Measurement Results of Radiation Monitoring Action Plan (Monitoring of Underground Water for Drinking such as Well Water, Rivers and Sources) for Supporting Restoration of the Former Evacuation-Prepared Area in case of Emergency (Minami Soma City, Tamura City, Kawauchi Village, Hirono Town, and Naraha Town)

February 17, 2012

Ministry of the Environment
Team in Charge of Assisting the Lives of Victims around the nuclear Power Plant, Cabinet Office
Emergency Operation Center, MEXT

1. Outline

On September 30, 2011, the designation of evacuation-prepared area in case of emergency was removed for five municipalities (Minami Soma City, Tamura City, Kawauchi Village, Hirono Town, and Naraha Town). In the context of the restoration plan for these municipalities, further enhancement of radiation monitoring is required. In response, MEXT, Team in Charge of Assisting the Lives of Victims around the nuclear power plant of the Cabinet Office, Local Nuclear Emergency Response Headquarters, the Ministry of the Environment, etc. have been conducting the following types of monitoring since September 2011 as part of the measures to support the restoration of these areas in coordination with the related municipalities and Fukushima prefecture:

(1) A vehicle-borne survey focusing on living areas, and wide-area monitoring using unmanned helicopters.
(2) Monitoring in response to requests from respective municipalities
  (i) Monitoring of underground water for drinking, such as well water
  (ii) Monitoring of rivers and reservoirs

Of the above, the partial measurement results for the monitoring of underground water for drinking, such as well water that was conducted from October to December, 2011, as well as the measurement results for the monitoring of rivers and water sources (monitoring results for the second survey) that was conducted from November, 2011 has been compiled. Therefore, these will be released.

2. Specific outline of announced measurement results

2-1 Results for monitoring of underground water for drinking, such as well water.

1) Outline

In coordination with Fukushima prefecture, etc., and in response to requests from the municipalities, the measurement of radioactive materials within the water from underground water sources, such as well water and water from springs, that is being provided for drinking purposes within the former Evacuation-Prepared Area in case of Emergency on a scale of several thousand locations will be conducted.

2) Targets

Underground water, such as well water and water from springs that is being provided for drinking purposes within the target areas

3) Method

With cooperation from the municipalities, etc., samples were collected using 500 ml PET bottles, as a general rule, filled with well water, etc. that is being used by the residents and water from the taps and/or wells, etc. inside residences.

The collected water was gathered through the municipalities, etc. and the concentration of the radioactive materials (iodine (I-131) and cesium (Cs-134, Cs-137)) within the water was measured through analyzing the radioactive nuclides using a Germanium semiconductor detector with the cooperation of various analytical institutions (Meteorological Research Institute (MRI), The Wakasa Wan Energy Research Center, High Energy Accelerator Research Organization (KEK), Hiroshima University, electric power companies, etc.)

4) Measurement results

This is a report on the measurement results for part of Minami Soma City (remainder from those announced on December 26, 2011) and Kawauchi Village, where analysis has been completed. The outline is as follows:

(i) Minami Soma City

Number of measurement locations: 676 locations

Radioactive iodine (I-131): Not detected in any location (Detection limit: approx. 5Bq/L)

Radioactive cesium: Cs-134 Not detected in any location (Detection limit: approx. 5Bq/L)

Cs-137 Not detected in any location (Detection limit: approx. 5Bq/L)

(Note: Detected at 1 location excluding wells (refer to “5) Response in receiving the measurement results”))

(ii) Kawauchi Village

Number of measurement locations: 615 locations

Radioactive iodine (I-131): Not detected in any location (Detection limit: approx. 5Bq/L)

Radioactive cesium: Cs-134 Not detected in any location (Detection limit: approx. 5Bq/L)

Cs-137 Not detected in any location (Detection limit: approx. 5Bq/L)

(Reference) Number of measurement locations that has been announced

	Announced on December 26, 2011	Announced this time (February 17, 2012)	Total
Minami Soma City	1,302 locations	676 locations	1,978 locations
Tamura City	—	—	—
Kawauchi Village	—	615 locations	615 locations
Hirono Town	11 locations	—	11 locations
Naraha Town	4 locations	—	4 locations

* “Emergency Preparedness for Nuclear Facilities (The Nuclear Safety Commission of Japan)” The index of drinking water based on the indicator concerning the restriction of food intake.
Radioactive iodine (I-131): 300Bq/kg or more
Radioactive cesium (Cs-134 and Cs-137): 200Bq/kg or more

5) Response in receiving the measurement results

The measurement results announced this time have been reported to the related institutions in Minami Soma City, Kawauchi Village, etc. Also, the results have been reported to the owners of the wells through the municipalities.

At Minami Soma City, cesium was detected at one location where rainwater was collected in a concrete water tank (cesium 134: 5.8Bq/L, cesium 137: 7.6Bq/L). However, it has been confirmed that the water stored in this water tank is normally not used for drinking.

Furthermore, the monitoring of underground water used for drinking, such as well water, at Tamura City will also be continued.

6) Analysis results for each location (Refer to Annex 1)

2.2 Monitoring of rivers and water sources

1) Outline

Measurement of the concentration of radioactive materials contained in the water and bottom sediments in the rivers and water sources within the restricted area, which is being used as the water source for tap water in the former evacuation-prepared areas (Minami Soma city, Kawauchi village, Hirono town, Naraha town) and the rivers and water sources upstream (monitoring period: November 2011).

Moreover, this monitoring is to be conducted at a frequency of once every 2 months from September 2011 (first monitoring (monitoring period: September 2011) was announced on November 15, 2011)

2) Locations

Minami Soma city: Mano River; Ochiai Bridge, Majima Bridge
Niida River; Takanokura dam reservoir, Kidouchi Bridge, Sakekawa Bridge
Ota River; Yokogawa dam reservoir, Ishiwatato Bridge, JR railroad bridge, Masuda Bridge
Kawauchi village: Kido River; Nishiyama Bridge
Hirono town: Asami River; Boda Bridge
Naraha town (inside restricted area): Kido River; Kido dam, Nagatoro Bridge, Kidogawa Bridge
Others (Iitate village): Mano River; Mano dam
Niida River; Ganbe dam reservoir, Kusano, Komiya

3) Results

The concentration of radioactive materials contained in the water and bottom sediments in the rivers and water sources where measurements were conducted are as given below:

<Water quality>

Radioactive iodine (I-131): Not detected (Detection limit: 1Bq/L)
Radioactive cesium: Cs-134 Not detected (Detection limit: 1Bq/L)
Cs-137 Not detected - 1Bq/L (Detection limit: 1Bq/L)

※"Emergency Preparedness for Nuclear Facilities (The Nuclear Safety Commission of Japan)," The index of drinking water based on the indicator about the restriction of food intake
Radioactive iodine (I-131): 300 Bq/kg or above
Radioactive cesium (Cs-134, Cs-137 total): 200 Bq/kg or above

<Bottom sediment quality>

Radioactive iodine (I-131): Not detected (Detection limit: 30Bq/kg (dry mud))
Radioactive cesium: Cs-134 230 – 17,000 Bq/kg (dry mud)
Cs-137 300 – 22,000 Bq/kg (dry mud)

In addition, to confirm the surrounding environment in the vicinity of the location where the

water and bottom sediments were collected, the concentration and air dose rates of radioactive materials in the soil at the riverbed, etc. were conducted, and the results are as given below:

<Soil>

Radioactive iodine (I-131): Not detected (Detection limit: 30Bq/kg (dry))

Radioactive cesium: Cs-134 100 – 15,000 Bq/kg (dry)

Cs-137 230 – 19,000 Bq/kg (dry)

<Air dose rate>

0.22－4.96μSv/h

4) Analysis results for river and water sources for each location (Refer to Annex 2)

(Contexture)

1. Monitoring Results of Underground Water for Drinking, Such as Well Water
   1) Monitoring Results Table for Underground Water for Drinking, Such as Well Water
   2) Measurement Location Map for Underground Water for Drinking, Such as Well Water

2. Monitoring Results of River and Water Sources
   1) Monitoring Results Table of River and Water Sources
   2) Measurement Location Map for Each Water System
      - Mano River water system measurement location map
        * Mano River (Ochiai Bridge, Majima Bridge), Mano Dam
      - Niida River water system measurement location map
        * Kusano, Komiya, Kidouchi Bridge, Sakekawa Bridge, Ganbe Dam Reservoir, Takanokura Dam Reservoir
      - Ota River water system measurement location map
        * Ishiwatato Bridge, Kaminouchi Bridge, Masuda Bridge, JR Railroad Bridge, Yokogawa Dam Reservoir
      - Kido River and Asami River water system measurement location map
        * Nishiyama Bridge, Nagatoro Bridge, Kido River Bridge, Boda Bridge (Asami River), Kido Dam

<Reference>

Radiation Monitoring Action Plan for Supporting Restoration of the Former Emergency Evacuation Preparation Areas (Minami Soma city, Tamura city, Kawauchi village, Hirono town, and Naraha town) (Announced on October 3, 2011)

1. Monitoring Result of Underground Water for Drinking, Such as Well Water

1) Monitoring Result Table for Underground Water for Drinking, Such as Well Water

◯Monitoring results (Minami Soma City)

Sample Location			Sample date	Radioactive Material Concentration (Bq/L)				Notes
Municipality	Location	No. of Location points		I-131	Cs		Other detected nuclides	
					Cs-134	Cs-137		
Minami Soma City	Etari, Kashima ward	5	Dec. 5 - Dec. 8, 2011	ND	ND	ND	None	
	Ouchi, Kashima ward	26	Dec. 4 - Dec. 9, 2011	ND	ND	ND	None	
	Oshimada, Kashima ward	1	December 5, 2011	ND	ND	ND	None	
	Karasuzaki, Kashima ward	3	Dec. 5 - Dec. 8, 2011	ND	ND	ND	None	
	Kawago, Kashima ward	15	Dec. 5 - Dec. 8, 2011	ND	ND	ND	None	
	Shionosaki, Kashima ward	32	Dec. 4 - Dec. 9, 2011	ND	ND	ND	None	
	Asahicho, Haramachi ward	1	December 6, 2011	ND	ND	ND	None	
	Azumacho, Haramachi ward	31	Oct. 31 - Dec. 7, 2011	ND	ND	ND	None	
	Ishigami, Haramachi ward	27	Nov. 27 - Dec. 1, 2011	ND	ND	ND	None	
	Ushigoe, Haramachi ward	2	Dec. 6 - Dec. 7, 2011	ND	ND	ND	None	
	Okido, Haramachi ward	2	Oct. 24 - Dec. 6, 2011	ND	ND	ND	None	
	Ohara, Haramachi ward	9	Nov. 28 - Dec. 2, 2011	ND	ND	ND	None	
	Omachi, Haramachi ward	2	Dec. 5 - Dec. 8, 2011	ND	ND	ND	None	
	Omika, Haramachi ward	1	November 1, 2011	ND	ND	ND	None	
	Oshigama, Haramachi ward	2	November 30, 2011	ND	ND	ND	None	
	Kaibama, Haramachi ward	1	December 7, 2011	ND	ND	ND	None	
	Kanezawa, Haramachi ward	19	Nov. 28 - Dec. 8, 2011	ND	ND	ND	None	
	Kamiota, Haramachi ward	42	Nov. 11 - Nov. 25, 2011	ND	ND	ND	None	
	Kamikita-takahira, Haramachi ward	90	Sep. 21 - Dec. 5, 2011	ND	ND	ND	None	
	Kamishibusa, Haramachi ward	8	Dec. 5 - Dec. 8, 2011	ND	ND	ND	None	
	Kamitakahira, Haramachi ward	72	Nov. 20 - Nov. 28, 2011	ND	ND	ND	None	
	Kamimachi, Haramachi ward	1	December 5, 2011	ND	ND	ND	None	
	Kitaizumi, Haramachi ward	4	Nov. 28 - Dec. 5, 2011	ND	ND	ND	None	
	Kitaniida, Haramachi ward	21	Oct. 24 - Dec. 1, 2011	ND	ND	ND	None	
	Kitanagano, Haramachi ward	2	Oct. 31 - Dec. 5, 2011	ND	ND	ND	None	
	Kunimicho, Haramachi ward	1	December 8, 2011	ND	ND	ND	None	
	Kobama, Haramachi ward	1	December 5, 2011	ND	ND	ND	None	
	Gorai, Haramachi ward	11	Nov. 2 - Nov. 16, 2011	ND	ND	ND	None	
	Sakae-cho, Haramachi ward	2	December 5, 2011	ND	ND	ND	None	
	Sakurai-cho, Haramachi ward	41	Nov. 4 - Dec. 8, 2011	ND	ND	ND	None	
	Shidazawa, Haramachi ward	1	December 8, 2011	ND	ND	ND	None	
	Shidoke, Haramachi ward	1	December 5, 2011	ND	ND	ND	None	
	Shimo-ota, Haramachi ward	8	Nov. 14 - Nov. 16, 2011	ND	ND	ND	None	
	Shimokita-takahira, Haramachi ward	21	Nov. 28 - Dec. 5, 2011	ND	ND	ND	None	
	Shimotakahira, Haramachi ward	28	Nov. 27 - Nov. 30, 2011	ND	ND	ND	None	
	Taka, Haramachi ward	16	Nov. 14 - Nov. 17, 2011	ND	ND	ND	None	
	Takanokura, Haramachi ward	6	Nov. 28 - Dec. 8, 2011	ND	ND	ND	None	
	Takami-cho, Haramachi ward	1	December 6, 2011	ND	ND	ND	None	
	Nakaota, Haramachi ward	2	November 24, 2011	ND	ND	ND	None	
	Nishiki-cho, Haramachi ward	3	Dec. 5 - Dec. 9, 2011	ND	ND	ND	None	
	Nishimachi, Haramachi ward	7	Dec. 4 - Dec. 8, 2011	ND	ND	ND	None	
	Hashimoto-cho, Haramachi ward	4	Oct. 31 - Dec. 5, 2011	ND	ND	ND	None	
	Baba, Haramachi ward	18	Nov. 1 - Dec. 8, 2011	ND	ND	ND	None	
	Hinode-cho, Haramachi ward	17	Nov. 7 - Dec. 5, 2011	ND	ND	ND	None	
	Honjin-mae, Haramachi ward	3	Nov. 7 - Dec. 6, 2011	ND	ND	ND	None	
	Masuda, Haramachi ward	10	Nov. 14 - Nov. 24, 2011	ND	ND	ND	None	
	Minamimachi, Haramachi ward	52	Oct. 21 - Nov. 1, 2011	ND	ND	ND	None	
	Motomachi, Haramachi ward	1	October 29, 2011	ND	ND	ND	None	
	Yagawara, Haramachi ward	1	December 5, 2011	ND	ND	ND	None	
	(Reference)							
	Kamikita-takahira, Haramachi ward	1	November 24, 2011	ND	5.8	7.6	None	Storage tank
	Total	676						

※"Emergency Preparedness for Nuclear Facilities (The Nuclear Safety Commission of Japan)," which is the index (of drinking water) based on the indicator concerning the restriction of food intake.

Radioactive iodine (I-131): 300Bq/kg or more
Radioactive cesium (Cs-134 and Cs-137): 200Bq/kg or more

Note) "ND" indicates the case where the detected radioactivity concentration in underground water, such as well water, was lower than the detection limits (about 5Be/L for I-131, Cs-134 and Cs-137). However, please note that these nuclides are sometimes detected even when they are below the threshold, depending on the detector and the samples.

◯Monitoring results (Kawauchi Village)

Sample Location			Sample date	Radioactive Material Concentration(Bq/L)				Notes
Municipality	Location	No. of Location points		I-131	Cs		Other detected nuclides	
					Cs-134	Cs-137		
Kawauchi Village	Oaza Kamikawauchi	340	Nov. 25 - Dec. 16, 2011	ND	ND	ND	None	
	Oaza Shimokawauchi	275	Dec. 1 - Dec. 16, 2011	ND	ND	ND	None	
	Total	615						

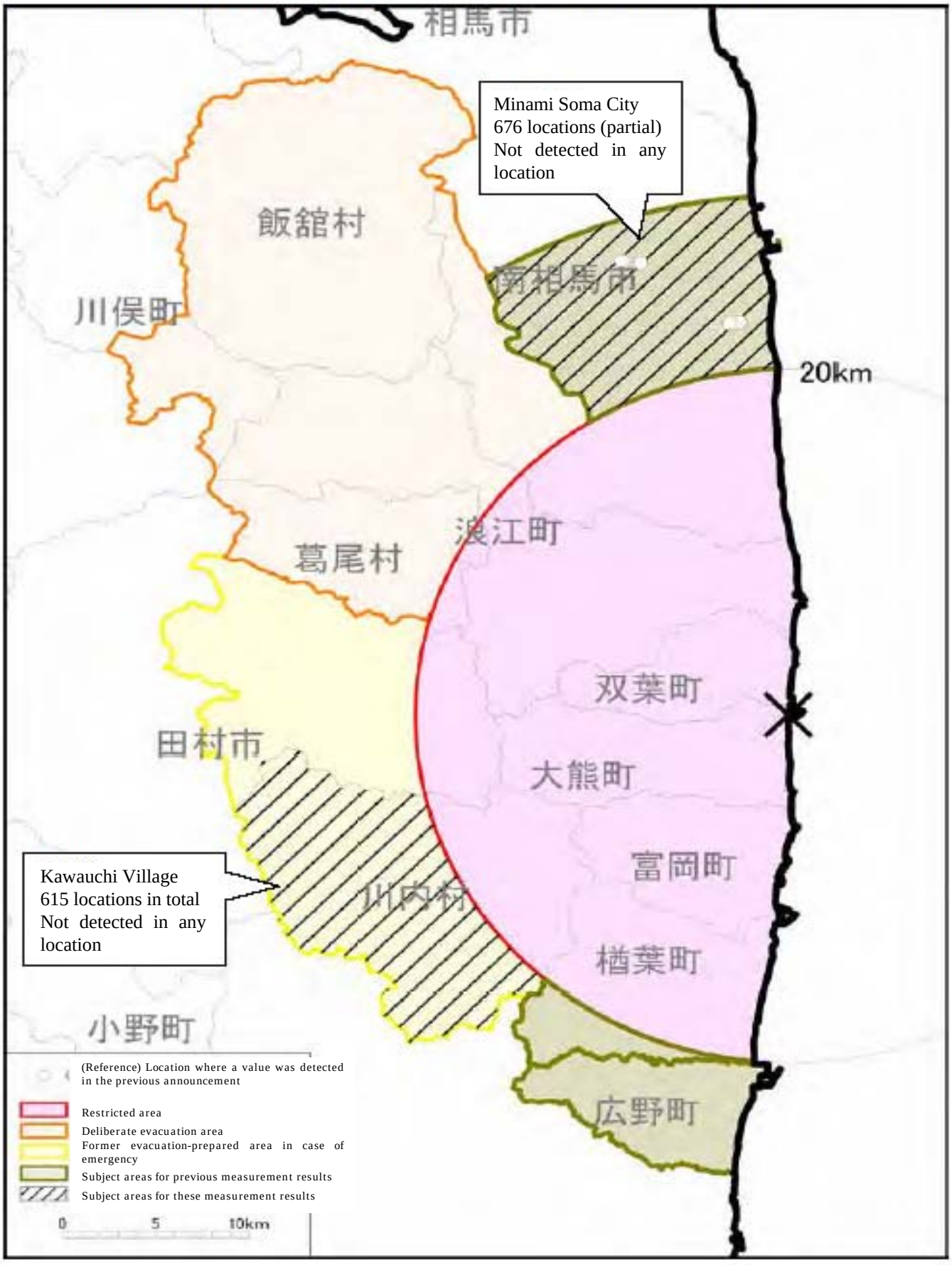
※"Emergency Preparedness for Nuclear Facilities (The Nuclear Safety Commission of Japan)," which is the index (of drinking water) based on the indicator concerning the restriction of food intake.

Radioactive iodine (I-131): 300Bq/kg or more

Radioactive cesium (Cs-134 and Cs-137): 200Bq/kg or more

Note) "ND" indicates the case where the detected radioactivity concentration in underground water, such as well water, was lower than the detection limits (about 5Be/L for I-131, Cs-134 and Cs-137). However, please note that these nuclides are sometimes detected even when they are below the threshold, depending on the detector and the samples.

2) Measurement Location Map for Underground Water for Drinking, Such as Well Water
(As Announced on February 17, 2012)



2. Monitoring Results of River and Water Sources

1) Monitoring Result Table of River and Water Sources

○ Monitoring Result Table for Water Quality

- Rivers

Sampling Location			Sampling Date	Weather	Temp. ℃	Depth m	General Category						Radioactive Material Concentration			Notes
River	Location	Municipality					Water Temp. ℃	Depth of sampling	Visibility cm	Electrical Conductivity mS/m	SS mg/L	Turbidity degrees	Radioactive Iodine I-131	Radioactive Cesium Cs-134	Cs-137	
Mano River	Ochiai Bridge	Minami Soma City	November 29	Fair	10.2	2.15	12.1	0	100 and above	13.2	2	1.9	<1	<1	<1	
	Majima Bridge	Minami Soma City	November 29	Fair	13.6	2.52	12.1	0	100 and above	2660.0	2	4.0	<1	<1	<1	Former Evacuation-Prepared Areas in case of Emergency
Niida River	Kusano	Iitate village	November 25	Snow	4.5	0.70	5.8	0	100 and above	8.5	1	1.6	<1	<1	<1	Deliberate Evacuation Areas
	Komiya	Iitate village	November 25	Snow	3.4	0.70	5.8	0	100 and above	8.5	1	1.6	<1	<1	<1	Deliberate Evacuation Areas
	Kidouchi Bridge	Minami Soma City	November 29	Fair	12.8	1.38	8.9	0	100 and above	7.7	<1	1.1	<1	<1	<1	Former Evacuation-Prepared Areas in case of Emergency
	Sakekawa Bridge	Minami Soma City	November 29	Fair	12.0	1.63	11.3	0	100 and above	139.5	1	1.6	<1	<1	<1	Former Evacuation-Prepared Areas in case of Emergency
Ota River	Ishiwatato Bridge	Minami Soma City	November 28	Cloudy	13.4	0.50	10.3	0	100 and above	6.0	<1	0.8	<1	<1	<1	Former Evacuation-Prepared Areas in case of Emergency
	Kaminouchi Bridge	Minami Soma City	November 29	Fair	13.2	0.30	11.1	0	100 and above	6.0	1	1.2	<1	<1	1	Former Evacuation-Prepared Areas in case of Emergency
	Masuda Bridge	Minami Soma City	November 29	Fair	9.2	0.48	11.8	0	100 and above	9.3	1	1.1	<1	<1	<1	Former Evacuation-Prepared Areas in case of Emergency
	JR Railroad Bridge	Minami Soma City	November 29	Fair	11.2	0.30	11.4	0	100 and above	8.9	2	2.0	<1	<1	<1	Former Evacuation-Prepared Areas in case of Emergency
Kido River	Nishiyama Bridge	Kawauchi Village	November 17	Fair	9.2	0.50	8.8	0	100 and above	6.1	2	1.2	<1	<1	<1	Former Evacuation-Prepared Areas in case of Emergency
	Nagatoro Bridge	Naraha Town	November 21	Fair	11.4	0.32	11.1	0	100 and above	40.1	1	2.9	<1	<1	<1	Restricted Areas
	Kido River Bridge	Naraha Town	November 21	Fair	11.9	0.25	10.4	0	100 and above	4.0	3	3.1	<1	<1	<1	Restricted Areas
Asami River	Boda Bridge	Hirono Town	November 18	Cloudy	9.2	0.40	8.8	0	100 and above	10.0	<1	1.0	<1	<1	<1	Former Evacuation-Prepared Areas in case of Emergency

- Water Sources

Sampling Location		Sampling Date	Weather	Temp. ℃	Depth m	General Category						Radioactive Material Concentration			Notes
Water Area Name	Municipality					Water Temp. ℃	Depth of sampling	Visibility m	Electrical Conductivity mS/m	SS mg/L	Turbidity degrees	Radioactive Iodine I-131	Radioactive Cesium Cs-134	Cs-137	
Mano Dam	Iitate village	November 24	Clear	10.8	0.5	13.2	0.0	0.5 and above	10.3	6	6.6	<1	<1	<1	Deliberate Evacuation Areas
Ganbe Dam Reservoir	Iitate village	November 29	Fair	15.6	0.5	6.6	0	0.5 and above	8.2	1	3.5	<1	<1	<1	Deliberate Evacuation Areas
Takanokura Dam Reservoir	Minami Soma City	November 28	Cloudy	14.0	0.3	9.4	0	0.3 and above	9.1	14	12.0	<1	<1	<1	Former Evacuation-Prepared Areas in case of Emergency
Yokogawa Dam Reservoir	Minami Soma City	November 28	Cloudy	11.6	0.4	10.5	0	0.4 and above	7.8	<1	1.2	<1	<1	<1	Former Evacuation-Prepared Areas in case of Emergency
Kido Dam	Naraha Town	November 21	Cloudy	10.2	0.3	11.0	0	0.3 and above	3.7	1	3	<1	<1	<1	Restricted Areas

○ Monitoring Result Table for Bottom Sediment

- Rivers

Sampling Location			Sampling Date	Weather	Temp. ℃	Depth m	General Category				Radioactive Material Concentration Bq/kg (dry mud)			Notes
River	Location	Municipality					Mud Temp. ℃	Mud Sampling Depth cm	Mud Content Ratio %	Properties	Radioactive Iodine I-131	Radioactive Cesium Cs-134	Radioactive Cesium Cs-137	
Mano River	Ochiai Bridge	Minami Soma City	November 29	Fair	10.2	2.15	12.0	3	91.6	Sand mixed with pebbles	<30	290	370	
	Majima Bridge	Minami Soma City	November 29	Fair	13.6	2.52	14.0	10	65.1	Sand mixed with silt	<30	1,500	1,900	Former Evacuation-Prepared Areas in case of Emergency
Niida River	Kusano	Iitate village	November 25	Snow	4.5	0.70	5.8	5	92.3	Pebbles mixed with sand	<30	560	730	Deliberate Evacuation Areas
	Komiya	Iitate village	November 25	Snow	3.4	0.70	6.1	5	79.4	Sand	<30	1,900	2,500	Deliberate Evacuation Areas
	Kidouchi Bridge	Minami Soma City	November 29	Fair	12.8	1.38	11.6	3	90.6	Pebbles mixed with sand	<30	1,100	1,500	Former Evacuation-Prepared Areas in case of Emergency
	Sakekawa Bridge	Minami Soma City	November 29	Fair	12.0	1.63	12.8	10	86.4	Sand	<30	270	340	Former Evacuation-Prepared Areas in case of Emergency
Ota River	Ishiwatato Bridge	Minami Soma City	November 28	Cloudy	13.4	0.50	10.6	5	88.4	Sand mixed with pebbles	<30	6,300	8,100	Former Evacuation-Prepared Areas in case of Emergency
	Kaminouchi Bridge	Minami Soma City	November 29	Fair	13.2	0.30	11.6	5	85.6	Pebbles mixed with sand	<30	10,000	12,000	Former Evacuation-Prepared Areas in case of Emergency
	Masuda Bridge	Minami Soma City	November 29	Fair	9.2	0.48	11.0	5	89.5	Pebbles mixed with sand	<30	1,300	1,600	Former Evacuation-Prepared Areas in case of Emergency
	JR Railroad Bridge	Minami Soma City	November 29	Fair	11.2	0.30	11.4	10	80.0	Sand	<30	1,300	1,700	Former Evacuation-Prepared Areas in case of Emergency
Kido River	Nishiyama Bridge	Kawauchi Village	November 17	Fair	9.2	0.50	9.8	5	68.8	Sand	<30	310	380	Former Evacuation-Prepared Areas in case of Emergency
	Nagatoro Bridge	Naraha Town	November 21	Fair	11.4	0.32	11.4	5	76.2	Sand	<30	230	300	Restricted Areas
	Kido River Bridge	Naraha Town	November 21	Fair	11.9	0.25	12.4	5	53.6	Pebbles/silt mixed with sand	<30	1,100	1,400	Restricted Areas
Asami River	Boda Bridge	Hirono Town	November 18	Cloudy	9.2	0.40	9.2	5	80.0	Sand	<30	370	460	Former Evacuation-Prepared Areas in case of Emergency

- Water Sources

Sampling Location		Sampling Date	Weather	Temp. ℃	Depth m	General Category				Radioactive Material Concentration Bq/kg (dry mud)			Notes
Water Area Name	Municipality					Mud Temp. ℃	Mud Sampling Depth cm	Mud Content Ratio %	Properties	Radioactive Iodine I-131	Radioactive Cesium Cs-134	Radioactive Cesium Cs-137	
Mano Dam	Iitate village	November 24	Clear	10.8	0.5	13.0	5	38.8	Silt	<30	5,200	6,300	Deliberate Evacuation Areas
Ganbe Dam Reservoir	Iitate village	November 29	Fair	15.6	0.5	7.4	5	80.4	Pebbles mixed with sand	<30	5,300	6,900	Deliberate Evacuation Areas
Takanokura Dam Reservoir	Minami Soma City	November 28	Cloudy	14.0	0.3	9.9	5	59.8	Pebbles mixed with sand	<30	17,000	22,000	Former Evacuation-Prepared Areas in case of Emergency
Yokogawa Dam Reservoir	Minami Soma City	November 28	Cloudy	11.6	0.4	11.0	10	77.3	Sand	<30	10,000	13,000	Former Evacuation-Prepared Areas in case of Emergency
Kido Dam	Naraha Town	November 21	Cloudy	10.2	0.3	10.5	5	35.2	Sand mixed with silt	<30	7,800	9,800	Restricted Areas

○ Monitoring Result Table for Surrounding Environment

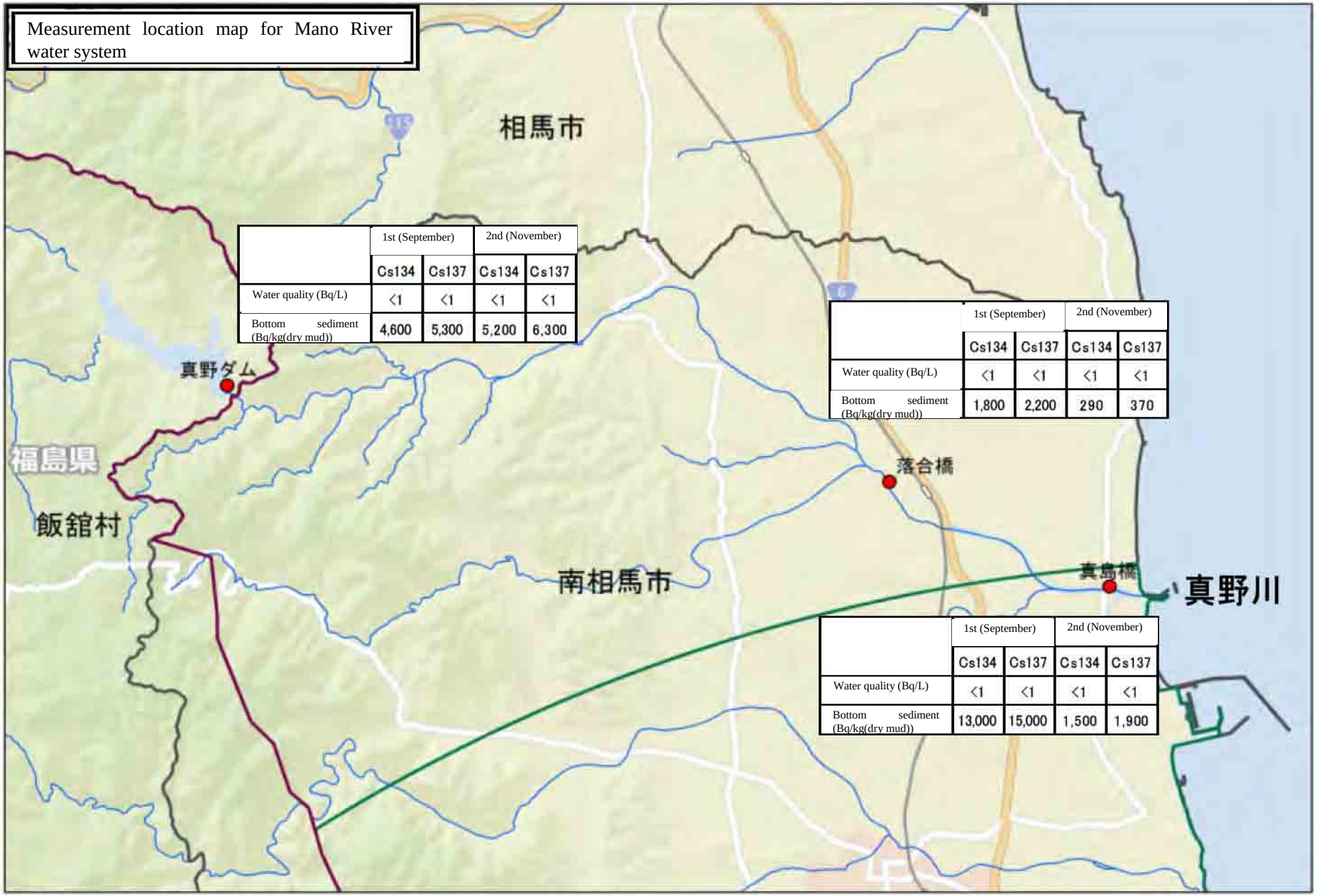
- Rivers

Sampling Location			Sampling Date	Weather	Temp. ℃	Left Bank					Right Bank					Notes
						Soil				Air Dose (μSv/h)	Soil				Air Dose (μSv/h)	
						Properties	Radioactive Material Concentration Bq/kg (dry)				Properties	Radioactive Material Concentration Bq/kg (dry)				
River	Location	Municipality					Radioactive Iodine I-131	Radioactive Cesium Cs-134	Radioactive Cesium Cs-137			Radioactive Iodine I-131	Radioactive Cesium Cs-134	Radioactive Cesium Cs-137		
Mano River	Ochiai Bridge	Minami Soma City	November 29	Fair	10.2	Earthy	<30	750	930	0.57	Earthy	<30	1,100	1,400	0.96	
	Majima Bridge	Minami Soma City	November 29	Fair	13.6	Strong viscous	<30	520	660	0.32	Strong viscous	<30	450	640	0.29	Former Evacuation-Prepared Areas in case of Emergency
Niida River	Kusano	Iitate village	November 25	Snow	4.5	Earthy	<30	8,500	10,000	4.48	Earthy	<30	13,000	16,000	4.37	Deliberate Evacuation Areas
	Komiya	Iitate village	November 25	Snow	3.4	Earthy	<30	8,900	11,000	4.70	Earthy	<30	8,100	10,000	4.96	Deliberate Evacuation Areas
	Kidouchi Bridge	Minami Soma City	November 29	Fair	12.8	Earthy	<30	3,000	3,800	1.17	Earthy	<30	1,200	1,500	1.36	Former Evacuation-Prepared Areas in case of Emergency
	Sakekawa Bridge	Minami Soma City	November 29	Fair	12.0	Earthy	<30	100	140	0.22	Earthy	<30	390	460	0.36	Former Evacuation-Prepared Areas in case of Emergency
Ota River	Ishiwatato Bridge	Minami Soma City	November 28	Cloudy	13.4	Earthy	<30	4,300	5,500	2.10	Earthy	<30	2,500	3,300	2.23	Former Evacuation-Prepared Areas in case of Emergency
	Kaminouchi Bridge	Minami Soma City	November 29	Fair	13.2	Earthy	<30	2,600	3,400	1.09	Earthy	<30	2,900	3,800	1.12	Former Evacuation-Prepared Areas in case of Emergency
	Masuda Bridge	Minami Soma City	November 29	Fair	9.2	Earthy	<30	1,400	1,800	0.50	Earthy	<30	600	780	0.47	Former Evacuation-Prepared Areas in case of Emergency
	JR Railroad Bridge	Minami Soma City	November 29	Fair	11.2	Earthy	<30	1,000	1,300	0.41	Earthy	<30	2,000	2,500	0.48	Former Evacuation-Prepared Areas in case of Emergency
Kido River	Nishiyama Bridge	Kawauchi Village	November 17	Fair	9.2	Sandy	<30	730	940	0.82	Sandy	<30	1,000	1,200	0.68	Former Evacuation-Prepared Areas in case of Emergency
	Nagatoro Bridge	Naraha Town	November 21	Fair	11.4	Viscous	<30	2,500	3,200	0.92	–	–	–	–	–	Restricted Areas
	Kido River Bridge	Naraha Town	November 21	Fair	11.9	–	–	–	–	–	Earthy	<30	2,000	2,500	0.93	Restricted Areas
Asami River	Boda Bridge	Hirono Town	November 18	Cloudy	9.2	Earthy	<30	1,200	1,500	1.33	Earthy	<30	1,800	2,200	1.66	Former Evacuation-Prepared Areas in case of Emergency

- Water Sources

Sampling Location		Sampling Date	Weather	Temp. ℃	Soil				Air Dose (μSv/h)		Notes
					Properties	Radioactive Material Concentration Bq/kg (dry)					
Water Area Name	Municipality					Radioactive Iodine I-131	Radioactive Cesium Cs-134	Radioactive Cesium Cs-137			
Mano Dam	Iitate village	November 24	Clear	10.8	Earthy	<30	2,500	3,000	1.69		Deliberate Evacuation Areas
Ganbe Dam Reservoir	Iitate village	November 29	Fair	15.6	Earthy	<30	15,000	19,000	2.14		Deliberate Evacuation Areas
Takanokura Dam Reservoir	Minami Soma City	November 28	Cloudy	14.0	Earthy	<30	4,800	6,000	2.97		Former Evacuation-Prepared Areas in case of Emergency
Yokogawa Dam Reservoir	Minami Soma City	November 28	Cloudy	11.6	Earthy	<30	7,100	9,000	3.45		Former Evacuation-Prepared Areas in case of Emergency
Kido Dam	Naraha Town	November 21	Cloudy	10.2	Earthy	<30	880	1,000	0.85		Restricted Areas

2) Measurement Location Map for Each Water System

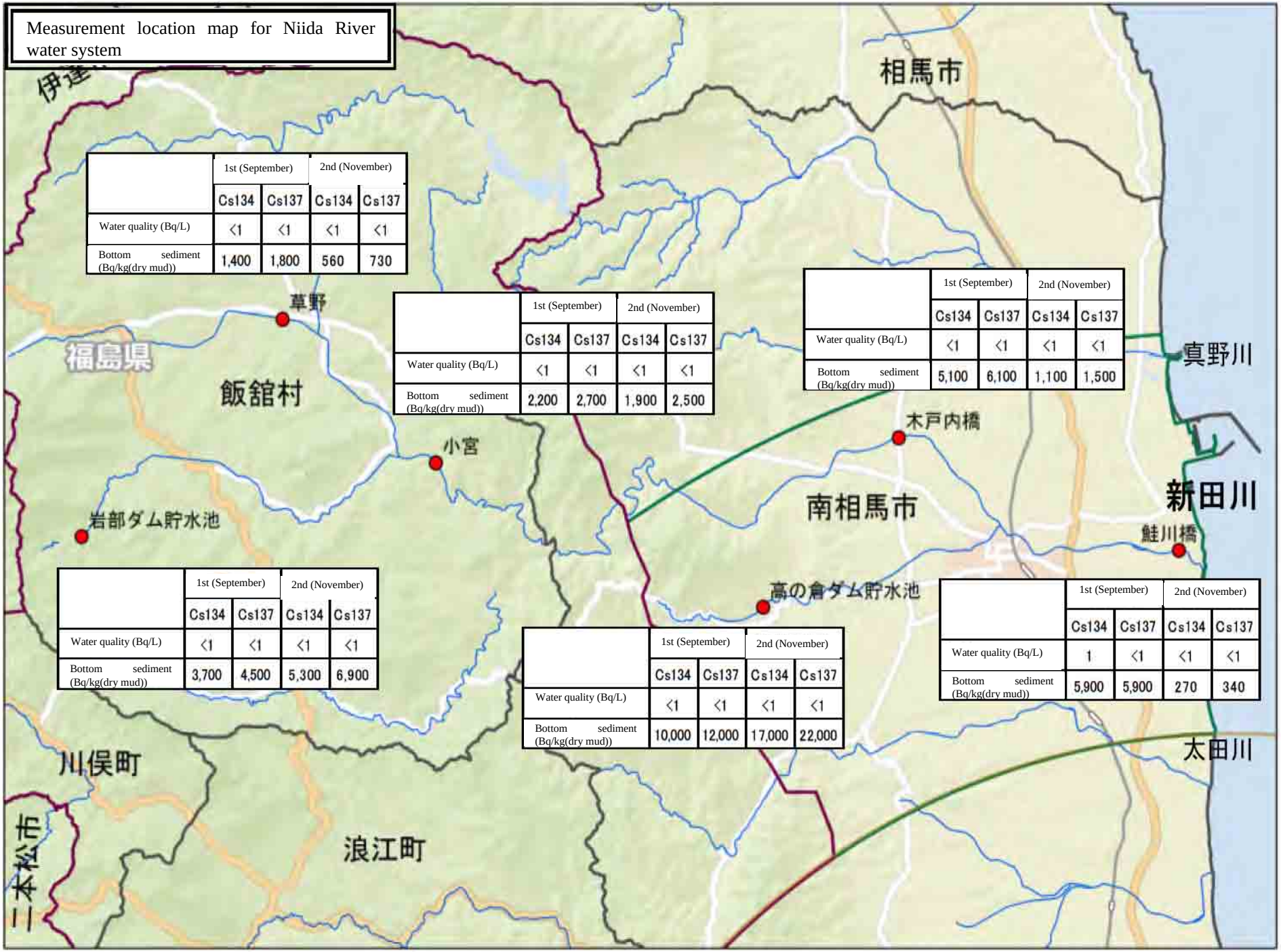


	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	4,600	5,300	5,200	6,300

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	1,800	2,200	290	370

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	13,000	15,000	1,500	1,900

Measurement location map for Niida River water system



	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	1,400	1,800	560	730

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	2,200	2,700	1,900	2,500

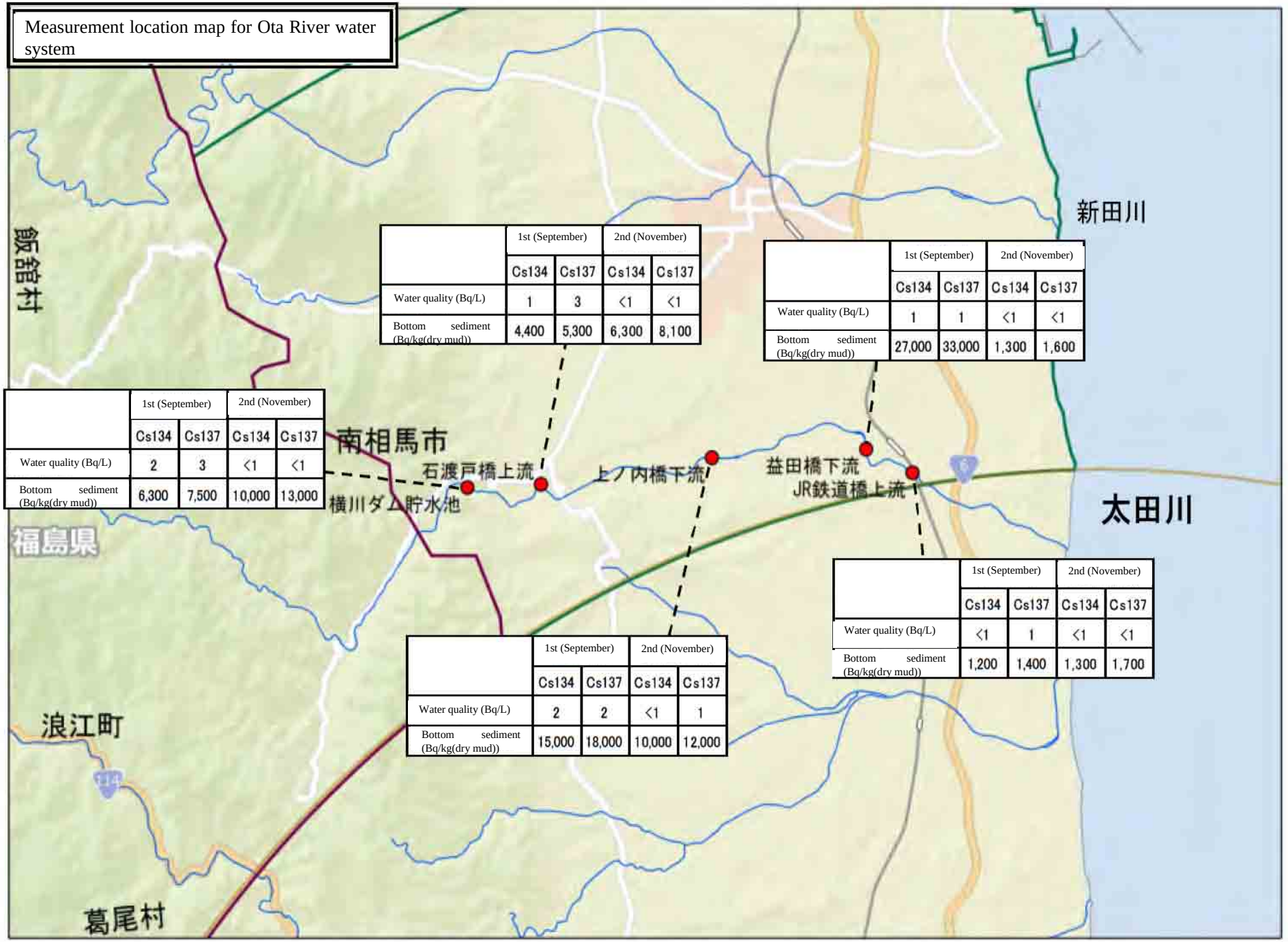
	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	5,100	6,100	1,100	1,500

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	3,700	4,500	5,300	6,900

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	10,000	12,000	17,000	22,000

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	5,900	5,900	270	340

Measurement location map for Ota River water system



	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	1	3	<1	<1
Bottom sediment (Bq/kg(dry mud))	4,400	5,300	6,300	8,100

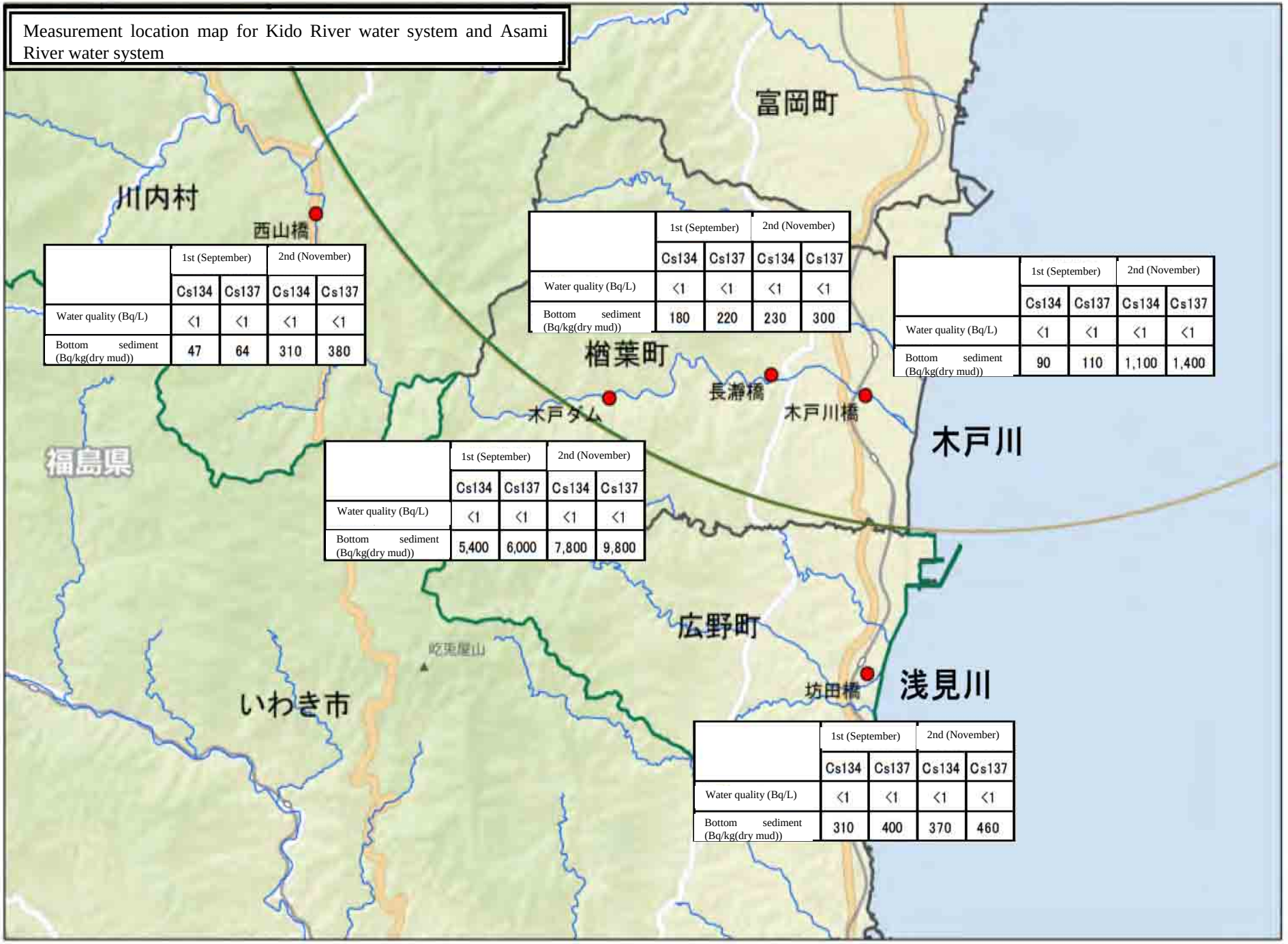
	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	1	1	<1	<1
Bottom sediment (Bq/kg(dry mud))	27,000	33,000	1,300	1,600

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	2	3	<1	<1
Bottom sediment (Bq/kg(dry mud))	6,300	7,500	10,000	13,000

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	2	2	<1	1
Bottom sediment (Bq/kg(dry mud))	15,000	18,000	10,000	12,000

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	1	<1	<1
Bottom sediment (Bq/kg(dry mud))	1,200	1,400	1,300	1,700

Measurement location map for Kido River water system and Asami River water system



	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	47	64	310	380

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	180	220	230	300

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	90	110	1,100	1,400

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	5,400	6,000	7,800	9,800

	1st (September)		2nd (November)	
	Cs134	Cs137	Cs134	Cs137
Water quality (Bq/L)	<1	<1	<1	<1
Bottom sediment (Bq/kg(dry mud))	310	400	370	460