Chapter 1 Results of the Initial Environmental Survey in FY2024

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 FY2024 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	Sedi-ment	Air
[1]	Allyl alcohol			I 22	I 28	I 28			○
[2]	1-Allyloxy-2,3-epoxypropane	II Monitored		I 23	I 29	I 29			○
[3]	4,4'-Diaminodiphenyl ether				I 143	I 163	○		
[4]	Diphenyl ether (synonym: Phenoxybenzene)	III Monitored			I 204	II 55	○		
[5]	Tributylamine				I 292	I 335	○	○	
[6]	Butyl-2,3-epoxypropyl ether	II Monitored			I 359	II 97	○		
[7]	4-*tert*-Butylphenol	II Monitored			I 368	II 106	○		
[8]	*N*-(tert-Butyl)-2-benzothiazolesulfenamide	III Monitored		I 282	I 372	II 109	○		
[9]	Propanal (synonym: Propionaldehyde)								○
[10]	Phosphate triesters								
	[10-1] Tris(2-chloro-1-methylethyl) phosphate (synonym: Tris(2-chloroisopropyl) phosphate)						○		
	[10-2] Tris(1,3-dichloro-2-propyl) phosphate						○		○
	[10-3] Tris(2-butoxyethyl) phosphate						○		
	[10-4] Tributyl phosphate	II Monitored		I 354	I 462	I 515	○	○	○

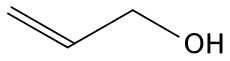
(Note 1) “The Chemical Substances Control Law” hereafter means “Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances (Law No. 117 of 1973).”

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

(Note 3) “2000-” in the “The PRTR Law” means designation at the time of enactment of government ordinance of tha low 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.

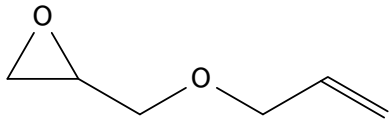
Chemical and physical properties of target chemicals of the Initial Environmental Survey are as follows.

[1] Allyl alcohol



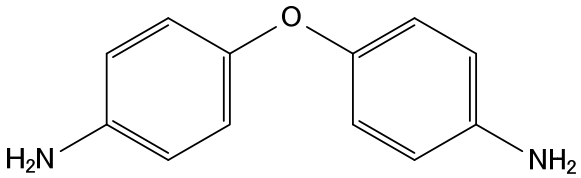
Molecular formula: C_3H_6O
CAS: 107-18-6
ENCS: 2-260
MW: 58.08
mp: -50°C [1)]
bp: 96 ~ 97°C [1)]
sw: Miscible [1)]
Specific gravities: 0.8540 (20°C/4°C) [1)]
logPow: 0.17 [1)]

[2] 1-Allyloxy-2,3-epoxypropane



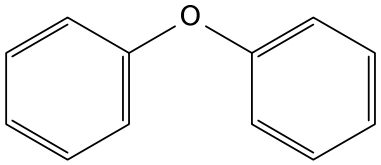
Molecular formula: $C_6H_{10}O_2$
CAS: 106-92-3
ENCS: 2-393
MW: 114.14
mp: -100°C (freezing point) [2)]
bp: 154°C (760 mmHg) [2)]
sw: 128 g/L (20.2°C) [2)]
Specific gravities: 0.9698 g/cm^3 (20°C) [2)]
logPow: 0.34 [2)]

[3] 4,4'-Diaminodiphenyl ether



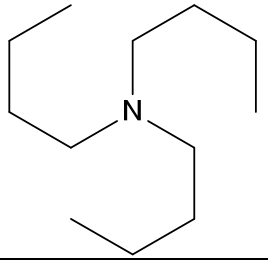
Molecular formula: $C_{12}H_{12}N_2O$
CAS: 101-80-4
ENCS: 3-854
MW: 200.24
mp: 191.5°C [3)]
bp: 396.8°C (731 mmHg) [3)]
sw: 48 mg/L (20°C、pH=6.49 ~ 6.71) [3)]
Specific gravities: 1.3 g/cm^3 (20°C) [3)]
logPow: 1.36 (pH=7.4) [3)]

[4] Diphenyl ether (synonym: Phenoxybenzene)



Molecular formula: $C_{12}H_{10}O$
CAS: 101-84-8
ENCS: 3-650
MW: 170.21
mp: 28°C [4)]
bp: 257°C [4)]
sw: 18 mg/L (25°C) [5)]
Specific gravities: 1.075 (20°C/4°C) [5)]
logPow: 4.21 (25°C) [5)]

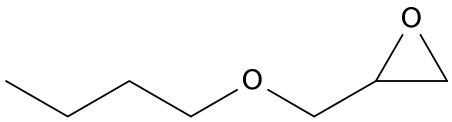
[5] Tributylamine



Molecular formula: $C_{12}H_{27}N$
CAS: 102-82-9
ENCS: 2-142
MW: 185.35
mp: ≤-90°C [6)]
bp: 208°C (101 kPa)[6)]
sw: 80 mg/L (20°C)[6)]
Specific gravities: 0.7770 g/cm^3 (20°C)[6)]
logPow: 3.34 (20°C)[6)]

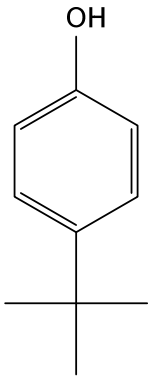
(Abbreviations) CAS CAS registry number, ENCS registry number in the Existing and New Chemical Substances List, MW molecular weight, mp melting point, bp boiling point, SW solubility in water, Specific gravities Specific gravity(no unit) or density, logPow octanol-water partition coefficient, kPa kilopascal (1 atom approximately equal to 101.3kPa).

[6] Butyl-2,3-epoxypropyl ether



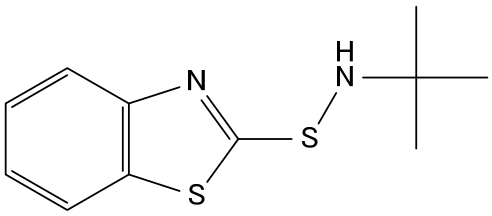
分子式： $C_7H_{14}O_2$
Molecular formula: 2426-08-6
CAS: 2-392
ENCS: 130.19
MW: <-100°C [5)]
mp: 169°C (101 kPa)[7)]
bp: 20 g/L (20°C)[7)]
sw: 0.918 g/cm^3 (20°C)[7)]
Specific gravities: 0.63 [7)]

[7] 4-*tert*-Butylphenol



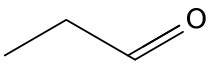
Molecular formula: $C_{10}H_{14}O$
CAS: 98-54-4
ENCS: 3-503[*1]
MW: 150.22
mp: 99.2°C [5)]
bp: 238.3°C (101 kPa)[5)]
sw: 607.2 mg/L (25°C)[5)]
Specific gravities: 0.38 g/cm^3 (22°C)[5)]
logPow: 3.0 (23°C)[5)]

[8] *N*-(tert-Butyl)-2-benzothiazolesulfenamide



Molecular formula: $C_{11}H_{14}N_2S_2$
CAS: 95-31-8
ENCS: 5-3417
MW: 238.37
mp: 104°C [8)]
bp: Decomposition at 207°C [5)]
sw: 1.74 mg/L (20°C)[5)]
Specific gravities: 1.290 (25°C/4°C)[8)]
logPow: 3.36 (25°C)[5)]

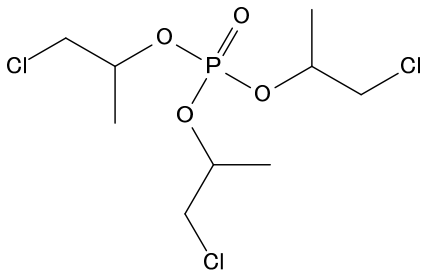
[9] Propanal (synonym: Propionaldehyde)



Molecular formula: C_3H_6O
CAS: 123-38-6
ENCS: 2-486
MW: 58.08
mp: -81°C [9)]
bp: 47.6°C (101 kPa)[5)]
sw: 200 g/L [9)]
Specific gravities: 0.8047 g/cm^3 (20°C)[5)]
logPow: 0.59 (20°C)[5)]

[10] Phosphate triesters

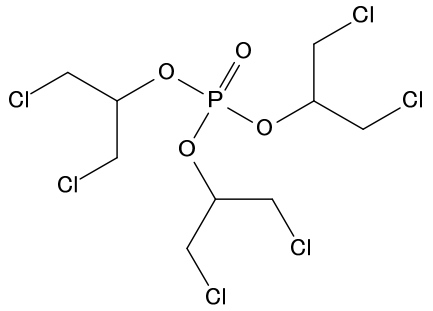
[10-1] Tris(2-chloro-1-methylethyl) phosphate (synonym: Tris(2-chloroisopropyl) phosphate)



Molecular formula: $C_9H_{18}Cl_3O_4P$
CAS: 13674-84-5
ENCS: 2-1941[*2]、2-2951[*3]
MW: 327.57
mp: <-20°C [10)]
bp: 288°C [10)]
sw: 1,080 mg/L (20°C) [10)]
Specific gravities: 1.288 (20°C) [10)]
logPow: 2.68 [10)]

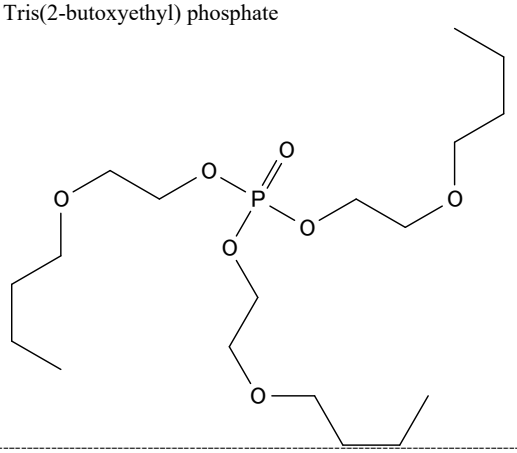
(Note 1) Monoalkyl phenol (The alkyl groups have 3 ~ 9 carbon atoms)
(Note 2) Bromo (or chloro) alkyl (or alkenyl) phosphate
(Note 3) Chlorinated alkyl (or chlorinated alkenyl) phosphate (The alkyl (or alkenyl) groups have 3 ~ 24 carbon atoms) (C3-24)

[10-2] Tris(1,3-dichloro-2-propyl) phosphate



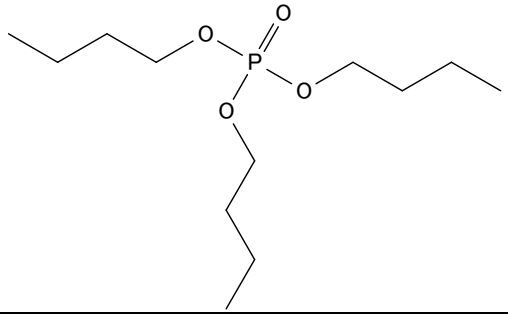
Molecular formula: $C_9H_{15}Cl_6O_4P$
CAS: 13674-87-8
ENCS: 2-1914[*2]
MW: 430.91
mp: <-20°C [11)]
bp: Approximately 326°C [11)]
sw: 18.1 mg/L (20°C) [11)]
Specific gravities: 1.513 (20°C) [11)]
logPow: 3.69 (20°C) [11)]

[10-3] Tris(2-butoxyethyl) phosphate



Molecular formula: $C_{18}H_{37}O_7P$
CAS: 78-51-3
ENCS: 2-2022
MW: 398.48
mp: -70°C [5)]
bp: 218 ~ 288°C [5)]
sw: 663..5 mg/L (20°C) [5)]
Specific gravities: 1.02 (20°C) [5)]
logPow: 3.75 [5)]

[10-4] Tributyl phosphate



Molecular formula: $C_{12}H_{27}O_4P$
CAS: 126-73-8
ENCS: 2-2021
MW: 266.32
mp: <-80°C [12)]
bp: Decomposition at 289°C [12)]
sw: 280 mg/L (25°C) [12)]
Specific gravities: 0.976 (25°C/25°C) [12)]
logPow: 4.00 [12)]

References

1) National Institute of Technology and Evaluation (NITE), Allyl alcohol, Chemicals Initial Risk Assessment Report Ver. 1.0 No. 80 (2007) (in Japanese)
2) Ministry of the Environment Government of Japan, Initial Environmental Risk Assessment of Chemicals, Vol. 18 (2020) (in Japanese)
3) Ministry of the Environment Government of Japan, Initial Environmental Risk Assessment of Chemicals, Vol. 15 (2017) (in Japanese)
4) International Labour Organization (ILO), Diphenyl ether, International Chemical Safety Cards (ICSCs), 0791 (2014)
5) European Chemicals Agency (ECHA), REACH registered substance factsheets (https://echa.europa.eu/, Retrieved on October, 2025)
6) Ministry of the Environment Government of Japan, Initial Environmental Risk Assessment of Chemicals, Vol. 22 (2024) (in Japanese)
7) Ministry of the Environment Government of Japan, Initial Environmental Risk Assessment of Chemicals, Vol. 20 (2022) (in Japanese)
8) National Institute of Technology and Evaluation (NITE), *N*-(tert-Butyl)-2-benzothiazolesulfenamide, Chemicals Initial Risk Assessment Report Ver. 1.0 No. 22 (2005) (in Japanese)
9) International Labour Organization (ILO), Propionaldehyde, International Chemical Safety Cards (ICSCs), 0550 (2003)
10) OECD, Tris(2-chloro-1-methylethyl) phosphate, Screening Information Dataset (SIDS) Initial Assessment Profile (2009)
11) OECD, Tris[2-chloro-1-(chloromethyl)ethyl] phosphate, Screening Information Dataset (SIDS) Initial Assessment Profile (2009)
12) National Institute of Technology and Evaluation (NITE), Tri-*n*-butyl phosphate, Chemicals Initial Risk Assessment Report Ver. 1.0 No. 141 (2008) (in Japanese)

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 *	Surveyed media		
		Surface water	Sedi-ment	Air
Hokkaido	Recycling-based Society Promotion Division, Environment and Lifestyle Department, Environmental Conservation Bureau, 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			○
Fukushima Pref.	Fukushima Prefectural Environmental Center	○		
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center	○	○	○
Tochigi Pref.	Tochigi Prefectural Institute of Public Health and Environmental Science	○		
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	○	○	○
Kawasaki City	Kawasaki Environment 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 Lake Suwa Environmental Research Center	○		
	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 Pref.	Kyoto Prefectural Institute of Public Health and Environment	○	○	
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	○	○	○[*2]
Osaka City	Osaka City Institute of Public Health and Environmental Sciences	○	○	
Hyogo Pref.	Water and Air Division, Environment Department, Hyogo Prefectural Government and Hyogo Prefectural Institute of Environmental Sciences, Hyogo Environmental Advancement Association			○
Kobe City	Environmental Conservation Division, Environment Bureau, Kobe City and Kobe City Institute of Health and Environmental Science	○	○	
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	○		
Hiroshima Pref.	Hiroshima Prefectural Technology Research Institute Health and Environment Center	○	○	
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	○		○

Local communities	Organisations responsible for sampling *	Surveyed media		
		Surface water	Sedi-ment	Air
Fukuoka Pref.	Fukuoka Institute of Health and Environmental Sciences	○		
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	○		○
Kumamoto Pref.	Kumamoto Prefectural Institute of Public-Health and Environmental Science	○		○
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 2024.
(Note 2) *2: Those organizations cooperated with a private analytical laboratory in sampling specimens

(2) Surveyed sites and target chemicals

The numbers of target chemicals 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 for surface water, Table 1-1-2 and Fig.1-1 for sediment, Table 1-1-3 and Fig.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	Numbers of surveyed sites	Numbers of samples at a surveyed site
Surface water	39	7	54	1
Sediment	28	2	36	3
Air	27*	4	33	3
All media	48	10	90	

(Note) *: For 2 of the 21 organizations, they were cooperated with a private analytical laboratory in sampling specimens.

(3) Sampling method of specimens

The sampling of specimens and the preparation of samples were carried out following the “Guidelines on Conducting of Environmental Surveys and Monitoring of Chemicals” (published on March 2021) by the Environment Health and Safety Division, Environmental Health Department, Ministry of the Environment of Japan (MOE).

(4) 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)).

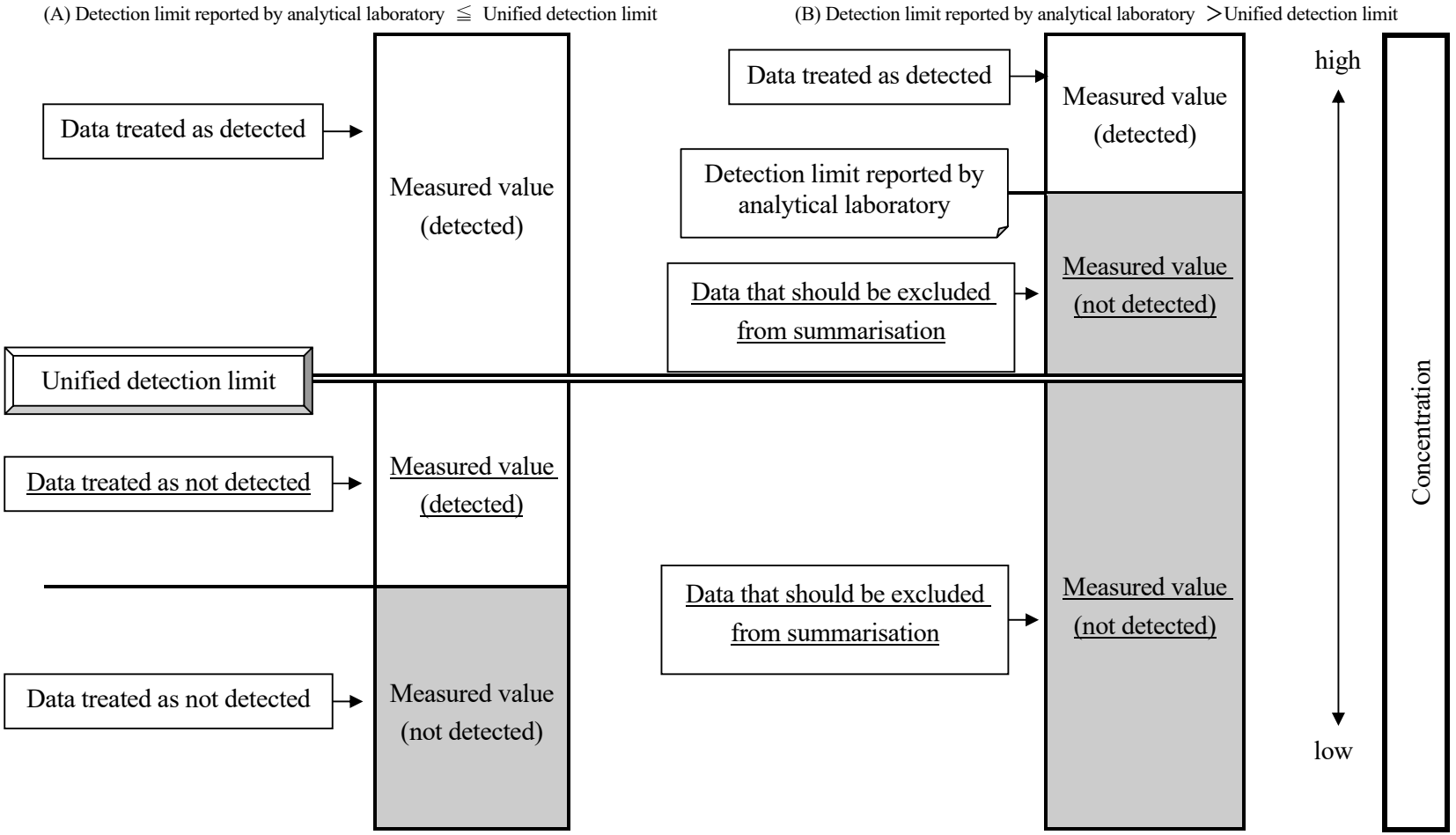
When the instrument detection limit (IDL) and the method detection limit (MDL) are given in the analytical method, which is described in reports on the investigation of the development of analytical methods for chemicals and adopted in the Initial Environmental Survey (hereafter, the Initial Environmental 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 FY2024

Local communities	Surveyed sites	Target chemicals [*1]						
		[3]	[4]	[5]	[6]	[7]	[8]	[10]
Sapporo City	Nakanuma of Riv.Toyohira (Sapporo City)	○			○			
	Daiichishinkawa-bashi Bridge, Riv. Shin (Sapporo City)	○			○			
Iwate Pref.	Toyosawa-bashi Bridge, Riv. Toyosawa (Hanamaki City)			○				○[*2]
Miyagi Pref.	Futatsuya-bashi Bridge, Riv. Hasama (Tome City)							○[*2]
Sendai City	Hirose-ohashi Bridge, Riv. Hirose (Sendai City)				○			○[*2]
Akita Pref.	Akita Canal (Akita City)			○	○			○
Fukushima Pref.	Onahama Port							○[*3]
Ibaraki Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone (Kamisu City)			○				
Tochigi Pref.	Tagawa Kyubun Area Head Works, Riv. Tagawa (Utsunomiya City)		○					
Saitama City	Nakadote-hashi Bridge, Riv. Kamo (Saitama City)							○
Chiba Pref.	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)			○	○			
Kawasaki City	Mouth of Riv. Tama (Kawasaki City)		○	○	○			○[*3]
	Front of Chidori Town, Keihin Canal, Port of Kawasaki		○					
	Front of Ougi Town, Keihin Canal, Port of Kawasaki		○	○	○			○
Niigata Pref.	Lower Riv. Shinano (Niigata City)		○	○	○			
Ishikawa Pref.	Mouth of Riv. Sai (Kanazawa City)		○	○	○			○
Fukui Pref.	Mishima-bashi Bridge, Riv. Shono (Tsuruga City)							○[*3]
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			○	○			○
Mie Pref.	Yokkaichi Port			○	○			○
Shiga Pref.	Lake Biwa (center, offshore of Minamihira)	○						○
	Lake Biwa (center, offshore of Karasaki)	○						○
Kyoto Pref.	Miyazu Port				○			
	Gokou-bashi Bridge, Riv. Kizu (Yawata City)			○		○		
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							○
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)			○	○			○
Okayama Pref.	Sasagase-bashi Bridge, Riv. Sasagase (Okayama City)		○	○	○			○
	Offshore of Mizushima		○	○				○
Hiroshima Pref.	Front of Miyukicho Otake City, Hiroshima Bay			○				
Yamaguchi Pref.	Tokuyama Bay							○
	Offshore of Hagi							○
Kagawa Pref.	Takamatsu Port		○					
Ehime Pref.	Niihama Port							○
	Sawadu Fishing Port				○			○
Fukuoka Pref.	Kabura-bashi Bridge, Riv. Raizan (Itoshima City)		○	○		○	○	
	Offshore of Omuta		○	○		○	○	
Kitakyushu City	Dokai Bay				○			○
Fukuoka City	Hakata Bay			○				
Saga Pref.	Imari Bay			○	○			○
Kumamoto Pref.	Hiraki-bashi Bridge, Riv. Midori (Uto City)							○[*3]
Oita Pref.	Mouth of Riv. Oita (Oita City)			○	○			○

(Note 1) The number in the "Target chemicals" column indicates the following chemicals.
[3] 4,4'-Diaminodiphenyl ether, [4] Diphenyl ether (synonym: Phenoxybenzene), [5] Tributylamine, [6] Butyl-2,3-epoxypropyl ether, [7] 4-*tert*-Butylphenol、[8] *N*-(*tert*- Butyl)-2-benzothiazolesulfenamide, [10] Phosphate triesters
(Note 2) Only [10-1] Tris(2-chloro-1-methylethyl) phosphate (synonym: Tris(2-chloroisopropyl) phosphate) [10-2] Tris(1,3-dichloro-2-propyl) phosphate and [10-3] Tris(2-butoxyethyl) phosphate were surveyed at those sites
(Note 3) Only [10-4] Tributyl phosphate was surveyed at those sites

Table 1-1-2 List of surveyed sites (sediment) and target chemical in the Initial Environmental Survey in FY2024

Local communities	Surveyed sites	Target chemicals	
		[5] Tributylamine	[10-4] Tributyl phosphate
Hokkaido	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari (Ishikari City)	○	○
Iwate Pref.	Toyosawa-bashi Bridge, Riv. Toyosawa (Hanamaki City)	○	
Sendai City	Hirose-ohashi Bridge, Riv. Hirose (Sendai City)	○	
Akita Pref.	Akita Canal (Akita City)	○	○
Ibaraki Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone (Kamisu City)	○	
Chiba Pref.	Coast of Ichihara and Anegasaki	○	○
Tokyo Met.	Mouth of Riv. Arakawa (Koto Ward)	○	○
	Mouth of Riv. Sumida (Minato Ward)	○	○
Yokohama City	Yokohama Port		○
Kawasaki City	Mouth of Riv. Tama (Kawasaki City)	○	○
	Front of Ougi Town, Keihin Canal, Port of Kawasaki	○	○
Niigata Pref.	Lower Riv. Shinano (Niigata City)	○	
Ishikawa Pref.	Mouth of Riv. Sai (Kanazawa City)	○	○
Shizuoka Pref.	Shimizu Port		○
	Kaketsuka-bashi Bridge, Riv. Tenryu (Iwata City)	○	
Aichi Pref.	Kinuura Port	○	○
	West of Shiomi Wharf, Nagoya Port	○	○
Mie Pref.	Yokkaichi Port	○	○
	Toba Port		○
Shiga Pref.	Lake Biwa (center, offshore of Minamihira)		○
	Lake Biwa (center, offshore of Karasaki)		○
Kyoto Pref.	Miyazu Port	○	
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		○
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)	○	
Hiroshima Pref.	Front of Miyukicho Otake City, Hiroshima Bay	○	○
Yamaguchi Pref.	Tokuyama Bay	○	○
	Offshore of Hagi		○
Kagawa Pref.	Takamatsu Port	○	○
Kitakyushu City	Dokai Bay	○	○
Oita Pref.	Mouth of Riv. Oita (Oita City)	○	
Okinawa Pref.	Naha Port		○

Figure 1-1 Surveyed sites (surface water and sediment) in the Initial Environmental Survey in FY 2024

Table 1-1-3 List of surveyed sites (air) and target chemicals in the Initial Environmental Survey in FY 2024

Local communities	Surveyed sites	Target chemicals *			
		[1]	[2]	[9]	[10]
Hokkaido	Research Institute of Energy, Environment and Geology, Hokkaido Research Organization (Sapporo City)				○
Sendai City	Tsutsujigaoka Park (Sendai City)	○	○		
Yamagata Pref.	Yonezawa-Kanaike Air Quality Monitoring Station (Yonezawa City)	○		○	
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center (Tsuchiura City)		○		○
Saitama Pref.	Center for Environmental Science in Saitama (Kazo City)	○			
Saitama City	Saitama City Public Health Center (Saitama 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)		○		
Kawasaki City	Daishi Air Quality Monitoring Station (Kawasaki City)	○			
Fukui Pref.	Mikuni Air Quality Monitoring Station (Sakai City)	○			
Nagano Pref.	Nagano Environmental Conservation Research Institute (Nagano City)		○	○	○
Aichi Pref.	Toyokawa City Government Building (Toyokawa City)				○
	Tokaishi-Nawamachi Air Quality Monitoring Station (Tokai City)	○			○
Nagoya City	Chikusa Ward Heiwa Park (Nagoya City)	○	○	○	○
Mie Pref.	Mie Prefecture Health and Environment Research Institute (Yokkaichi City)				○
Kyoto City	Kyoto City Institute of Health and Environmental Sciences(Kyoto City)				○
Osaka Pref.	Osaka Joint Prefectural Government Building, Building 2 Annex (Osaka City)	○			○
Hyogo Pref.	Summit of Mt. Rokko (Kobe City)			○	
	Hyogo Prefectural Environmental Research Center (Kobe City)			○	○
	Aboshi Air Quality Monitoring Station (Himeji 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 Research Institute for Environmental Sciences and Public Health (Takamatsu City)		○		
	Takamatsu Joint Prefectural Government Building(Takamatsu City)				○
Ehime Pref.	Mibu Air Quality Monitoring Station (Matsuyama City)		○		
	Matsuyama City Habu Elementary School (Matsuyama City)	○			
Kitakyushu City	Kitakyushu City Institute of Health and Environmental Sciences (Kitakyushu City)				○
Saga Pref.	Saga Prefectural Environmental Research Center (Saga City)	○	○	○	○
Kumamoto Pref.	Minamata Public Health Center (Minamata City)		○		
Oita Pref.	Oita City Misa Elementary School (Oita City)	○	○	○	○
Miyazaki Pref.	Nobeoka Public Health Center (Nobeoka City)	○			

(Note) The number in the “Target chemicals” column indicates the following chemicals.
[1] Allyl alcohol, [2] 1-Allyloxy-2,3-epoxypropane, [9] Propanal (synonym: Propionaldehyde) [10] Phosphate triesters

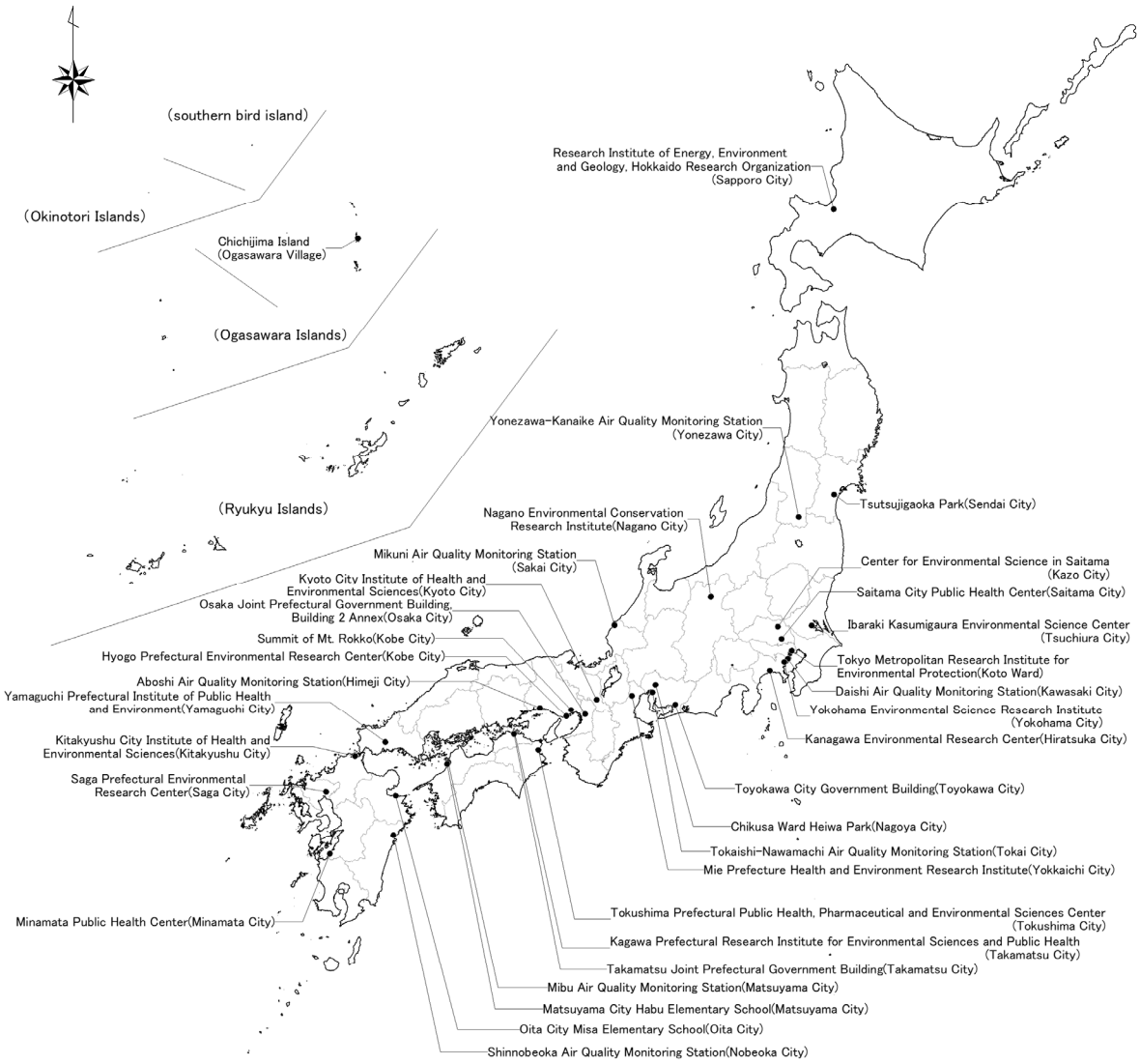


Figure 1-2 Surveyed sites (air) in the Initial Environmental Survey in FY 2024

4. Summary of survey results

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

In surface water, 1 out of the 7 target chemicals (groups) was detected. Target chemicals were categorized by analytical methods such as structurally similar chemicals capable of simultaneous analyses.

[10] Phosphate triesters

[10-1] Tris(2-chloro-1-methylethyl) phosphate (synonym: Tris(2-chloroisopropyl) phosphate): 31 of 32 valid sites

[10-2] Tris(1,3-dichloro-2-propyl) phosphate: 31 of the 32 valid sites

[10-3] Tris(2-butoxyethyl) phosphate: all 32 valid sites

[10-4] Tributyl phosphate: 23 of the 33 valid sites

In sediment, 1 out of the 2 target chemicals was detected.

[5] Tributylamine: 22 of the 27 valid sites

In air, all 4 target chemicals (groups) were detected. Target chemicals were categorized by analytical methods such as structurally similar chemicals capable of simultaneous analyses.

[3] Allyl alcohol: 3 of the 17 valid sites

[4] 1-Allyloxy-2,3-epoxypropane: 5 of the 15 valid sites

[9] Propanal (synonym: Propionaldehyde): all 12 valid sites

[10] Phosphate triesters

[10-2] Tris(1,3-dichloro-2-propyl) phosphate: 4 of the 16 valid sites

[10-4] Tributyl phosphate: 11 of the 16 valid sites

Table 1-2 Summary of the detection ranges and the detection limits in the Initial Environmental Survey in FY 2024

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]	Allyl alcohol *					nd ~ 37 3/17	16
[2]	1-Allyloxy-2,3-epoxypropane *					nd ~ 94 5/15	2.3
[3]	4,4'-Diaminodiphenyl ether	nd 0/5	3.0				
[4]	Diphenyl ether (synonym: Phenoxybenzene) *	nd 0/12	3.1				
[5]	Tributylamine *	nd 0/25	11	nd ~ 28 22/27	0.28		
[6]	Butyl-2,3-epoxypropyl ether	nd 0/26	190				
[7]	4-*tert*-Butylphenol	nd 0/4	3.4				
[8]	*N*-(tert-Butyl)-2-benzothiazolesulfenamide	nd 0/2	12				
[9]	Propanal (synonym: Propionaldehyde) *					64 ~ 1,200 12/12	16
[10]	Phosphate triesters *						
	[10-1] Tris(2-chloro-1-methylethyl) phosphate (synonym: Tris(2-chloroisopropyl) phosphate)	nd ~ 480 31/32	1.5				
	[10-2] Tris(1,3-dichloro-2-propyl) phosphate	nd ~ 92 31/32	0.29			nd ~ 3.3 4/16	1.1
	[10-3] Tris(2-butoxyethyl) phosphate	0.12～450 32/32	0.11				
	[10-4] Tributyl phosphate	nd～35 23/33	0.33	nd 0/22	4.7	nd～0.35 11/16	0.067

(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 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) *: The substances were surveyed including the points selected for survey in light of documentation or submittals regarding emissions.