

# Chapter 1 Results of the Initial Environmental Survey in FY2020

## 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 Law); 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 FY2020 Initial Environmental Survey, 10 chemicals (groups) that were selected and designated as target chemicals. The combinations of target chemicals and the surveyed media are given below.

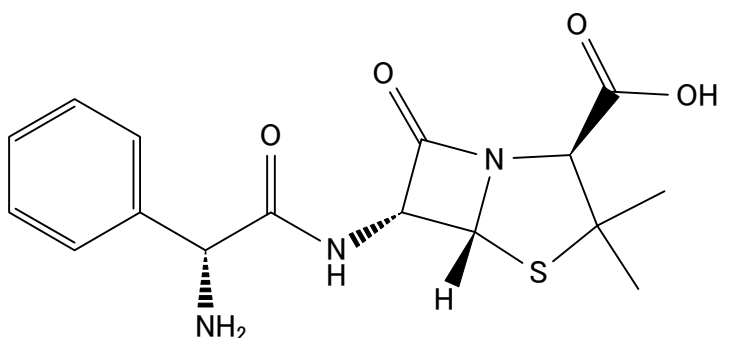
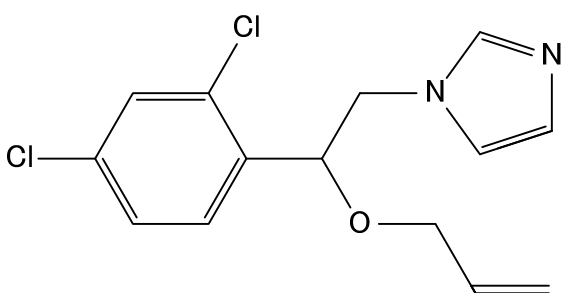
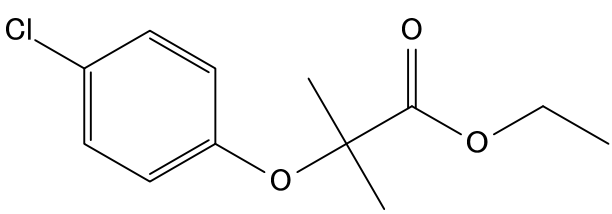
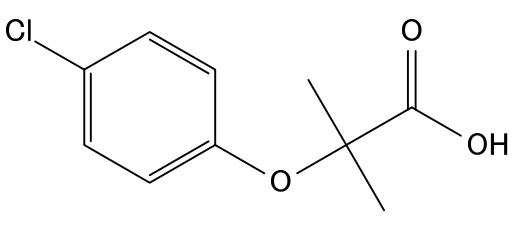
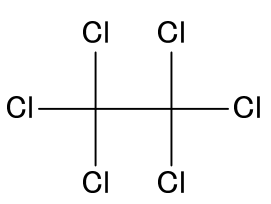
No.	Name	The Chemical Substances Control Law *1,2		The PRTR Law *3			Surveyed media	
		Before the revision	After the revision	2000-	2008-	2021-	Surface water	Air
[1]	Ampicillin						○	
[2]	Imazalil	II Monitored III Monitored					○	
[3]	Clofibrate and its metabolite							
	[3-1] Clofibrate						○	
	[3-2] Clofibric acid						○	
[4]	Hexachloroethane	II Monitored III Monitored			II 82		○	
[5]	Benzophenone-4 (synonym: 2-Hydroxy-4-methoxybenzophenone-5-sulfonic acid)						○	
[6]	Venlafaxine and its metabolite							
	[6-1] Venlafaxine						○	
	[6-2] O-Desmethylvenlafaxine						○	
[7]	Triethylenetetramine	II Monitored			I 278	II 70	○	
[8]	1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1 <i>H</i> ,3 <i>H</i> ,5 <i>H</i> )-trione (synonym: 1,3,5-Trisglycidyl-isocyanuric acid)	II Monitored		I 218	I 291	II 71		○
[9]	2-Ethylhexyl methacrylate			I 315	I 416		○	
[10]	Dimethyl 2,2-dichlorovinyl phosphate (synonym: Dichlorvos)	II Monitored III Monitored		I 350	I 457	I 510	○	○

(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)."

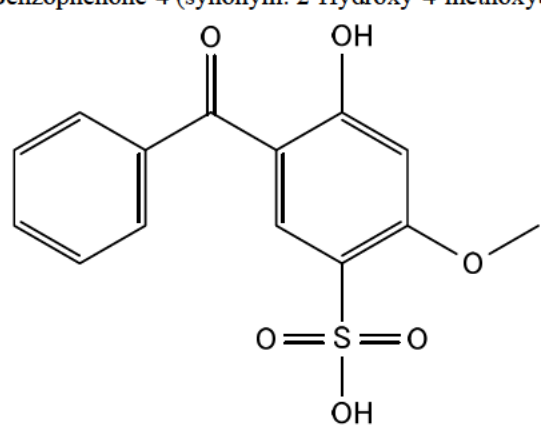
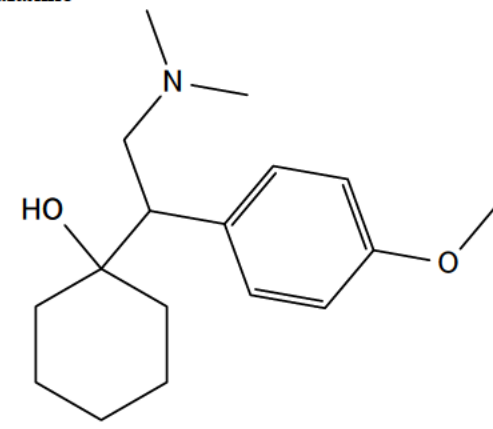
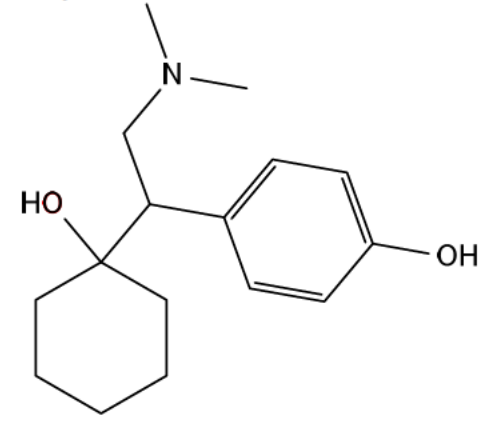
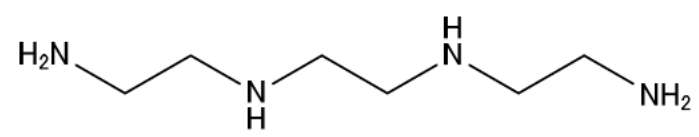
(Note 2) "Before the revision" in "The Chemical Substances Control Law" means designation before the May 20, 2009 revision of the law (enforced April 1, 2011), and "After the revision" means designation after the law revision.

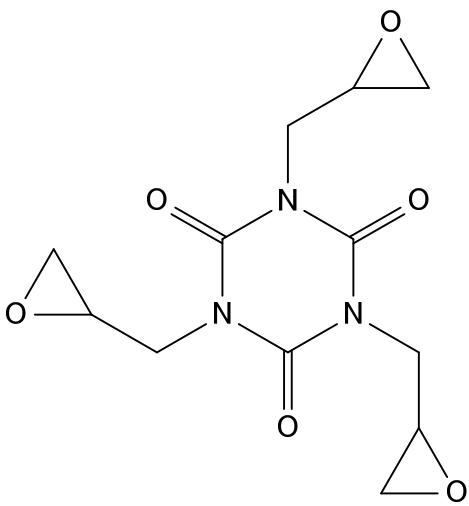
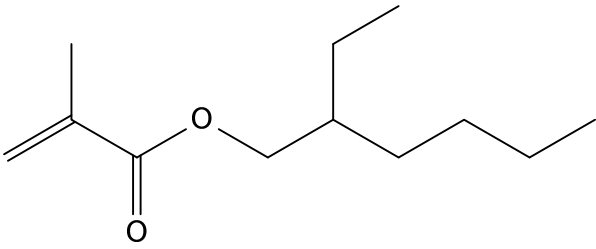
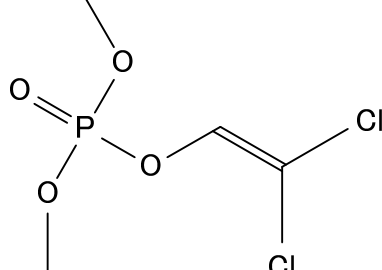
(Note 3) "2000-" in the "The PRTR Law" means designation at the time of enactment of government ordinance of the law on June 7, 2000, "2008-" means the designation after the revision of the government ordinance on November 21, 2008, and "2021-" means the designation after the revision of the government ordinance on October 20, 2021.

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

<p>[1] Ampicillin</p> 	<p>Molecular formula: C<sub>16</sub>H<sub>19</sub>N<sub>3</sub>O<sub>4</sub>S  CAS: 69-53-4  ENCS: No pertinence  MW: 349.40  mp: Decompose at 199 ~ 202 °C<sup>1)</sup>  bp: Uncertain  sw: 1.01 x 10<sup>4</sup> mg/L (25 °C)<sup>2)</sup>  Specific gravities: Uncertain  logPow: 1.35<sup>2)</sup></p>
<p>[2] Imazalil</p> 	<p>Molecular formula: C<sub>14</sub>H<sub>14</sub>Cl<sub>2</sub>N<sub>2</sub>O  CAS: 35554-44-0  ENCS: 5-6891  MW: 297.18<sup>3)</sup>  mp: 50 °C<sup>3)</sup>  bp: 347 °C<sup>2)</sup>  sw: 0.14 g/100mL<sup>3)</sup>  Specific gravities: 1.2<sup>3)</sup>  logPow: 4.56<sup>3)</sup></p>
<p>[3] Clofibrate and its metabolite</p>	
<p>[3-1] Clofibrate</p> 	<p>Molecular formula: C<sub>12</sub>H<sub>15</sub>ClO<sub>3</sub>  CAS: 637-07-0  ENCS: 9-266  MW: 242.70  mp: 118 ~ 119 °C<sup>2)</sup>  bp: 158 ~ 160 °C (25 mmHg)<sup>4)</sup>  sw: 2.90 x 10<sup>-2</sup> g/L<sup>2)</sup>  Specific gravities: 1.138 ~ 1.144 (25 °C)<sup>4)</sup>  logPow: 3.3<sup>2)</sup></p>
<p>[3-2] Clofibric acid</p> 	<p>Molecular formula: C<sub>10</sub>H<sub>11</sub>ClO<sub>3</sub>  CAS: 882-09-7  ENCS: 3-844, 9-425  MW: 214.65  mp: 118.5 °C<sup>2)</sup>  bp: Uncertain  sw: Uncertain  Specific gravities: Uncertain  logPow: 2.57<sup>2)</sup></p>
<p>[4] Hexachloroethane</p> 	<p>Molecular formula: C<sub>2</sub>Cl<sub>6</sub>  CAS: 67-72-1  ENCS: 2-57 (Polychloroethane (Cl<sub>5</sub> or Cl<sub>6</sub>))  MW: 236.74  mp: Sublimes at 186.8 °C (760 mmHg)<sup>2)</sup>  bp: Same as above  sw: 50 mg/L (20 °C)<sup>2)</sup>  Specific gravities: 2.1<sup>5)</sup>  logPow: 3.9<sup>5)</sup></p>

(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, Specific gravities Specific gravity(no unit) or density, logPow *n*-octanol-water partition coefficient, kPa kilopascal (1 atom approximately equal to 101.3kPa).

<p>[5] Benzophenone-4 (synonym: 2-Hydroxy-4-methoxybenzophenone-5-sulfonic acid)</p> 	<p>Molecular formula: C<sub>14</sub>H<sub>12</sub>O<sub>6</sub>S  CAS: 4065-45-6  ENCS: 4-145, 4-160  MW: 308.31  mp: 145 °C<sup>2)</sup>  bp: Uncertain  sw: 2.5 x 10<sup>3</sup> mg/L<sup>2)</sup>  Specific gravities: Uncertain  logPow: Uncertain</p>
<p>[6] Venlafaxine and its metabolite</p> <p>[6-1] Venlafaxine</p> 	<p>Molecular formula: C<sub>17</sub>H<sub>27</sub>NO<sub>2</sub>  CAS: 93413-69-5  ENCS: No pertinence  MW: 277.40  mp: 74 ~ 76°C<sup>2)</sup>  bp: Uncertain  sw: 572mg/mL (Hydrochloride salt)<sup>2)</sup>  Specific gravities: Uncertain  logPow: 3.20<sup>2)</sup></p>
<p>[6-2] O-Desmethylenlafaxine</p> 	<p>Molecular formula: C<sub>16</sub>H<sub>25</sub>NO<sub>2</sub>  CAS: 93413-62-8  ENCS: No pertinence  MW: 263.38  mp: Uncertain  bp: Uncertain  sw: Uncertain  Specific gravities: Uncertain  logPow: Uncertain</p>
<p>[7] Triethylenetetramine</p> 	<p>Molecular formula: C<sub>6</sub>H<sub>18</sub>N<sub>4</sub>  CAS: 112-24-3  ENCS: 2-163, 7-5 (Alkylated (or alkenylated) (C<sub>1</sub> ~ C<sub>24</sub>) or unmodified polyalkylene polyamine)  MW: 146.23  mp: -35 °C<sup>6)</sup>  bp: 277 °C<sup>6)</sup>  sw: Miscible<sup>6)</sup>  Specific gravities: 0.98 g/cm<sup>3</sup><sup>6)</sup>  logPow: -1.4 or -1.66<sup>6)</sup></p>

<p>[8] 1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1<i>H</i>,3<i>H</i>,5<i>H</i>)-trione (synonym: 1,3,5-Trisglycidyl-isocyanuric acid)</p> 	<p>Molecular formula: C<sub>12</sub>H<sub>15</sub>N<sub>3</sub>O<sub>6</sub>  CAS: 2451-62-9  ENCS: 5-1052  MW: 297.26  mp: 95 °C<sup>7)</sup>  bp: Decomposition at more than 240 °C<sup>2)</sup>  sw: 0.9g/100mL (25 °C, technical grade)<sup>7)</sup>  Specific gravities: Uncertain  logPow: -0.8 (technical grade)<sup>7)</sup></p>
<p>[9] 2-Ethylhexyl methacrylate</p> 	<p>Molecular formula: C<sub>12</sub>H<sub>22</sub>O<sub>2</sub>  CAS: 688-84-6  ENCS: 2-1039 (Alkyl (C<sub>2</sub> ~ C<sub>20</sub>) methacrylate)  MW: 198.30  mp: Uncertain  bp: 113 - 224 °C<sup>8)</sup>  sw: Uncertain  Specific gravities: 0.9<sup>8)</sup>  logPow: 4.2 ~ 4.8<sup>8)</sup></p>
<p>[10] Dimethyl 2,2-dichlorovinyl phosphate (synonym: Dichlorvos)</p> 	<p>Molecular formula: C<sub>4</sub>H<sub>7</sub>Cl<sub>2</sub>O<sub>4</sub>P  CAS: 62-73-7  ENCS: 2-3224  MW: 220.98  mp: Less than -60 °C<sup>2)</sup>  bp: 234 °C (101.3 kPa)<sup>9)</sup>  sw: 10 g/L<sup>9)</sup>  Specific gravities: 1.4<sup>9)</sup>  logPow: 1.47<sup>9)</sup></p>

#### References

- 1) International Agency for Research on Cancer (IARC), Pharmaceutical Drugs, IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 50 (1990)
- 2) U.S. National Library of Medicine, PubChem (<https://pubchem.ncbi.nlm.nih.gov/>, Retrieved on October, 2021)
- 3) International Labour Organization (ILO), Imazalil, International Chemical Safety Cards (ICSCs), ICSC: 1303 (1998)
- 4) International Agency for Research on Cancer (IARC), Some Pharmaceutical Drugs, IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, Vol. 66 (1996)
- 5) International Labour Organization (ILO), Hexachloroethane, International Chemical Safety Cards (ICSCs), ICSC: 0051 (2010)
- 6) International Labour Organization (ILO), Triethylenetetramine, International Chemical Safety Cards (ICSCs), ICSC: 1123 (2009)
- 7) International Labour Organization (ILO), Triglycidyl isocyanurate, International Chemical Safety Cards (ICSCs), ICSC: 1274 (1997)
- 8) International Labour Organization (ILO), 2-Ethylhexyl methacrylate, International Chemical Safety Cards (ICSCs), ICSC: 1289 (1998)
- 9) International Labour Organization (ILO), Dichlorvos, International Chemical Safety Cards (ICSCs), ICSC: 0690 (2014)

### 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 analysed by private analytical laboratories.

#### (1) Organisations responsible for sampling

Local communities	Organisations responsible for sampling *1	Surveyed media	
		Surface water	Air
Hokkaido	Environmental Promotion Section, Environment Division, Department of Environment and Lifestyle, Hokkaido Prefectural Government and Research Institute of Energy, Environment and Geology, Hokkaido Research Organization	○	
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 Environmental Science Research Center	○	
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center	○	○*2
Tochigi Pref.	Tochigi Prefectural Institute of Public Health and Environmental Science	○	
Gunma Pref.	Gunma Prefectural Institute of Public Health and Environmental Sciences	○	
Saitama Pref.	Center for Environmental Science in Saitama	○	○
Saitama City	Saitama City Institute of Health Science and Research	○	○
Chiba Pref.	Chiba Prefectural Environmental Research Center	○	○
Tokyo Met.	Environmental Improvement Division, Bureau of Environment, Tokyo Metropolitan Government and Tokyo Metropolitan Research Institute for Environmental Protection	○	○
Kanagawa Pref.	Kanagawa Environmental Research Center		○
Yokohama City	Yokohama Environmental Science Research Institute	○	○
Niigata Pref.	Niigata Prefectural Institute of Public Health and Environmental Sciences	○	
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science	○	○
Fukui Pref.	Fukui Prefectural Institute of Public Health and Environmental Science	○	
Nagano Pref.	Nagano Environmental Conservation Research Institute	○	○
Shizuoka Pref.	Shizuoka Institute of Environment and Hygiene	○	
Aichi Pref.	Aichi Environmental Research Center	○	
Nagoya City	Nagoya City Environmental Science Research Center, Regional Environmental measures Division, Environmental Bureau, Nagoya city	○	○
Mie Pref.	Mie Prefecture Health and Environment Research Institute	○	○
Shiga Pref.	Lake Biwa Environmental Research Institute	○	
Kyoto City	Kyoto City Institute of Health and Environmental Sciences	○	○
Osaka Pref.	Environment Preservation Division, Environment Management Office, Department of Environment, Agriculture, Forestry and Fisheries, Osaka Prefectural Government	○	○*3
Osaka City	Osaka City Institute of Public Health and Environmental Sciences	○	
Hyogo Pref.	Water and Air Quality Control Division, Environmental Management Bureau, Agricultural and Environmental Affairs Department, Hyogo Prefectural Government and Hyogo Prefectural Institute of Environmental Sciences, Hyogo Environmental Advancement Association	○	
Kobe City	Natural Environmental Symbiotic Division, Environmental Preservation Branch, Environment Bureau, Kobe City and Kobe Institute of Health, Welfare Bureau, Health Division, Health	○	
Nara Pref.	Nara Prefecture Landscape and Environment Center	○	
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 Institute of Public Health and Environment	○	○
Tokushima Pref.	Tokushima Prefectural Public Health, Pharmaceutical and Environmental Sciences Center		○
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 Sciences	○	○*3
Kitakyushu City	Kitakyushu City Institute of Health and Environmental Sciences	○	
Fukuoka City	Fukuoka City Institute for Hygiene and the Environment	○	
Saga Pref.	Saga Prefectural Environmental Research Center	○	○
Oita Pref.	Environment Preservation Division, Department of Environment, Oita Prefectural Government and Oita Prefectural Institute of Health and Environment	○	
Miyazaki Pref.	Miyazaki Prefectural Institute for Public Health and Environment	○	
Okinawa Pref.	Okinawa Prefectural Institute of Health and Environment	○	

(Note 1) \*1: Organisations responsible for sampling are described by their official names in FY 2020.

(Note 2) \*2: That organization sampled at one surveyed site and cooperated with a private analytical laboratory in sampling specimens at the other surveyed site.

(Note 3) \*3: Those organizations cooperated with a private analytical laboratory in sampling specimens

## (2) Surveyed sites and target chemicals

The numbers of target chemicals (groups) and the numbers of surveyed sites, etc. by surveyed medium in the initial environmental survey were as shown in the following table.

The target chemicals and the national distribution map of the survey sites for each medium are shown in Table 1-1-1 and Fig.1-1-1 for surface water, Table 1-1-2 and Fig.1-1-2 for air.

In addition, about 20 sites were selected as survey sites per target chemical. To obtain data for areas to be expected to high concentrations in the general environment survey sites are selected based on information regarding releases and emissions. Among the sites considering to rank in the top of PRTR emissions, it was included the surrounding sites where samples can be taken in the survey sites.

Surveyed media	Numbers of local communities	Numbers of target chemicals (groups)	Numbers of surveyed sites	Numbers of samples at a surveyed site
Surface water	41	9	67	1
Air	20*	2	23	3
All media	44	10	90	

(Note) \*: For 1 of the 20 organizations, it was sampled at one surveyed site and cooperated with a private analytical laboratory in sampling specimens at the other surveyed site. And 2 organizations were cooperated with a private analytical laboratory in sampling specimens.

## (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.

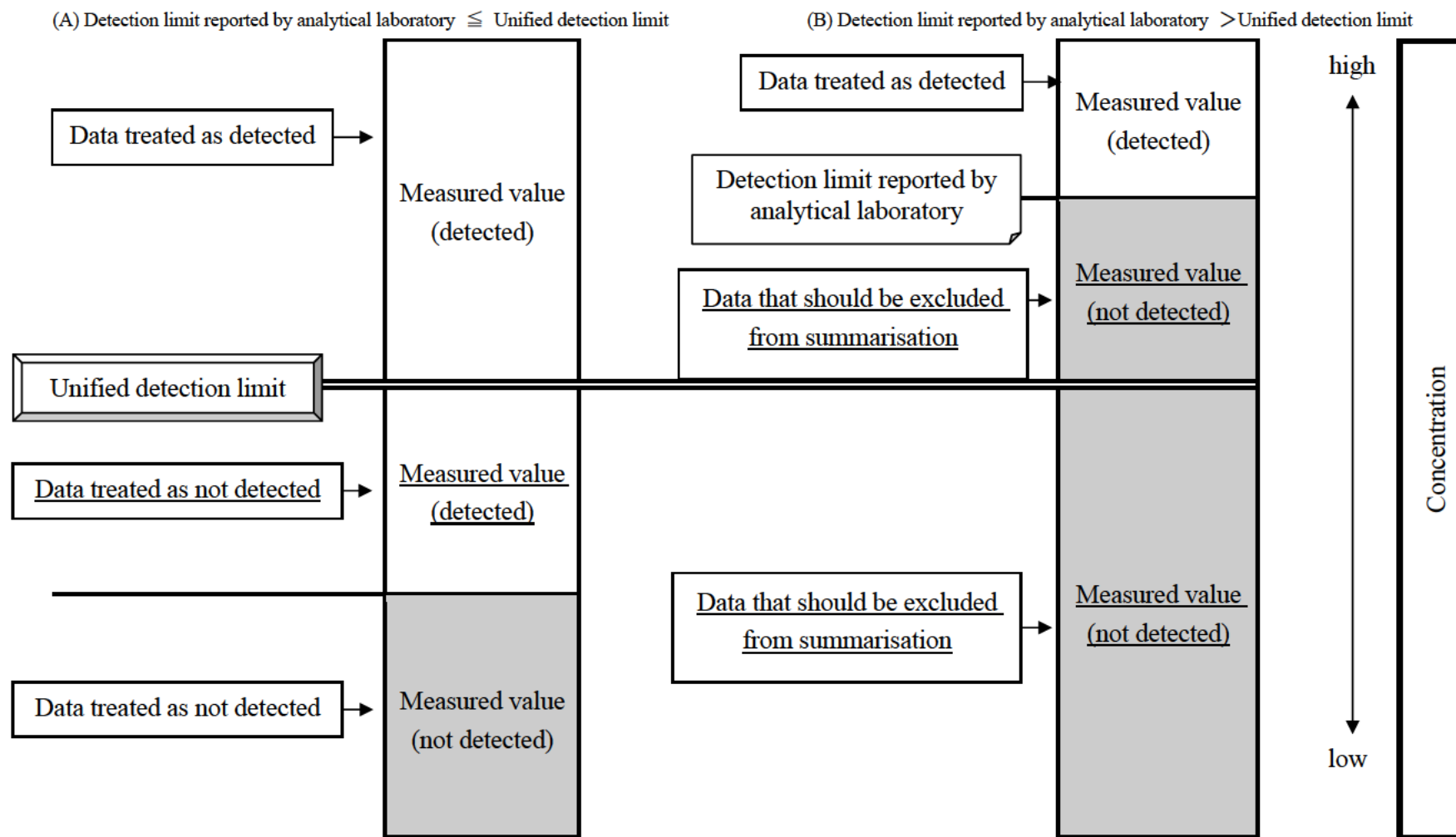
When IDL and MDL are not given in the Initial Environmental Survey Analytical Method, the detection limit is predetermined by the following procedure.

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



Table 1-1-1 List of surveyed sites (surface water) and target chemicals in the Initial Environmental Survey in FY2020

Local communities	Surveyed sites	Target chemicals									
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[9]	[10]	
Hokkaido	Inou-ohashi Bridge, Riv. Ishikari (Asahikawa City)	○	○	○		○	○				
	Osamunai Bridge, Riv. Ishikari (Fukagawa City)						○				
	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.	Toyosawa-bashi Bridge, Riv. Toyosawa (Hanamaki City)								○	○	
Miyagi Pref.	Futatsuya-bashi Bridge, Riv. Hasama (Tome City)									○	
	Sakura-hodoukyou Bridge, Riv.Shiroishi (Shibata Town)									○	
Akita Pref.	Akita Canal (Akita City)	○	○	○	○	○	○	○	○	○	
Yamagata Pref.	Tozawa-bashi Bridge, Riv. Sake (Tozawa village)	○									
	Goten-bashi Bridge, Riv. Mogami (Murayama City)			○							
Ibaraki Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone (Kamisu City)								○		
Tochigi Pref.	Tagawa Kyubun Area Head Works, Riv. Tagawa (Utsunomiya City)	○	○	○	○				○		
Gunma Pref.	Kezouji-bashi Bridge, Riv. Kasu (Isesaki City)	○									
Saitama Pref.	Akigaseshusuizeki of Riv. Arakawa (Shiki City)							○		○	
Saitama City	Nakadote-hashi Bridge, Riv. Kamo (Saitama City)							○	○	○	
Chiba Pref.	Asai-bashi Bridge, Riv. Yourou (Ichihara City)	○	○	○		○	○				
	Coast of Ichihara and Anegasaki	○	○	○	○	○	○	○	○	○	
Tokyo Met.	Mouth of Riv. Arakawa (Koto Ward)							○	○	○	
	Mouth of Riv. Sumida (Minato Ward)							○	○	○	
Yokohama City	Kamenoko-bashi Bridge, Riv.Tsurumi (Yokohama City)	○	○	○	○	○	○	○	○	○	
	Yokohama Port	○	○	○	○	○	○	○		○	
	Yoshikura-bashi Bridge, Riv.Kashio (Yokohama City)	○	○		○	○	○	○	○	○	
Niigata Pref.	Lower Riv. Shinano (Niigata City)			○	○	○	○				
Ishikawa Pref.	Mouth of Riv. Sai (Kanazawa City)	○	○	○	○	○	○		○		
Fukui Pref.	Mishima-bashi Bridge, Riv. Shono (Tsuruga City)		○						○		
Nagano Pref.	Lake Suwa (center)		○						○		
Shizuoka Pref.	Shimizu Port							○	○	○	
	Kaketsuka-bashi Bridge, Riv. Tenryu (Iwata City)							○	○	○	
Aichi Pref.	Kinuura Port				○						
	West of Shiomi Wharf, Nagoya Port							○		○	
Nagoya City	Hinode-bashi Bridge, Riv. Sinhori (Nagoya City)			○		○	○				
	Minatoshinbashi Bridge, Riv. Hori (Nagoya City)		○	○		○	○	○	○	○	
	South of Shiomi Wharf, Nagoya Port							○		○	
Mie Pref.	Yokkaichi Port				○	○					
	Toba Port					○			○		

Local communities	Surveyed sites	Target chemicals								
		[1]	[2]	[3]	[4]	[5]	[6]	[7]	[9]	[10]
Shiga Pref.	Lake Biwa (center, offshore of Minamihira)			○	○	○	○	○		
	Lake Biwa (center, offshore of Karasaki)			○	○	○	○	○		
Kyoto City	Miyamae-bashi Bridge, Riv. Katsura (Kyoto City)						○			
Osaka Pref.	Mouth of Riv. Yamato (Sakai City)				○			○		○
Osaka City	Kema-bashi Bridge, Riv. Oh-kawa (Osaka City)	○		○			○	○		○
	Osaka Port	○		○			○	○		○
Hyogo Pref.	Offshore of Takasago West Port				○					
	Offshore of Himeji				○			○		
	Shikama Port				○					
Kobe City	Kobe Port (center)	○						○	○	
Nara Pref.	Taisho-bashi Bridge, Riv. Yamato (Oji Town)		○	○			○			
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa (Wakayama City)		○						○	
	Noguchi-bashi Bridge, Riv. Hidaka (Gobo City)								○	
Okayama Pref.	Sasagase-bashi Bridge, Riv. Sasagase (Okayama City)				○					
	Offshore of Mizushima				○					
Yamaguchi Pref.	Tokuyama Bay				○			○	○	
	Offshore of Hagi				○			○	○	
Kagawa Pref.	Takamatsu Port				○			○		○
Ehime Pref.	Sawadu Fishing Port					○			○	
	Mishima area, Riv. Iwamatsu (Uwajima City)								○	
Fukuoka Pref.	Kabura-bashi Bridge, Riv. Raizan (Itoshima City)		○							○
	Offshore of Omuta		○							○
Kitakyushu City	Dokai Bay							○		○
Fukuoka City	Hakata Bay	○	○	○		○	○	○		○
Saga Pref.	Imari Bay				○				○	
Oita Pref.	Mouth of Riv. Oita (Oita City)	○	○	○		○	○			
Miyazaki Pref.	Kamesawa-bashi Bridge, Riv. Sendai (Ebino City)	○								
	Shiinoki-bashi Bridge, Riv. Takasaki (Miyakonojo City, Takaharu Town)	○								
	Hiwatashi-bashi Bridge, Riv. Ohyodo (Miyazaki City)	○								
Okinawa Pref.	Naha Port									○
	Maekawa-bashi Bridge, Riv. Yuuhi (Nanjo City)	○								

[1] Ampicillin, [2] Imazalil, [3] Clofibrate and its metabolite, [4] Hexachloroethane, [5] Benzophenone-4 (synonym: 2-Hydroxy-4-methoxybenzophenone-5-sulfonic acid), [6] Venlafaxine and its metabolite, [7] Triethylenetetramine, [9] 2-Ethylhexyl methacrylate, [10] Dimethyl 2,2-dichlorovinyl phosphate (synonym: Dichlorvos)

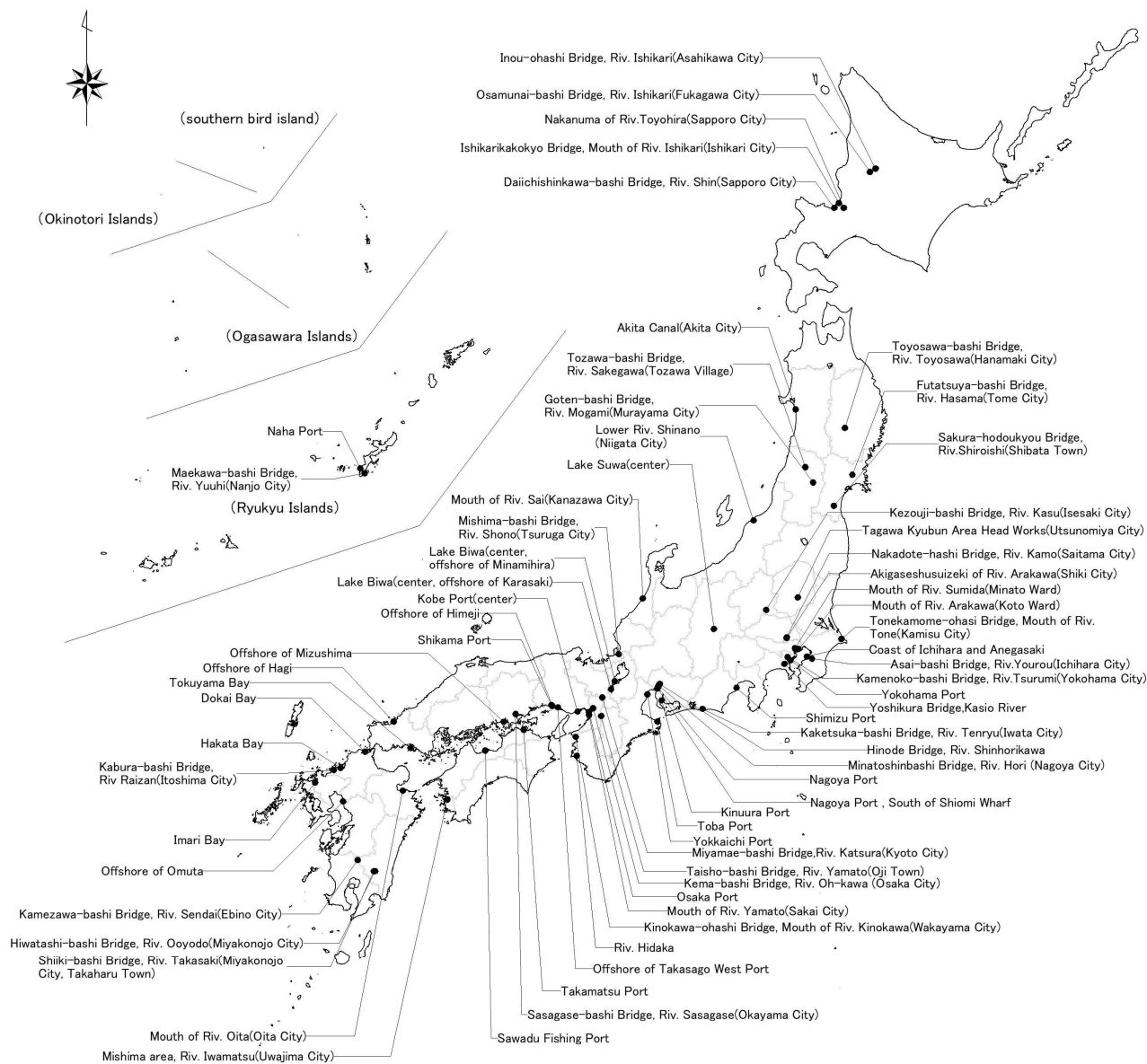


Figure 1-1-1 Surveyed sites (surface water) in the Initial Environmental Survey in FY 2020

Table 1-1-2 List of surveyed sites (air) and target chemicals in the Initial Environmental Survey in FY 2020

Local Communities	Surveyed sites	Target chemicals	
		[8]	[10]
Sendai City	Tsutsujigaoka Park (Sendai City)	○	○
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center (Tsuchiura City)	○	○
	Tsukuba-Takano Air Quality Monitoring Station (Tsukuba City)	○	○
Saitama Pref.	Center for Environmental Science in Saitama (Kazo City)		○
Saitama City	Saitama City Public Health Center (Saitama City)		○
Chiba Pref.	Ichihara-Iwasakinishi Air Quality Monitoring Station (Ichihara City)	○	○
Tokyo Met.	Tokyo Metropolitan Research Institute for Environmental Protection (Koto Ward)	○	○
	Chichijima Island (Ogasawara Village)	○	○
Kanagawa Pref.	Kanagawa Environmental Research Center (Hiratsuka City)	○	○
Yokohama City	Yokohama Environmental Science Research Institute (Yokohama City)		○
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science (Kanazawa City)	○	○
Nagano Pref.	Nagano Environmental Conservation Research Institute (Nagano City)	○	○
	Ina Air Quality Monitoring Station (Ina City)	○	○
Nagoya City	Chikusa Ward Heiwa Park (Nagoya City)	○	○
Mie Pref.	Mie Prefecture Health and Environment Research Institute (Yokkaichi City)	○	○
Kyoto City	Fushimi Ward Office (Kyoto City)	○	○
Osaka Pref.	Osaka Joint Prefectural Government Building, Building 2 Annex (Osaka City)	○	○
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health (Wakayama City)	○	
Yamaguchi Pref.	Yamaguchi Prefectural Institute of Public Health and Environment (Yamaguchi City)	○	○
Tokushima Pref.	Tokushima Prefectural Public Health, Pharmaceutical and Environmental Sciences Center (Tokushima City)	○	○
Kagawa Pref.	Kagawa Prefectural Public Swimming Pool (Takamatsu City)	○	○
Fukuoka Pref.	Omuta City Government Building (Omuta City)	○	○
Saga Pref.	Saga Prefectural Environmental Research Center (Saga City)	○	○

[8] 1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1*H*,3*H*,5*H*)-trione (synonym: 1,3,5- Trisglycidyl-isocyanuric acid), [10] Dimethyl 2,2-dichlorovinyl phosphate (synonym: Dichlorvos)

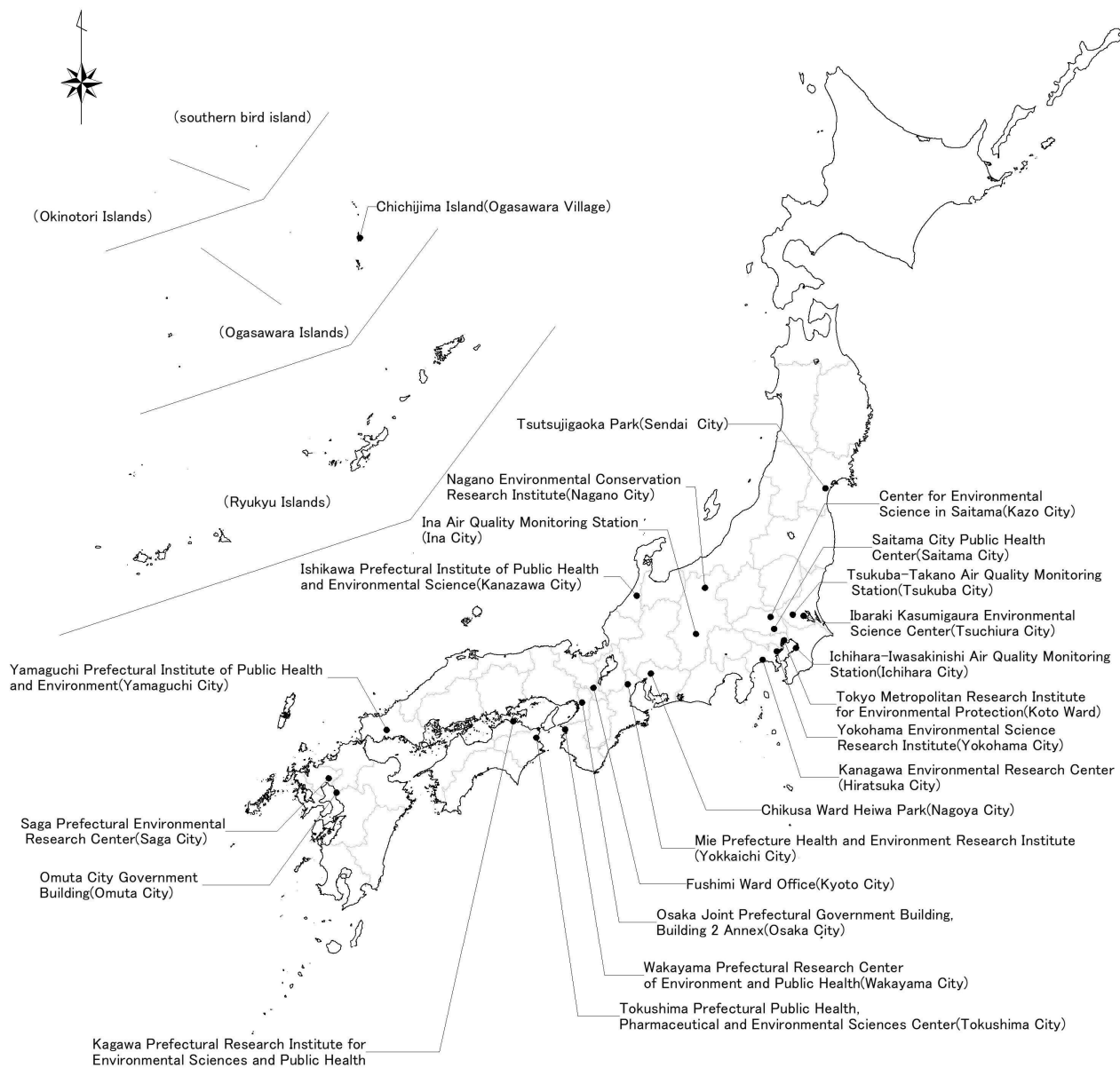


Figure 1-1-2 Surveyed sites (air) in the Initial Environmental Survey in FY 2020

#### 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, 4 out of the 9 target chemicals (groups) were detected. Target chemicals were categorized by analytical methods such as structurally similar chemicals capable of simultaneous analyses.

[1] Ampicillin: 4 of the 22 valid sites

[5] Benzophenone-4 (synonym: 2-Hydroxy-4-methoxybenzophenone-5-sulfonic acid): 6 of the 21 valid sites

[6] Venlafaxine and its metabolite

[6-1] Venlafaxine: 19 of the 23 valid sites

[6-2] *O*-Desmethylvenlafaxine: 6 of the 21 valid sites

[10] Dimethyl 2,2-dichlorovinyl phosphate (synonym: Dichlorvos): 2 of the 27 valid sites

In air, all 2 target chemicals were detected.

[8] 1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1*H*,3*H*,5*H*)-trione (synonym: 1,3,5-Trisglycidylisocyanuric acid): 1 of the 20 valid sites


[10] Dimethyl 2,2-dichlorovinyl phosphate (synonym: Dichlorvos): 6 of the 21 valid sites

Table 1-2 Summary of the detection ranges and the detection limits in the Initial Environmental Survey in FY 2020

No.	Target chemicals	Surface water [ng/L]		Air [ng/m <sup>3</sup> ]	
		Detection range and frequency	Detection limit	Detection range and frequency	Detection limit
[1]	Ampicillin	nd ~ 1.4 4/22	0.12		
[2]	Imazalil	nd 0/21	3.9		
[3]	Clofibrate and its metabolite				
	[3-1] Clofibrate	nd 0/23	28		
	[3-2] Clofibric acid	nd 0/23	33		
[4]	Hexachloroethane *	nd 0/22	0.55		
[5]	Benzophenone-4 (synonym: 2-Hydroxy-4-methoxybenzophenone-5-sulfonic acid)	nd ~ 150 6/21	16		
[6]	Venlafaxine and its metabolite				
	[6-1] Venlafaxine	nd ~ 53 19/23	0.24		
	[6-2] <i>O</i> -Desmethylvenlafaxine	nd ~ 190 6/21	6.0		
[7]	Triethylenetetramine *	nd 0/26	12		
[8]	1,3,5-Tris(2,3-epoxypropyl)-1,3,5-triazine-2,4,6(1 <i>H</i> ,3 <i>H</i> ,5 <i>H</i> )-trione (synonym: 1,3,5- Trisglycidyl-isocyanuric acid) *			nd ~ 0.11 1/20	0.039
[9]	2-Ethylhexyl methacrylate	nd 0/25	12		
[10]	Dimethyl 2,2-dichlorovinyl phosphate (synonym: Dichlorvos) *	nd ~ 33 2/27	0.43	nd ~ 2.3 6/21	0.63

(Note 1) Detection frequency is based on the number of sites, thus means (the number of detected sites/the number of surveyed sites). A site where data was not available was excluded from the number of surveyed sites. A site where the data became invalid under a unified detection limit was also excluded. In sediment, wildlife and air, 3 samples were measured for a site, and the detection in more than one out of samples from a site can be defined as one detected site.

(Note 2) Detection range is based on the number of samples and therefore can be shown as “nd - ” even if a target chemical is detected in all sites.

(Note 3)  means the medium was not surveyed.

(Note 4) \* connote target substances or points selected for survey in light of documentation or submittals regarding emissions.