1	2.725	34.8	19.9	35.0	6.7	1.6	2.0	1.0	19	600	1,300	—

< Location D along the Mano River: Analysis 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					
D-1 D-2	37.733217° 37.709467°	140.925250° 140.956500°	2013/7/16	Vertebrata	Osteichthyes	Osmeriformes	Osmeridae	<i>Plecoglossus altivelis</i>	Sweetfish (stock)	42	1.5	Yearling fish	—	1.4	4.5	—		
				Vertebrata	Osteichthyes	Osmeriformes	Osmeridae	<i>Plecoglossus altivelis</i>	Sweetfish (natural upstream)	106	1.1	Yearling fish	—	26	51	—		
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Zacco platypus</i>	Common carp	3	0.053	Mature fish	—	9.6	20	—		
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Tribolodon hakonensis</i>	Zacco platypus	1	0.026	Mature fish	—	13	24	—		
				Vertebrata	Osteichthyes	Cypriniformes	Cyprinidae	<i>Cyprinus carpio</i>	Japanese dace	1	1.1	5-year-old fish	—	9.3	21	—		
				Amphibia	Amphibia	Anura	Ranidae	<i>Rana catesbeiana</i>	American Bullfrog (tadpole)	5	0.072	Larva	—	140	280	—		
D-4a D-4b	37.730933° 37.731100°	140.907800° 140.909000°	2013/7/13	Algae/plant	—	—	—	—	Attached algae	—	0.095	—	—	510	1,100	—		
				Streptophyta	Zygnemmatophyceae	Zygnematales	Zygnemataceae	<i>Spirogyra sp.</i>	Spirogyra	—	0.39	—	—	—	—	4.4	9.1	—
				Bryopsida	Sphagnopsida	Sphagnales	Sphagnaceae	<i>Sphagnum sp.</i>	Sphagnum	—	0.42	—	—	—	—	110	240	—
				Arthropod	Insecta	Trichoptera	Stenopsychidae	<i>Stenopsyche marmorata</i>	<u>Stenopsyche marmorata</u>	432	0.11	Larva	—	72	150	—		
				Arthropod	Insecta	Trichoptera	Stenopsychidae	<i>Stenopsyche sauteri</i>	<u>Stenopsyche sauteri</u>	—	—	—	—	—	—	—	—	—
				Arthropod	Insecta	Megaloptera	Corydalidae	<i>Parachauliodes continentalis</i>	Parachauliodes continentalis Weele	150	0.087	Larva	—	15	29	—		
				Arthropod	Insecta	Megaloptera	Corydalidae	<i>Protohermes grandis</i>	<u>Protohermes grandis</u>	—	—	—	—	—	—	—	—	—
				Arthropod	Insecta	Odonata	Cordulidae	<i>Macromia amphigena amphigena</i>	<u>Macromia amphigena</u>	—	—	—	—	—	—	—	—	—
				Arthropod	Insecta	Odonata	Gomphidae	<i>Davidius nanus</i>	Davidius nanus	—	—	—	—	—	—	—	—	—
				Arthropod	Insecta	Odonata	Gomphidae	<i>Davidius sp.</i>	Davidius	—	—	—	—	—	—	—	—	—
				Arthropod	Insecta	Odonata	Gomphidae	<i>Nihonogomphus viridis</i>	Nihonogomphus viridis	—	—	—	—	—	—	—	—	—
				Arthropod	Insecta	Odonata	Gomphidae	<i>Onychogomphus viridicostus</i>	Onychogomphus viridicostus	104	0.034	Larva	—	20	39	—		
				Arthropod	Insecta	Odonata	Gomphidae	<i>Sieboldius albardae</i>	<u>Sieboldius albardae</u>	—	—	—	—	—	—	—	—	—
				Arthropod	Insecta	Odonata	Libellulidae	<i>Sympetrum sp.</i>	Sympetrum	—	—	—	—	—	—	—	—	—
				Arthropod	Insecta	Odonata	Aeshnidae	<i>Boyeria maclachlani</i>	Boyeria maclachlani	—	—	—	—	—	—	—	—	—
				Arthropod	Insecta	Odonata	Aeshnidae	<i>Planaeschna milnei</i>	Planaeschna milnei	—	—	—	—	—	—	—	—	—
				Arthropod	Malacostraca	Decapoda	Procambarus	<i>Procambarus clarkii</i>	Red swamp crawfish	17	0.64	Imago	—	110	240	—		
				Arthropod	Malacostraca	Decapoda	Atyidae	<i>Atyidae</i>	Freshwater shrimp	414	0.079	Imago	—	60	120	—		
				Mollusca	Gastropoda	Sorbococoncha	Pleuroceridae	<i>Semisulcospira libertina</i>	Semisulcospira libertina	51	0.087	Imago	—	32	67	—		
				Vertebrata	Osteichthyes	Perciformes	Gobiidae	<i>Rhinogobius sp.</i>	R. sp. CB	55	0.13	More than 1 year old	—	84	170	—		
Vertebrata	Osteichthyes	Salmoniformes	Salmonidae	<i>Oncorhynchus masou</i>	Yamame trout	1	0.013	Yearling fish	Some (details unknown)	35	64	—						
Vertebrata	Amphibia	Anura	—	—	Tadpole	25	0.0087	Larva	—	370	730	—						
					Coarse particulate organic matters	—	—	—	CPOMs (fallen leaves)	—	1.1	—	220	450	—			

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.