

# Chapter 1 Results of the Initial Environmental Survey in FY 2008

## 1. Purpose of the survey

The Initial Environmental Survey is aimed at understanding the environmental presence of chemicals requiring examination of the appropriateness of the designation as a Designated Chemical Substance in the Law Concerning Reporting, etc. of Releases of Specific Chemical Substances to the Environment and Promoting Improvement in Their Management (Law No. 86 of 1999) (hereafter, the PRTR Law) and chemicals requiring survey from social viewpoints.

## 2. Target chemicals

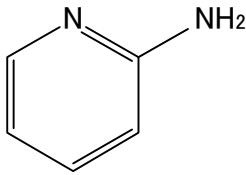
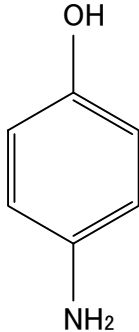
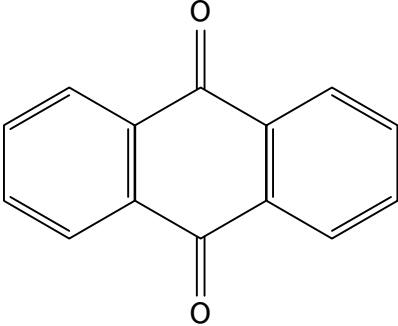
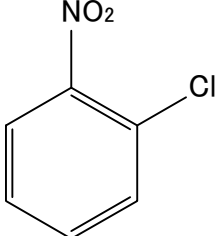
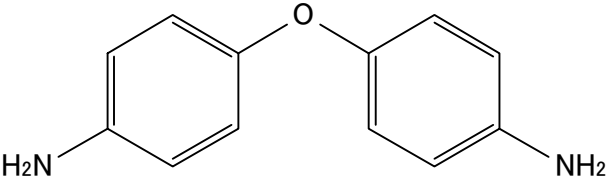
In the FY 2008 Initial Environmental Survey, 24 chemicals that were selected and designated as target chemicals. The combinations of target chemicals and the surveyed media are given below.

No.	Name	The Chemical Substances Control Law	The PRTR Law		Surveyed media		
			Before the revision	After the revision	Surface water	Sediment	Air
[1]	2-Aminopyridine	II Monitored	II 4				○
[2]	<i>p</i> -Aminophenol	III Monitored	II 6	I 23	○		
[3]	9,10-Anthracenedione (synonym: Anthraquinone)						○
[4]	2-Chloronitrobenzene	II Monitored III Monitored		I 112		○	○
[5]	4,4'-Diaminodiphenyl ether			I 143	○		
[6]	Diethylene glycol						○
[7]	<i>S</i> -2-(Ethylthio)ethyl <i>O,O</i> -dimethyl phosphorodithioate (synonym: Thiometon)		I 149				○
[8]	Disodium 2,2'-vinylenebis[5-(4-morpholino-6-anilino-1,3,5-triazin-2-ylamino)benzenesulfonate] (synonym: C.I. Fluorescent 260)		II 32	I 199			○
[9]	4,6-Dinitro- <i>o</i> -cresol		II 34		○		
[10]	2,6-Dinitrotoluene	II Monitored III Monitored	I 157	I 200		○	
[11]	<i>m</i> -Dinitrobenzene	II Monitored	II 35	II 43		○	
[12]	Dibenzyl ether (synonym: [(Benzyloxy)methyl] benzene)	III Monitored	II 41	II 49			○
[13]	3,3'-Dimethoxybenzidine				○		
[14]	<i>O,O</i> -Dimethyl <i>S</i> -2-[1-( <i>N</i> -methylcarbamoyl)ethylthio]ethyl phosphorothioate (synonym: Vamidithion)		I 191		○		○
[15]	2-(2-Naphthyl)propionanilide (synonym: Naproanilide)		I 229		○		
[16]	<i>o</i> -Nitroanisole	II Monitored		I 311			○
[17]	<i>o</i> -Nitroaniline	II Monitored		I 312		○	○
[18]	<i>m</i> -Nitroaniline	II Monitored III Monitored	II 55	II 69		○	
[19]	<i>o</i> -Nitrotoluene	II Monitored		I 315			○
[20]	Methyl 4-hydroxybenzoate			I 334	○		
[21]	6-Phenyl-1,3,5-triazine-2,4-diamine	II Monitored			○		○
[22]	2-Propanol (synonym: Isopropyl alcohol)						○
[23]	Methylenebis(4,1-cyclohexylene)diisocyanate	III Monitored	I 341	I 447			○
[24]	4,4'-methylenebis( <i>N,N</i> -dimethylaniline)	II Monitored	II 77	II 96	○		

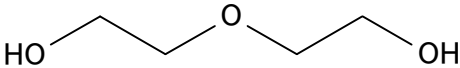
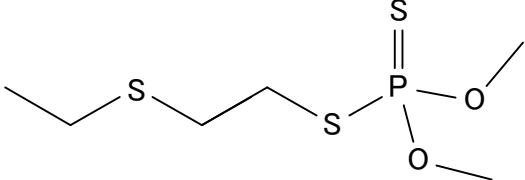
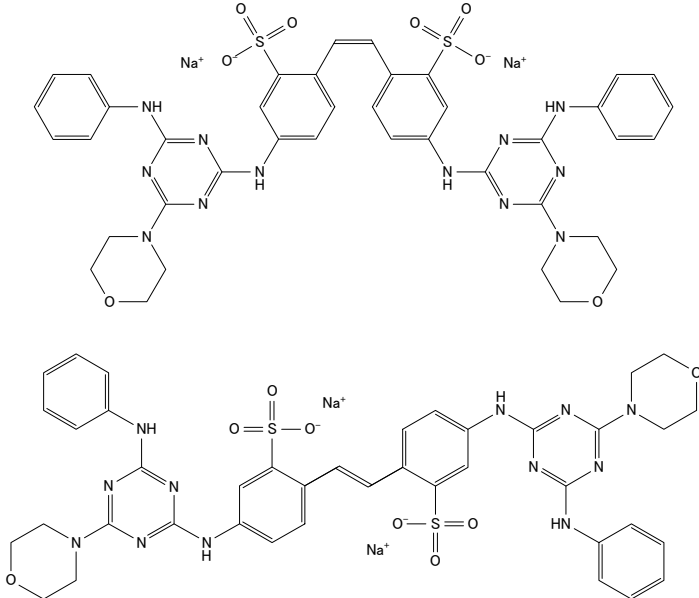
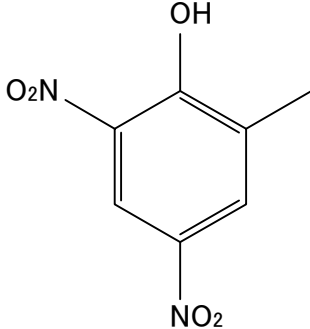
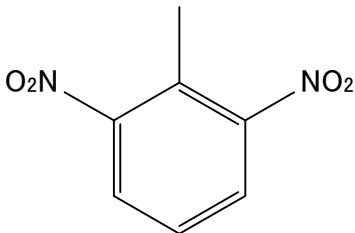
(Note 1) "The Chemical Substances Control Law" hereafter means "Law Concerning the Examination and Regulation of Manufacture, etc. Of Chemical Substances (Law No. 117 of 1973)."

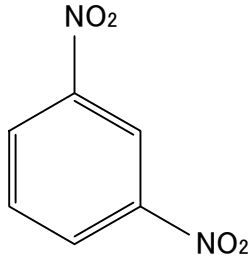
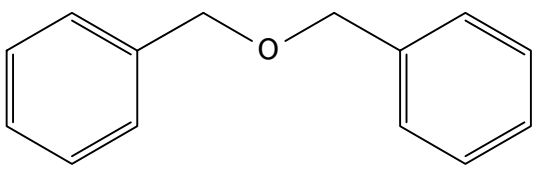
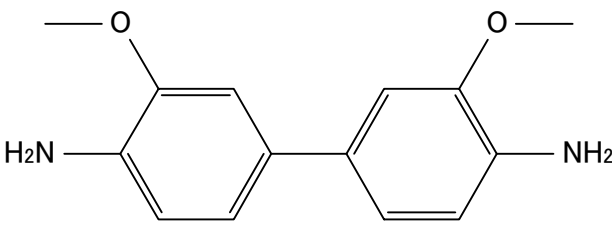
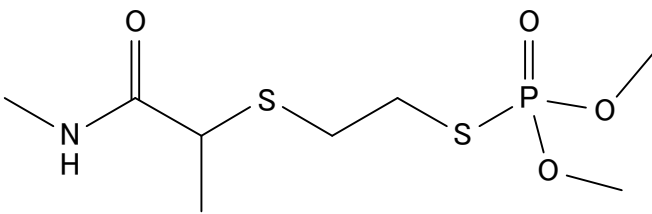
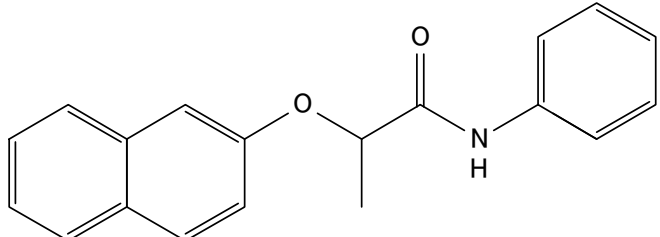
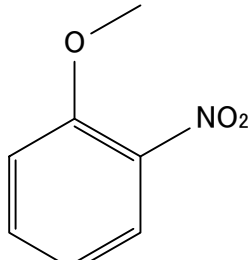
(Note 2) "Before the revision" in "The PRTR Law" means "appointments before the revision of government ordinance on November 21, 2008" and "After the revision" in "The PRTR Law" means "appointments after that revision".

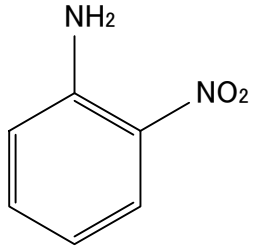
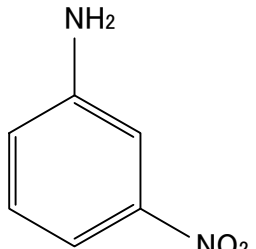
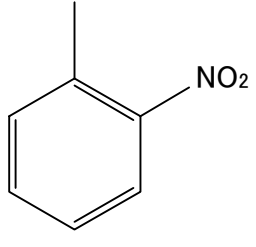
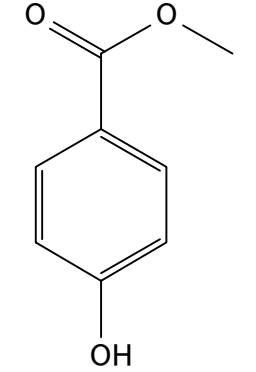
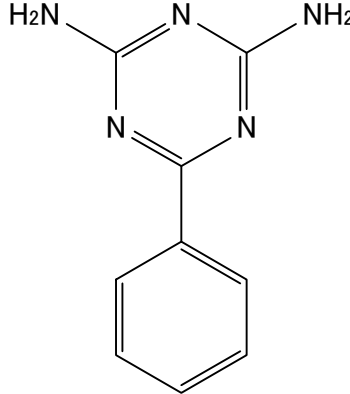
Chemical and physical properties of target chemicals of the Initial Environmental Survey are as follows.

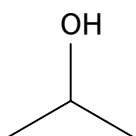
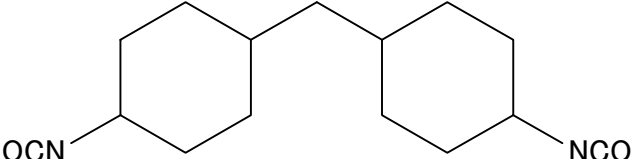
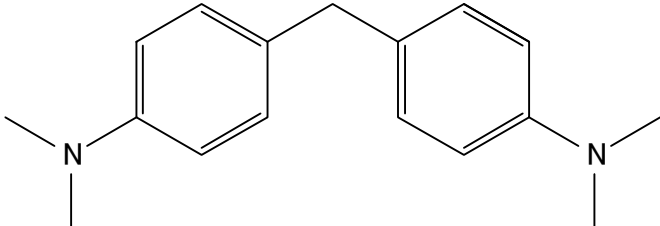
<p>[1] 2-Aminopyridine</p> 	<p>Molecular formula: C<sub>5</sub>H<sub>6</sub>N<sub>2</sub>            CAS: 504-29-0            ENCS: 5-724、9-106            MW: 94.11            mp: 58.1°C<sup>1)</sup>            bp: 210.6°C<sup>1)</sup>            SW: 5,400mg/L(25°C)<sup>2)</sup>            Specific gravity: 1.065(20/4°C)<sup>3)</sup>            logPow: 0.48<sup>4)</sup></p>
<p>[2] <i>p</i>-Aminophenol</p> 	<p>Molecular formula: C<sub>6</sub>H<sub>7</sub>NO            CAS: 123-30-8            ENCS: 3-675            MW: 109.13            mp: 189.6~190.2°C<sup>1)</sup>            bp: 284°C<sup>1)</sup>            SW: 0.65%(24°C)<sup>1)</sup>            Specific gravity: 1.30g/cm<sup>3</sup><sup>5)</sup>            logPow: 0.04<sup>4)</sup></p>
<p>[3] 9,10-Anthracenedione (synonym: Anthraquinone)</p> 	<p>Molecular formula: C<sub>14</sub>H<sub>8</sub>O<sub>2</sub>            CAS: 84-65-1            ENCS: 4-686            MW: 208.21            mp: 286°C<sup>1)</sup>            bp: 377°C<sup>1)</sup>            SW: 0.0014g/kg(25°C)<sup>6)</sup>            Specific gravity: 1.42~1.44(20/4°C)<sup>1)</sup>            logPow: 3.39<sup>4)</sup></p>
<p>[4] 2-Chloronitrobenzene</p> 	<p>Molecular formula: C<sub>6</sub>H<sub>4</sub>ClNO<sub>2</sub>            CAS: 88-73-3            ENCS: 3-442            MW: 157.55            mp: 32-33°C<sup>1)</sup>            bp: 245~246°C<sup>1)</sup>            SW: 0.441g/kg(20°C)<sup>6)</sup>            Specific gravity: 1.305<sup>1)</sup>            logPow: 2.24<sup>4)</sup></p>
<p>[5] 4,4'-Diaminodiphenyl ether</p> 	<p>Molecular formula: C<sub>12</sub>H<sub>12</sub>N<sub>2</sub>O            CAS: 101-80-4            ENCS: 3-854            MW: 200.24            mp: 186~187°C<sup>2)</sup>            bp: 350°C<sup>2)</sup>            SW: Uncertain            Specific gravity: Uncertain            logPow: Uncertain</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, logPow: *n*-octanol-water partition coefficient, kPa: kilopascal (1 atm  $\approx$  101.3kPa).

<p>[6] Diethylene glycol</p> 	<p>Molecular formula: C<sub>4</sub>H<sub>10</sub>O<sub>3</sub>  CAS: 111-46-6  ENCS: 2-415  MW: 106.12  mp: -6.5°C<sup>1)</sup>  bp: 244~245°C<sup>1)</sup>  SW: Freely soluble<sup>1)</sup>  Specific gravity: 1.118(20/20°C)<sup>1)</sup>  logPow: -1.98<sup>7)</sup></p>
<p>[7] S-2-(Ethylthio)ethyl O,O-dimethyl phosphorodithioate (synonym:Thiometon)</p> 	<p>Molecular formula: C<sub>6</sub>H<sub>15</sub>O<sub>2</sub>PS<sub>3</sub>  CAS: 640-15-3  ENCS: No pertinence  MW: 246.35  mp: Uncertain  bp: 110°C(0.1mmHg)<sup>6)</sup>  SW: 200mg/L(25°C)<sup>8)</sup>  Specific gravity: 1.209g/cm<sup>3</sup>(20°C)<sup>6)</sup>  logPow: 3.15(20°C)<sup>8)</sup></p>
<p>[8] Disodium 2,2'-vinylenebis[5-(4-morpholino-6-anilino-1,3,5-triazin-2-ylamino)benzenesulfonate] (synonym:C.I. Fluorescent 260)</p> 	<p>Molecular formula: C<sub>40</sub>H<sub>38</sub>N<sub>12</sub>Na<sub>2</sub>O<sub>8</sub>S<sub>2</sub>  CAS: 16090-02-1  ENCS: 5-2742  MW: 924.91  mp: &gt;270°C<sup>9)</sup>  bp: Uncertain  SW: &lt;1.9g/L(20°C)<sup>10)</sup>  Specific gravity: 1.54g/cm<sup>3</sup>(22°C)<sup>10)</sup>  logPow: -1.58(°C)<sup>10)</sup></p>
<p>[9] 4,6-Dinitro-<i>o</i>-cresol</p> 	<p>Molecular formula: C<sub>7</sub>H<sub>6</sub>N<sub>2</sub>O<sub>5</sub>  CAS: 534-52-1  ENCS: 3-2769  MW: 198.13  mp: 87.5°C<sup>1)</sup>  bp: 378°C<sup>2)</sup>  SW: 1.58(20°C)<sup>11)</sup>  Specific gravity: 0.130g/kg<sup>6)</sup>  logPow: 2.13<sup>4)</sup></p>
<p>[10] 2,6-Dinitrotoluene</p> 	<p>Molecular formula: C<sub>7</sub>H<sub>6</sub>N<sub>2</sub>O<sub>4</sub>  CAS: 606-20-2  ENCS: 3-446  MW: 182.13  mp: 66.0°C<sup>6)</sup>  bp: 285°C<sup>6)</sup>  SW: 145mg/L(25°C)<sup>12)</sup>  Specific gravity: 1.538kg/L<sup>12)</sup>  logPow: 2.10<sup>4)</sup></p>

<p>[11] <i>m</i>-Dinitrobenzene</p> 	<p>Molecular formula: C<sub>6</sub>H<sub>4</sub>N<sub>2</sub>O<sub>4</sub>  CAS: 99-65-0  ENCS: 3-445  MW: 168.11  mp: 90.3°C<sup>(6)</sup>  bp: 291°C<sup>(6)</sup>  SW: 21.3g/kg(20°C)<sup>(6)</sup>  Specific gravity: 1.5751g/cm<sup>3</sup>(18°C)<sup>(6)</sup>  logPow: 1.49<sup>(4)</sup></p>
<p>[12] Dibenzyl ether (synonym: [(Benzyloxy)methyl]benzene)</p> 	<p>Molecular formula: C<sub>14</sub>H<sub>14</sub>O  CAS: 103-50-4  ENCS: 3-1082  MW: 198.26  mp: 1.8°C<sup>(6)</sup>  bp: 295~298°C(Decomposition)<sup>(1)</sup>  SW: 0.040g/kg(35°C)<sup>(6)</sup>  Specific gravity: 1.00142<sup>(1)</sup>  logPow: 3.31<sup>(4)</sup></p>
<p>[13] 3,3'-Dimethoxybenzidine</p> 	<p>Molecular formula: C<sub>14</sub>H<sub>16</sub>N<sub>2</sub>O<sub>2</sub>  CAS: 119-90-4  ENCS: No pertinence  MW: 244.29  mp: 137~138°C<sup>(1)</sup>  bp: 356°C<sup>(2)</sup>  SW: 0.06g/kg(25°C)<sup>(6)</sup>  Specific gravity: Uncertain  logPow: 1.81<sup>(2)</sup></p>
<p>[14] <i>O,O</i>-Dimethyl <i>S</i>-2-[1-(<i>N</i>-methylcarbamoyl)ethylthio]ethyl phosphorothioate (synonym: Vamidotion)</p> 	<p>Molecular formula: C<sub>8</sub>H<sub>18</sub>NO<sub>4</sub>PS<sub>2</sub>  CAS: 2275-23-2  ENCS: No pertinence  MW: 287.34  mp: 43°C<sup>(8)</sup>  bp: Uncertain  SW: 4kg/L<sup>(8)</sup>  Specific gravity: Uncertain  logPow: Uncertain</p>
<p>[15] 2-(2-Naphthyloxy)propionanilide (synonym: Naproanilide)</p> 	<p>Molecular formula: C<sub>19</sub>H<sub>17</sub>NO<sub>2</sub>  CAS: 52570-16-8  ENCS: No pertinence  MW: 291.34  mp: 128°C<sup>(8)</sup>  bp: Uncertain  SW: 0.75 mg/L(27°C)<sup>(8)</sup>  Specific gravity: Uncertain  logPow: Uncertain</p>
<p>[16] <i>o</i>-Nitroanisole</p> 	<p>Molecular formula: C<sub>7</sub>H<sub>7</sub>NO<sub>3</sub>  CAS: 91-23-6  ENCS: 3-787  MW: 153.14  mp: 9.4°C<sup>(1)</sup>  bp: 277°C<sup>(1)</sup>  SW: 1.69g/kg(30°C)<sup>(6)</sup>  Specific gravity: 1.254(20/4°C)<sup>(1)</sup>  logPow: 1.73<sup>(4)</sup></p>

[17] <i>o</i> -Nitroaniline		Molecular formula: C <sub>6</sub> H <sub>6</sub> N <sub>2</sub> O <sub>2</sub> CAS: 88-74-4 ENCS: 3-392 MW: 138.12 mp: 69~71°C <sup>1)</sup> bp: 284°C <sup>1)</sup> SW: 14.9g/kg(30°C) <sup>6)</sup> Specific gravity: 0.9015(25/4°C) <sup>1)</sup> logPow: 1.85 <sup>4)</sup>
[18] <i>m</i> -Nitroaniline		Molecular formula: C <sub>6</sub> H <sub>6</sub> N <sub>2</sub> O <sub>2</sub> CAS: 99-09-2 ENCS: 3-392 MW: 138.12 mp: 114°C <sup>1)</sup> bp: Uncertain SW: 1g/880mL <sup>1)</sup> Specific gravity: 0.9011(25/4°C) <sup>1)</sup> logPow: 1.37 <sup>4)</sup>
[19] <i>o</i> -Nitrotoluene		Molecular formula: C <sub>7</sub> H <sub>7</sub> NO <sub>2</sub> CAS: 88-72-2 ENCS: 3-437 MW: 137.14 mp: -9.3°C <sup>1)</sup> bp: 220.4°C <sup>1)</sup> SW: 652mg/L <sup>1)</sup> Specific gravity: 1.1622(19/15°C) <sup>1)</sup> logPow: 2.30 <sup>4)</sup>
[20] Methyl 4-hydroxybenzoate		Molecular formula: C <sub>8</sub> H <sub>8</sub> O <sub>3</sub> CAS: 99-76-3 ENCS: 3-1585 MW: 152.15 mp: 131°C <sup>1)</sup> bp: 270~280°C(Decomposition) <sup>1)</sup> SW: 1g/400mL(20°C) <sup>1)</sup> Specific gravity: Uncertain logPow: 1.96 <sup>4)</sup>
[21] 6-Phenyl-1,3,5-triazine-2,4-diamine		Molecular formula: C <sub>9</sub> H <sub>9</sub> N <sub>5</sub> CAS: 91-76-9 ENCS: 5-1028 MW: 187.20 mp: 227~228°C <sup>1)</sup> bp: >350°C <sup>13)</sup> SW: 0.06%(22°C) <sup>1)</sup> Specific gravity: 1.40(25/4°C) <sup>1)</sup> logPow: 1.36 <sup>4)</sup>

<p>[22] 2-Propanol (synonym: Isopropyl alcohol)</p> 	<p>Molecular formula: C<sub>3</sub>H<sub>8</sub>O  CAS: 67-63-0  ENCS: 2-207  MW: 60.10  mp: -88.5°C<sup>1)</sup>  bp: 82.5°C<sup>1)</sup>  SW: 36g/L(25°C)<sup>7)</sup>  Specific gravity: 0.78505(20/4°C)<sup>1)</sup>  logPow: 0.05<sup>4)</sup></p>
<p>[23] Methylenebis(4,1-cyclohexylene)diisocyanate</p> 	<p>Molecular formula: C<sub>15</sub>H<sub>22</sub>N<sub>2</sub>O<sub>2</sub>  CAS: 5124-30-1  ENCS: 4-119  MW: 262.35  mp: 15°C<sup>14)</sup>  bp: 167~168°C(2hPa)<sup>14)</sup>  SW: Uncertain (In water, it diisocyanate hydrolyzes with a half-life of approximately 2 h.)<sup>14)</sup>  Specific gravity: 1.066g/cm<sup>3</sup><sup>6)</sup>  logPow: Uncertain (In water, it diisocyanate hydrolyzes with a half-life of approximately 2 h.)<sup>14)</sup></p>
<p>[24] 4,4'-methylenebis(<i>N,N</i>-dimethylaniline)</p> 	<p>Molecular formula: C<sub>17</sub>H<sub>22</sub>N<sub>2</sub>  CAS: 101-61-1  ENCS: 3-140  MW: 254.37  mp: 90~91°C<sup>1)</sup>  bp: 390°C<sup>1)</sup>  SW: Uncertain  Specific gravity: Uncertain  logPow: Uncertain</p>

#### References

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- 9) Chemicals Inspection and Testing Institute, Biodegradation and bioaccumulation data of existing chemicals based on the CSCL Japan, Japan Chemical Industry Ecology - Toxicology and Information Center (1992)
- 10) OECD, Fluorescent Brightener FWA-1, SIDS Initial Assessment Report for 21st SIAM (2005)
- 11) WHO, DINITRO-ortho-CRESOL, Environmental Health Criteria 220 (2000)
- 12) OECD, Dinitrotoluene (isomers mixture), SIDS Initial Assessment Report for 18th SIAM (2004)
- 13) OECD, 2,4-Diamino-6-phenyl-1,3,5-triazine, SIDS Initial Assessment Report for 13rd SIAM (2005)
- 14) OECD, 4,4'-Methylenedicyclohexyl diisocyanate, SIDS Initial Assessment Report for 20th SIAM (2005)

### 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 Institute of Environmental Sciences		○	○
Sapporo City	Sapporo City Institute of Public Health	○	○	○*2
Sendai City	Sendai City Institute of Public Health			○
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center			○
Gunma Pref.	Gunma Prefectural Institute of Public Health and Environmental Sciences	○		
Saitama Pref.	Center for Environmental Science in Saitama			○
Chiba Pref.	Chiba Prefectural Environmental Research Center	○		○*2
Kanagawa Pref.	Kanagawa Environmental Research Center			○
Yokohama City	Yokohama Environmental Science Research Institute	○		
Kawasaki City	Kawasaki Municipal Research Institute for Environmental Protection		○	
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science	○	○	○
Nagano Pref.	Nagano Environmental Conservation Research Institute			○
Gifu Pref.	Gifu Prefectural Research Institute for Health and Environmental Sciences			○
Shizuoka Pref.	Shizuoka Institute of Environment and Hygiene	○		
Aichi Pref.	Aichi Environmental Research Center		○	
Nagoya City	Nagoya City Environmental Science Research Institute	○		○*2
Mie Pref.	Mie Prefecture Health and Environment Research Institute	○		○
Kyoto Pref.	Kyoto Prefectural Institute of Public Health and Environment			○*3
Kyoto City	Kyoto City Institute of Health and Environmental Sciences			○
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 Institute of Public Health and Environmental Sciences			○*2
Kobe City	Environmental Conservation and Guidance Division, Environment Bureau	○	○	
Nara Pref.	Nara Prefectural Institute for Hygiene and Environment	○		
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health	○		
Okayama Pref.	Okayama Prefectural Institute for Environmental Science and Public Health	○	○	
Hiroshima Pref.	Hiroshima Prefectural Technology Research Institute Health and Environment Center		○	
Yamaguchi Pref.	Yamaguchi Prefectural Public Health and Environment		○	○*2
Kagawa Pref.	Kagawa Prefectural Research Institute for Environmental Sciences and Public Health		○	○
Fukuoka Pref.	Fukuoka Institute of Health and Environmental Science	○		○*3
Kitakyushu City	Kitakyushu City Institute of Environmental Sciences		○	○*2
Saga Pref.	Saga Prefectural Environmental Research Center			○
Kumamoto Pref.	Kumamoto Prefectural Institute of Public Health and Environmental Science			○
Oita Pref.	Environmental Preservation Division, Life and Environment Department	○		

(Note 1) \*1: Organisations responsible for sampling are described by their official names in FY 2008.

(Note 2) \*2: Those organizations sampled some specimens, and cooperated with a private analytical laboratory in sampling other specimens.

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

Surveyed media	Numbers of local communities	Numbers of target chemicals	Numbers of surveyed sites	Numbers of samples at a surveyed site
Surface water	14	9	17	3
Sediment	13	5	15	3
Air	22*	14	22	3
All media	34	24	52	

(Note) 6 of the 22 organizations sampled some of the specimens and cooperated with private analytical laboratories in sampling other specimens. 3 organizations cooperated with private analytical laboratories in sampling all specimens.

Table 1-1-1 List of surveyed sites (surface water) and target chemicals in the Initial Environmental Survey in FY 2008

Local communities	Surveyed sites	Target chemicals								
		[2]	[5]	[9]	[13]	[14]	[15]	[20]	[21]	[24]
Sapporo City	Nakanuma of Riv. Toyohira(Sapporo City)								○	
	Azuma-bashi Bridge, Riv. Toyohira(Sapporo City)								○	
Gunma Pref.	Tako Bridge of Riv. Kabura(Yoshii Town)	○	○	○	○					○
Chiba Pref.	Asai-bashi Bridge, Riv. Yourou(Ichihara City)								○	
Yokohama City	Kamenoko Bridge over Riv. Tsurumi(Yokohama City)								○	
Ishikawa Pref.	Mouth of Riv. Sai(Kanazawa City)	○	○	○	○					○
Shizuoka Pref.	Shimizu Port	○	○	○	○					○
	Riv. Tenryu(Iwata City)	○	○	○	○					○
Nagoya City	Minatoshinbashi Bridge, Riv. Hori (Nagoya City)								○	
Mie Pref.	Yokkaichi Port		○						○	
Kobe City	Kobe Port(center)		○	○					○	
Nara Pref.	Riv. Yamato(Ooji Town)	○	○	○	○					○
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa (Wakayama City)		○						○	○
Okayama Pref.	Otoidezeki of Riv. Asahi(Okayama City)					○	○			
Fukuoka Pref.	Offshore of Omuta		○			○	○			○
	Kabura-bashi Bridge, River Raizan(Maebaru City)		○			○	○			○
Oita Pref.	Mouth of Riv. Oita(Oita City)	○	○	○	○					○

[2] *p*-Aminophenol, [5] 4,4'-Diaminodiphenyl ether, [9] 4,6-Dinitro-*o*-cresol, [13] 3,3'-Dimethoxybenzidine, [14] *O,O*-Dimethyl *S*-2-[1-(*N*-methylcarbamoyl) ethylthio]ethyl phosphorothioate (synonym:Vamidotion), [15] 2-(2-Naphthoxy)propionanilide (synonym:Naproanilide), [20] Methyl 4-hydroxybenzoate, [21] 6-Phenyl-1,3,5-triazine-2,4-diamine, [24] 4,4'-methylenebis (*N,N*-dimethylaniline)

Table 1-1-2 List of surveyed sites (sediment) and target chemicals in the Initial Environmental Survey in FY 2008

Local communities	Surveyed sites	Target chemicals				
		[4]	[10]	[11]	[17]	[18]
Hokkaido	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari(Ishikari City)	○	○	○	○	○
Tokyo Met.	Mouth of Riv. Arakawa (Koto Ward)	○	○	○	○	○
	Mouth of Riv. Sumida (Minato Ward)	○	○	○	○	○
Kawasaki City	Mouth of Riv. Tama(Kawasaki City)	○	○	○	○	○
Ishikawa Pref.	Mouth of Riv. Sai(Kanazawa City)	○	○	○	○	○
Aichi Pref.	Nagoya Port	○	○	○	○	○
Osaka Pref.	Mouth of Riv. Yamato(Sakai City)	○	○	○	○	○
Osaka City	Osaka Port	○	○	○	○	○
Kobe City	Kobe Port(center)	○	○	○	○	○
Okayama Pref.	Offshore of Mizushima	○	○	○	○	○
Hiroshima Pref.	Kure Port	○	○	○	○	○
Yamaguchi Pref.	Tokuyama Bay	○	○	○	○	○
	Offshore of Hagi	○	○	○	○	○
Kagawa Pref.	Takamatsu Port	○	○	○	○	○
Kitakyushu City	Dokai Bay	○	○	○	○	○

[4] 2-Chloronitrobenzene, [10] 2,6-Dinitrotoluene, [11] *m*-Dinitrobenzene, [17] *o*-Nitroaniline, [18] *m*-Nitroaniline



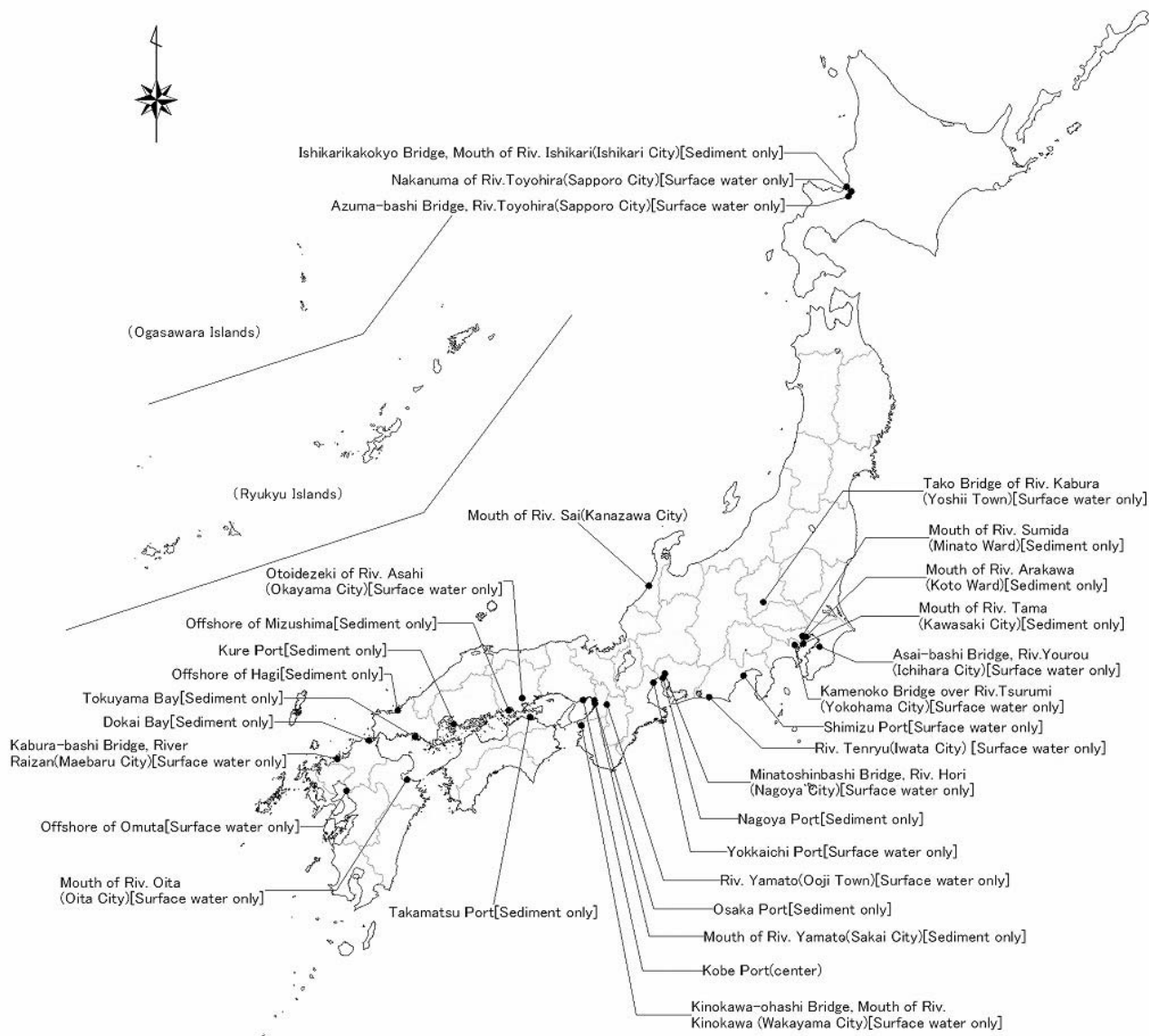


Figure 1-1-1 Surveyed sites (surface water and sediment) in the Initial Environmental Survey in FY 2008

Table 1-1-3 List of surveyed sites (air) and target chemicals in the Initial Environmental Survey in FY 2008

Local communities	Surveyed sites	Target chemicals														
		[1]	[3]	[4]	[6]	[7]	[8]	[12]	[14]	[16]	[17]	[19]	[21]	[22]	[23]	
Hokkaido	Hokkaido Institute of Environmental Sciences		○	○				○		○	○	○				
Sapporo City	Sapporo City Institute of Public Health	○			○	○	○	○	○					○	○	○
Sendai City	Tsutsujigaoka Park(Sendai City)									○	○					
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center(Tsuchiura City)									○	○					
Saitama Pref.	Center for Environmental Science in Saitama(Kisai Town)	○					○			○	○					
Chiba Pref.	Ichihara-Matsuzaki Air Quality Monitoring Station(Ichihara City)			○						○	○	○				
Kanagawa Pref.	Kanagawa Environmental Research Center(Hiratsuka City)		○	○	○	○				○	○	○	○	○	○	
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science(Kanazawa City)							○		○	○					
Nagano Pref.	Nagano Environmental Conservation Research Institute(Nagano City)			○						○	○	○		○		
Gifu Pref.	Gifu Prefectural Research Institute for Health and Environmental Sciences(Kakamigahara City)									○	○					
Nagoya City	Chikusa Ward Heiwa Park(Nagoya City)	○	○	○						○	○	○	○	○		
Mie Pref.	Mie Prefecture Health and Environment Research Institute(Yokkaichi City)			○		○		○		○	○	○		○	○	
Kyoto Pref.	Kyoto Prefecture Joyo Senior High School(Joyo 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 Institute of Public Health and Environmental Sciences(Kobe City)							○		○	○					
Yamaguchi Pref.	Yamaguchi Prefectural Public Health and Environment(Yamaguchi City)	○		○	○	○	○		○	○	○					
Kagawa Pref.	Takamatsu Joint Prefectural Government Building(Takamatsu City)									○	○					
Fukuoka Pref.	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)									○	○					

[1] 2-Aminopyridine, [3] 9,10-Anthracenedione (synonym:Anthraquinone), [4] 2-Chloronitrobenzene, [6] Diethylene glycol, [7] S-2-(Ethylthio)ethyl O,O-dimethyl phosphorodithioate (synonym:Thiometon), [8] Disodium 2,2'-vinylenebis[5-(4-morpholino-6-anilino-1,3,5-triazin-2-ylamino)benzenesulfonate] (synonym:C.I. Fluorescent 260), [12] Dibenzyl ether (synonym:[(Benzyloxy)methyl]benzene), [14] O,O-Dimethyl S-2-[1-(N-methylcarbamoyl)ethylthio]ethyl phosphorothioate (synonym: Vamidothion), [16] o-Nitroanisole, [17] o-Nitroaniline, [19] o-Nitrotoluene, [21] 6-Phenyl-1,3,5-triazine-2,4-diamine, [22] 2-Propanol (synonym:Isopropyl alcohol), [23] Methylenebis(4,1-cyclohexylene)diisocyanate



Figure 1-1-2 Surveyed sites (air) in the Initial Environmental Survey in FY 2008

### (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.

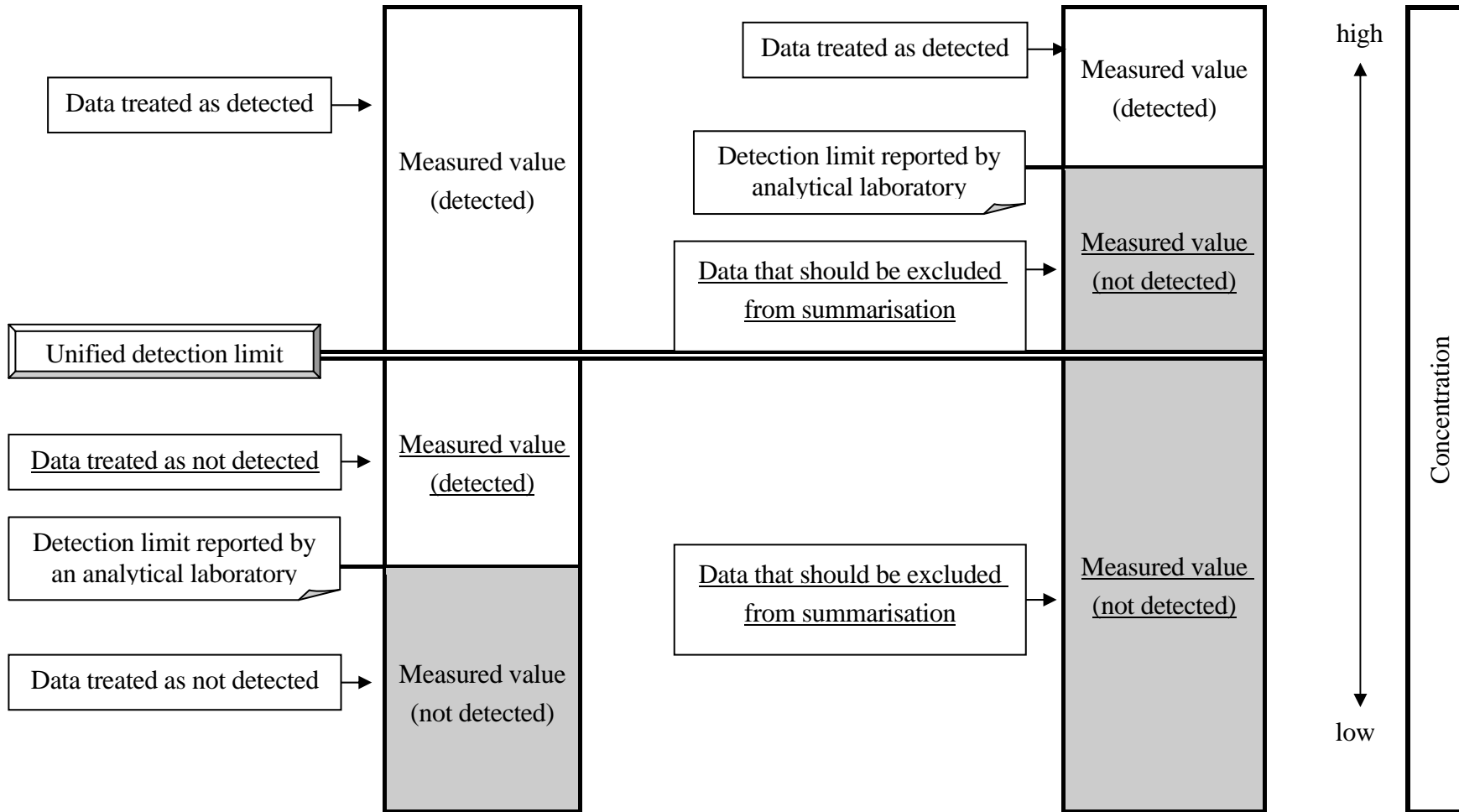
When the analytical laboratory calculates the appropriate IDL and MDL following the calculation method stated in the analytical method development instruction manuals, this calculated MDL is used as the detection limit by the analytical laboratory.

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

(A) Detection limit reported by analytical laboratory  $\leq$  Unified detection limit

(B) Detection limit reported by analytical laboratory  $>$  Unified detection limit



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, 4 out of the 9 target chemicals were detected.

- [2] *p*-Aminophenol: 1 of the 3 valid sites
- [9] 4,6-Dinitro-*o*-cresol: 7 of the 7 valid sites
- [20] Methyl 4-hydroxybenzoate: 1 of the 3 valid sites
- [21] 6-Phenyl-1,3,5-triazine-2,4-diamine: 8 of the 6 valid sites

In sediment, 1 out of the 5 target chemicals was detected.

- [17] *o*-Nitroaniline: 2 of the 15 valid sites

In air, 6 out of the 14 target chemicals were detected.

- [3] 9,10-Anthracenedione (synonym:Anthraquinone): 5 of the 5 valid sites
- [6] Diethylene glycol: 5 of the 5 valid sites
- [12] Dibenzyl ether (synonym:[(Benzyloxy)methyl]benzene): 3 of the 6 valid sites
- [19] *o*-Nitroanisole: 1 of the 8 valid sites
- [21] 6-Phenyl-1,3,5-triazine-2,4-diamine: 5 of the 5 valid sites
- [22] 2-Propanol (synonym:Isopropyl alcohol): 5 of the 5 valid sites

Table 1-2 Summary of the detection ranges and the detection limits in the Initial Environmental Survey in FY 2008

No.	Target chemicals	Surface water [ng/L]		Sediment [ng/g-dry]		Air [ng/m <sup>3</sup> ]	
		Detection range and frequency	Detection limit	Detection range and frequency	Detection limit	Detection range and frequency	Detection limit
[1]	2-Aminopyridine					nd 0/5	0.051
[2]	<i>p</i> -Aminophenol	nd~14 1/3	9				
[3]	9,10-Anthracenedione (synonym:Anthraquinone)					1.1~8.7 5/5	0.43
[4]	2-Chloronitrobenzene			nd 0/15	0.22	nd 0/9	0.12
[5]	2-Aminopyridine	nd 0/11	3.2				
[6]	<i>p</i> -Aminophenol					6.1~45 5/5	3.3
[7]	9,10-Anthracenedione (synonym:Anthraquinone)					nd 0/4	0.23
[8]	2-Chloronitrobenzene					nd 0/5	0.16
[9]	4,4'-Diaminodiphenyl ether	3.7~69 7/7	0.19				
[10]	Diethylene glycol			nd 0/15	0.10		
[11]	<i>S</i> -2-(Ethylthio)ethyl <i>O,O</i> -dimethyl phosphorodithioate (synonym:Thiometon)			nd 0/15	0.11		
[12]	Disodium 2,2'-vinylenebis[5-(4-morpholino-6-anilino-1,3,5-triazin-2-ylamino)benzenesulfonate] (synonym:C.I. Fluorescent 260)					nd~0.59 3/6	0.12
[13]	4,6-Dinitro- <i>o</i> -cresol	nd 0/6	2.1				
[14]	2,6-Dinitrotoluene	nd 0/3	0.062			nd 0/5	0.28
[15]	<i>m</i> -Dinitrobenzene	nd 0/3	0.77				
[16]	Dibenzyl ether (synonym:[(Benzyloxy)methyl]benzene)					nd 0/20	1.4
[17]	3,3'-Dimethoxybenzidine			nd~0.22 2/15	0.10	nd 0/14	0.32
[18]	<i>O,O</i> -Dimethyl <i>S</i> -2-[1-( <i>N</i> -methylcarbamoyl)ethylthio]ethyl phosphorothioate (synonym: Vamidotion)			nd 0/10	0.22		
[19]	2-(2-Naphthyl)propionanilide (synonym:Naproanilide)					nd~31 1/8	0.2
[20]	<i>o</i> -Nitroanisole	nd~3 1/3	2				
[21]	<i>o</i> -Nitroaniline	nd~12 6/8	1.0			nd~0.22 5/5	0.019
[22]	<i>m</i> -Nitroaniline					200~4,900 5/5	10
[23]	<i>o</i> -Nitrotoluene					nd 0/5	0.3
[24]	Methyl 4-hydroxybenzoate	nd 0/6	2.4				

(Note 1) Detection frequency is based on the number of sites or areas, 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. 3 samples were measured for a site or area, and the detection in more than one out of samples from a site or area can be defined as one detected site or area.

(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 (or areas).

(Note 3)  means the medium was not surveyed.