

Chapter 2 Results of the Detailed Environmental Survey in FY 2008

1. Purpose of the survey

The Detailed Environmental Survey is aimed at understanding the environmental persistence of the Specified Chemical Substances and the Monitored Chemical Substances under the Chemical Substances Control Law (Law No.117 of 1973) and chemicals requiring the Initial Environmental Risk Assessment.

2. Target chemicals

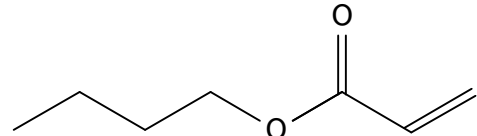
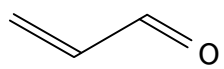
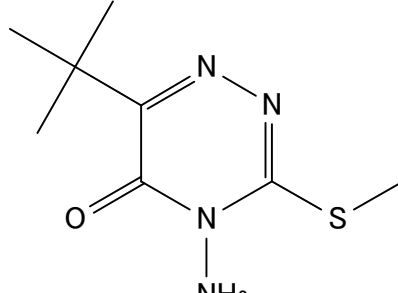
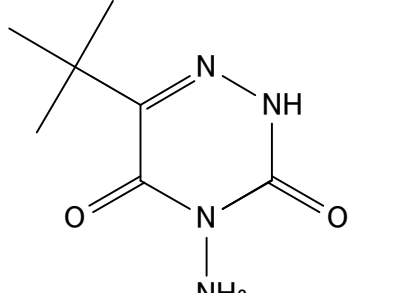
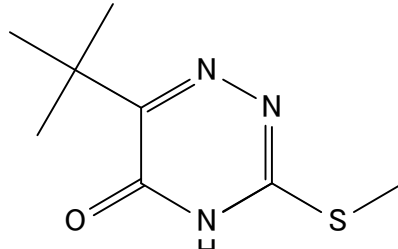
In the FY 2008 Detailed Environmental Survey, 19 chemicals (groups) that were selected and designated as target chemicals. The combinations of target chemicals and the surveyed media are given below.

| No. | Name | The Chemical Substances Control Law | The PRTR Law | | Surveyed media | | |
|------|--|-------------------------------------|---------------------|--------------------|----------------|----------|-----|
| | | | Before the revision | After the revision | Surface water | Sediment | Air |
| [1] | <i>n</i> -Butyl acrylate | | | I 7 | | | ○ |
| [2] | Acrolein | II Monitored III Monitored | I 8 | I 10 | | | ○ |
| [3] | 4-Amino-6- <i>tert</i> -butyl-3-methylthio-1,2,4-triazin-5(4 <i>H</i>)-one (synonym:Metribuzin) and that decomposed compounds | | | | | | |
| | [3-1] 4-Amino-6- <i>tert</i> -butyl-3-methylthio-1,2,4-triazin-5(4 <i>H</i>)-one(synonym:Metribuzin) | | | I 25 | ○ | ○ | ○ |
| | [3-2] 4-amino-6- <i>tert</i> -butyl-2 <i>H</i> -1,2,4-triazine-3,5-dione (synonym:Metribuzin-diketo) | | | | ○ | ○ | |
| | [3-3] 6- <i>tert</i> -butyl-3-methylthio-1,2,4-triazin-5(4 <i>H</i>)-one (synonym:Metribuzin-desamino) | | | | ○ | ○ | |
| | [3-4] 6- <i>tert</i> -butyl-1,2,4-triazine-3,5(2 <i>H</i> ,4 <i>H</i>)-dione (synonym:Metribuzin-desamino-diketo) | | | | ○ | ○ | |
| [4] | Isobutyl alcohol | | | | | | ○ |
| [5] | Quinoline | II Monitored | | I 81 | | | ○ |
| [6] | 4-Chlorophenol (synonym: <i>p</i> -Chlorophenol) | II Monitored III Monitored | II 22 | I 121 | ○ | | |
| [7] | α -Cyano-3-phenoxybenzyl 2-(4-chlorophenyl)-3-methylbutyrate (synonym:Fenvalerate) | | I 106 | | | ○ | |
| [8] | 4,4'-Diaminodiphenylmethane (synonym:4,4'-Methylenedianiline) | II Monitored III Monitored | I 340 | I 446 | ○ | | |
| [9] | Dicyclopentadiene | III Monitored | | I 190 | | | ○ |
| [10] | 1,4-Dimethyl-2-(1-phenylethyl)benzene | II Monitored III Monitored | | | ○ | ○ | |
| [11] | 2,4,5-Trichlorophenol | III Monitored | | | ○ | | |
| [12] | 3,5,5-Trimethyl-2-cyclohexen-1-one (synonym:Isophorone) | | | | | | ○ |
| [13] | Piperazine | II Monitored | I 258 | I 341 | ○ | | |
| [14] | 2- <i>tert</i> -Butyl-5-methylphenol | II Monitored III Monitored | | I 373 | ○ | | |
| [15] | <i>p</i> -Bromophenol | III Monitored | II 67 | | ○ | | |
| [16] | 4- <i>tert</i> -Pentylphenol | | | | ○ | ○ | |
| [17] | 1-Naphthyl <i>N</i> -methylcarbamate (synonym:Carbaryl or NAC) and that decomposed compound | | | | | | |
| | [17-1] 1-Naphthyl <i>N</i> -methylcarbamate (synonym: Carbaryl or NAC) | | I 329 | I 427 | ○ | | |
| | [17-2] 1-Naphthol | | | | ○ | | |
| [18] | 3-Methylpyridine | | I 336 | I 439 | | | ○ |
| [19] | <i>S</i> -Methyl- <i>N</i> -(methylcarbamoyloxy)thioacetimidate (synonym:Methomyl) | | | I 443 | ○ | | |

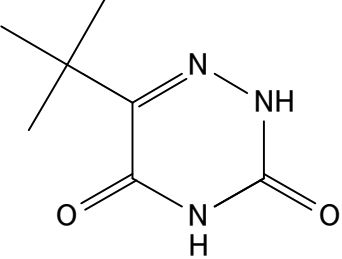
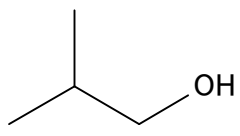
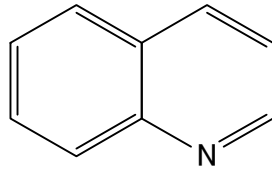
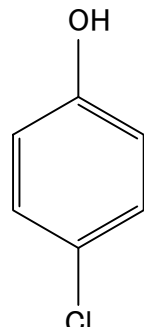
(Note 1) "The PRTR Law" hereafter means "Act on Confirmation, etc. of Release Amounts of Specific Chemical Substances in the Environment and Promotion of Improvements to the Management Thereof (Law No. 86 of 1999)."

(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".

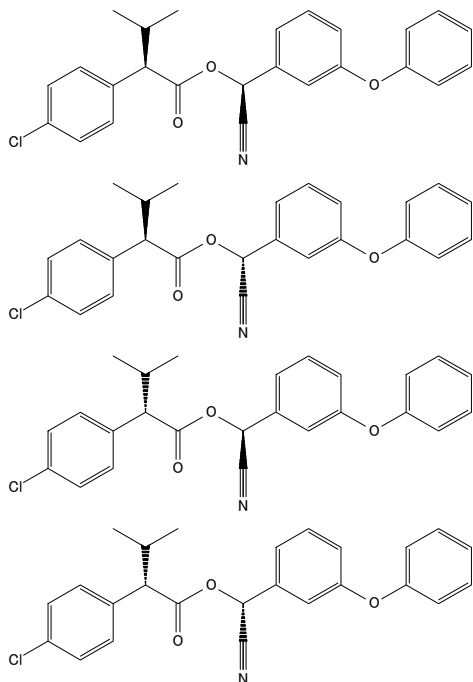
Chemical and physical properties of target chemicals of the Detailed Environmental Survey are as follows.

| | |
|--|--|
| <p>[1] <i>n</i>-Butyl acrylate</p>  | <p>Molecular formula: C₇H₁₂O₂ CAS: 141-32-2 ENCS: 2-989 MW: 128.17 mp: -64.6°C¹⁾ bp: 145°C²⁾ SW: 0.14g/100mL(20°C)²⁾ Specific gravity: 0.8986(20/4°C)²⁾ logPow: 2.36³⁾</p> |
| <p>[2] Acrolein</p>  | <p>Molecular formula: C₃H₄O CAS: 107-02-8 ENCS: 2-521 MW: 56.06 mp: -88°C²⁾ bp: 52.5°C²⁾ SW: 263g/kg(20°C)¹⁾ Specific gravity: 0.8389(20°C)²⁾ logPow: -0.01³⁾</p> |
| <p>[3] 4-Amino-6-<i>tert</i>-butyl-3-methylthio-1,2,4-triazin-5(4<i>H</i>)-one (synonym:Metribuzin) and that decomposed compounds</p> | |
| <p>[3-1] 4-Amino-6-<i>tert</i>-butyl-3-methylthio-1,2,4-triazin-5(4<i>H</i>)-one (synonym:Metribuzin)</p>  | <p>Molecular formula: C₈H₁₄N₄OS CAS: 21087-64-9 ENCS: No pertinence MW: 214.29 mp: 125~126°C²⁾ bp: Uncertain SW: 1,200ppm²⁾ Specific gravity: 1.28(20/4°C)²⁾ logPow: 1.70³⁾</p> |
| <p>-----</p> | |
| <p>[3-2] 4-amino-6-<i>tert</i>-butyl-2<i>H</i>-1,2,4-triazine-3,5-dione (synonym:Metribuzin-diketo)</p>  | <p>Molecular formula: C₇H₁₂N₄O₂ CAS: 56507-37-0 ENCS: No pertinence MW: 184.20 mp: Uncertain bp: Uncertain SW: Uncertain Specific gravity: Uncertain logPow: Uncertain</p> |
| <p>-----</p> | |
| <p>[3-3] 6-<i>tert</i>-butyl-3-methylthio-1,2,4-triazin-5(4<i>H</i>)-one (synonym:Metribuzin-desamino)</p>  | <p>Molecular formula: C₈H₁₃N₃OS CAS: 35045-02-4 ENCS: No pertinence MW: 199.27 mp: Uncertain bp: Uncertain 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 atom \cong 101.3kPa).

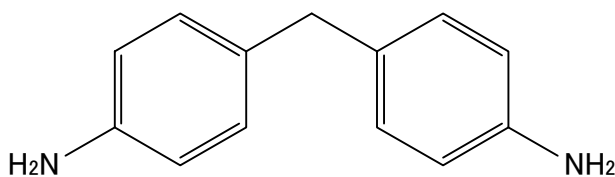
| | |
|---|--|
| <p>[3-4] 6-<i>tert</i>-butyl-1,2,4-triazine-3,5(2<i>H</i>,4<i>H</i>)-dione (synonym:Metribuzin-desamino-diketo)</p>  | <p>Molecular formula: C₇H₁₁N₃O₂ CAS: 52236-30-3 ENCs: No pertinence MW: 169.18 mp: Uncertain bp: Uncertain SW: Uncertain Specific gravity: Uncertain logPow: Uncertain</p> |
| <p>[4] Isobutyl alcohol</p>  | <p>Molecular formula: C₄H₁₀O CAS: 78-83-1 ENCs: 2-3049 MW: 74.12 mp: -108°C²⁾ bp: 108°C²⁾ SW: 約 20%²⁾ Specific gravity: 0.806(15°C)²⁾ logPow: 0.76³⁾</p> |
| <p>[5] Quinoline</p>  | <p>Molecular formula: C₉H₇N CAS: 91-22-5 ENCs: 5-794 MW: 129.16 mp: -15°C²⁾ bp: 237.7°C²⁾ SW: 6.33g/kg(20°C)¹⁾ Specific gravity: 1.0900(25/4°C)²⁾ logPow: 2.03³⁾</p> |
| <p>[6] 4-Chlorophenol (synonym:<i>p</i>-Chlorophenol)</p>  | <p>Molecular formula: C₆H₅ClO CAS: 106-48-9 ENCs: 3-895 MW: 128.56 mp: 43.2~43.7°C²⁾ bp: 220°C²⁾ SW: 26.2g/kg(25°C)¹⁾ Specific gravity: 1.2651g/cm³(40°C)¹⁾ logPow: 2.39³⁾</p> |

[7] α -Cyano-3-phenoxybenzyl 2-(4-chlorophenyl)-3-methylbutyrate (synonym:Fenvalerate)



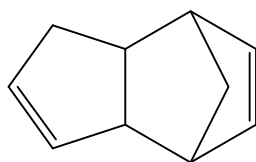
Molecular formula: $C_{25}H_{22}ClNO_3$
 CAS: 51630-58-1
 ENCS: No pertinence
 MW: 419.90
 mp: Uncertain
 bp: $300^{\circ}C(37mmHg)^4$
 SW: $0.085mg/L^5$
 Specific gravity: $1.17(23^{\circ}C)^2$
 logPow: 6.20^3

[8] 4,4'-Diaminodiphenylmethane (synonym:4,4'-Methylenedianiline)



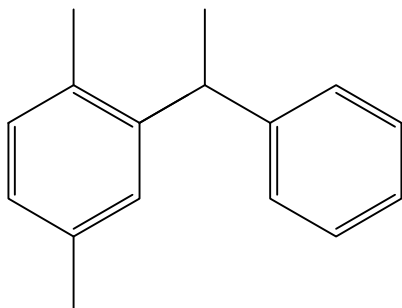
Molecular formula: $C_{13}H_{14}N_2$
 CAS: 101-77-9
 ENCS: 4-40
 MW: 198.26
 mp: $91.5\sim 92^{\circ}C^2$
 bp: $398\sim 399^{\circ}C^2$
 SW: $1.25g/L(20^{\circ}C)^6$
 Specific gravity: $1.056(100^{\circ}C)^6$
 logPow: 1.59^3

[9] Dicyclopentadiene

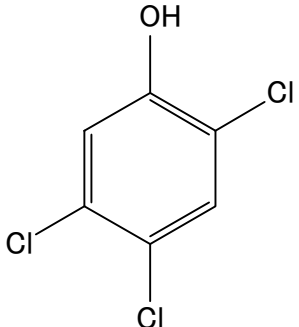
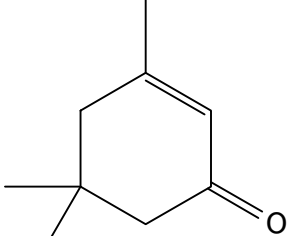
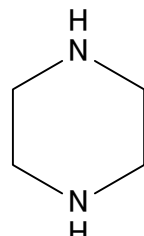
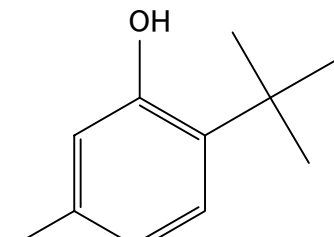
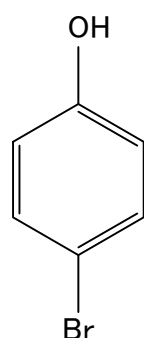


Molecular formula: $C_{10}H_{12}$
 CAS: 77-73-6
 ENCS: 4-634
 MW: 132.2
 mp: $32^{\circ}C^1$
 bp: $170^{\circ}C^1$
 SW: $20mg/L(25^{\circ}C)^7$
 Specific gravity: $0.9302g/cm^3(35^{\circ}C)^1$
 logPow: $2.78(25^{\circ}C)^7$

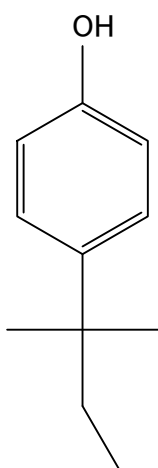
[10] 1,4-Dimethyl-2-(1-phenylethyl)benzene



Molecular formula: $C_{16}H_{18}$
 CAS: 6165-51-1
 ENCS: 4-38, 4-244
 MW: 210.31
 mp: $<-50^{\circ}C^8$
 bp: Uncertain
 SW: $0.96mg/L(25^{\circ}C)^8$
 Specific gravity: $0.989g/cm^3(15^{\circ}C)^8$
 logPow: $5.39(25^{\circ}C)^8$

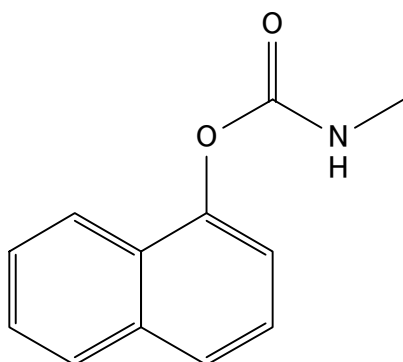
| | |
|--|--|
| <p>[11] 2,4,5-Trichlorophenol</p>  | <p>Molecular formula: C₆H₃Cl₃O CAS: 95-95-4 ENCS: 3-931 MW: 197.45 mp: 67°C²⁾ bp: 253°C²⁾ SW: 1g/kg(25°C)¹⁾ Specific gravity: 1.678(25/4°C)⁹⁾ logPow: 3.72³⁾</p> |
| <p>[12] 3,5,5-Trimethyl-2-cyclohexen-1-one (synonym: Isophorone)</p>  | <p>Molecular formula: C₉H₁₄O CAS: 78-59-1 ENCS: 3-2381, 3-2389 MW: 138.21 mp: -8.1°C¹⁾ bp: 215.3°C²⁾ SW: 12.000mg/L(20°C)²⁾ Specific gravity: 0.9613(20/4°C)²⁾ logPow: 1.70³⁾</p> |
| <p>[13] Piperazine</p>  | <p>Molecular formula: C₄H₁₀N₂ CAS: 110-85-0 ENCS: 5-953 MW: 86.14 mp: 106°C²⁾ bp: 146°C²⁾ SW: Freely soluble²⁾ Specific gravity: 1.1(20/4°C)¹⁰⁾ logPow: -1.50³⁾</p> |
| <p>[14] 2-<i>tert</i>-Butyl-5-methylphenol</p>  | <p>Molecular formula: C₁₁H₁₆O CAS: 88-60-8 ENCS: 3-521 MW: 164.24 mp: 46.5°C¹⁾ bp: 117°C(11mmHg)¹⁾ SW: 0.42g/L(25°C)¹¹⁾ Specific gravity: 0.922g/cm³(80°C)¹⁾ logPow: 4.11(25°C)¹¹⁾</p> |
| <p>[15] <i>p</i>-Bromophenol</p>  | <p>Molecular formula: C₆H₅BrO CAS: 106-41-2 ENCS: 3-896 MW: 173.01 mp: 64°C²⁾ bp: 238°C²⁾ SW: 19.0g/kg(25°C)¹⁾ Specific gravity: 1.840(15°C)²⁾ logPow: 2.59³⁾</p> |

[16] 4-*tert*-Pentylphenol



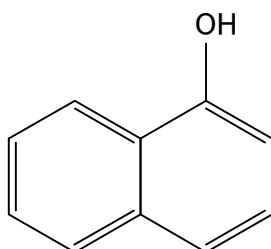
Molecular formula: C₁₁H₁₆O
 CAS: 80-46-6
 ENCS: 3-503
 MW: 164.24
 mp: 94~95°C²⁾
 bp: 262.5°C²⁾
 SW: 0.17g/kg(25°C)¹⁾
 Specific gravity: 0.962(20/4°C)²⁾
 logPow: Uncertain

[17] 1-Naphthyl *N*-methylcarbamate (synonym:Carbaryl or NAC) and that decomposed compound
 [17-1] 1-Naphthyl *N*-methylcarbamate (synonym:Carbaryl or NAC)



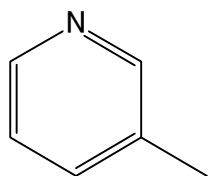
Molecular formula: C₁₂H₁₁NO₂
 CAS: 63-25-2
 ENCS: 4-387
 MW: 201.22
 mp: 142°C²⁾
 bp: Uncertain
 SW: 120mg/L(30°C)²⁾
 Specific gravity: 1.232(20/20°C)²⁾
 logPow: 2.36³⁾

[17-2] 1-Naphthol



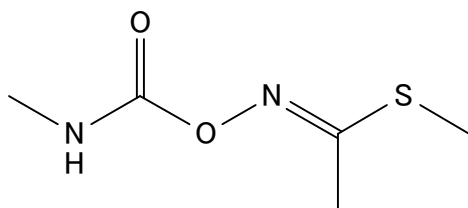
Molecular formula: C₁₀H₈O
 CAS: 90-15-3
 ENCS: 4-354
 MW: 144.17
 mp: 96°C²⁾
 bp: 288°C²⁾
 SW: 1.11g/kg(20°C)¹⁾
 Specific gravity: 1.0954(98.7/4°C)²⁾
 logPow: 2.85³⁾

[18] 3-Methylpyridine



Molecular formula: C₆H₇N
 CAS: 108-99-6
 ENCS: 5-711
 MW: 93.13
 mp: -18.14°C¹⁾
 bp: 143~144°C²⁾
 SW: Freely soluble²⁾
 Specific gravity: 0.9613(15/4°C)²⁾
 logPow: 1.20³⁾

[19] *S*-Methyl-*N*-(methylcarbamoyloxy)thioacetimidate (synonym:Methomyl)



Molecular formula: C₅H₁₀N₂O₂S
 CAS: 16752-77-5
 ENCS: No pertinence
 MW: 162.21
 mp: 78~79°C²⁾
 bp: Uncertain
 SW: 5.8w/w%(25°C)²⁾
 Specific gravity: 1.2946(24/4°C)²⁾
 logPow: 0.60³⁾

References

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- 8) OECD, 1,4-Dimethyl-2-(1-phenylethyl)benzene, SIDS Initial Assessment Report for 17th SIM (2003)
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- 11) OECD, 6-*tert*-Butyl-*m*-cresol, SIDS Initial Assessment Report for 15th SIAM (2002)

3. Surveyed site and procedure

In the Detailed 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. In addition to the ordinary survey, the water for target chemicals [3], [17] and [19], and sediment for target chemicals [3] were sampled in the summer as the pesticide survey by a private analytical laboratory.

(1) Organisations responsible for sampling

| Local communities | Organisations responsible for sampling | Surveyed media | | |
|-------------------|--|----------------|----------|-----------------|
| | | Surface water | Sediment | Air |
| Hokkaido | Hokkaido 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 | ○ | ○ | ○ ^{*2} |
| Yamagata Pref. | Environmental Science Research Center of Yamagata Prefecture | ○ | ○ | |
| Ibaraki Pref. | Ibaraki Kasumigaura Environmental Science Center | ○ | ○ | ○ ^{*2} |
| Tochigi Pref. | Tochigi Prefectural Institute of Public Health and Environmental Science | ○ | | |
| Saitama Pref. | Center for Environmental Science in Saitama | ○ | | ○ ^{*2} |
| Chiba Pref. | Chiba Prefectural Environmental Research Center | ○ | | ○ ^{*2} |
| Tokyo Met. | Tokyo Metropolitan Research Institute for Environmental Protection | ○ | ○ | |
| Kanagawa Pref. | Kanagawa Environmental Research Center | | | ○ ^{*2} |
| 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 | ○ | ○ | ○ ^{*2} |
| Nagano Pref. | Nagano Environmental Conservation Research Institute | ○ | ○ | ○ |
| Gifu Pref. | Gifu Prefectural Research Institute for Health and Environmental Sciences | | | ○ ^{*2} |
| Aichi Pref. | Aichi Environmental Research Center | ○ | ○ | |
| Nagoya City | Nagoya City Environmental Science Research Institute | ○ | | ○ ^{*2} |
| 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 | ○ | ○ | ○ ^{*3} |
| Kyoto City | Kyoto City Institute of Health and Environmental Sciences | ○ | ○ | |
| Osaka Pref. | Research Institute of Environment, Agriculture and Fisheries, Osaka Prefectural Government | ○ | ○ | ○ ^{*2} |
| Osaka City | Osaka City Institute of Public Health and Environmental Sciences | ○ | ○ | |
| Hyogo Pref. | Hyogo Prefectural Institute of Public Health and Environmental Sciences | ○ | ○ | ○ ^{*3} |
| 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 | ○ | ○ | |
| Hiroshima Pref. | Hiroshima Prefectural Technology Research Institute Health and Environment Center | ○ | ○ | |
| Yamaguchi Pref. | Yamaguchi Prefectural Public Health and Environment | ○ | ○ | ○ ^{*2} |
| Tokushima Pref. | Tokushima Prefectural Institute of Public Health and Environmental Sciences | ○ | ○ | |
| 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 | | | ○ ^{*2} |
| Kitakyushu City | Kitakyushu City Institute of Environmental Sciences | ○ | ○ | ○ ^{*2} |
| Fukuoka City | Fukuoka City Institute for Hygiene and the Environment | ○ | ○ | |
| Saga Pref. | Saga Prefectural Environmental Research Center | ○ | ○ | ○ ^{*2} |
| Kumamoto Pref. | Kumamoto Prefectural Institute of Public Health and Environmental Science | | | ○ |
| Kagoshima Pref. | Kagoshima Prefectural Institute for Environmental Research and Public Health | ○ | ○ | |

(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 (or areas) and target chemicals

Surveyed sites and target chemicals for surface water are shown in Table 2-1-1 and Figure 2-1-1. Surveyed sites and target chemicals for sediment are shown in Table 2-1-2 and Figure 2-1-1. Surveyed sites and target chemicals for air are shown in Table 2-1-4 and Figure 2-1-3. The breakdown is summarized as follows. Surveyed sites and target chemicals for surface water and sediment at the pesticide survey are shown in Table 2-1-3 and Figure 2-1-2.

| Surveyed media | Numbers of local communities | Numbers of target chemicals | Numbers of surveyed sites | Numbers of samples at a surveyed site |
|----------------|------------------------------|-----------------------------|---------------------------|---------------------------------------|
| Surface water | 37 | 11 | 48 ^{*1} | 3 ^{*2} |
| Sediment | 31 | 4 | 35 ^{*1} | 3 |
| Air | 22 ^{*3} | 8 | 23 | 3 |
| All media | 41 | 19 | 71 | |

(Note 1) *1: In addition to the ordinary survey, the water for target chemicals [3], [17] and [19], and sediment for target chemicals [3] were sampled at 20 sites in the summer as the pesticide survey.

(Note 1) *2: For target chemicals [3], [17], and [19] specimens were sampled during 3 days taking into consideration the time of pesticide spraying at the pesticide survey.

(Note 3) *3: 13 of the 22 organizations sampled some of the specimens and cooperated with private analytical laboratories in sampling other specimens. 2 organizations cooperated with private analytical laboratories in sampling all specimens.

Table 2-1-1 List of surveyed sites (surface water) and target chemicals in the Detailed Environmental Survey in FY 2008

| Local communities | Surveyed sites | Target chemicals | | | | | | | | | | |
|-------------------|--|------------------|-----|-----|------|------|------|------|------|------|------|------|
| | | [3] | [6] | [8] | [10] | [11] | [13] | [14] | [15] | [16] | [17] | [19] |
| Hokkaido | Ishikarikakokyo Bridge, Mouth of Riv. Ishikari(Ishikari City) | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Sapporo City | Nakanuma of Riv. Toyohira(Sapporo City) | | | | ○ | | ○ | | | | | |
| | Azuma-bashi Bridge, Riv. Toyohira(Sapporo City) | | | | ○ | | ○ | | | | | |
| Iwate Pref. | Riv. Toyosawa(Hanamaki City) | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Miyagi Pref. | Nishimae Bridge of Riv. Hasama(Tome City) | ○ | ○ | | | ○ | | | ○ | ○ | ○ | ○ |
| | Funaoka-ohashi Bridge, Riv. Shiraishi(Shibata Town) | ○ | ○ | | | ○ | | | ○ | ○ | ○ | ○ |
| Sendai City | Hirose-ohashi Bridge, Riv. Hirose(Sendai City) | | | | ○ | ○ | | | | | | |
| Yamagata Pref. | Mouth of Riv. Mogami(Sakata City) | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ibaraki Pref. | Katta-bashi Bridge, Riv. Naka(Hitachinaka City) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | Tonekamome-ohashi Bridge, Mouth of Riv. Tone(Kamisu City) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | Fukawasakae Bridge of Mouth of Riv. Tone(Tone Town) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Tochigi Pref. | Riv. Tagawa(Utsunomiya City) | | ○ | | | ○ | | ○ | ○ | ○ | | |
| Saitama Pref. | Shiki-ohashi Bridge, Riv. Yanase(Shiki City) | | | | | | | ○ | | | | ○ |
| | Kachi-hashhi Bridge, Riv. Ichino(Yoshimi Town) | | | | | | | ○ | | | | ○ |
| 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) | ○ | ○ | | | | ○ | | ○ | | ○ | ○ |
| 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) | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nagano Pref. | Lake Suwa(center) | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Aichi Pref. | Nagoya Port | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Nagoya City | Minatoshinbashi Bridge, Riv. Hor (Nagoya City) | ○ | | | | | | | | | ○ | |
| Mie Pref. | Yokkaichi Port | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Shiga Pref. | Lake Biwa(center, offshore of Karasaki) | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Kyoto Pref. | Miyazu Port | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Kyoto City | Miyamae Bridge, Riv. Katsura(Kyoto City) | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Osaka Pref. | Mouth of Riv. Yamato(Sakai City) | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Osaka City | Kema Bridge, Riv. Oh-kawa (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 | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Hiroshima Pref. | Kure Port | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Yamaguchi Pref. | Tokuyama Bay | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| | Offshore of Hagi | | | | | ○ | | | | | | |
| Tokushima Pref. | Mouth of Riv. Yoshino(Tokushima City) | ○ | | | | | | | | | | |
| Kagawa Pref. | Takamatsu Port | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Ehime Pref. | Mishima area, Riv. Iwamatsu(Uwajima City) | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Kitakyushu City | Kanmon Strait | | | | | ○ | | | | | | |
| | Dokai Bay | | | | | ○ | | | | | | |
| Fukuoka City | Hakata Bay | | | | ○ | | | | | | | |
| Saga Pref. | Imari Bay | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Kagoshima Pref. | Gotanda-bashi Bridge, Riv. Gotanda(Ichikikushikino City) | ○ | ○ | ○ | | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

[3] 4-Amino-6-*tert*-butyl-3-methylthio-1,2,4-triazin-5(4*H*)-one (synonym:Metribuzin) and that decomposed compounds, [6] 44-Chlorophenol (synonym:*p*-Chlorophenol), [8] 4,4'-Diaminodiphenylmethane (synonym:4,4'-Methylenedianiline), [10] 1,4-Dimethyl-2-(1-phenylethyl)benzene, [11] 2,4,5-Trichlorophenol, [13] Piperazine, [14] 2-*tert*-Butyl-5-methylphenol, [15] *p*-Bromophenol, [16] 4-*tert*-Pentylphenol, [17] 1-Naphthyl *N*-methylcarbamate (synonym:Carbaryl or NAC) and that decomposed compound,[19] *S*-Methyl-*N*-(methylcarbamoyloxy)thioacetimidate (synonym:Methomyl)

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

| Local communities | Surveyed sites | Target chemicals | | | |
|-------------------|--|------------------|-----|------|------|
| | | [3] | [7] | [10] | [16] |
| Hokkaido | Ishikarikakokyo Bridge, Mouth of Riv. Ishikari(Ishikari City) | ○ | ○ | ○ | ○ |
| Sapporo City | Azuma-bashi Bridge, Riv. Toyohira(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) | ○ | ○ | | ○ |
| Ibaraki Pref. | Tonekamome-ohashi Bridge, Mouth of Riv. Tone(Kamisu City) | ○ | ○ | ○ | ○ |
| Tokyo Met. | Mouth of Riv. Arakawa(Koto Ward) | ○ | ○ | | ○ |
| | Mouth of Riv. Sumida(Minato Ward) | ○ | ○ | | ○ |
| Yokohama City | Kamenoko Bridge over Riv.Tsurumi (Yokohama City) | | ○ | | |
| 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) | ○ | ○ | | ○ |
| Nagano Pref. | Lake Suwa(center) | ○ | ○ | | ○ |
| Aichi Pref. | Nagoya Port | ○ | ○ | ○ | ○ |
| Mie Pref. | Yokkaichi Port | ○ | ○ | ○ | ○ |
| Shiga Pref. | Lake Biwa(center, offshore of Karasaki) | ○ | ○ | | ○ |
| Kyoto Pref. | Miyazu Port | ○ | ○ | | ○ |
| Kyoto City | Miyamae Bridge, Riv. Katsura(Kyoto City) | ○ | ○ | | ○ |
| Osaka Pref. | Mouth of Riv. Yamato(Sakai City) | ○ | ○ | | ○ |
| Osaka City | Kema Bridge, Riv. Oh-kawa (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 | ○ | ○ | | ○ |
| Hiroshima Pref | Kure Port | ○ | ○ | | ○ |
| Yamaguchi Pref. | Tokuyama Bay | ○ | ○ | | ○ |
| Tokushima Pref. | Mouth of Riv. Yoshino(Tokushima City) | ○ | | | |
| Kagawa Pref. | Takamatsu Port | ○ | ○ | ○ | ○ |
| Kitakyushu City | Dokai Bay | | ○ | ○ | |
| Fukuoka City | Hakata Bay | | | ○ | |
| Saga Pref. | Imari Bay | ○ | ○ | ○ | ○ |
| Kagoshima Pref. | Gotanda-bashi Bridge, Riv. Gotanda(Ichikikushikino City) | ○ | ○ | | ○ |

[3] 4-Amino-6-*tert*-butyl-3-methylthio-1,2,4-triazin-5(4*H*)-one (synonym:Metribuzin) and that decomposed compounds, [7] α -Cyano-3-phenoxybenzyl 2-(4-chlorophenyl)-3- methylbutyrate (synonym:Fenvalerate), [10] 1,4-Dimethyl-2-(1-phenylethyl) benzene, [16] 4-*tert*-Pentylphenol

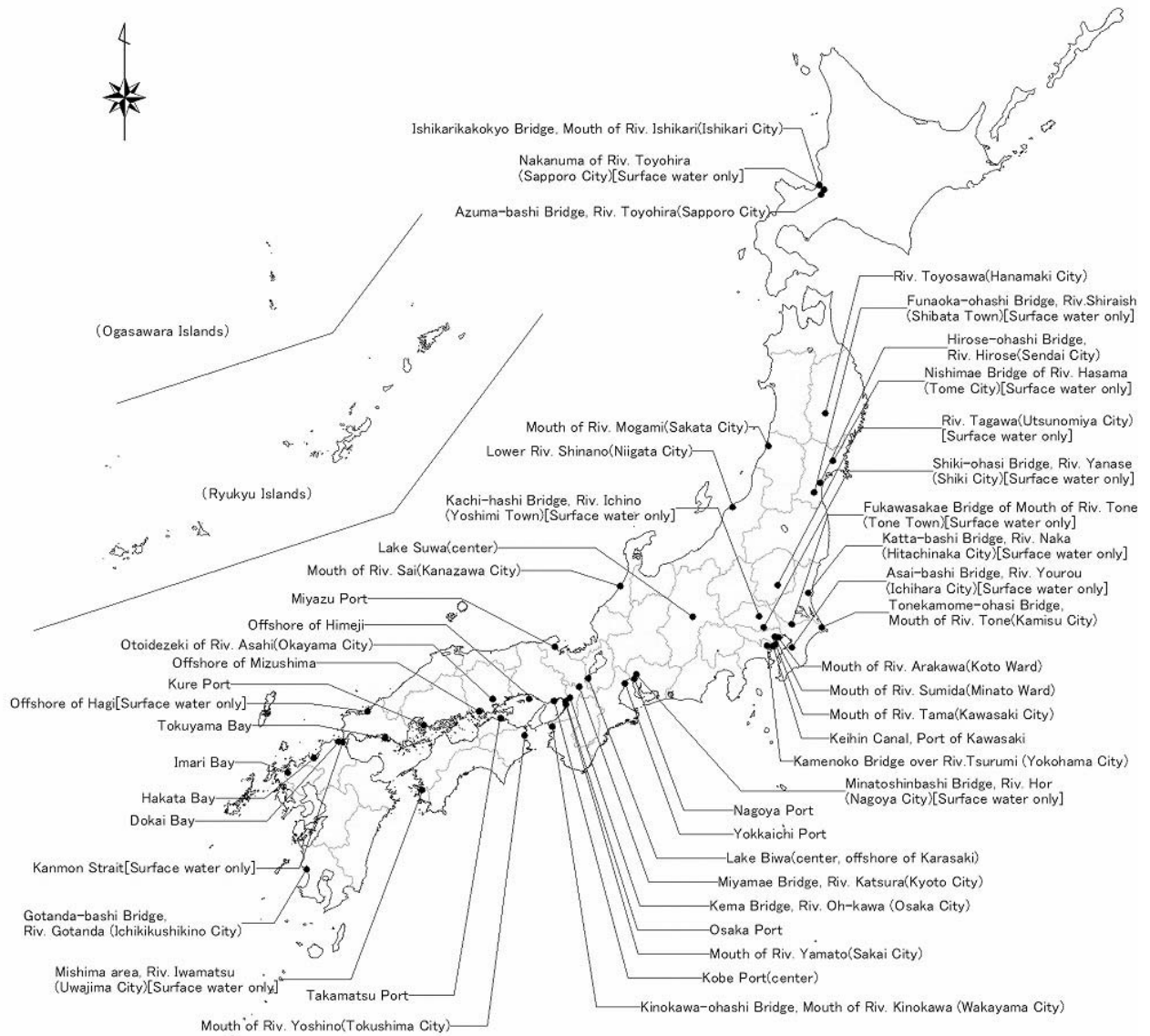


Figure 2-1-1 Surveyed sites (surface water and sediment) in the Detailed Environmental Survey in FY 2008

Table 2-1-3 List of surveyed sites (surface water and sediment) and target chemicals in the Detailed Environmental Survey (the Pesticide Survey) in FY 2008

| Local communities | Surveyed sites | Target chemicals | | |
|-------------------|--|------------------|------|------|
| | | [3] | [17] | [19] |
| Hokkaido | Suzuran-ohashi Bridge, Riv Tokachi(Obihiro City) | ○ | ○ | ○ |
| | Ishikarikakokyo Bridge, Mouth of Riv. Ishikari(Ishikari City) | ○ | ○ | ○ |
| Iwate Pref. | Riv. Toyosawa(Hanamaki City) | ○ | ○ | ○ |
| Yamagata Pref. | Mouth of Riv. Mogami(Sakata City) | ○ | ○ | ○ |
| Ibaraki Pref. | Riv. Tone(Inashiki City,Kawauchi Town) | ○ | ○ | ○ |
| Tochigi Pref. | Riv. Tagawa(Utsunomiya City) | ○ | ○ | ○ |
| Tokyo Met. | Mouth of Riv. Arakawa(Koto Ward) | ○ | ○ | ○ |
| | Mouth of Riv. Sumida(Minato Ward) | ○ | ○ | ○ |
| Niigata Pref. | Lower Riv. Shinano(Niigata City) | ○ | ○ | ○ |
| Toyama Pref. | Hagiura-bashi Bridge, Mouth of Riv. Jintsu(Toyama City) | ○ | ○ | ○ |
| Ishikawa Pref. | Mouth of Riv. Sai(Kanazawa City) | ○ | ○ | ○ |
| Fukui Pref. | Mishima-bashi Bridge, Riv. Shono(Tsuruga City) | ○ | ○ | ○ |
| Shizuoka Pref. | Riv. Tenryu(Iwata City) | ○ | ○ | ○ |
| Kyoto City | Miyamae Bridge, Riv. Katsura(Kyoto City) | ○ | ○ | ○ |
| Osaka Pref. | Mouth of Riv. Yamato(Osaka City, Sakai City) | ○ | ○ | ○ |
| Wakayama Pref. | Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa (Wakayama City) | ○ | ○ | ○ |
| Tokushima Pref. | Mouth of Riv. Yoshino(Tokushima City) | ○ | ○ | ○ |
| Kochi Pref. | Mouth of Riv. Shimanto(Shimanto City) | ○ | ○ | ○ |
| Kagoshima Pref. | Riv. Amori(Kirishima City) | ○ | ○ | ○ |
| | Gotanda-bashi Bridge, Riv. Gotanda (Ichikikushikino City) | ○ | ○ | ○ |

[3] 4-Amino-6-*tert*-butyl-3-methylthio-1,2,4-triazin-5(4*H*)-one (synonym:Metribuzin) and that decomposed compounds, [17] 1-Naphthyl *N*-methylcarbamate (synonym:Carbaryl or NAC) and that decomposed compound,[19] *S*-Methyl-*N*-(methylcarbamoyloxy)thioacetimidate (synonym:Methomyl)



Figure 2-1-2 Surveyed sites (surface water and sediment) in the Detailed Environmental Survey (the Pesticide Survey) in FY 2008

Table 2-1-4 List of surveyed sites (air) and target chemicals in the Detailed Environmental Survey in FY 2008

| Local communities | Surveyed sites | Target chemicals | | | | | | | |
|-------------------|--|------------------|-----|-----|-----|-----|-----|------|------|
| | | [1] | [2] | [3] | [4] | [5] | [9] | [12] | [18] |
| 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) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 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) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| 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. | Omuta City Government Building(Omuta City) | ○ | ○ | ○ | ○ | ○ | ○ | ○ | |
| | Munakata Prefectural Government Building(Munakata 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] *n*-Butyl acrylate, [2] Acrolein, [3] 4-Amino-6-*tert*-butyl-3-methylthio-1,2,4-triazin-5(4*H*)-one (synonym:Metribuzin) and that decomposed compounds, [4] Isobutyl alcohol, [5] Quinoline, [9] Dicyclopentadiene, [12] 3,5,5-Trimethyl-2-cyclohexen-1-one (synonym:Isophorone), [18] 3-Methylpyridine



Figure 2-1-4 Surveyed sites (air) in the Detailed 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 Detailed Environmental Survey (hereafter, the Detailed Environmental Survey Analytical Method), if the IDL measured by the analytical laboratory is lower than the given IDL, the MDL of the Detailed Environmental Survey Analytical Method is used as the detection limit by the analytical laboratory.

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

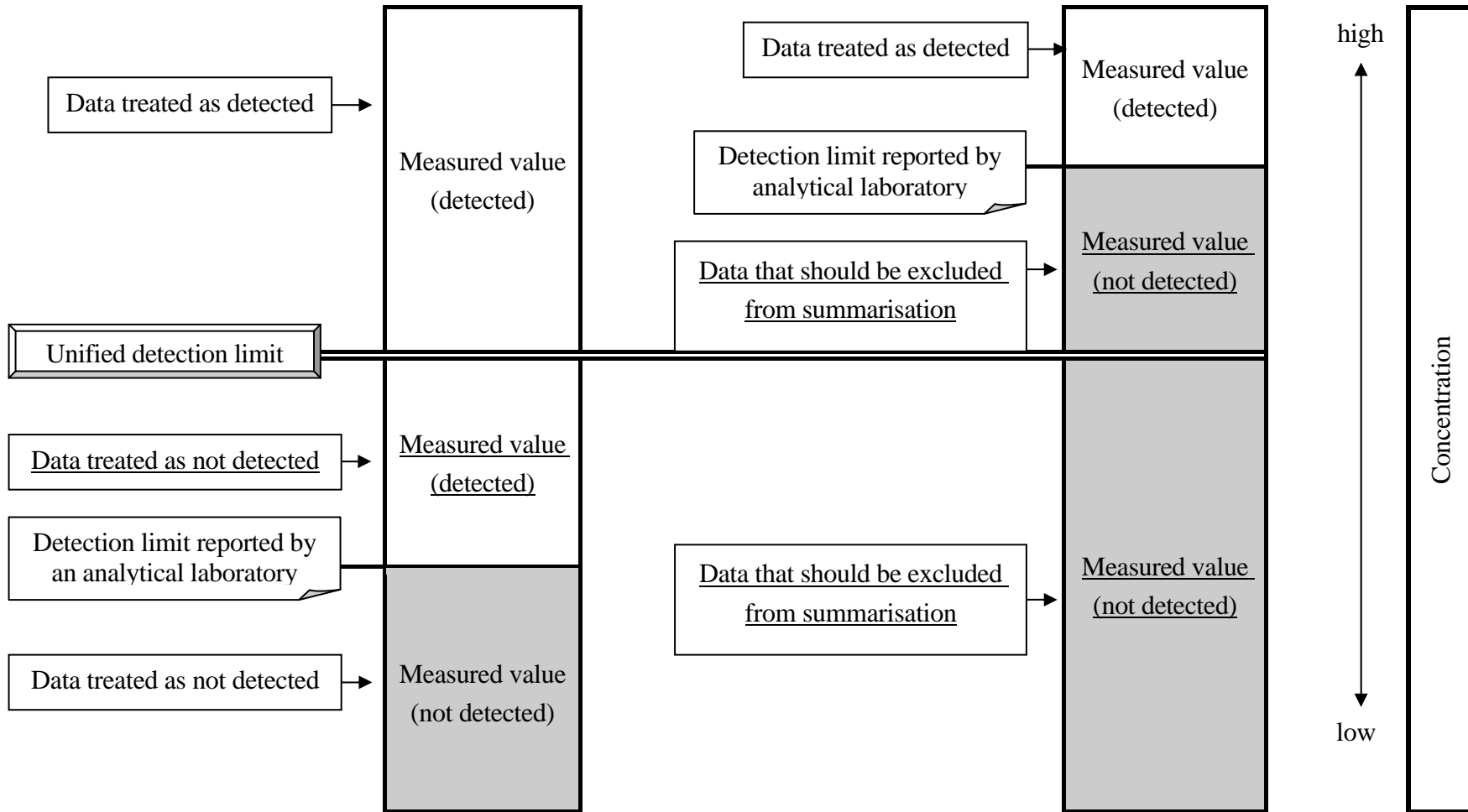
When the analytical laboratory calculates the appropriate IDL and MDL following the calculation method stated in the analytical method development instruction manuals, this calculated MDL is used as the detection limit by the analytical laboratory.

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 Detailed 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 2-2. The survey results are summarized as follows.

In surface water, 8 out of the 11 target chemicals (groups) were detected.

- [3] 4-Amino-6-*tert*-butyl-3-methylthio-1,2,4-triazin-5(4*H*)-one (synonym:Metribuzin) and that decomposed compounds
- [3-1] 4-Amino-6-*tert*-butyl-3-methylthio-1,2,4- triazin-5(4*H*)-one(synonym:Metribuzin): 7 of the 20 valid sites (in summer)
- [3-3] 6-*tert*-butyl-3-methylthio-1,2,4-triazin-5(4*H*)- one (synonym:Metribuzin-desamino): 5 of the 20 valid sites (in summer)
- [3-4] 6-*tert*-butyl-1,2,4-triazine-3,5(2*H*,4*H*)-dione (synonym:Metribuzin-desamino-diketo): 1 of the 20 valid sites (in summer)
- [6] 4-Chlorophenol (synonym:*p*-Chlorophenol) : 34 of the 2 valid sites
- [8] 4,4'-Diaminodiphenylmethane (synonym:4,4'-Methylenedianiline) : 11 of the 28 valid sites
- [10] 1,4-Dimethyl-2-(1-phenylethyl)benzene: 3 of the 7 valid sites
- [13] Piperazine: 4 of the 31 valid sites
- [15] *p*-Bromophenol: 2 of the 34 valid sites
- [17] 1-Naphthyl *N*-methylcarbamate (synonym:Carbaryl or NAC) and that decomposed compound
- [17-1] 1-Naphthyl *N*-methylcarbamate (synonym: Carbaryl or NAC): 19 of the 20 valid sites (in summer)
- [17-2] 1-Naphthol: 20 of the 20 valid sites (in summer)
- [19] *S*-Methyl-*N*-(methylcarbamoyloxy)thioacetimidate (synonym:Methomyl): 16 of the 20 valid sites (in summer) and 7 of the 33 valid sites (in autumn)

In sediment, 2 out of the 4 target chemicals (groups) were detected.

- [10] 1,4-Dimethyl-2-(1-phenylethyl)benzene: 13 of the 13 valid sites
- [16] 4-*tert*-Pentylphenol: 6 of the 26 valid sites

In air, 4 out of the 8 target chemicals (groups) were detected.

- [1] *n*-Butyl acrylate: 1 of the 20 valid sites
- [2] Acrolein: 21 of the 21 valid sites
- [4] Isobutyl alcohol: 11 of the 21 valid sites
- [5] Quinoline: 11 of the 15 valid sites

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

| 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] | <i>n</i> -Butyl acrylate | | | | | nd~78 1/20 | 29 |
| [2] | Acrolein | | | | | 20~500 21/21 | 0.50 |
| [3] | 4-Amino-6- <i>tert</i> -butyl-3-methylthio-1,2,4-triazin-5(4 <i>H</i>)-one (synonym:Metribuzin) and that decomposed compounds | | | | | | |
| [3-1] | 4-Amino-6- <i>tert</i> -butyl-3-methylthio-1,2,4-triazin-5(4 <i>H</i>)-one(synonym:Metribuzin) | Summer nd~4.4 7/20 Autumn nd 0/33 | Summer 1.4 Autumn 1.3 | Summer nd 0/20 Autumn nd 0/26 | Summer 0.046 Autumn 0.0055 | nd 0/20 | 1.5 |
| [3-2] | 4-amino-6- <i>tert</i> -butyl-2 <i>H</i> -1,2,4-triazine-3,5-dione (synonym:Metribuzin-diketo) | Summer nd 0/20 Autumn nd 0/1 | Summer 1.8 Autumn 6.5 | Summer nd 0/20 Autumn nd 0/26 | Summer 0.15 Autumn 0.22 | | |
| [3-3] | 6- <i>tert</i> -butyl-3-methylthio-1,2,4-triazin-5(4 <i>H</i>)-one (synonym:Metribuzin-desamino) | Summer nd~1.4 5/20 Autumn nd 0/1 | Summer 0.46 Autumn 0.14 | Summer nd 0/20 Autumn nd 0/26 | Summer 0.018 Autumn 0.033 | | |
| [3-4] | 6- <i>tert</i> -butyl-1,2,4-triazine-3,5(2 <i>H</i> ,4 <i>H</i>)-dione (synonym:Metribuzin-desamino-diketo) | Summer nd~3.2 1/20 Autumn nd 0/1 | Summer 2.8 Autumn 5.3 | Summer nd 0/20 Autumn nd 0/26 | Summer 0.11 Autumn 0.19 | | |
| [4] | Isobutyl alcohol | | | | | nd~900 11/21 | 170 |
| [5] | Quinoline | | | | | nd~12 11/15 | 0.32 |
| [6] | 4-Chlorophenol (synonym: <i>p</i> -Chlorophenol) | nd~2.7 2/34 | 1.7 | | | | |
| [7] | α -Cyano-3-phenoxybenzyl 2-(4-chlorophenyl)-3-methylbutyrate (synonym:Fenvalerate) | | | nd 0/27 | 1.5* | | |
| [8] | 4,4'-Diaminodiphenylmethane (synonym:4,4'-Methylenedianiline) | nd~16 11/28 | 1.2 | | | | |
| [9] | Dicyclopentadiene | | | | | nd 0/20 | 2.5 |
| [10] | 1,4-Dimethyl-2-(1-phenylethyl)benzene | nd~17 3/7 | 2.1 | 0.04~65 13/13 | 0.02 | | |
| [11] | 2,4,5-Trichlorophenol | nd 0/36 | 7 | | | | |
| [12] | 3,5,5-Trimethyl-2-cyclohexen-1-one (synonym:Isophorone) | | | | | nd 0/21 | 31 |
| [13] | Piperazine | nd~40 4/31 | 4 | | | | |
| [14] | 2- <i>tert</i> -Butyl-5-methylphenol | nd 0/33 | 1.9 | | | | |
| [15] | <i>p</i> -Bromophenol | nd~2.9 2/34 | 1.8 | | | | |
| [16] | 4- <i>tert</i> -Pentylphenol | nd 0/33 | 1.1 | nd~0.44 6/26 | 0.28 | | |

| 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 |
| [17] | 1-Naphthyl <i>N</i> -methylcarbamate (synonym: Carbaryl or NAC) and that decomposed compound | | | | | | |
| [17-1] | 1-Naphthyl <i>N</i> -methylcarbamate (synonym: Carbaryl or NAC) | Summer nd~9.9 19/20 Autumn nd 0/32 | Summer 0.011 Autumn 0.53 | | | | |
| [17-2] | 1-Naphthol | Summer nd~9.3 20/20 Autumn - | Summer 0.35 Autumn - | | | | |
| [18] | 3-Methylpyridine | | | | | nd 0/7 | 3.4 |
| [19] | <i>S</i> -Methyl- <i>N</i> -(methylcarbamoyloxy)thioacetimide (synonym: Methomyl) | Summer nd~36 16/20 Autumn nd~6.4 7/33 | Summer 0.38 Autumn 3.0 | | | | |

(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.

(Note 4) * is the sum value of detection limits of each congener, and therefore a detection range that does not exceed this value can be shown instead of "nd".

(Note 5) "Summer" means the pesticide survey results and "Autumn" means the ordinary survey results.