Chapter 1 Results of the Initial Environmental Survey in FY 2010

1. Purpose of the survey

Initial Environmental Surveys are implemented in compliance with the Law Concerning Reporting, etc. of Releases of Specific Chemical Substances to the Environment and Promoting Improvement in Their Management (Law No. 86, 1999) (hereafter, the PRTR); these surveys provide the basic resources to properly evaluate chemical substances which may present environmental risk by compiling and tracking data notably from areas susceptible to high concentrations in their general environments, as well as for evaluating environmental and exposure risks to chemical substances that are other than as designated by law.

2. Target chemicals

In the FY 2010 Initial Environmental Survey, 16chemicals that were selected and designated as target chemicals. The combinations of target chemicals and the surveyed media are given below.

No.	Name	The Chemical Substances Control Law		The PRTR Law		Surveyed media		
		Before the revision	After the revision	Before the revision	After the revision	Surface water	Sediment	Air
[1]	Amylcinnamaldehyde					○		
[2]	Iopanoic acid					○		
[3]	ε-Caprolactam	II Monitored	Priority Assessment Chemical Substances	I 61	I 76			○
[4]	2,4-Xylenol			II 17	I 78		○	
[5]	Quinoline	II Monitored			I 81		○	
[6]	2-Ethoxyethyl acetate (synonym:Ethylene glycol monoethyl ether acetate)	II Monitored		I 101	I 133			○
[7]	4,4'-Diaminodiphenyl ether				I 143		○	
[8]	Diethylstilbesterol					○		
[9]	Dimethyl sulfoxide							○
[10]	*L*-Thyroxine					○		
[11]	*o*-Nitrotoluene	II Monitored			I 315		○	
[12]	Methyl 4-hydroxybenzoate				I 334		○	
[13]	*n*-Butyl benzyl phthalate			I 273	I 356			○
[14]	Tri-*n*-octyl 1,2,4-benzenetricarboxylate					○		
[15]	Pentanal					○		
[16]	4-Methoxybenzaldehyde					○		

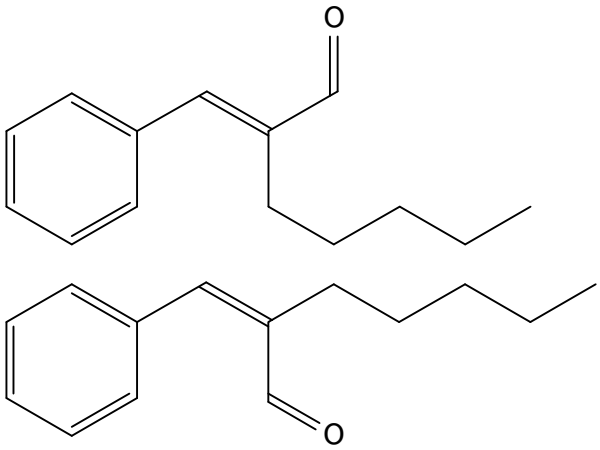
(Note 1)"The Chemical Substances Control Law" hereafter means "Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances (Law No. 117 of 1973)."

(Note 2) Pre-Revision "Areas as designated under the Chemical Substances Control Law" refer to those areas designated prior to the 20 May 2009 revision of the law (which went into effect on 1 April 2011), while "Post Revision Areas" refer to the areas defined as designated post-20 May 2009.

(Note 3) "Before the revision" in "The PRTR Law" means "appointments before the revision of government ordinance on November 21, 2008" and "After the revision" in "The PRTR Law" means "appointments after that revision".

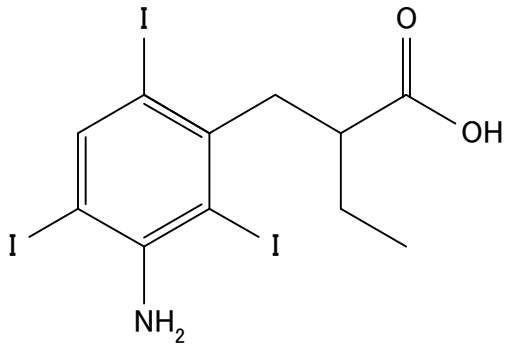
Chemical and physical properties of target chemicals of the Initial Environmental Survey are as follows.

[1] Amylcinnamaldehyde



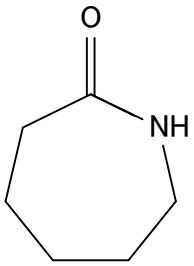
Molecular formula: $C_{14}H_{18}O$
CAS: 122-40-7
ENCS: 3-2657
MW: 202.29
mp: 80°C [1)]
bp: 174°C (20mmHg) [1)]
sw: Uncertain
Specific gravity: 0.9711g/cm^3 (20°C) [1)]
logPow: Uncertain

[2] Iopanoic acid



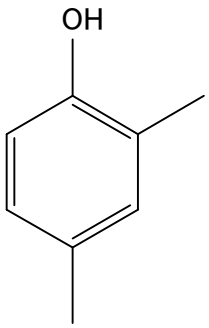
Molecular formula: $C_{11}H_{12}I_3NO_2$
CAS: 96-83-3
ENCS: 3-3088、9-171
MW: 570.93
mp: 156°C [1)]
bp: Uncertain
sw: Uncertain
Specific gravity: Uncertain
logPow: Uncertain

[3] ε-Caprolactam



Molecular formula: $C_6H_{11}NO$
CAS: 105-60-2
ENCS: 5-1097
MW: 113.16
mp: 70°C [2)]
bp: 180°C [2)]
sw: 5,525g/kg (25°C) [3)]
Specific gravity: 1.05 (25/4°C) [2)]
logPow: Uncertain

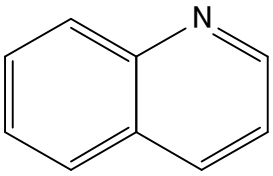
[4] 2,4-Xylenol



Molecular formula: $C_8H_{10}O$
CAS: 105-67-9
ENCS: 3-521、4-57
MW: 122.16
mp: 25°C [1)]
bp: 210.94°C [1)]
sw: 7.87g/kg (25°C) [1)]
Specific gravity: 0.9650g/cm^3 (20°C) [1)]
logPow: 2.35 [1)]

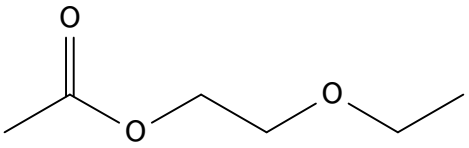
(Abbreviations) CAS CAS registry number, ENCS registry number in the Existing and New Chemical Substances List, MW molecular weight, mp melting point, bp boiling point, SW solubility in water, logPow *n*-octanol-water partition coefficient, kPa kilopascal (1 atom ≒101.3kPa).

[5] Quinoline



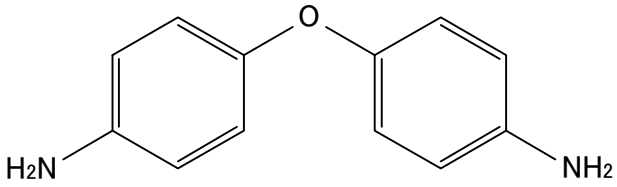
Molecular formula:	C_9H_7N
CAS:	91-22-5
ENCS:	5-794
MW:	129.16
mp:	-15°C [2)]
bp:	237.7°C [2)]
sw:	6.33g/kg (20°C) [1)]
Specific gravity:	1.0900 (25/4°C) [2)]
logPow:	2.03 [4)]

[6] 2-Ethoxyethyl acetate (synonymEthylene glycol monoethyl ether acetate)



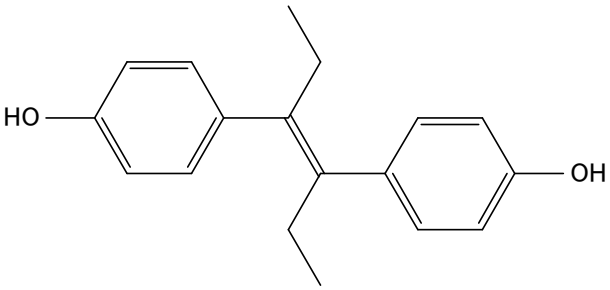
Molecular formula:	$C_6H_{12}O_3$
CAS:	111-15-9
ENCS:	2-740
MW:	132.16
mp:	-61.7°C [1)]
bp:	156.6°C [1)]
sw:	163g/kg [1)]
Specific gravity:	0.9740g/cm^3 (20°C) [1)]
logPow:	0.24 [5)]

[7] 4,4'-Diaminodiphenyl ether



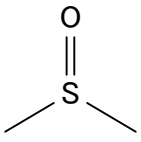
Molecular formula:	$C_{12}H_{12}N_2O$
CAS:	101-80-4
ENCS:	3-854
MW:	200.24
mp:	186～187°C [3)]
bp:	350°C [3)]
sw:	Uncertain
Specific gravity:	Uncertain
logPow:	Uncertain

[8] Diethylstilbesterol



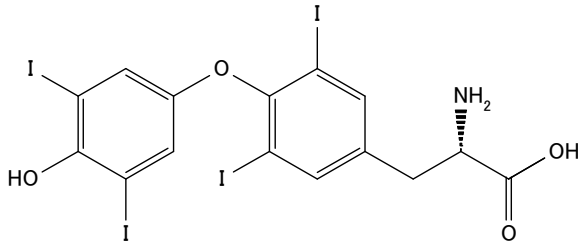
Molecular formula:	$C_{18}H_{20}O_2$
CAS:	56-53-1
ENCS:	No pertinence
MW:	268.35
mp:	169～172°C [2)]
bp:	Uncertain
sw:	0.1g/kg （20°C） [1)]
Specific gravity:	Uncertain
logPow:	5.07 [4)]

[9] Dimethyl sulfoxide



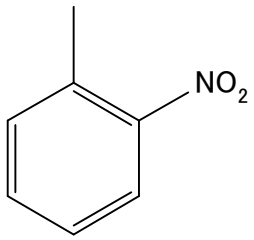
Molecular formula:	C_2H_6OS
CAS:	67-68-5
ENCS:	2-1553
MW:	78.13
mp:	18.55°C [2)]
bp:	189°C [2)]
sw:	339g/kg (25°C) [1)]
Specific gravity:	1.100 (20/4°C) [2)]
logPow:	-1.35 [2)]

[10] *L*-Thyroxine



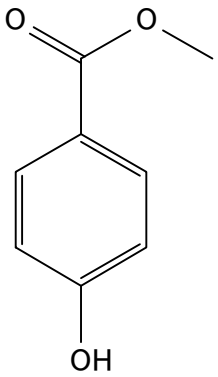
Molecular formula: $C_{15}H_{11}I_4NO_4$
CAS: 51-48-9
ENCS: No pertinence
MW: 776.87
mp: 235～236°C (degradation) [2)]
bp: Uncertain
sw: 15mg/100mL (25°C,sodium salt) [2)]
Specific gravity: 2.381 (20/4°C,sodium salt) [2)]
logPow: Uncertain

[11] *o*-Nitrotoluene



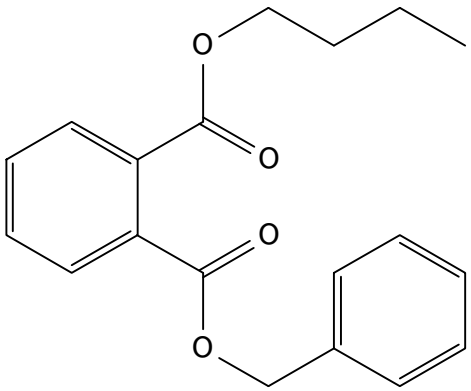
Molecular formula: $C_7H_7NO_2$
CAS: 88-72-2
ENCS: 3-437
MW: 137.14
mp: -9.3°C [2)]
bp: 220.4°C [2)]
sw: 652mg/L [2)]
Specific gravity: 1.1622 (19/15°C) [2)]
logPow: 2.30 [4)]

[12] Methyl 4-hydroxybenzoate



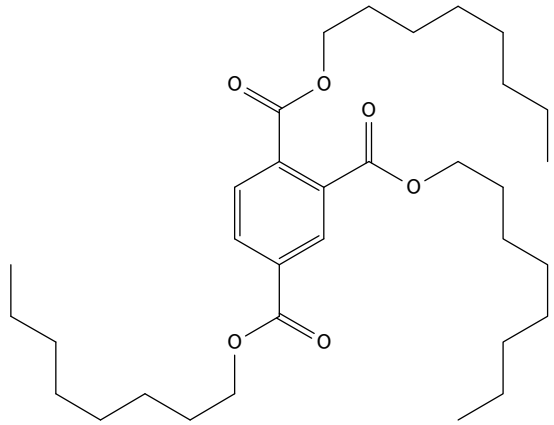
Molecular formula: $C_8H_8O_3$
CAS: 99-76-3
ENCS: 3-1585
MW: 152.15
mp: 131°C [2)]
bp: 270～280°C (degradation) [2)]
sw: 1g/400mL (20°C) [2)]
Specific gravity: Uncertain
logPow: 1.96 [4)]

[13] *n*-Butyl benzyl phthalate



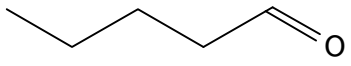
Molecular formula: $C_{19}H_{20}O_4$
CAS: 85-68-7
ENCS: 3-1312
MW: 312.36
mp: -3.5°C [6)]
bp: 370°C [1)]
sw: 2.69mg/L (25°C) [3)]
Specific gravity: 1.119g/cm^3 (25°C) [1)]
logPow: 4.91 [3)]

[14] Tri-*n*-octyl 1,2,4-benzenetricarboxylate



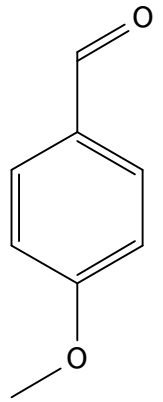
Molecular formula: $C_{33}H_{54}O_6$
CAS: 89-04-3
ENCS: 3-1372
MW: 546.78
mp: Uncertain
bp: Uncertain
sw: Uncertain
Specific gravity: Uncertain
logPow: Uncertain

[15] Pentanal



Molecular formula: $C_5H_{10}O$
CAS: 110-62-3
ENCS: 2-494
MW: 86.13
mp: -81.5°C [1)]
bp: 103°C [1)]
sw: 12g/kg (25°C) [1)]
Specific gravity: 0.8095g/cm^3 (20°C) [1)]
logPow: Uncertain

[16] 4-Methoxybenzaldehyde



Molecular formula: $C_8H_8O_2$
CAS: 123-11-5
ENCS: 3-2661
MW: 136.15
mp: 0°C [2)]
bp: 248°C [2)]
sw: 4.29g/kg (25°C) [1)]
Specific gravity: 1.119 (15/4°C) [2)]
logPow: 1.76 [4)]

References

1) Haynes, CRC Handbook of Chemistry and Physics, 92nd Edition, CRC Press LLC (2011)
2) O'Neil, The Merck Index - An Encyclopedia of Chemicals, Drugs, and Biologicals 14th Edition, Merck Co. Inc. (2006)
3) Howard et al., Handbook of Physical Properties of Organic Chemicals, CRC Press Inc. (1996)
4) Hansch et al., Exploring QSAR - Hydrophobic, Electronic and Steric Constants, American Chemical Society (1995)
5) Verschueren, Handbook of Environmental Data on Organic Chemicals 5th Edition, John Wiley & Sons (2008)
6) Richardson et al., Dictionary of Substances and Their Effects; Index, Royal Society of Chemistry, 620 (1995)

3. Surveyed site and procedure

In the Initial Environmental Survey, the sampling and analysis of specimens was entrusted to prefectural governments and government-designated cities across Japan, and some specimens were sampled and analyzed by private analytical laboratories.

(1) Organisations responsible for sampling

Local communities	Organisations responsible for sampling*1	Surveyed media		
		Surface water	Sediment	Air
Hokkaido	Hokkaido Research Organization Environmental and Geological Research Department Institute of Environmental Sciences		○	○
Sapporo City	Sapporo City Institute of Public Health	○	○	○
Iwate Pref.	Research Institute for Environmental Sciences and Public Health of Iwate Prefecture		○	○
Miyagi Pref.	Miyagi Prefectural Institute of Public Health and Environment	○		
Sendai City	Sendai City Institute of Public Health	○	○	○
Akita Pref.	Akita Research Center for Public Health and Environment			○
Yamagata Pref.	Yamagata Institute of Environmental Sciences		○	
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center	○		○*2
Saitama Pref.	Center for Environmental Science in Saitama			○
Chiba Pref.	Chiba Prefectural Environmental Research Center	○		○
Tokyo Met.	Tokyo Metropolitan Research Institute for Environmental Protection	○	○	○
Kanagawa Pref.	Kanagawa Environmental Research Center			○
Yokohama City	Yokohama Environmental Science Research Institute	○		
Kawasaki City	Kawasaki Municipal Research Institute for Environmental Protection	○	○	
Niigata Pref.	Niigata Prefectural Institute of Public Health and Environmental Sciences	○	○	
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science	○	○	○
Gifu Pref.	Gifu Prefectural Research Institute for Health and Environmental Sciences			○
Aichi Pref.	Aichi Environmental Research Center	○	○	○*2
Nagoya City	Nagoya City Environmental Science Research Institute	○		○
Mie Pref.	Mie Prefecture Health and Environment Research Institute	○	○	○
Shiga Pref.	Lake Biwa Environmental Research Institute	○	○	○
Kyoto Pref.	Kyoto Prefectural Institute of Public Health and Environment		○	○
Kyoto City	Kyoto Prefectural Institute of Public Health and Environment	○		○
Osaka Pref.	Research Institute of Environment, Agriculture and Fisheries, Osaka Prefectural Government	○	○	○*3
Osaka City	Osaka City Institute of Public Health and Environmental Sciences	○	○	
Hyogo Pref.	Hyogo Prefectural Agricultural Administration and Environment Division, Environment Bureau	○		○
Kobe City	Environmental Conservation and Guidance Division, Environment Bureau	○	○	
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health	○	○	○
Okayama Pref.	Okayama Prefectural Institute for Environmental Science and Public Health	○	○	
Yamaguchi Pref.	Yamaguchi Prefectural Public Health and Environment	○	○	○
Kagawa Pref.	Kagawa Prefectural Research Institute for Environmental Sciences and Public Health		○	○
Ehime Pref.	Ehime Prefectural Institute of Public Health and Environmental Science	○		
Fukuoka Pref.	Fukuoka Institute of Health and Environmental Science	○	○	○
Kitakyushu City	Kitakyushu City Institute of Environmental Sciences			○
Saga Pref.	Saga Prefectural Environmental Research Center			○
Kumamoto Pref.	Kumamoto Prefectural Institute of Public Health and Environmental Science			○

(Note 1) *1: Organisations responsible for sampling are described by their official names in FY 2010.
(Note 2) *2: Those organizations sampled some specimens, and cooperated with a private analytical laboratory in sampling other specimens.

(2) Surveyed sites and target chemicals

Surveyed sites and target chemicals for surface water are shown in Table 1-1-1 and Figure 1-1-1. Surveyed sites and target chemicals for sediment are shown in Table 1-1-2 and Figure 1-1-1. Surveyed sites and target chemicals for air are shown in Table 1-1-3 and Figure 1-1-2. The breakdown is summarized as follows.

To ensure more accurate data for areas susceptible to high concentrations in the general environment, Survey Points are selected and determined based on information regarding releases and emissions. New survey points utilized for the FY 2010 surveys were finalized considering the emissions and releases reports submitted in accord with the PRTR, correlated with identification of geographical points with high particulate release volumes.

Surveyed media	Numbers of local communities	Numbers of target chemicals	Numbers of surveyed sites	Numbers of samples at a surveyed site
Surface water	24	7	33	3
Sediment	21	5	28	3
Air	27※	4	36	3
All media	36	16	76	

(Note) For two of the 27 organizations, sampling was restricted to a portion of substances subject to survey, and the remaining substances subject to survey were given over, along with support, to a private analysis service. For one specific organization, a private analysis service, with support, handled all sampling of substances subject to survey.

Table 1-1-1 List of surveyed sites (surface water) and target chemicals in the Initial Environmental Survey in FY 2010

Local communities	Surveyed sites	Target chemicals						
		[1]	[2]	[8]	[10]	[14]	[15]	[16]
Sapporo City	Nakanuma of Riv.Toyohira(Sapporo City)		○					
	Daiichishinkawa-bashi Bridge, Riv. Shin(Sapporo City)		○					
Miyagi Pref.	Hutatsuya-bashi Bridge, Riv. Hasama(Tome City)		○	○	○			
	Funaoka-ohashi Bridge, Riv.Shiraishi(Shibata Town)		○	○	○			
Sendai City	Hirose-ohashi Bridge, Riv. Hirose(Sendai City)	○					○	○
Ibaraki Pref.	Katta-bashi Bridge, Riv. Naka(Hitachinaka City)	○	○	○	○	○	○	○
	Tonekamome-ohasi Bridge, Mouth of Riv. Tone(Kamisu City)	○	○	○	○	○	○	○
Chiba Pref.	Asai-bashi Bridge, Riv.Yourou(Ichihara City)	○	○				○	○
Tokyo Met.	Mouth of Riv. Arakawa(Koto Ward)	○	○	○	○		○	○
	Mouth of Riv. Sumida(Minato Ward)	○	○	○	○		○	○
Yokohama City	Kamenoko Bridge over Riv.Tsurumi(Yokohama City)			○	○	○		
	Yokohama Port			○	○	○		
Kawasaki City	Mouth of Riv. Tama(Kawasaki City)					○		
	Keihin Canal, Port of Kawasaki	○					○	○
Niigata Pref.	Lower Riv. Shinano(Niigata City)		○	○	○			
Ishikawa Pref.	Mouth of Riv. Sai(Kanazawa City)	○					○	○
Aichi Pref.	Nagoya Port	○	○	○	○	○	○	○
Nagoya City	Minatoshinbashi Bridge, Riv. Hori (Nagoya City)			○				
Mie Pref.	Yokkaichi Port	○	○		○	○	○	○
Shiga Pref.	Lake Biwa(center, offshore of Minamihira)	○		○	○		○	○
	Lake Biwa(center, offshore of Karasaki)	○		○	○		○	○
Kyoto City	Miyamae-bashi Bridge, Miyamae Bridge, Riv. Katsura(Kyoto City)					○		
Osaka Pref.	Mouth of Riv. Yamato(Sakai City)	○	○	○	○	○	○	○
Osaka City	Osaka Port	○					○	○
Hyogo Pref.	Offshore of Himeji					○		
Kobe City	Kobe Port(center)	○	○	○	○	○	○	○
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa(Wakayama City)				○			
Okayama Pref.	Otoidezeki of Riv. Asahi(Okayama City)		○		○	○		
	Offshore of Mizushima		○		○	○		
Yamaguchi Pref.	Tokuyama Bay	○					○	○
Ehime Pref.	Mishima area, Riv. Iwamatsu(Uwajima City)	○					○	○
Fukuoka Pref.	Kabura-bashi Bridge, River Raizan(Maebaru City)				○	○		
	Offshore of Omuta				○	○		

[1] Amylcinnamaldehyde, [2] Iopanoic acid, [8] Diethylstilbesterol, [10] *L*-Thyroxine,
[14] Tri-*n*-octyl 1,2,4-benzenetricarboxylate, [15]Pentanal, [16] 4-Methoxybenzaldehyde

Table 1-1-2 List of surveyed sites (sediment) and target chemicals in the Initial Environmental Survey in FY 2010

Local communities	Surveyed sites	Target chemicals				
		[4]	[5]	[7]	[11]	[12]
Hokkaido	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari(Ishikari City)		○	○		
Sapporo City	Nakanuma of Riv.Toyohira(Sapporo City)					○
	Daiichishinkawa-bashi Bridge, Riv. Shin(Sapporo City)					○
Iwate Pref.	Riv. Toyosawa(Hanamaki City)	○			○	
Sendai City	Hirose-ohashi Bridge, Riv. Hirose(Sendai City)		○			
Yamagata Pref.	Mouth of Riv. Mogami(Sakata City)			○		
Tokyo Met.	Mouth of Riv. Arakawa(Koto Ward)			○	○	
	Mouth of Riv. Sumida(Minato Ward)			○	○	
Kawasaki City	Keihin Canal, Port of Kawasaki	○	○			
Niigata Pref.	Lower Riv. Shinano(Niigata City)	○				
Ishikawa Pref.	Mouth of Riv. Sai(Kanazawa City)		○			
Aichi Pref.	Nagoya Port	○	○	○	○	
Mie Pref.	Yokkaichi Port		○	○		
Shiga Pref.	Lake Biwa(center, offshore of Minamihira)	○	○			
	Lake Biwa(center, offshore of Karasaki)	○	○			
Kyoto Pref.	Miyazu Port			○	○	
Osaka Pref.	Mouth of Riv. Yamato(Sakai City)	○	○	○	○	
Osaka City	Kema Bridge, Riv. Oh-kawa (Osaka City)			○	○	
	Osaka Port	○	○			
Kobe City	Kobe Port(center)	○	○	○	○	
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa(Wakayama City)		○	○		○
Okayama Pref.	Otoidezeki of Riv. Asahi(Okayama City)			○		
	Offshore of Mizushima			○		
Yamaguchi Pref.	Tokuyama Bay	○	○			
	Offshore of Hagi	○	○			
Kagawa Pref.	Takamatsu Port	○			○	
Fukuoka Pref.	Kabura-bashi Bridge, River Raizan(Maebaru City)			○		
	Offshore of Omuta	○		○		

[4] 2,4-Xylenol, [5] Quinoline, [7] 4,4'-Diaminodiphenyl ether, [11] *o*-Nitrotoluene, [12] Methyl 4-hydroxybenzoate

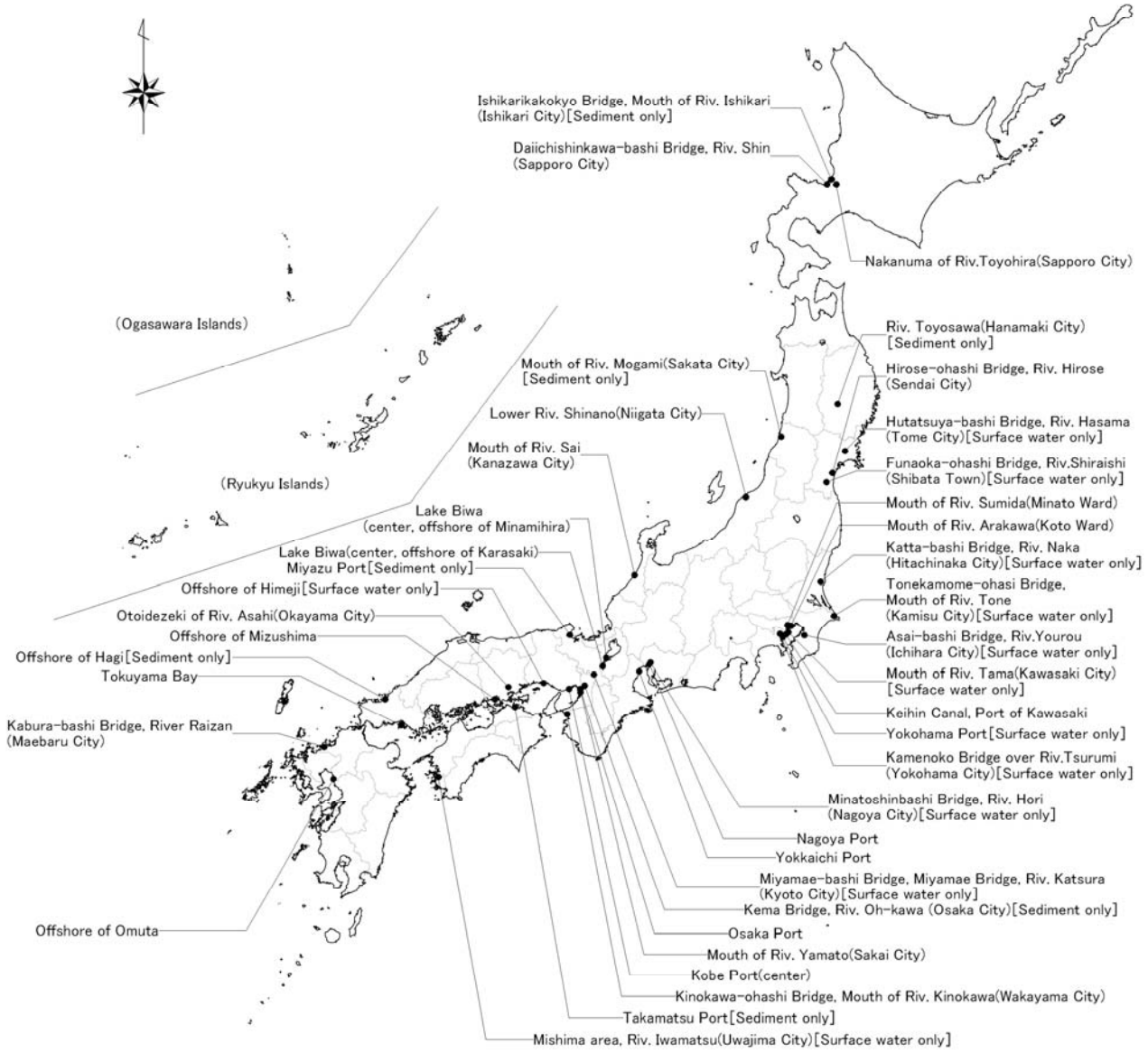


Figure 1-1-1 Surveyed sites (surface water and sediment) in the Initial Environmental Survey in FY 2010

Table 1-1-3 List of surveyed sites (air) and target chemicals in the Initial Environmental Survey in FY 2010

Local communities	Surveyed sites	Target chemicals			
		[3]	[6]	[9]	[13]
Hokkaido	Hokkaido Institute of Environmental Sciences	○		○	
Sapporo City	Sapporo City Institute of Public Health(Sapporo City)		○		
Iwate Pref.	Kitakami City Kasamatsu Elementary School(Kitakami City)				○
Sendai City	Tsutsujigaoka Park(Sendai City)				○
Akita Pref.	Nikaho Community Center(Nikaho City)				○
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center(Tsuchiura City)	○			
	Kamisu Fire Station(Kamisu City)	○			
Saitama Pref.	Center for Environmental Science in Saitama(Kazo City)	○	○		○
Chiba Pref.	Chiba Flower Gardener Center(Narita City)				○
Tokyo Met.	Tokyo Metropolitan Research Institute for Environmental Protection(Koto Ward)	○	○	○	
	Hane in Hamura City(Hamura City)		○		
	Hamura City Government Building(Hamura City)		○		
	Chichijima Island		○		
Kanagawa Pref.	Kanagawa Environmental Research Center(Hiratsuka City)	○			
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science(Kanazawa City)		○	○	
Gifu Pref.	Gifu Prefectural Research Institute for Health and Environmental Sciences(Kakamigahara City)		○		
Aichi Pref.	Aichi Prefectural Komaki Senior High School(Komaki City)	○			
	Aichi Prefectural Anjo Norin(Agricultural and Forestry) Senior High School(Anjo City)		○		
	Toyokawa City Government Building(Toyokawa City)				○
Nagoya City	Chikusa Ward Heiwa Park(Nagoya City)	○			○
Mie Pref.	Mie Prefecture Health and Environment Research Institute(Yokkaichi City)			○	○
	Yokkaichi Prefectural Government Building(Yokkaichi City)	○			
Shiga Pref.	Higashioumi Air Quality Monitoring Station (Higashioumi City)		○		
	Moriyama Air Quality Monitoring Station(Moriyama City)	○			
Kyoto Pref.	Uji Prefectural Government Building(Uji City)	○			
Kyoto City	Kyoto City Hall(Kyoto City)	○	○	○	
Osaka Pref.	Research Institute of Environment, Agriculture and Fisheries, Osaka Prefectural Government(Osaka City)	○	○	○	○
Hyogo Pref.	Hyogo Prefectural Environmental Research Center (Kobe City)		○	○	
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health(Wakayama City)			○	
Yamaguchi Pref.	Yamaguchi Prefectural Public Health and Environment(Yamaguchi City)		○	○	
Kagawa Pref.	Takamatsu Joint Prefectural Government Building (Takamatsu City)		○	○	
Fukuoka Pref.	Munakata Prefectural Government Building(Munakata City)			○	
	Omuta City Government Building(Omuta City)			○	
Kitakyushu City	Kitakyushu Monitoring Station (Kitakyushu City)		○	○	○
Saga Pref.	Saga Prefectural Environmental Research Center(Saga City)		○		
Kumamoto Pref.	Kumamoto Prefectural Institute of Public Health and Environmental Science(Udo City)	○	○	○	○

[3] ε-Caprolactam, [6] 2-Ethoxyethyl acetate , [9] Dimethyl sulfoxide, [13] *n*-Butyl benzyl phthalate

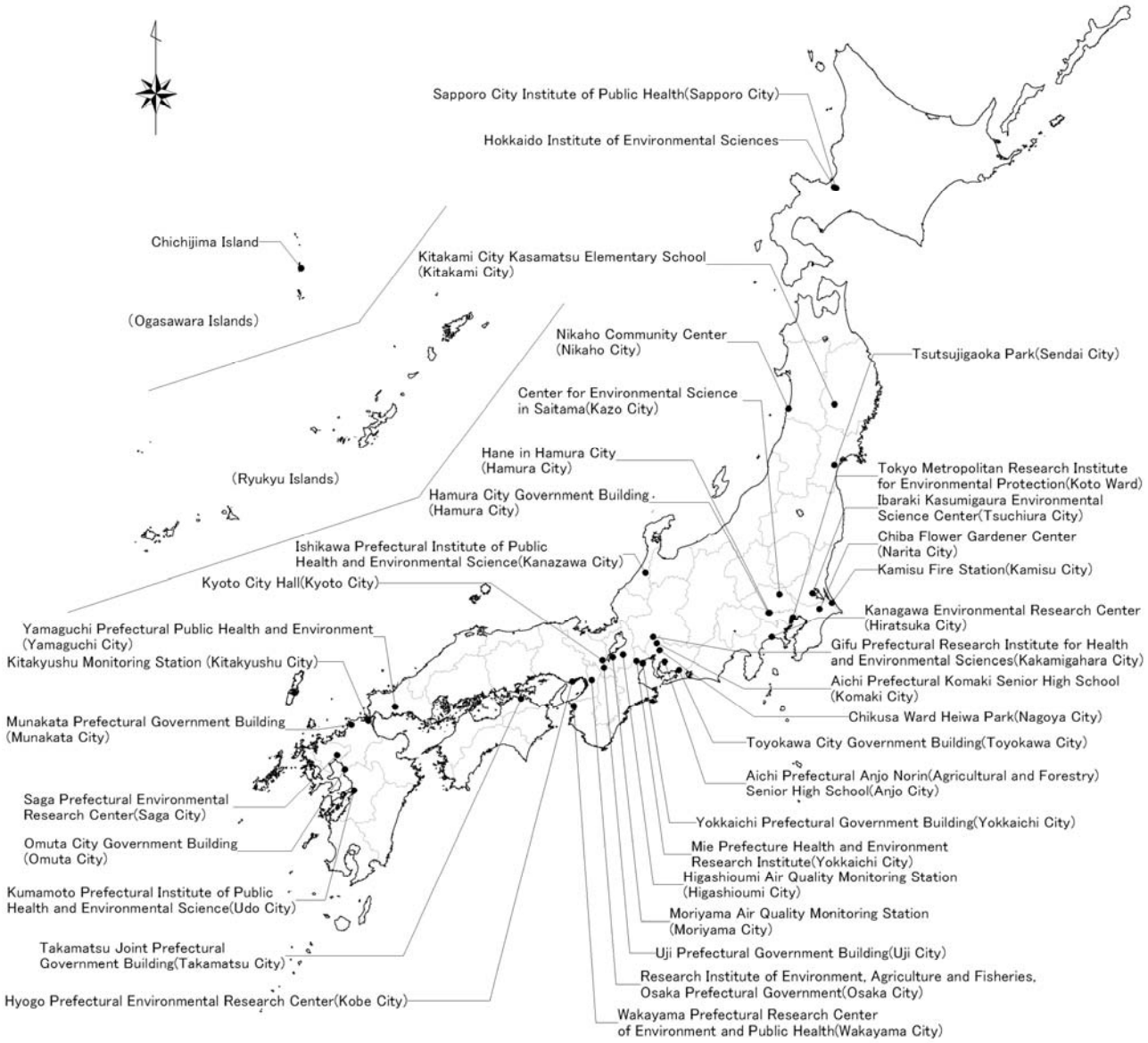


Figure 1-1-2 Surveyed sites (air) in the Initial Environmental Survey in FY 2010

(3) Detection limit

The detection limits of analysed values reported by the analytical laboratory are not necessarily the same because of differences in the properties of specimens and in the available measurement equipment. To enable summarisation, therefore, a unified detection limit is predetermined and the analytical values reported by the analytical laboratory are summarised by the following procedure.

Treatment of measured value as an undetected value in high-sensitivity analysis

In the case of high-sensitivity analysis, in which the detection limit of the analytical laboratory is lower than the unified detection limit, any measured value lower than the unified detection limit is treated as an undetected value in the nationwide summary (see schematic (A)).

Elimination of undetected values in low-sensitivity analysis from summary subject

When the detection limit of the analytical laboratory is higher than the unified detection limit, any target chemical not detected is eliminated from the subject of the summary (see schematic (B)).

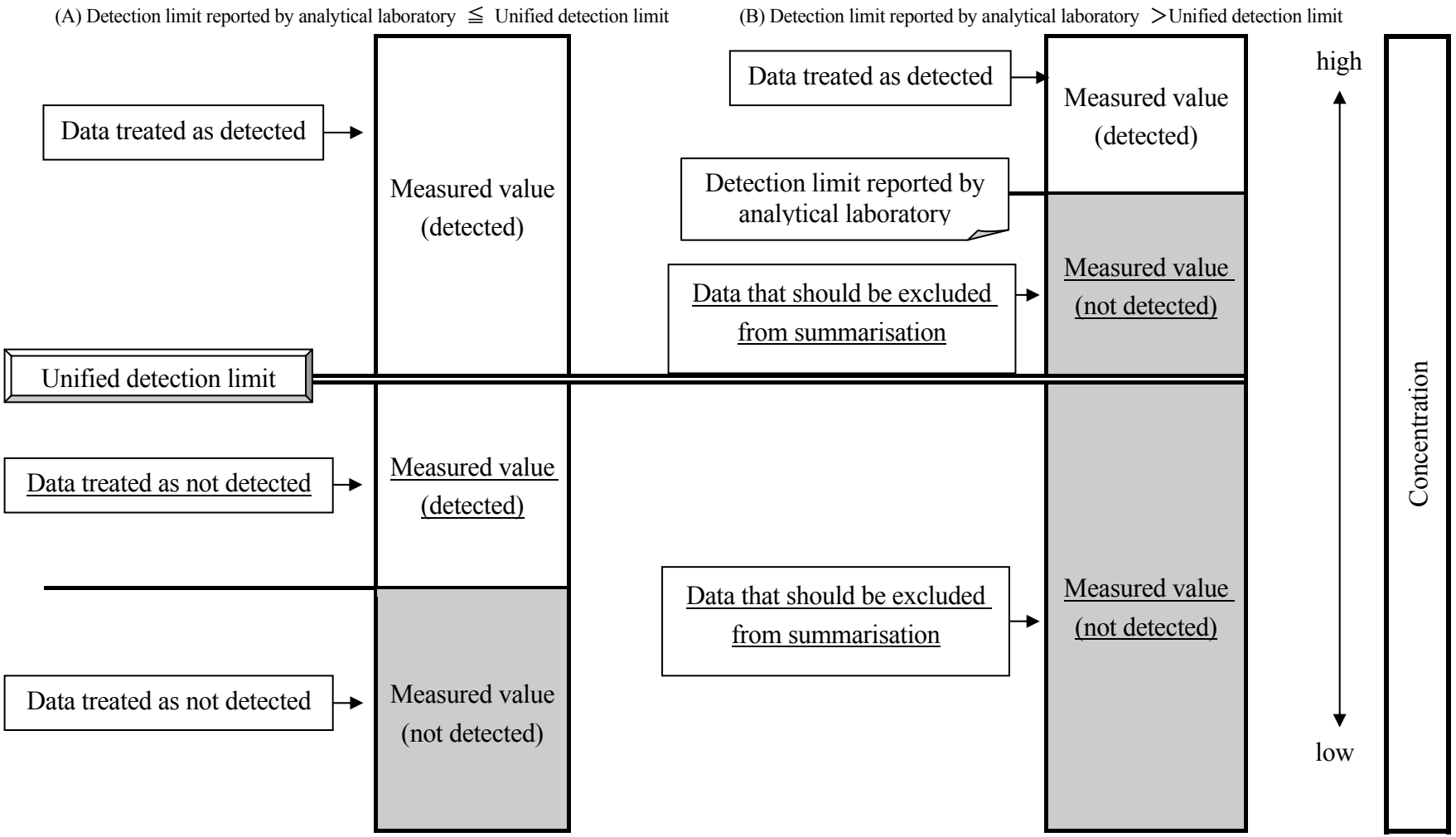
When the instrument detection limit (IDL) and the method detection limit (MDL) are given in the analytical method, which is described in reports on the investigation of the development of analytical methods for chemicals and adopted in the Initial Environmental Survey (hereafter, the Initial Environmental Survey Analytical Method), if the IDL measured by the analytical laboratory is lower than the given IDL, the MDL of the Initial Environmental Survey Analytical Method is used as the detection limit by the analytical laboratory.

When IDL and MDL are not given in the Initial Environmental Survey Analytical Method, the detection limit is predetermined by the following procedure.

When the analytical laboratory calculates the appropriate IDL and MDL following the calculation method stated in the analytical method development instruction manuals, this calculated MDL is used as the detection limit by the analytical laboratory.

When the appropriate IDL and MDL are not calculated by the analytical laboratory, one of the following procedures was employed to establish the detection limit by the analytical laboratory.

- deduction from the IDL and MDL calculated for the corresponding chemical by Initial Environmental Survey Analytical Method or other analytical laboratories
- deduction from the lowest calibration curve concentration and the results of recovery tests
- deduction from the results of addition and collection tests, the results of operation blank tests, and the signal/noise ratio (S/N ratio) obtained from the chromatogram of environmental specimens



Schematic of procedure for data summarisation

4. Summary of survey results

The detection ranges and the detection limits are shown in Table 1-2. The survey results are summarized as follows.

In surface water, 1 out of the 7 target chemicals was detected.

・[15] Pentanal: 1 of the 17 valid site

In sediment, 4 out of the 5 target chemicals were detected.

・[4] 2,4-Xylenol: 9 of the 9 valid sites
・[5] Quinoline: 10 of the 14 valid sites
・[7] 4,4'-Diaminodiphenyl ether: 2 of the 13 valid sites
・[12] Methyl 4-hydroxybenzoate: 1 of the 3 valid site

In air, 4 out of the 4 target chemicals were detected.

・[3] ε-Caprolactam: 9 of the 14 valid sites
・[6] 2-Ethoxyethyl acetate: 8 of the 18 valid sites
・[9] Dimethyl sulfoxide: 8 of the 14 valid sites
・[13] *n*-Butyl benzyl phthalate: 3 of the 11 valid sites

Table 1-2 Summary of the detection ranges and the detection limits in the Initial Environmental Survey in FY 2010

No.	Target chemicals	Surface water [ng/L]		Sediment [ng/g-dry]		Air [ng/m^3]	
		Detection range and frequency	Detection limit	Detection range and frequency	Detection limit	Detection range and frequency	Detection limit
[1]	Amylcinnamaldehyde	nd 0/17	10				
[2]	Iopanoic acid	nd 0/16	9.6				
[3]	ε-Caprolactam					nd～370 9/14	3.6
[4]	2,4-Xylenol			0.09～2.5 9/9	0.09		
[5]	Quinoline			nd～2.0 10/14	0.10		
[6]	2-Ethoxyethyl acetate					nd～26 8/18	12
[7]	4,4'-Diaminodiphenyl ether			nd～20 2/13	2.0		
[8]	Diethylstilbesterol	nd 0/15	0.005				
[9]	Dimethyl sulfoxide					nd～46 8/14	22
[10]	*L*-Thyroxine	nd 0/19	0.15				
[11]	*o*-Nitrotoluene			nd 0/9	0.62		
[12]	Methyl 4-hydroxybenzoate			nd～0.70 1/3	0.22		
[13]	*n*-Butyl benzyl phthalate					nd～29 3/11	0.56
[14]	Tri-*n*-octyl 1,2,4-benzenetricarboxylate	nd 0/15	11				
[15]	Pentanal	nd～37 2/17	21				
[16]	4-Methoxybenzaldehyde	nd 0/17	14				