Chapter 4 Results of the Environmental Monitoring in FY 2005

1. Purpose of the monitoring

Environmental Monitoring is aimed at conducting an annual survey of the environmental persistence of target chemicals listed in the Stockholm Convention on Persistent Organic Pollutants (hereafter, the Stockholm Convention), and the possible candidate chemicals, and highly persistent chemicals among the Specified Chemical Substances and Monitored Chemical Substances under the Law Concerning the Examination and Regulation of Manufacture, etc. of Chemical Substances (Law No. 117 of 1973) (hereafter, the Chemical Substances Control Law), whose environmental standards are not yet established but whose change in persistence in the environment must be understood.

*POPs: persistent organic pollutants

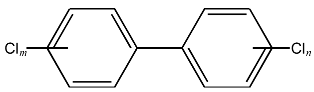
2. Target chemicals

In the FY 2005 Environmental Monitoring, 10 chemicals (groups) included in the Stockholm Convention (except for polychlorinated-*p*-dioxin and polychlorinated dibenzofuran) (hereafter, POPs), 1 type of HCHs that is a possible candidate for inclusion in the Stockholm Convention, and 3 chemicals (groups), namely, 2,6-di-*tert*-butyl-4-methylphenol, dibenzothiophene, and organotin compounds, were designated as target chemicals. The combinations of target chemicals and the monitoring media are given below.

Target chemicals		Monitored media			
No	Name	Surface water	Sediment	Wildlife	Air
1	Polychlorinated biphenyls (PCBs) (mono～decachloninated congeners)	○	○	○	○
2	Hexachlorobenzene	○	○	○	○
3	Aldrin	○	○	○	○
4	Dieldrin	○	○	○	○
5	Endrin	○	○	○	○
6	DDTs [6-1] *p,p'*-DDT, [6-2] *p,p'*-DDE, [6-3] *p,p'*-DDD, [6-4] *o,p'*-DDT, [6-5] *o,p'*-DDE, [6-6] *o,p'*-DDD	○	○	○	○
7	Chlordanes [7-1] *cis*-Chlordane, [7-2] *trans*-Chlordane, [7-3] Oxychlordane, [7-4] *cis*-Nonachlor, [7-5] *trans*-Nonachlor	○	○	○	○
8	Heptachlors [8-1] Heptachlor, [8-2] *cis*-Heptachlor epoxide, [8-3] *trans*-Heptachlor epoxide	○	○	○	○
9	Toxaphenes [9-1] 2-Endo,3-exo,5-endo,6-exo,8,8,10,10-octachlorobornane (Parlar-26), [9-2] 2-Endo,3-exo,5-endo,6-exo,8,8,9,10,10-nonachlorobornane (Parlar-50), [9-3] 2,2,5,5,8,9,9,10,10-nonachlorobornane (Parlar-62)	○	○	○	○
10	Mirex	○	○	○	○
11	HCHs (Hexachlorohexanes) [11-1] α-HCH, [11-2], β-HCH, [11-3] γ-HCH, [11-4] δ-HCH	○	○	○	○
12	2,6-Di-*tert*-butyl-4-methylphenol (BHT)		○	○	○
13	Dibenzothiophene	○	○	○	
14	Organotin compounds [14-1] Monbutyltin compounds (MBTs), [14-2] Dibutyltin compounds (DBTs), [14-3] Tributyltin compounds (TBTs), [14-4] Monophenyltin compounds (MPTs), [14-5] Diphenyltin compounds (DPTs), [14-6] Triphenyltin compounds (TPTs)	○	○	○	

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

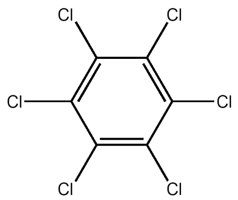
[1] Polychlorinated biphenyls (PCBs)



i = m+n =1～10

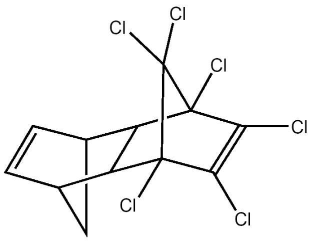
Molecular formula: $C_{12}H_{(10-i)}Cl_i$ （i = m+n =1～10）
CAS: 1336-36-3
ENCS: Not identified
MW: 291.98～360.86
mp: 340～375°C[1)]
bp: Uncertain
SW: Almost insoluble[2)]
Specific gravity: 1.44 (30°C)[1)]
logPow: 3.76～8.26 (25°C)[3)]

[2] Hexachlorobenzene



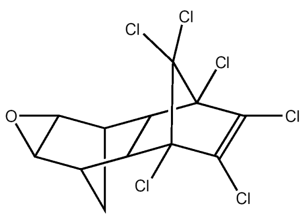
Molecular formula: C_6Cl_6
CAS: 118-74-1
ENCS: 3-0076
MW: 284.78
mp: 231.8°C[4)]
bp: 325°C[4)]
SW: 0.0047mg/L (25°C)[5)]
Specific gravity: 2.04 (23°C)[4)]
logPow: 5.73[6)]

[3] Aldrin



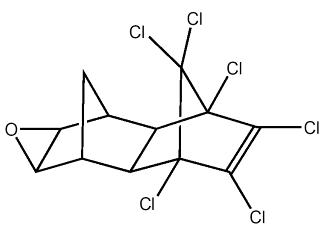
Molecular formula: $C_{12}H_8Cl_6$
CAS: 309-00-2
ENCS: 4-0303
MW: 364.91
mp: 104°C[7)]
bp: 145°C (2mmHg)[8)]
SW: 170mg/L (25°C)[5)]
Specific gravity: 1.6 (20°C)[9)]
logPow: 6.50[6)]

[4] Dieldrin



Molecular formula: $C_{12}H_8Cl_6O$
CAS: 60-57-1
ENCS: 4-0299
MW: 380.91
mp: 175.5°C[4)]
bp: Uncertain
SW: 0.195mg/L (25°C)[1)]
Specific gravity: 1.75[10)]
logPow: 5.40[6)]

[5] Endrin

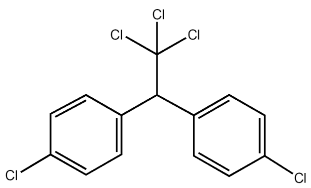


Molecular formula: $C_{12}H_8Cl_6O$
CAS: 72-20-8
ENCS: 4-0299
MW: 380.91
mp: 200°C[11)]
bp: 245°C (decomposition)[7)]
SW: 0.25mg/L[10)]
Specific gravity: 1.7[12)]
logPow: 5.20[6)]

(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, logPow: *n*-octanol-water partition coefficient.

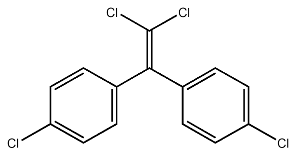
[6] DDTs

[6-1] *p,p'*-DDT



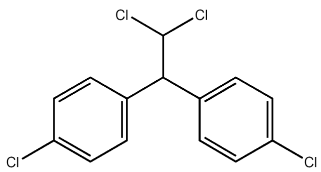
Molecular formula: $C_{14}H_9Cl_5$
CAS: 50-29-3
ENCS: 4-0910
MW: 354.49
mp: 108.5°C[4]
bp: 260°C[4]
SW: 0.0055mg/L (25°C)[5]
Specific gravity: 0.98～0.99[13]
logPow: 6.91[6]

[6-2] *p,p'*-DDE



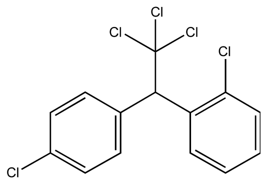
Molecular formula: $C_{14}H_8Cl_4$
CAS: 72-55-9
ENCS: Not identified
MW: 318.03
mp: 89°C[4]
bp: Uncertain
SW: 0.04mg/L (25°C)[5],
0.065mg/L (24°C)[14]
Specific gravity: Uncertain
logPow: 6.51[6]

[6-3] *p,p'*-DDD



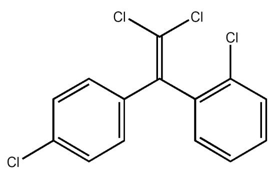
Molecular formula: $C_{14}H_{10}Cl_4$
CAS: 72-54-8
ENCS: Not identified
MW: 320.04
mp: 109～110°C[7]
bp: 193°C (1mmHg)[4]
SW: 0.16mg/L[14]
Specific gravity: 1.385[4]
logPow: 6.02[6]

[6-4] *o,p'*-DDT



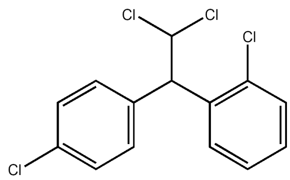
Molecular formula: $C_{14}H_9Cl_5$
CAS: 789-02-6
ENCS: Not identified
MW: 354.49
mp: Uncertain
bp: Uncertain
SW: Uncertain
Specific gravity: Uncertain
logPow: Uncertain

[6-5] *o,p'*-DDE



Molecular formula: $C_{14}H_8Cl_4$
CAS: 3424-82-6
ENCS: Not identified
MW: 318.03
mp: Uncertain
bp: Uncertain
SW: Uncertain
Specific gravity: Uncertain
logPow: Uncertain

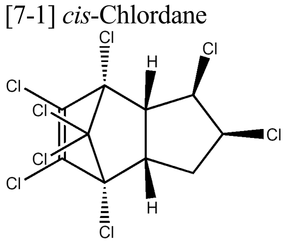
[6-6] *o,p'*-DDD



Molecular formula: $C_{14}H_{10}Cl_4$
CAS: 53-19-0
ENCS: Not identified
MW: 320.04
mp: Uncertain
bp: Uncertain
SW: Uncertain
Specific gravity: Uncertain
logPow: Uncertain

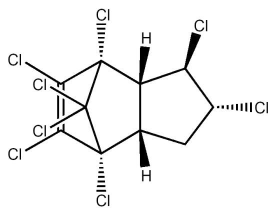
[7] Chlordanes

[7-1] *cis*-Chlordane



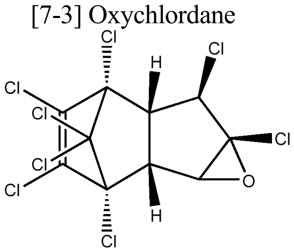
Molecular formula: $C_{10}H_6Cl_8$
CAS: 5103-71-9
ENCS: 4-637
MW: 409.78
mp: 106～107°C[2]
bp: 175°C (1mmHg)[2]
SW: Insoluble[7]
Specific gravity: 1.59～1.63 (25°C)[7]
logPow: 6.16[6]

[7-2] *trans*-Chlordane



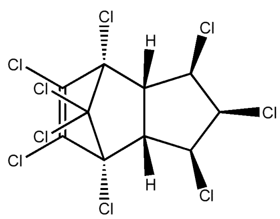
Molecular formula: $C_{10}H_6Cl_8$
CAS: 5103-74-2
ENCS: 4-637
MW: 409.78
mp: 104～105°C[2]
bp: 175°C (1mmHg)[2]
SW: Insoluble[7]
Specific gravity: 1.59～1.63 (25°C)[7]
logPow: 6.16[6]

[7-3] Oxychlordane



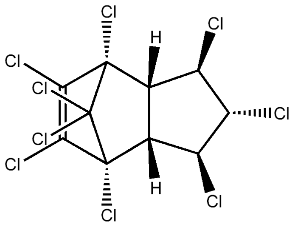
Molecular formula: $C_{10}H_4Cl_8O$
CAS: 26880-48-8
ENCS: Not identified
MW: 423.76
mp: 98～101°C[7]
bp: Uncertain
SW: Insoluble[7]
Specific gravity: Uncertain
logPow: 4.76[6]

[7-4] *cis*-Nonachlor



Molecular formula: $C_{10}H_5Cl_9$
CAS: 5103-73-1
ENCS: Not identified
MW: 444.23
mp: 214～215°C[7]
bp: Uncertain
SW: 0.057mg/L[7]
Specific gravity: Uncertain
logPow: 5.21[6]

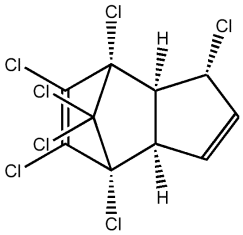
[7-5] *trans*-Nonachlor



Molecular formula: $C_{10}H_5Cl_9$
CAS: 39765-80-5
ENCS: Not identified
MW: 444.23
mp: 128～130°C[7)]
bp: Uncertain
SW: 0.064mg/L[7)]
Specific gravity: Uncertain
logPow: 5.08[6)]

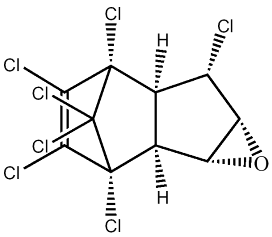
[8] Heptachlors

[8-1] Heptachlor

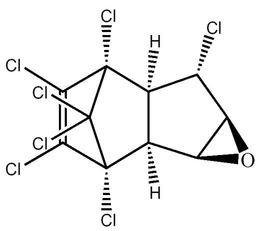


Molecular formula: $C_{10}H_5Cl_7$
CAS: 76-44-8
ENCS: 4-637, 9-1646
MW: 373.32
mp: 95～96°C[7)]
bp: 145°C (1.5mmHg)[4)]
SW: 0.18mg/L (25°C)[10)]
Specific gravity: 1.57 (9°C)[4)]
logPow: 6.10[6)]

[8-2] *cis*-Heptachlor epoxide



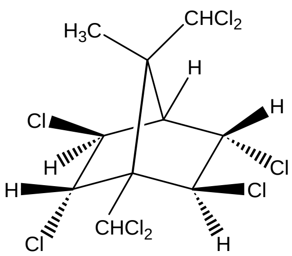
[8-3] *trans*-Heptachlor epoxide



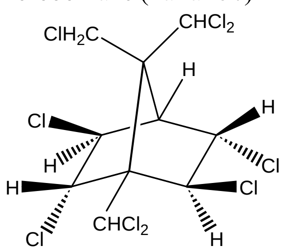
The following data are for both [8-2] and [8-3].
Molecular formula: $C_{10}H_5Cl_7O$
CAS: 1024-57-3
ENCS: Not identified
MW: 389.32
mp: 160～161.5°C[2)]
bp: Uncertain
SW: 0.275mg/L[5)]
Specific gravity: 1.58[7)]
logPow: 5.40[6)]

[9] Toxaphenes

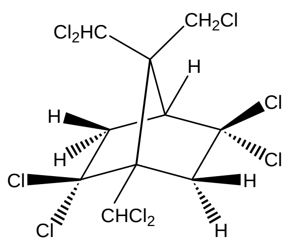
[9-1]
2-Endo,3-exo,5-endo,6-exo,8,8,10,10-octachlorobornane (Parlar-26)



[9-2]
2-Endo,3-exo,5-endo,6-exo,8,8,9,10,10-nonachlorobornane (Parlar-50)

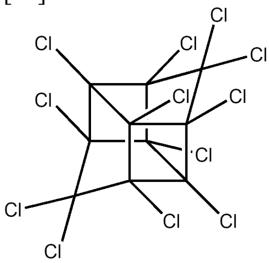


[9-3]
2,2,5,5,8,9,9,10,10-nonachlorobornane (Parlar-62)



Molecular formula: $C_{16}H_{10}Cl_8$ ([9-1]), $C_{16}H_9Cl_9$ ([9-2], [9-3])
CAS: 8001-35-2
ENCS: Not identified
MW: 409.83 (([9-1]), 443.79 (([9-2], [9-3])
The following data are for both [9-1].
mp: 65～90°C[11)]
bp: Uncertain
SW: 0.55mg/L (20°C)[15)]
Specific gravity: 1.65 (25°C)[14)]
logPow: 5.90[16)]

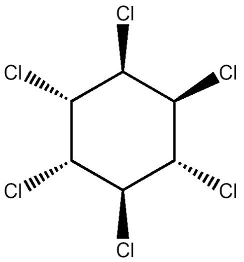
[10] Mirex



Molecular formula: $C_{10}Cl_{12}$
CAS: 2385-85-5
ENCS: Not identified
MW: 545.59
mp: 485°C[17)]
bp: Uncertain
SW: 0.20mg/L (24°C)[14)]
Specific gravity: Uncertain
logPow: 5.28[6)]

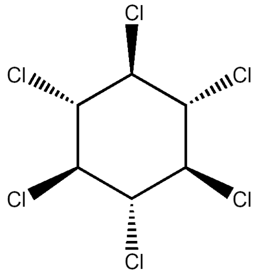
[11] HCHs (Hexachlorohexanes)

[11-1] α-HCH



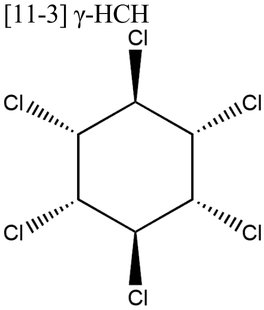
Molecular formula: $C_6H_6Cl_6$
CAS: 319-84-6
ENCS: 3-2250, 9-1652
MW: 290.83
mp: 158°C[1)]
bp: 288°C[18)]
SW: 2mg/L[2)]
Specific gravity: 1.87 (20°C)[19)]
logPow: 3.8[6)]

[11-2] *β*-HCH



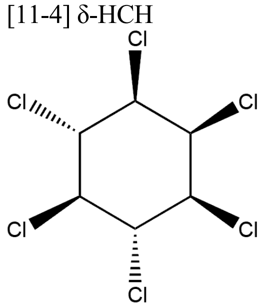
Molecular formula: $C_6H_6Cl_6$
CAS: 319-85-7
ENCS: 3-2250, 9-1652
MW: 290.83
mp: 309°C[20)]
bp: 60°C[2)]
SW: 5mg/L[2)]
Specific gravity: 1.87 (20°C)[19)]
logPow: 3.78[1)]

[11-3] γ-HCH



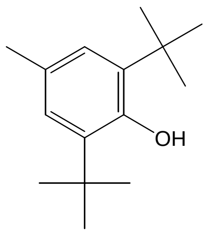
Molecular formula: $C_6H_6Cl_6$
CAS: 58-89-9
ENCS: 3-2250, 9-1652
MW: 290.83
mp: 112.5°C[7)]
bp: 323.4°C[4)]
SW: 7.3mg/L[5)]
Specific gravity: 1.85 (20°C)[19)]
logPow: 3.72[6)]

[11-4] δ-HCH



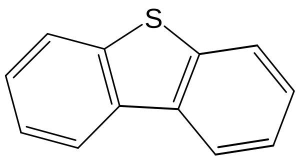
Molecular formula: $C_6H_6Cl_6$
CAS: 319-86-8
ENCS: 3-2250, 9-1652
MW: 290.83
mp: 141.5°C[4)]
bp: 60°C (0.36mmHg)[4)]
SW: 21.3mg/L[2)]
Specific gravity: 1.87 (20°C)[19)]
logPow: 4.14[6)]

[12] 2,6-Di-*tert*-butyl-4-methylphenol (BHT)



Molecular formula: $C_{15}H_{24}O$
CAS: 128-37-0
ENCS: 3-540, 9-1805
MW: 220.35
mp: 70°C[7)]
bp: 265°C[7)]
SW: 0.4mg/L (20°C)[14)]
Specific gravity: 1.05[7)]
logPow: 5.63[6)]

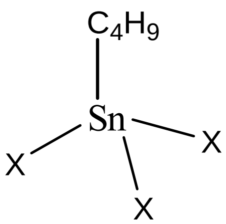
[13] Dibenzothiophene



Molecular formula: $C_{12}H_{8}S$
CAS: 132-65-0
ENCS: 5-3352
MW: 184.26
mp: 98.2°C[4)]
bp: 332.5°C[4)]
SW: 1.47mg/L (25°C)[21)]
Specific gravity: Uncertain
logPow: 4.38[6)]

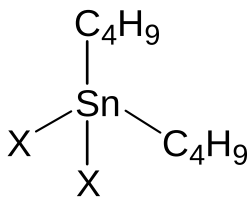
[14] Organotin compounds

[14-1] Monbutyltin compounds



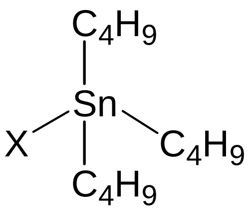
Molecular formula: Not specified
CAS: Not specified
ENCS: Not specified
MW: Not specified
mp: Not specified
bp: Not specified
SW: Not specified
Specific gravity: Not specified
logPow: Not specified

[14-2] Dibutyltin compounds



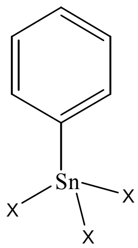
Molecular formula: Not specified
CAS: Not specified
ENCS: Not specified
MW: Not specified
mp: Not specified
bp: Not specified
SW: Not specified
Specific gravity: Not specified
logPow: Not specified

[14-3] Tributyltin compounds



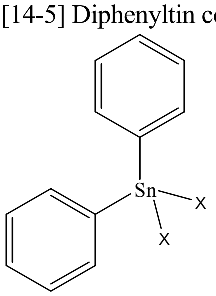
Molecular formula: Not specified
CAS: Not specified
ENCS: Not specified
MW: Not specified
mp: Not specified
bp: Not specified
SW: Not specified
Specific gravity: Not specified
logPow: Not specified

[14-4] Monophenyltin compounds



Molecular formula: Not specified
CAS: Not specified
ENCS: Not specified
MW: Not specified
mp: Not specified
bp: Not specified
SW: Not specified
Specific gravity: Not specified
logPow: Not specified

[14-5] Diphenyltin compounds



Molecular formula: Not specified
CAS: Not specified
ENCS: Not specified
MW: Not specified
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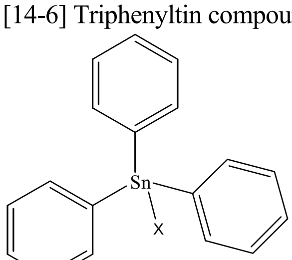
bp: Not specified
SW: Not specified
Specific gravity: Not specified
logPow: Not specified

[14-6] Triphenyltin compounds



Molecular formula: Not specified
CAS: Not specified
ENCS: Not specified
MW: Not specified
mp: Not specified
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SW: Not specified
Specific gravity: Not specified
logPow: Not specified

References

1) Sax, Dangerous Properties of Industrial Materials Volumes 1-3 7th edition, Van Nostrand Reinhold (1989)
2) International Agency for Research on Cancer (IARC), IARC Monographs on the Evaluation of the Carcinogenic Risk of Chemicals to Man. World Health Organisation (1972)
3) U.S.EPA, Ambient Water Quality Criteria Document, Polychlorinated Biphenyls (1980)
4) Lide, CRC Handbook of Chemistry and Physics 81st edition, CRC Press LLC (2004-2005)
5) Yalkowsky et al., Aquasol Database of Aqueous Solubility Version 5, College of Pharmacy, University of Arizona (1992)
6) Hansch et al., Exploring QSAR - Hydrophobic, Electronic, and Steric Constants, American Chemical Society (1995)
7) O’Neil, The Merck Index - An Encyclopedia of Chemicals, Drugs and Biologicals 13th Edition, Merck Co. Inc. (2001)
8) Hartley et al., The Agrochemical Handbook 2nd edition, The Royal Society of Chemistry (1987)
9) US Coast Guard, Department of Transportation, CHRIS - Hazardous Chemical Data Volume II, US Government Printing Office (1984-1985)
10) Biggar et al., Apparent solubility of organochlorine insecticides in water at various temperatures, Hilgardia, 42, 383-391 (1974)
11) Lewis, Hawley’s Condensed Chemical Dictionary 13rd edition, John Wiley & Sons (1997)
12) U.S.EPA, Ambient Water Quality Criteria Doc, Endrin (1980)
13) Clayton et al., Patty's Industrial Hygiene and Toxicology Volumes 2A, 2B and 2C: Toxicology 3rd edition, John Wiley Sons (1981-1982)
14) Verschueren, Handbook of Environmental Data of Organic Chemicals 2nd edition, Van Nostrand Reinhold Co. (1983)
15) Murphy et al., Equilibration of polychlorinated biphenyls and toxaphene with air and water, Environmental Science and Technology, 21, 155-162 (1987)
16) Fisk et al., Octanol/water partition coefficients of toxaphene congeners determined by the “slow-stirring” method, Chemosphere, 39, 2549-2562 (1999)
17) Spencer, Guide to the Chemicals Used in Crop Protection 7th edition Publication 1093, Research Institute, Agriculture Canada, Information Canada (1982)
18) IPCS, International Chemical Safety Cards, alpha-Hexachlorocyclohexane ICSC No. 0795 (1998)
19) ATSDR, Toxicological Profile for alpha-, beta-, gamma- and delta-Hexachlorocyclohexane (2005)
20) Kirk-Othmer Encyclopedia of Chemical Technology 5th edition, John Wiley & Sons (2004)
21) Hassett et al., Sorption of benzidine by sediments and soils, Journal of Environmental Quality, 9, 184-186 (1980)

3. Monitored site and procedure

In the Environmental Monitoring (of surface water, sediment, and wildlife), the sampling of specimens was entrusted to prefectural governments and government-designated cities across Japan and the specimens sampled were analysed by private analytical laboratories.

(1) Organisations responsible for sampling

Local communities	Organisations responsible for sampling	Monitored media			
		Surface water	Sediment	Wildlife	Air
Hokkaido	Hokkaido Institute of Environmental Sciences	○	○	○	○
Sapporo City	Sapporo City Institute of Public Health				○
Aomori Pref.	Aomori Prefectural Institute of Public Health and Environment	○	○		
Aomori Pref.	Hachinohe Environmental Management Office, Aomori Prefectural Institute of Public Health and Environment			○	
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.	Environmental Science Research Center of Yamagata Prefecture	○	○		
Fukushima Pref.	Fukushima Prefectural Institute of Environmental Research	○	○		
Ibaraki Pref.	Ibaraki Kasumigaura Environmental Science Center	○	○	○	○
Tochigi Pref.	Tochigi Prefectural Institute of Public Health and Environmental Science	○	○		
Gunma Pref.	Gunma Prefectural Institute of Public Health and Environmental Sciences				○
Chiba Pref.	Chiba Prefectural Environmental Research Center		○		○
Chiba City	Chiba City Institute of Health and Environment	○	○		
Tokyo Met.	Tokyo Metropolitan Research Institute for Environmental Protection	○	○	○	○
Kanagawa Pref.	Kanagawa Environmental Research Center				○
Yokohama City	Yokohama Environmental Science Research Institute	○	○	○	○
Kawasaki City	Kawasaki Municipal Research Institute for Environmental Protection	○	○	○	
Niigata Pref.	Niigata Prefectural Institute of Public Health and Environmental Sciences	○	○		○
Toyama Pref.	Toyama Prefectural Environmental Science Research Center	○	○		○
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science	○	○	○	○
Fukui Pref.	Fukui Prefectural Institute of Public Health and Environmental Science	○	○		
Yamanashi Pref.	Yamanashi Institute for Public Health		○		○
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				○
Mie Pref.	Mie Prefectural Science and Technology Promotion Center	○	○		○
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.	Osaka Prefecture Environmental Pollution Control Center	○	○	○	○
Osaka City	Osaka City Institute of Public Health and Environmental Sciences	○	○		
Hyogo Pref.	Hyogo Prefectural Institute of Public Health and Environmental Sciences	○	○	○	○
Kobe City	Environmental Conservation and Guidance Division, Environment Bureau	○	○		○

Local communities	Organisations responsible for sampling	Monitored media			
		Surface water	Sediment	Wildlife	Air
Nara Pref.	Nara Prefectural Institute for Hygiene and Environment		○		○
Wakayama Pref.	Wakayama Prefectural Research Center of Environment and Public Health	○	○		
Tottori Pref.	Tottori Prefectural Institute of Public Health and Environmental Science			○	
Shimane Pref.	Shimane Prefectural Institute of Public Health and Environmental Science			○	○
Okayama Pref.	Okayama Prefectural Institute for Environmental Science and Public Health	○	○		
Hiroshima Pref.	Hiroshima Prefectural Institute of Public Health and Environment	○	○		
Hiroshima City	Hiroshima City Institute of Public Health			○	○
Yamaguchi Pref.	Yamaguchi Prefectural Institute of Public Health and Environment	○	○		○
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		○		○
Kochi Pref.	Kochi Prefectural Environmental Research Center	○	○	○	
Fukuoka Pref.	Fukuoka Institute of Health and Environmental Science				○
Kitakyushu City	Kitakyushu City Institute of 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.	Environmental Preservation Division, Life and Environment Department		○		
Miyazaki Pref.	Miyazaki Prefectural Institute for Public Health and Environment	○	○		○
Kagoshima Pref.	Kagoshima Prefectural Institute for Environmental Research and Public Health	○	○	○	○
Okinawa Pref.	Okinawa Prefectural Institute of Health and Environment	○	○	○	○

(Note) Organisations responsible for sampling are described by their official names in FY 2005.

(2) Monitored sites (areas)

Monitored sites (areas) are shown in Figure 4-1-1 for surface water, Figure 4-1-2 for sediment, Figure 4-1-3 for wildlife, and Figure 4-1-4 for air. The breakdown is summarized as follows. The numbers of target chemicals (groups) were identical for each monitored medium in each monitored site (or area).

Monitored media	Numbers of local communities	Numbers of target chemicals (groups)	Numbers of monitored sites (or areas)	Numbers of samples at a monitored site (or area)
Surface water	42	21	48	1
Sediment	48	18	64	3
Wildlife (fish)	7	18	7	5
Wildlife (bivalves)	14	18	16	5
Wildlife (birds)	2	18	2	5
Air (warm season)	35	12	37	1
Air (cold season)	35	12	37	1

List of monitored sites (surface water) in the Environmental Monitoring in FY 2005

Local communities	Monitored sites	Sampling dates
Hokkaido	Suzuran-ohashi Bridge, Riv Tokachi (Obihiro City)	October 10, 2005
	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari (Ishikari City)	October 14, 2005
Aomori Pref.	Lake Jusan	October 5, 2005
Iwate Pref.	Riv. Toyosawa (Hanamaki City)	October 19, 2005
Miyagi Pref.	Sendai Bay (Matsushima Bay)	October 6, 2005
Akita Pref.	Lake Hachiro	October 5, 2005
Yamagata Pref.	Mouth of Riv. Mogami (Sakata City)	October 6, 2005
Fukushima Pref.	Onahama Port	November 1, 2005
Ibaraki Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone (Kamisu City)	October 27, 2005
Tochigi Pref.	Riv. Tagawa (Utsunomiya City)	October 27, 2005
Chiba City	Mouth of Riv. Hanami (Chiba City)	October 28, 2005
Tokyo	Mouth of Riv. Arakawa (Koto Ward)	October 4, 2005
	Mouth of Riv. Sumida (Minato Ward)	October 4, 2005
Yokohama City	Yokohama Port	October 25, 2005
Kawasaki City	Keihin Canal in Kawasaki Port	October 24, 2005
Niigata Pref.	Lower Riv. Shinano (Niigata City)	October 3, 2005
Toyama Pref.	Hagiura-bashi Bridge, Mouth of Riv. Jintsu (Toyama City)	November 15, 2005
Ishikawa Pref.	Mouth of Riv. Sai (Kanazawa City)	October 12, 2005
Fukui Pref.	Mishima-bashi Bridge, Riv. Shono (Tsuruga City)	October 14, 2005
Nagano Pref.	Lake Suwa (center)	October 12, 2005
Shizuoka Pref.	Riv. Tenryu (Iwata City)	November 24, 2005
Aichi Pref.	Nagoya Port	September 15, 2005
Mie Pref.	Yokkaichi Port	October 25, 2005
Shiga Pref.	Lake Biwa (center, offshore of Karasaki)	October 25, 2005
Kyoto Pref.	Miyazu Port	October 7, 2005
Kyoto City	Miyamae-bashi Bridge, Riv. Katsura (Kyoto City)	October 20, 2005
Osaka Pref.	Mouth of Riv. Yamato (Sakai City)	November 8, 2005
Osaka City	Osaka Port	November 30, 2005
Hyogo Pref.	Offshore of Himeji	October 19, 2005
Kobe City	Kobe Port (center)	November 15, 2005
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa (Wakayama City)	October 25, 2005
Okayama Pref.	Offshore of Mizushima	October 26, 2005
Hiroshima Pref.	Kure Port	November 15, 2005
	Hiroshima Bay	November 15, 2005
Yamaguchi Pref.	Tokuyama Bay	October 24, 2005
	Offshore of Ube	October 6, 2005
	Offshore of Hagi	October 14, 2005
Tokushima Pref.	Mouth of Riv. Yoshino (Tokushima City)	October 27, 2005
Kagawa Pref.	Takamatsu Port	October 3, 2005
Kochi Pref.	Mouth of Riv. Shimanto (Shimanto City)	October 31, 2005
Kitakyushu City	Dokai Bay	November 11, 2005
Saga Pref.	Imari Bay	November 1, 2005
Kumamoto Pref.	Riv. Midori (Uto City)	November 16, 2005
Miyazaki Pref.	Mouth of Riv. Oyodo (Miyazaki City)	November 15, 2005
Kagoshima Pref.	Riv. Amori (Hayato Town)	November 1, 2005
	Gotanda-bashi Bridge, Riv. Gotanda (Ichikikushikino City)	October 13, 2005
Okinawa Pref.	Naha Port	October 27, 2005

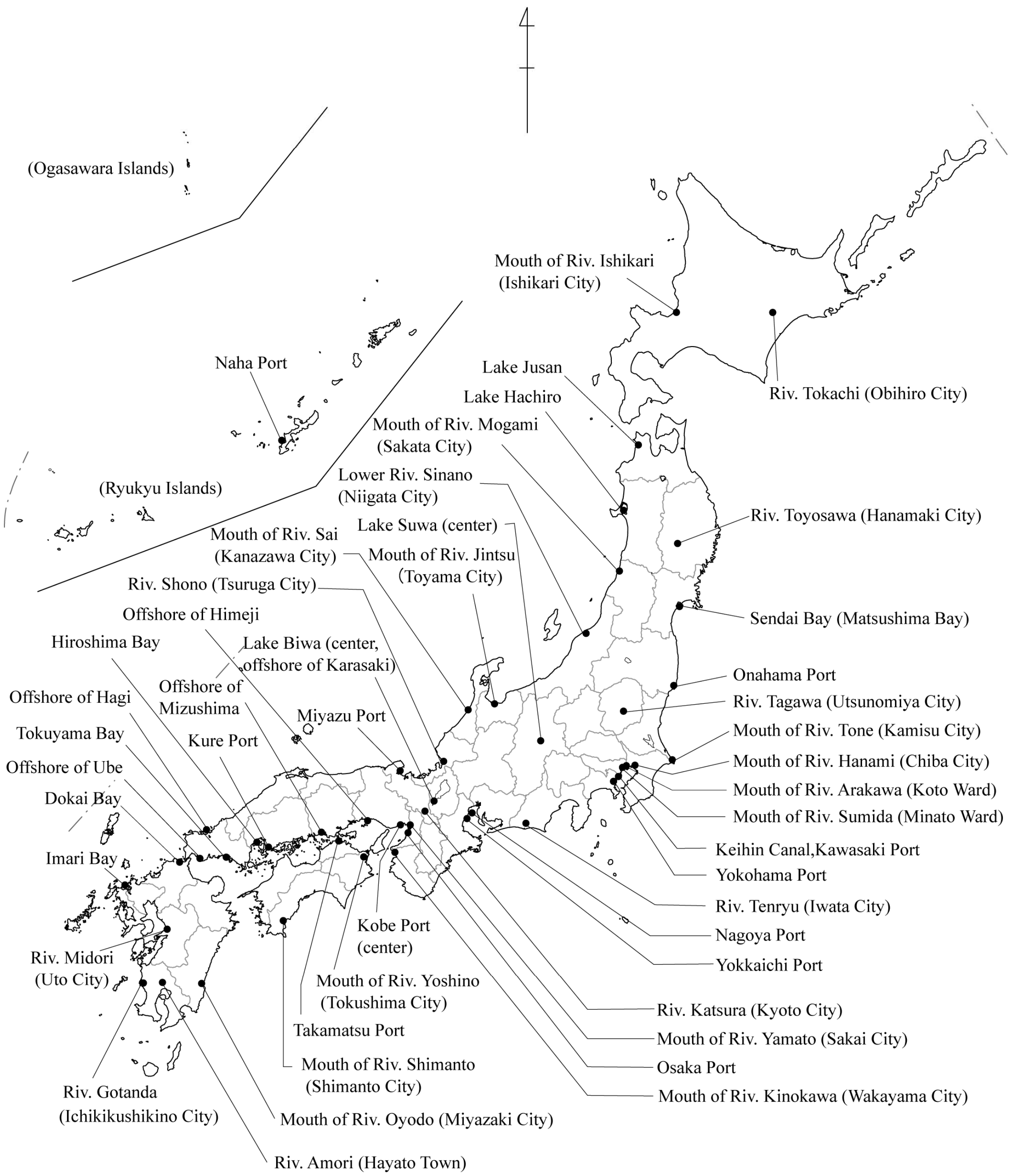

Figure 4-1-1 Monitored sites (surface water) in the Environmental Monitoring in FY 2005

List of monitored sites (sediment) in the Environmental Monitoring in FY 2005

Local communities	Monitored sites	Sampling dates
Hokkaido	Onnenai-ohashi Bridge, Riv. Teshio (Bifuka Town)	October 17, 2005
	Suzuran-ohashi Bridge, Riv Tokachi (Obihiro City)	October 19, 2005
	Ishikarikakokyo Bridge, Mouth of Riv. Ishikari (Ishikari City)	October 14, 2005
	Tomakomai Port	September 28, 2005
Aomori Pref.	Lake Jusan	October 5, 2005
Iwate Pref.	Riv. Toyosawa (Hanamaki City)	October 19, 2005
Miyagi Pref.	Sendai Bay (Matsushima Bay)	October 6, 2005
Sendai City	Hirose-ohashi Bridge, Riv. Hirose (Sendai City)	November 16, 2005
Akita Pref.	Lake Hachiro	October 5, 2005
Yamagata Pref.	Mouth of Riv. Mogami (Sakata City)	October 6, 2005
Fukushima Pref.	Onahama Port	November 1, 2005
Ibaraki Pref.	Tonekamome-ohasi Bridge, Mouth of Riv. Tone (Kamisu City)	October 27, 2005
Tochigi Pref.	Riv. Tagawa (Utsunomiya City)	October 27, 2005
Chiba Pref.	Coast of Ichihara and Anegasaki	October 27, 2005
Chiba City	Mouth of Riv. Hanami (Chiba City)	October 28, 2005
Tokyo	Mouth of Riv. Arakawa (Koto Ward)	October 4, 2005
	Mouth of Riv. Sumida (Minato Ward)	October 4, 2005
Yokohama City	Yokohama Port	October 25, 2005
Kawasaki City	Mouth of Riv. Tama (Kawasaki City)	October 25, 2005
	Keihin Canal in Kawasaki Port	October 24, 2005
Niigata Pref.	Lower Riv. Shinano (Niigata City)	October 3, 2005
Toyama Pref.	Hagiura-bashi Bridge, Mouth of Riv. Jintsu (Toyama City)	November 15, 2005
Ishikawa Pref.	Mouth of Riv. Sai (Kanazawa City)	October 12, 2005
Fukui Pref.	Mishima-bashi Bridge, Riv. Shono (Tsuruga City)	October 14, 2005
Yamanashi Pref.	Senshu-bashi Bridge, Riv. Arakawa (Kofu City)	November 16, 2005
Nagano Pref.	Lake Suwa (center)	October 12, 2005
Shizuoka Pref.	Shimizu Port	November 15, 2005
	Riv. Tenryu (Iwata City)	November 24, 2005
Aichi Pref.	Kinuura Port	September 15, 2005
	Nagoya Port	September 15, 2005
Mie Pref.	Yokkaichi Port	October 25, 2005
	Toba Port	November 15, 2005
Shiga Pref.	Lake Biwa (center, offshore of Minamihira)	October 25, 2005
	Lake Biwa (center, offshore of Karasaki)	October 25, 2005
Kyoto Pref.	Miyazu Port	October 7, 2005
Kyoto City	Riv. Katsura (Kyoto City)	October 20, 2005
Osaka Pref.	Mouth of Riv. Yamato (Sakai City)	November 8, 2005
Osaka City	Osaka Port	November 30, 2005
	Outside Osaka Port	January 18, 2006
	Mouth of Riv. Yodo (Osaka City)	January 18, 2006
	Riv. Yodo (Osaka City)	November 9, 2005
Hyogo Pref.	Offshore of Himeji	October 19, 2005
Kobe City	Kobe Port (center)	November 15, 2005
Nara Pref.	Riv. Yamato (Ooji Town)	October 31, 2005
Wakayama Pref.	Kinokawa-ohashi Bridge, Mouth of Riv. Kinokawa (Wakayama City)	October 25, 2005
Okayama Pref.	Offshore of Mizushima	October 26, 2005
Hiroshima Pref.	Kure Port	November 15, 2005
	Hiroshima Bay	November 15, 2005
Yamaguchi Pref.	Tokuyama Bay	October 24, 2005
	Offshore of Ube	October 6, 2005
	Offshore of Hagi	October 14, 2005
Tokushima Pref.	Mouth of Riv. Yoshino (Tokushima City)	October 27, 2005
Kagawa Pref.	Takamatsu Port	October 3, 2005
Ehime Pref.	Niihama Port	October 26, 2005
Kochi Pref.	Mouth of Riv. Shimanto (Shimanto City)	October 31, 2005
Kitakyushu City	Dokai Bay	November 11, 2005
Fukuoka City	Hakata Bay	October 27, 2005
Saga Pref.	Imari Bay	November 1, 2005
Oita Pref.	Mouth of Riv. Oita (Oita City)	December 9, 2005

Local communities	Monitored sites	Sampling dates
Miyazaki Pref.	Mouth of Riv. Oyodo (Miyazaki City)	November 15, 2005
Kagoshima Pref.	Riv. Amori (Hayato Town)	November 1, 2005
	Gotanda-bashi Bridge, Riv. Gotanda (Ichikikushikino City)	October 13, 2005
Okinawa Pref.	Naha Port	October 27, 2005

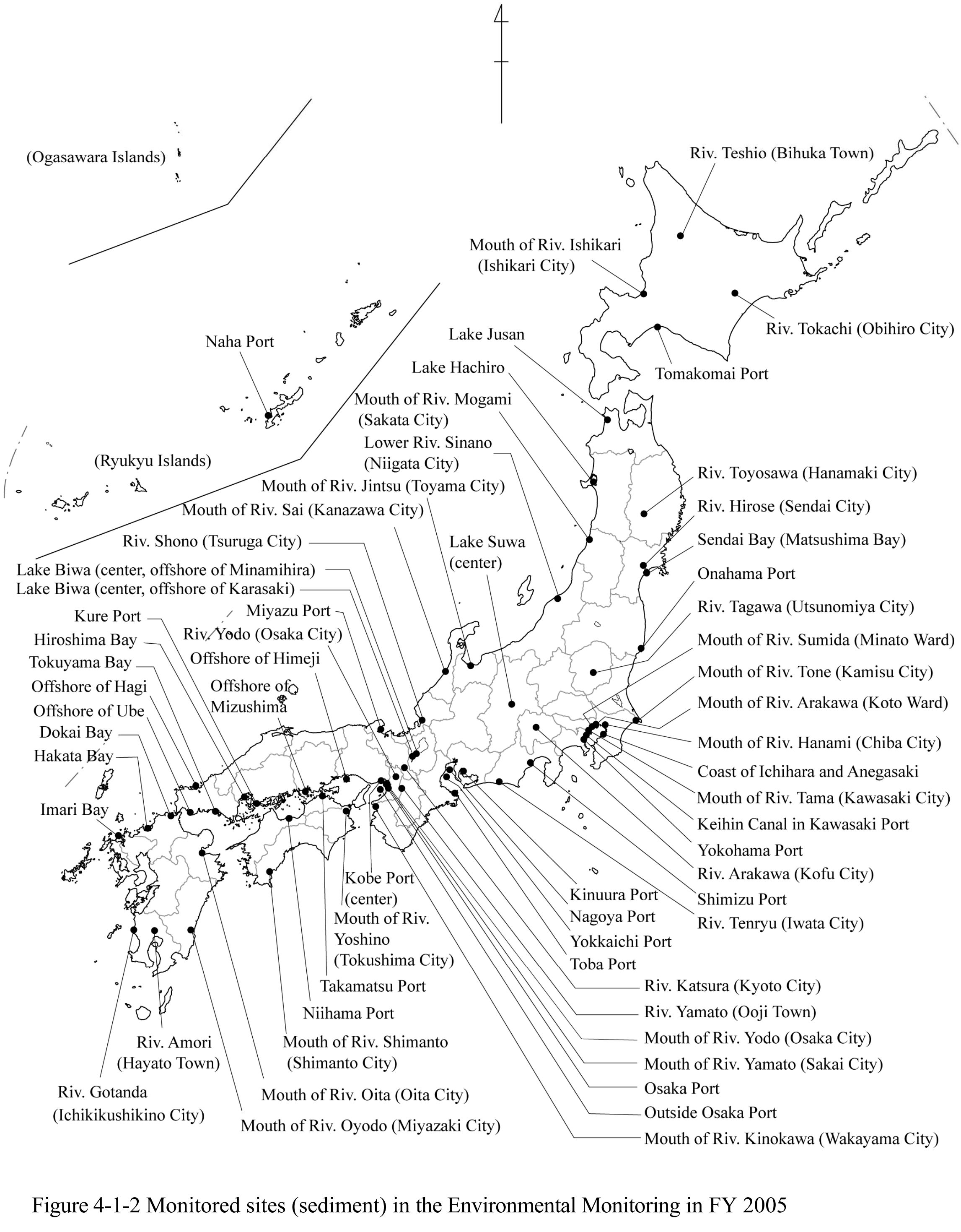

Figure 4-1-2 Monitored sites (sediment) in the Environmental Monitoring in FY 2005

List of monitored areas (wildlife) in the Environmental Monitoring in FY 2005

Local communities	Monitored sites	Sampling dates	Wildlife species	
Hokkaido	Offshore of Kushiro	March, 9, 2006 November 18, 2005	Fish Fish	Rock greenling (*Hexagrammos otakki*) Chum salmon (*Oncorhynchus keta*)
	Offshore of Japan Sea (offshore of Iwanai)	January 30, 2006	Fish	Greenling (*Hexagrammos lagocephalus*)
Aomori Pref.	Kabu Is. (Hachinohe City)	July 7～13, 2005	Birds	Black-taild gull (*Larus crassirostris*)
Iwate Pref.	Yamada Bay	November 21, 2005 November 29, 2005	Bivalves Fish	Blue mussel (*Mytilus galloprovincialis*) Greenling (*Hexagrammos lagocephalus*)
	Suburb of Morioka City	October 21, 2005	Birds	Gray starling (*Sturnus cineraceus*)
Miyagi Pref.	Sendai Bay (Matsushima Bay)	November 2, 2005	Fish	Sea bass (*Lateolabrax japonicus*)
Ibaraki Pref.	Offshore of Joban	October 25, 2005	Fish	Pacific saury (*Cololabis saira*)
Tokyo Met.	Tokyo Bay	September 12, 2005	Fish	Sea bass (*Lateolabrax japonicus*)
Yokohama City	Yokohama Port	November 30, 2005	Bivalves	Blue mussel (*Mytilus galloprovincialis*)
Kawasaki City	Offshore of Ogi Island in Kawasaki Port	October 3, 2005	Fish	Sea bass (*Lateolabrax japonicus*)
Ishikawa Pref.	Coast of Noto Peninsula	January 24, 2006	Bivalves	Blue mussel (*Mytilus galloprovincialis*)
Shiga Pref.	Lake Biwa, Riv. Azumi (Takashima City)	April 14, 2005	Fish	Dace (*Tribolodon hakonensis*)
Osaka Pref.	Osaka Bay	October 21, 2005	Fish	Sea bass (*Lateolabrax japonicus*)
Hyogo Pref.	Offshore of Himeji	December 12, 2005	Fish	Sea bass (*Lateolabrax japonicus*)
Tottori Pref.	Nakaumi	November 25, 2005	Fish	Sea bass (*Lateolabrax japonicus*)
Shimane Pref.	Shichirui Bay, Shimane Peninsula	October 3, 2005	Bivalves	Blue mussel (*Mytilus galloprovincialis*)
Hiroshima City	Hiroshima Bay	October 7, 2005 November 22, 2005 November 29, 2005	Fish	Sea bass (*Lateolabrax japonicus*)
Tokushima Pref.	Naruto	October 12, 2005	Bivalves	Hard-shelled mussel (*Mytilus coruscus*)
Kagawa Pref.	Takamatsu Port	October 31, 2005	Bivalves	Hard-shelled mussel (*Mytilus coruscus*)
Kochi Pref.	Mouth of Riv. Shimanto (Shimanto City)	November 20, 2005	Fish	Sea bass (*Lateolabrax japonicus*)
Kitakyushu City	Dokai Bay	July 12, 2005	Bivalves	Blue mussel (*Mytilus galloprovincialis*)
Kagoshima Pref.	West Coast of Satsuma Peninsula	October 18, 2005 December 15, 2005	Fish	Sea bass (*Lateolabrax japonicus*)
Okinawa Pref.	Nakagusuku Bay	January 16, 2006 January 17, 2006 January 21, 2006 January 24, 2006	Fish	Okinawa seabream (*Acanthopagrus sivicolus*)

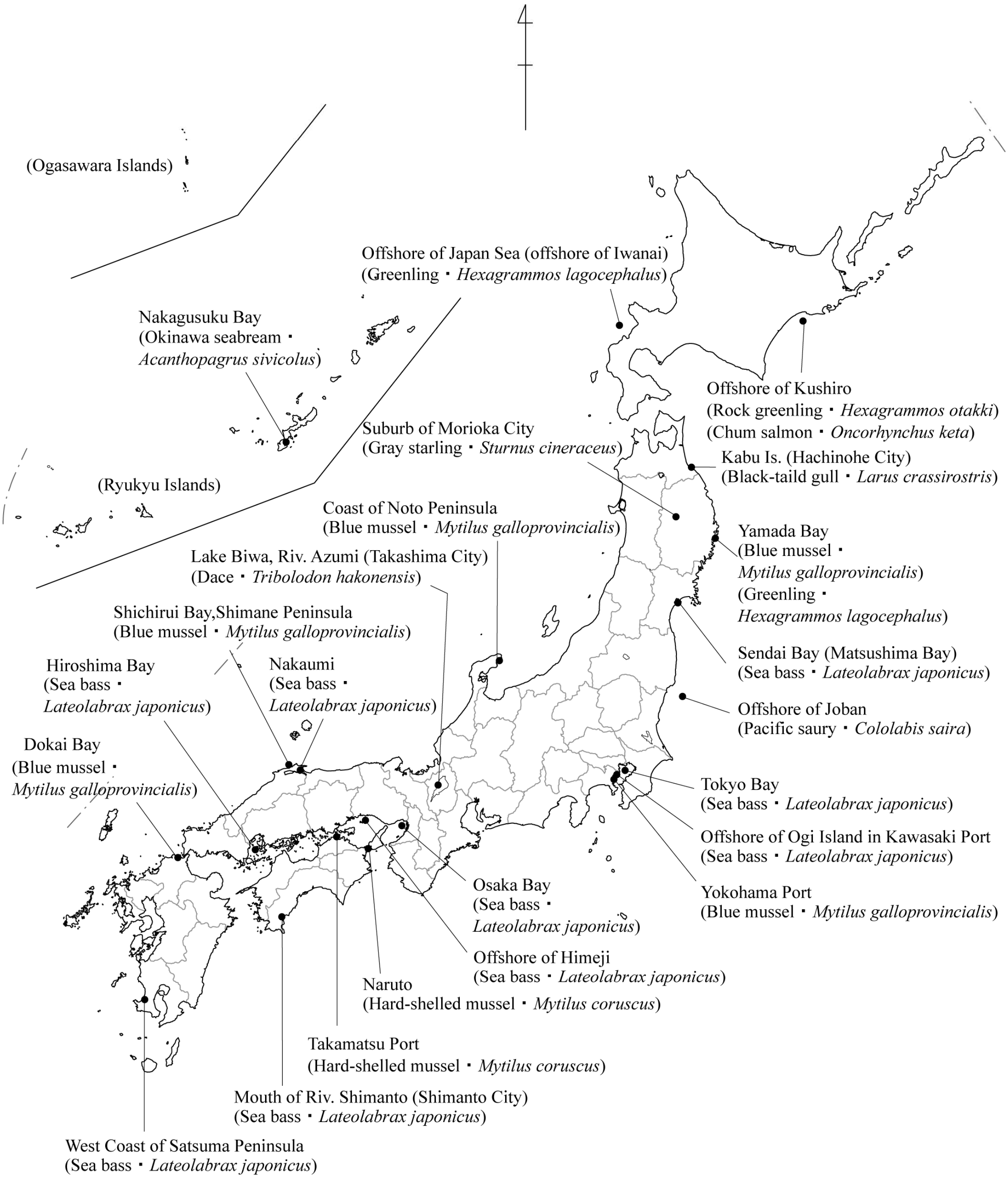

Figure 4-1-3 Monitored areas (wildlife) in the Environmental Monitoring in FY 2005

List of monitored sites (air) in the Environmental Monitoring in FY 2005

Local communities	Monitored sites	Sampling dates (Warm season)	Sampling dates (Cold season)
Hokkaido	Kushiro City Harutori Junior High School (Kushiro City)	September 13～16, 2005	December 6～9, 2005
Sapporo City	Sapporo Art Park (Sapporo City)	September 12～15, 2005	November 14～17, 2005
Iwate Pref.	Amihari Ski Area (Shizukuishi Town)	September 21～October 6, 2005	November 2～10, 2005
Miyagi Pref.	Miyagi Prefectural Institute of Public Health and Environment (Sendai City)	September 8～15, 2005	December 8～15, 2005
Ibaraki Pref.	Ibaraki Prefecture Environmental Observation Center (Mito City)	September 28～October 1, 2005	November 15～18, 2005
Gunma Pref.	Gunma Prefectural Institute of Public Health and Environmental Sciences (Maebashi City)	October 7～15, 2005	December 2～9, 2005
Chiba Pref.	Ichihara-Matsuzaki Air Quality Monitoring Station (Ichihara City)	September 19～22, 2005	November 14～17, 2005
Tokyo	Tokyo Metropolitan Research Institute for Environmental Protection (Koto Ward)	September 12～October 3, 2005	November 14～25, 2005
	Chichijima Island	September 30～October 7, 2005	December 3～10, 2005
Kanagawa Pref.	Kanagawa Environmental Research Center (Hiratsuka City)	September 12～October 6, 2005	November 28～December 15, 2005
Yokohama City	Yokohama Environmental Science Research Institute (Yokohama City)	September 26～October 3, 2005	December 12～19
Niigata Pref.	Oyamadai Koen Air Quality Monitoring Station (Niigata City)	September 26～29, 2005	November 28～December 1, 2005
Toyama Pref.	Tonami Air Quality Monitoring Station (Tonami City)	October 11～14, 2005	November 29～December 2, 2005
Ishikawa Pref.	Ishikawa Prefectural Institute of Public Health and Environmental Science (Kanazawa City)	October 3～14, 2005	November 7～17, 2005
Yamanashi Pref.	Fujiyoshida Joint Prefectural Government Building (Fujiyoshida City)	September 12～15, 2005	November 7～10, 2005
Nagano Pref.	Nagano Environmental Conservation Research Institute (Nagano City)	September 27～October 4, 2005	December 6～13, 2005
Gifu Pref.	Gifu Prefectural Research Institute for Health and Environmental Sciences (Kakamigahara City)	September 28～October 1, 2005	November 15～18, 2005
Nagoya City	Chikusa Ward Heiwa Park (Nagoya City)	September 27～October 4, 2005	December 6～13, 2005
Mie Pref.	Mie Prefectural Science and Technology Promotion Center (Yokkaichi City)	September 12～15, 2005	December 6～9, 2005
Kyoto Pref.	Kyoto Prefecture Joyo Senior High School (Joyo City)	October 3～6, 2005	November 29～December 2, 2005
Osaka Pref.	Osaka Prefecture Environmental Pollution Control Center (Osaka City)	October 3～7, 2005	December 6～9
Hyogo Pref.	Hyogo Prefectural Institute of Public Health and Environmental Sciences (Kobe City)	September 18～21, 2005	December 19～22, 2005
Kobe City	Fukiai Air Quality Monitoring Station (Kobe City)	September 13～16, 2005	December 13～16, 2005
Nara Pref.	Tenri Air Quality Monitoring Station (Tenri City)	September 26～29, 2005	November 28～December 2, 2005
Shimane Pref.	Oki National Acid Rain Observatory (Okinoshima Town)	October 3～6, 2005	November 28～December 1, 2005
Hiroshima City	Hiroshima City Kokutaiji Junior High School (Hiroshima City)	September 12～15, 2005	November 28～December 1, 2005
Yamaguchi Pref.	Yamaguchi Prefectural Institute of Public Health and Environment (Yamaguchi City)	September 23～30, 2005	November 28～December 1, 2005
	Hagi City Government Building, Mishima Branch (Hagi City)	September 22～29, 2005	November 28～December 1, 2005
Tokushima Pref.	Tokushima Prefectural Institute of Public Health and Environmental Sciences (Tokushima City)	September 20～23, 2005	December 19～22, 2005
Kagawa Pref.	Takamatsu Joint Prefectural Government Building (Takamatsu City) Kagawa Prefectural Public Swimming Pool (Takamatsu City) as a reference site	September 12～October 5, 2005	November 28～December 7, 2005
Ehime Pref.	Ehime Prefecture Government Building, Uwajima Branch (Uwajima City)	October 3～6, 2005	November 14～17, 2005
Fukuoka Pref.	Omuta City Government Building (Omuta City)	October 3～6, 2005	November 28～December 1, 2005
Saga Pref.	Saga Prefectural Environmental Research Center (Saga City)	September 30～October 7, 2005	December , 200512～19, 2005
Kumamoto Pref.	Kumamoto Prefectural Institute of Public Health and Environmental Science (Udo City)	September 26～29, 2005	December , 20056～22, 2005
Miyazaki Pref.	Miyazaki Prefectural Institute for Public Health and Environment (Miyazaki City)	September 27～October 4, 2005	December , 200512～26, 2005
Kagoshima Pref.	Kagoshima Prefectural Institute for Environmental Research and Public Health (Kagoshima City)	September 26～October 6, 2005	November 15～18, 2005 January 16～19, 2006
Okinawa Pref.	Cape Hedo (Kunigami Village)	September 27～30, 2005	November 28～December 1, 2005 December 12～15, 2005

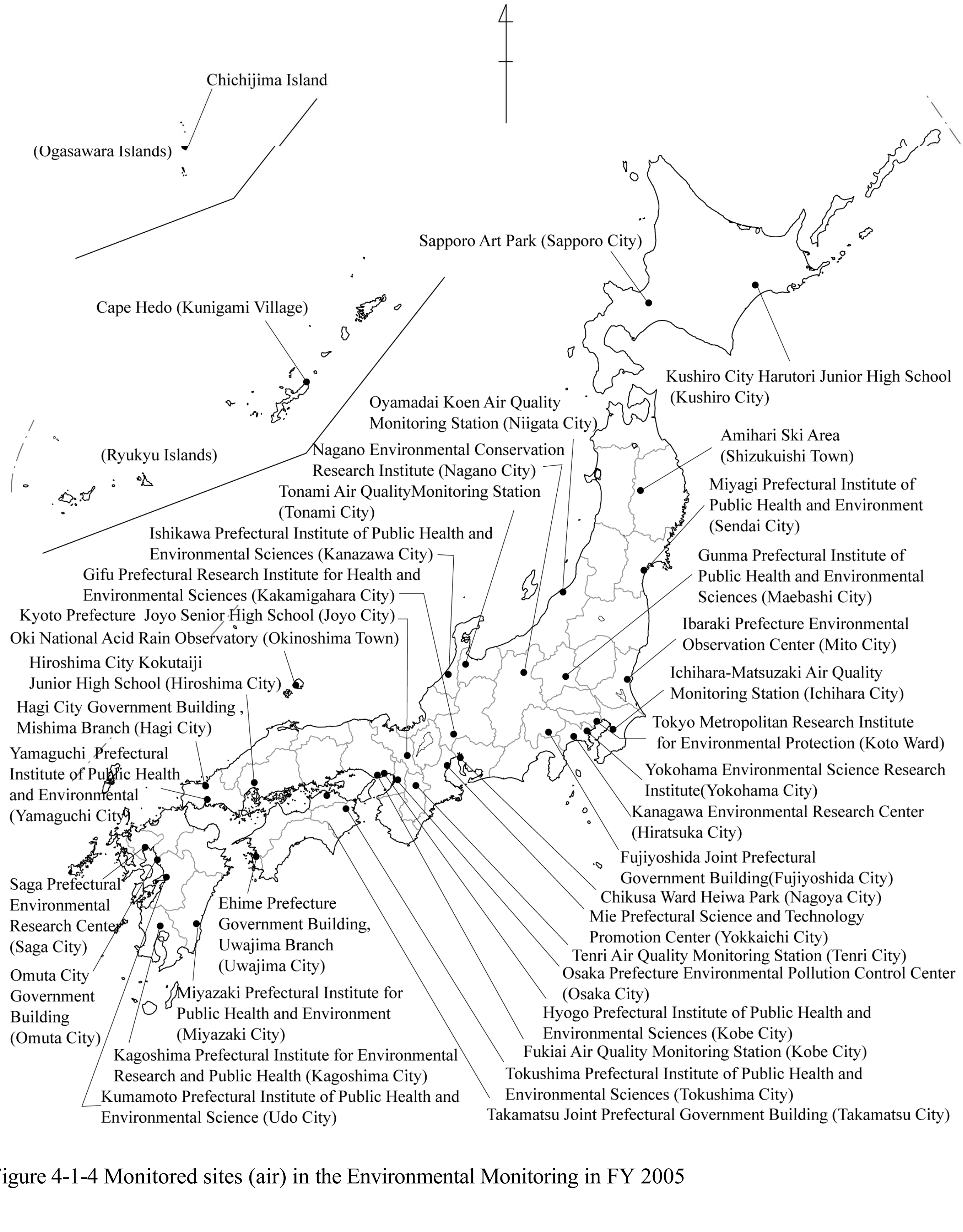

Figure 4-1-4 Monitored sites (air) in the Environmental Monitoring in FY 2005

(3) Target species

The species to be monitored among the wildlife media were selected considering the possibility of international comparison, as well as their significance and practicality as indicators: 3 bivalves (predominantly blue mussel), 7 fishes (predominantly sea bass), and 2 birds, namely, 12 species in total.

The properties of the species determined as targets in the FY 2005 monitoring are shown in Table 4-1. Moreover, Table 4-2 summarizes the outline of the samples used for analysis. Here, in the case of the black-tailed gull, prefledged juveniles (sacrificed) were used as samples.

(4) Sampling method of specimens

The sampling of specimens and the preparation of samples were carried out following the "Environmental Monitoring Instruction Manual" (No. 040309001, published on March 9th, 2004) by the Environment Health and Safety Division, Environmental Health Department, Ministry of the Environment of Japan (MOE).

Table 4-1 Properties of target species

Species		Properties	Monitored areas	Aim of monitoring	Notes
Bibalves	Blue mussel (*Mytilus galloprovincialis*)	① Distributed worldwide, excluding tropical zones ② Adheres to rocks in inner bays and to bridge piers; To understand the persistence level in specific areas. 5 areas with different persistence levels of pollution were monitored	・Iwate Pref. Yamada Bay ・Kanagawa Pref. Yokohama Port ・Ishikawa Pref. Coast of Noto Peninsula • Shitirui Bay • Kitakyushu City, Dokai Bay	Follow-up of the environmental fate and persistency in specific areas	Monitored areas of 5 different levels of persistency
	Hard-shelled mussel (*Mytilus coruscus*)	① Distributed in various areas of southern Hokkaido and southward ② Adheres to rocks where the current is fast (1-10 m/s); To understand the persistence level in specific areas	・Tokushima Pref. Naruto ・Kagawa Pref. Takamatsu Port	Follow-up of the environmental fate and persistency in specific areas	
Fish	Greenling (*Hexagrammos lagocephalus*)	① Distributed from Hokkaido to southern Japan, the Korean Peninsula, and China ② Lives in shallow seas of 5-50 m depth from sea level; To understand the persistence level in specific areas	・Hokkaido Offshore of Iwanai ・Iwate Pref.Yamada Bay	Follow-up of the environmental fate and persistency in specific areas	
	Rock greenling (*Hexagrammos otakki*)	① Lives in cold-current areas of Hidaka and eastward (Hokkaido) ② Larger than the greenling and eats fish smaller than its mouth size at the sea bottom; To understand the persistence level in specific areas	・Hokkaido Offshore of Kushiro	Follow-up of the environmental fate and persistency in specific areas	
	Pacific saury (*Cololabis saira*)	① Distributed widely in northern Pacific Ocean ② Migrates around Japanese Archipelago; in Chishima in autumn and northern Kyushu in winter ③ Bioaccumulation of chemicals is said to be moderate; To understand the persistence level around the Japanese Archipelago	・Ibaraki Pref. Offshore of Joban	Follow-up of the environmental fate and persistency around the Japanese archipelago	
	Chum salmon (*Oncorhynchus keta*)	① Distributed in northern Pacific Ocean, Sea of Japan, Bering Sea, Sea of Okhotsk, the whole of the Gulf of Alaska, and part of the Arctic Ocean ② Spawns in the Tone River (*Tonegawa*) on the Pacific Ocean side and rivers north of Yamaguchi Prefecture on the Sea of Japan side in the case of Japan ③ Bioaccumulation of chemicals is said to be moderate; To understand the persistence level on a global scale	・Hokkaido Offshore of Kushiro	Follow-up of the environmental fate and persistency on a global scale	
	Sea bass (*Lateolabrax japonicus*)	① Distributed around the shores of various areas in Japan, the Korean Peninsula, and the coastal areas of China ② Sometimes lives in a freshwater environment and brackish-water regions during its life cycle ③ Bioaccumulation of chemicals is said to be high; To understand the persistence level in specific areas, 9 areas with different persistence levels of pollution were monitored.	・Miyagi Pref.Matsushima Bay ・Tokyo Met.Tokyo Bay ・Kanagawa Pref.Kawasaki Port ・Osaka Pref.Osaka Bay ・Hyogo Pref.Offshore of Himeji ・Tottori Pref.Nakaumi ・Hiroshima Pref.Hiroshima Bay ・Kochi Pref.Mouth of Riv. Shimanto ・Kagoshima Pref.West Coast of Satsuma Peninsula	Follow-up of the environmental fate and persistency in specific areas	Monitored areas of 9 different levels of persistency
	Okinawa seabeam (*Acanthopagrus sivicolus*)	① Distributed around Nansei Shoto (Ryukyu Islands) ② Lives in coral reefs and in bays into which rivers flow; To understand the persistence level in specific areas	・Okinawa Pref.Kanagusuku Bay	Follow-up of the environmental fate and persistency in specific areas	
	Dace (*Tribolodon hakonensis*)	① Distributed widely in freshwater environments throughout Japan ② Preys mainly on insects; To understand the persistence level in specific areas	・Shiga Pref.Lake Biwa, Riv. Azumi (Takashima City)	Follow-up of the environmental fate and persistency in specific areas	

Species		Properties	Monitored areas	Aim of monitoring	Notes
Birds	Gray starling (*Sturnus cineraceus*)	① Distributed widely in the Far East (Related species are distributed worldwide) ② Eats primarily insects; To understand the persistence level in northern Japan。	・Iwate Pref.Morioka City	Follow-up of the environmental fate and persistency in northern Japan	
	Black-taild gull (*Larus crassirostris*)	① Breeds mainly in the sea off Japan ② Breeds in groups at shore reefs and in grassy fields; To understand the persistence level in specific areas	・Aomori Pref. Kabu Is. (Hachinohe City)	Follow-up of the environmental fate and persistency in specific areas	

Table 4-2-1 Basic data of specimens (bivalves as wildlife) in the Environmental Monitoring in FY 2005

Bivalve species (Area)	No.	Sampling month	Sex	Number of animals	Weight (g) (Average)				Length (cm) (Average)				Water content %	Lipid content %
Blue mussel *Mytilus galloprovincialis* (Yamada Bay)	1	November, 2005	Uncertain	208	20.2	～	36.7	(31.1)	6.8	～	7.3	(7.0)	83.2	1.5
	2		Uncertain	169	28.6	～	51.8	(47.4)	7.3	～	7.7	(7.6)	81.9	1.6
	3		Uncertain	130	36.2	～	59.9	(39.4)	7.8	～	8.2	(7.9)	80.6	1.8
	4		Uncertain	117	35.2	～	79.1	(55.8)	8.4	～	9.7	(8.9)	81.8	1.7
	5		Uncertain	260	15.4	～	36.5	(25.7)	6.0	～	6.7	(6.5)	83.5	1.6
Blue mussel *Mytilus galloprovincialis* (Yokohama Port)	1	November, 2005	Uncertain	465	1.54	～	3.82	(2.8)	2.5	～	3.4	(2.9)	88.7	0.44
	2		Uncertain	483	1.75	～	4.94	(2.8)	2.6	～	3.6	(3.0)	89.0	0.43
	3		Uncertain	490	1.79	～	3.84	(2.6)	2.6	～	3.5	(3.1)	89.5	0.49
	4		Uncertain	488	1.55	～	5.74	(2.6)	2.5	～	3.6	(3.0)	89.4	0.43
	5		Uncertain	484	1.43	～	5.70	(2.5)	2.5	～	4.1	(2.9)	87.2	0.44
Blue mussel *Mytilus galloprovincialis* (Coast of Noto Peninsula)	1	January, 2006	Uncertain	33	54.3	～	110.8	(76.5)	8.0	～	10.1	(9.2)	80.8	1.7
	2		Uncertain	59	23.0	～	46.7	(33.5)	6.5	～	7.7	(7.2)	81.2	1.6
	3		Uncertain	83	14.9	～	32.7	(23.7)	5.8	～	7.2	(6.6)	83.1	1.6
	4		Uncertain	95	14.0	～	36.6	(22.9)	5.6	～	6.8	(6.2)	83.8	1.5
	5		Uncertain	168	9.5	～	22.1	(16.7)	5.2	～	6.3	(5.8)	83.1	1.6
Blue mussel *Mytilus galloprovincialis* (Shitirui Bay)	1	October, 2005	Uncertain	167	23.2	～	47.3	(34.9)	5.4	～	7.2	(6.3)	74.6	3.0
	2		Uncertain	330	15.3	～	42.4	(26.0)	4.5	～	6.1	(5.5)	76.4	2.6
	3		Uncertain	550	6.8	～	12.7	(9.3)	3.3	～	4.1	(3.6)	78.6	2.4
	4		Uncertain	1,020	4.3	～	10.2	(6.6)	2.8	～	3.5	(3.1)	78.3	2.0
	5		Uncertain	1,200	2.1	～	5.0	(3.7)	2.0	～	2.5	(2.1)	80.3	1.6
Hard-shelled mussel *Mytilus coruscus* (Naruto)	1	October, 2005	Uncertain	24	314	～	539	(432)	14	～	17	(15)	78.4	1.1
	2		Uncertain	18	301	～	647	(497)	14	～	18.5	(16)	78.0	1.3
	3		Uncertain	17	287	～	790	(488)	15	～	17.5	(16)	71.8	1.3
	4		Uncertain	20	500	～	688	(572)	16	～	18.5	(18)	72.5	1.3
	5		Uncertain	17	465	～	848	(637)	17	～	20	(18)	76.5	1.1
Hard-shelled mussel *Mytilus coruscus* (Takamatsu Port)	1	October, 2005	Uncertain	120	40.06	～	163.88	(77.4)	7.55	～	12.50	(9.6)	Uncertain	2.5
	2		Uncertain	120	43.69	～	108.03	(75.0)	8.52	～	10.82	(9.6)	Uncertain	2.0
	3		Uncertain	130	34.99	～	137.47	(66.2)	7.66	～	11.67	(9.2)	Uncertain	2.2
	4		Uncertain	125	32.22	～	111.73	(64.8)	8.57	～	10.80	(9.6)	Uncertain	2.0
	5		Uncertain	128	30.40	～	119.82	(66.3)	6.94	～	10.26	(9.1)	Uncertain	2.1
Blue mussel *Mytilus galloprovincialis* (Dokai Bay)	1	July, 2005	Mixed	210	2.9	～	14.0	(8.4)	3.1	～	5.4	(4.5)	75.9	2.0

Table 4-2-2 Basic data of specimens (fish as wildlife) in the Environmental Monitoring in FY 2005

Fish species (Area)	No.	Sampling month	Sex	Number of animals	Weight (g) (Average)	Length (cm) (Average)	Water content %	Lipid content %
Rock greenling *Hexagrammos otakki* (Offshore of Kushiro)	1	March, 2006	Male	4	707 ～ 1,073 (871.8)	31.4 ～ 37.0 (34.4)	80.1	1.0
	2		Male	4	826 ～ 993 (915.3)	32.8 ～ 35.8 (34.8)	79.7	0.7
	3		Female	4	811 ～ 1,105 (927.0)	34.8 ～ 36.3 (35.4)	78.9	1.9
	4		Female	4	802 ～ 1,233 (985.5)	33.4 ～ 37.8 (35.7)	79.5	1.3
	5		Female	5	667 ～ 998 (859.6)	32.1 ～ 35.3 (34.5)	79.4	1.5
Greenling *Hexagrammos lagocephalus* (Offshore of Iwanai)	1	January, 2006	Male	4	465 ～ 1,432 (897)	26.8 ～ 38.7 (32.2)	78.8	0.9
	2		Female	8	191 ～ 449 (326)	23.2 ～ 25.8 (24.7)	77.9	1.3
	3		Mixed	7	246 ～ 487 (417)	23.2 ～ 28.7 (27.1)	79.0	1.7
	4		Mixed	6	309 ～ 853 (564)	25.1 ～ 33.5 (29.6)	79.1	1.5
	5		Mixed	5	473 ～ 776 (656)	26.8 ～ 33.2 (30.7)	79.4	1.0
Chum salmon *Oncorhynchus keta* (Offshore of Kushiro)	1	November, 2005	Male	1	5,750 (5,750)	70.8 (70.8)	74.1	1.9
	2		Female	1	5,540 (5,540)	68.6 (68.6)	74.9	2.0
	3		Female	1	5,060 (5,060)	70.6 (70.6)	74.6	2.4
	4		Male	2	3,520 ～ 4,300 (3,910)	60.0 ～ 66.3 (63.2)	74.1	2.7
	5		Mixed	2	3,730 ～ 4,140 (3,935)	63.7 ～ 67.8 (65.8)	73.2	2.3
Greenling *Hexagrammos lagocephalus* (Yamada Bay)	1	November, 2005	Uncertain	5	552.2 ～ 671.4 (597.5)	34.8 ～ 38.0 (36.1)	75.8	4.3
	2		Uncertain	6	426.9 ～ 535.0 (469.2)	32.0 ～ 34.8 (33.7)	74.2	4.1
	3		Uncertain	8	391.7 ～ 446.4 (420.2)	31.7 ～ 32.7 (32.2)	76.0	3.8
	4		Uncertain	9	369.4 ～ 409.0 (384.4)	30.1 ～ 32.4 (31.0)	75.0	4.0
	5		Uncertain	10	286.2 ～ 350.3 (316.5)	27.6 ～ 30.0 (28.8)	76.7	3.9
Sea bass *Lateolabrax japonicus* (Matsushima Bay)	1	November, 2005	Mixed	28	82.8 ～ 170 (132)	18.0 ～ 23.5 (20.9)	77.2	2.3
	2		Mixed	23	113 ～ 212 (156)	19.5 ～ 26.0 (22.3)	77.8	2.1
	3		Mixed	28	86.2 ～ 268 (160)	18.0 ～ 26.5 (22.3)	77.3	2.0
	4		Mixed	26	78.7 ～ 233 (161)	18.5 ～ 26.1 (22.9)	78.5	1.9
	5		Mixed	24	74.5 ～ 238 (163)	18.0 ～ 27.8 (22.7)	77.7	2.2
Pacific saury *Cololabis saira* (Offshore of Joban)	1	October, 2005	Mixed	40	92 ～ 137 (127.4)	26 ～ 30 (28.2)	60.1	18.7
	2		Mixed	30	139 ～ 157 (148.8)	27 ～ 31 (28.8)	58.8	19.7
	3		Mixed	30	158 ～ 176 (165.0)	28 ～ 31 (29.6)	58.6	19.2
	4		Mixed	20	180 ～ 203 (187.5)	29 ～ 33 (30.9)	57.0	26.0
	5		Mixed	40	116 ～ 200 (149.8)	26 ～ 33 (29.3)	59.2	20.0
Sea bass *Lateolabrax japonicus* (Tokyo Bay)	1	September, 2005	Mixed	3	1,440 ～ 1,761 (1,560)	448 ～ 473 (459)	75.2	3.0
	2		Mixed	3	1,140 ～ 1,740 (1,438)	449 ～ 473 (458)	75.7	2.8
	3		Mixed	3	1,410 ～ 1,490 (1,453)	444 ～ 448 (446)	74.4	2.8
	4		Mixed	7	935 ～ 1,150 (1,063)	396 ～ 434 (415)	74.5	2.8
	5		Mixed	6	875 ～ 1,310 (1,080)	402 ～ 442 (420)	75.6	2.7
Sea bass *Lateolabrax japonicus* (Kawasaki Port)	1	October, 2005	Uncertain	3	1,220 ～ 1,710 (1,517)	43.0 ～ 49.5 (46.5)	76	2.7
	2		Mixed	2	1,340 ～ 3,250 (2,295)	43.0 ～ 55.0 (49.0)	74	4.4
	3		Female	2	1,420 ～ 3,100 (2,260)	46.5 ～ 58.5 (52.5)	77	2.1
	4		Uncertain	3	1,180 ～ 1,380 (1,293)	41.0 ～ 46.0 (44.0)	76	2.5
	5		Uncertain	2	1,320 ～ 2,600 (1,960)	43.5 ～ 53.5 (48.5)	75	4.5
Dace *Tribolodon hakonensis* (Lake Biwa, Riv. Azumi)	1	April, 2005	Female	29	165 ～ 448 (243)	25.5 ～ 33.5 (28.3)	74.8	2.2
	2		Male	27	138 ～ 267 (195)	23.4 ～ 29.2 (26.4)	76.4	2.7
	3		Female	30	135 ～ 236 (197)	23.5 ～ 29.2 (26.8)	75.7	3.0
	4		Male	28	117 ～ 259 (186)	22.2 ～ 29.7 (26.1)	74.8	3.7
	5		Female	28	182 ～ 564 (257)	26.2 ～ 35.6 (28.5)	75.6	3.0
Sea bass *Lateolabrax japonicus* (Osaka Bay)	1	August, 2005	Uncertain	15	406.1 ～ 473.6 (431.8)	28.0 ～ 33.0 (30.1)	75.9	1.9
	2		Uncertain	15	333.3 ～ 443.5 (387.8)	27.0 ～ 30.0 (28.7)	75.8	3.1
	3		Uncertain	15	352.1 ～ 435.8 (387.1)	27.0 ～ 30.0 (28.5)	75.6	3.3
	4		Uncertain	10	324.2 ～ 434.2 (378.0)	26.0 ～ 30.0 (28.5)	76.0	2.8
	5		Uncertain	10	311.0 ～ 438.0 (362.7)	26.0 ～ 29.0 (27.2)	75.8	3.2

Fish species (Area)	No.	Sampling month	Sex	Number of animals	Weight (g) (Average)	Length (cm) (Average)	Water content %	Lipid content %
Sea bass *Lateolabrax japonicus* (Offshore of Himeji)	1	December, 2005	Female	1	2,700 (2,700)	72 (72)	4.0	3.9
	2		Female	1	2,300 (2,300)	65 (65)	4.5	3.5
	3		Male	1	1,900 (1,900)	60 (60)	5.0	5.7
	4		Female	1	1,400 (1,400)	55 (55)	4.5	4.7
	5		Female	1	1,150 (1,150)	53 (53)	5.2	6.3
Sea bass *Lateolabrax japonicus* (Nakaumi)	1	November, 2005	Mixed	14	400 ～ 580 (506)	32.0 ～ 36.7 (34.5)	78.7	2.2
	2		Mixed	13	340 ～ 393 (695)	34.0 ～ 39.3 (37.0)	77.9	3.6
	3		Mixed	13	382 ～ 415 (772)	38.2 ～ 41.5 (40.1)	79.4	2.5
	4		Mixed	13	320 ～ 350 (490)	25.0 ～ 33.7 (32.0)	77.9	2.5
	5		Mixed	13	340 ～ 383 (535)	34.0 ～ 38.3 (35.5)	77.3	2.4
Sea bass *Lateolabrax japonicus* (Hiroshima Bay)	1	October～ November, 2005	Male	5	601 ～ 782 (685)	33.0 ～ 39.0 (35.3)	76.1	1.8
	2		Male	5	544 ～ 785 (653)	33.0 ～ 38.5 (35.0)	76.5	1.9
	3		Male	4	915 ～ 1,250 (1,069)	39.0 ～ 44.0 (41.2)	71.3	2.9
	4		Male	4	887 ～ 1,058 (956)	38.5 ～ 42.0 (40.2)	72.8	3.1
	5		Male	4	931 ～ 1,141 (1,042)	40.5 ～ 43.0 (42.0)	71.0	3.0
Sea bass *Lateolabrax japonicus* (Mouth of Riv. Shimanto)	1	November, 2005	Mixed	13	173 ～ 530 (319)	21.3 ～ 31.0 (25.6)	77.9	1.3
	2		Mixed	13	119 ～ 694 (324)	18.4 ～ 37.0 (25.6)	78.0	1.2
	3		Mixed	23	99 ～ 398 (176)	17.7 ～ 28.0 (21.0)	77.4	1.2
	4		Mixed	25	109 ～ 238 (147)	17.0 ～ 23.6 (19.9)	77.7	1.0
	5		Mixed	21	110 ～ 514 (198)	17.7 ～ 30.2 (21.5)	77.5	1.3
Sea bass *Lateolabrax japonicus* (West Coast of Satsuma Peninsula)	1	October～ December, 2005	Mixed	14	323.0 ～ 448.3 (392.0)	24.5 ～ 28.6 (27.3)	73.9	1.2
	2		Mixed	11	411.6 ～ 659.5 (517.1)	28.8 ～ 33.0 (30.9)	73.8	1.5
	3		Mixed	10	494.2 ～ 619.2 (543.1)	33.0 ～ 33.9 (33.4)	73.6	1.5
	4		Male	10	582.6 ～ 744.2 (640.7)	34.4 ～ 35.8 (35.3)	73.2	1.8
	5		Male	8	617.6 ～ 790.3 (693.9)	36.0 ～ 39.5 (37.1)	73.7	2.1
Okinawa seabeam *Acanthopagrus sivicolus* (Kanagusuku Bay)	1	January, 2006	Female	3	1,380 ～ 1,520 (1,467)	35.6 ～ 37.5 (36.5)	78.3	1.2
	2		Female	3	1,180 ～ 1,360 (1,260)	32.5 ～ 33.8 (33.1)	74.9	1.2
	3		Female	3	1,060 ～ 1,140 (1,093)	32.5 ～ 33.7 (33.0)	74.9	1.3
	4		Male	3	1,060 ～ 1,340 (1,153)	31.7 ～ 34.5 (33.4)	75.6	1.8
	5		Male	3	1,000 ～ 1,000 (1,000)	32.0 ～ 33.7 (32.8)	76.0	1.4

Table 4-2- Basic data of specimens (birds as wildlife) in the Environmental Monitoring in FY 2005

Bird species (Area)	No	Sampling month	Sex	Number of animals	Weight (g) (Average)	Length (cm) (Average)	Water content %	Lipid content %
Black-taild gull *Larus crassirostris* (Kabu Is. (Hachinohe City))	1	July, 2005	Uncertain	35	259 ～ 492 (391)	24 ～ 36 (30)	73.0	4.7
	2		Uncertain	35	243 ～ 547 (390)	23 ～ 35 (30)	73.5	4.4
	3		Uncertain	38	240 ～ 498 (404)	27 ～ 34 (31)	72.9	3.8
	4		Uncertain	40	286 ～ 568 (427)	24 ～ 41 (30)	75.0	3.5
	5		Uncertain	41	306 ～ 571 (448)	24 ～ 38 (32)	74.8	3.5
Gray starling *Sturnus cineraceus* (Morioka City)	1	October, 2005	Male	30	74 ～ 114 (91)	12.0 ～ 13.7 (13.0)	71.4	3.4
	2		Female	30	70 ～ 103 (88)	12.2 ～ 13.9 (13.1)	70.8	3.1
	3		Female	30	75 ～ 98 (88)	12.0 ～ 13.7 (12.9)	71.1	3.1
	4		Female	30	71 ～ 95 (86)	12.0 ～ 13.2 (12.7)	71.4	2.9
	5		Mixed	30	82 ～ 100 (86)	11.8 ～ 13.7 (12.8)	70.8	2.8

4. Summary of monitoring results

Lists of the detection ranges are shown in Table 4-8-1 and Table 4-8-3, and lists of the detection limits are shown in Table 4-8-2 and Table 4-8-4. Data were carefully handled on the basis of following points.

・In general

The data were described as “nd” in cases where the measured concentrations did not exceed the detection limit (=MDL), whereas the data were described as “tr( )” in cases where the measured concentrations exceeded the detection limit but did not exceed the quantification limit (=MQL). Geometric means were calculated by quantifying “nd” as half the value of the corresponding detection limit.

・For surface water

In Hyogo Pref., 50L and 250L water samples were collected with a high volume sampling system, and only the data of the 250L sample were used. In Kitakyushu City, water was sampled three times and the resultant mixture was treated as one sample.

・For air

In each monitored site, the first sampling was the monitoring in the warm season (September 18, 2005～October 15, 2005) and the second was that in the cold season (November 2, 2005～January 19, 2006).

In Kagawa Pref., monitoring was carried out at not only the Takamatsu Joint Prefectural Government Building but also at the location of the Kagawa Prefectural Public Swimming Pool (Takamatsu City) as a reference site.

Table 4-8-1 List of the detection ranges in the Environmental Monitoring in FY 2005 (Part 1: POPs and HCHs)

No	Target chemicals	Surface water (pg/L)		Sediment (pg/g-dry)		Wildlife (pg/g-dry)						Air (pg/m^3)			
						Bivalves		Fish		Birds		First (Warm season)		Second (Cold season)	
		Range (Frequency)	Av.	Range (Frequency)	Av.	Range (Frequency)	Av.	Range (Frequency)	Av.	Range (Frequency)	Av.	Range (Frequency)	Av.	Range (Frequency)	Av.
1	Polychlorinated biphenyls (PCBs)	140～7,800 (47/47)	520	42～690,000 (63/63)	7,500	920～85,000 (7/7)	8,200	800～540,000 (16/16)	13,000	5,600～19,000 (2/2)	10,000	23～1,500 (37/37)	190	20～380 (37/37)	66
2	HCB	6～210 (47/47)	21	13～22,000 (63/63)	160	19～450 (7/7)	38	29～1,700 (16/16)	170	400～2,500 (2/2)	980	27～250 (37/37)	88	44～180 (37/37)	77
3	Aldrin	nd～5.7 (32/47)	tr(0.6)	nd～500 (62/63)	7.5	nd～84 (3/7)	nd	nd～6.4 (5/16)	nd	nd (0/2)	nd	nd～10 (29/37)	0.33	nd～1.8 (9/37)	tr(0.04)
4	Dieldrin	4.5～630 (47/47)	39	tr(2)～4,200 (63/63)	56	34～39,000 (7/7)	320	21～1,400 (16/16)	220	500～1,800 (2/2)	810	1.5～200 (37/37)	14	0.88～50 (37/37)	3.9
5	Endrin	nd～120 (45/47)	4.0	nd～19,000 (61/63)	10	nd～2,100 (7/7)	30	nd～2,100 (12/16)	tr(16)	nd～64 (2/2)	tr(16)	nd～2.9 (27/37)	tr(0.4)	nd～0.7 (8/37)	nd
6	DDTs														
6-1	*p,p'*-DDT	1～110 (47/47)	8	5.1～1,700,000 (63/63)	280	66～1,300 (7/7)	180	tr(3.8)～8,400 (16/16)	250	180～900 (2/2)	410	0.44～31 (37/37)	4.1	0.25～4.8 (37/37)	1.1
6-2	*p,p'*-DDE	4～410 (47/47)	26	8.4～64,000 (63/63)	630	230～6,600 (7/7)	1,100	230～73,000 (16/16)	2,200	7,100～300,000 (2/2)	44,000	1.2～42 (37/37)	5.0	0.76～9.9 (37/37)	1.7
6-3	*p,p'*-DDD	tr(1.8)～130 (47/47)	17	5.2～210,000 (63/63)	520	13～1,700 (7/7)	300	29～6,700 (16/16)	470	45～1,400 (2/2)	300	tr(0.07)～1.3 (37/37)	0.24	nd～0.29 (28/37)	tr(0.06)
6-4	*o,p'*-DDT	nd～39 (42/47)	3	0.8～160,000 (63/63)	47	29～440 (7/7)	75	5.8～1,500 (16/16)	94	3.4～24 (2/2)	11	0.67～14 (37/37)	3.0	0.32～3.0 (37/37)	0.76
6-5	*o,p'*-DDE	0.4～410 (47/47)	2.5	nd～31,000 (62/63)	35	12～470 (7/7)	66	tr(1.4)～12,000 (16/16)	50	nd～tr(2.9) (2/2)	tr(1.4)	0.33～7.9 (37/37)	1.6	0.24～2.0 (37/37)	0.62
6-6	*o,p'*-DDD	tr(0.5)～51 (47/47)	5.2	tr(0.8)～32,000 (63/63)	110	10～1,800 (7/7)	140	nd～1,400 (16/16)	77	4.7～9.7 (2/2)	7.1	tr(0.07)～0.90 (37/37)	0.22	nd～0.21 (35/37)	tr(0.07)
7	Chlordanes														
7-1	*cis*-Chlordane	6～510 (47/47)	53	3.3～44,000 (63/63)	140	78～13,000 (7/7)	820	42～8,000 (16/16)	490	tr(5.8)～340 (2/2)	49	3.4～1,000 (37/37)	92	1.4～260 (37/37)	16
7-2	*trans*-Chlordane	3～200 (47/47)	25	3.4～32,000 (63/63)	98	40～2,400 (7/7)	370	tr(9.8)～3,100 (16/16)	150	tr(4.5)～30 (2/2)	10	3.2～1,300 (37/37)	100	1.9～310 (37/37)	19
7-3	Oxychlordane	nd～19 (46/47)	2.6	nd～160 (51/63)	2.1	12～1,400 (7/7)	81	20～1,900 (16/16)	140	390～860 (2/2)	600	0.65～8.8 (37/37)	1.9	0.27～2.2 (37/37)	0.55
7-4	*cis*-Nonachlor	0.9～43 (47/47)	6.0	tr(1.1)～9,900 (63/63)	50	27～1,300 (7/7)	220	27～6,200 (16/16)	360	86～370 (2/2)	160	0.30～160 (37/37)	10	0.08～34 (37/37)	1.6
7-5	*trans*-Nonachlor	2.6～150 (47/47)	20	2.4～24,000 (63/63)	89	72～3,400 (7/7)	570	80～13,000 (16/16)	910	440～2,000 (2/2)	850	3.1～870 (37/37)	75	1.2～210 (37/37)	13
8	Heptachlors														
8-1	Heptachlor	nd～54 (25/47)	nd	nd～200 (48/63)	2.5	nd～24 (6/7)	tr(2.3)	nd～7.6 (8/16)	nd	nd (0/2)	nd	1.1～190 (37/37)	25	0.52～61 (37/37)	6.5
8-2	*cis*- Heptachlor epoxide	1.0～59 (47/47)	7.1	nd～140 (49/63)	tr(4)	7.4～590 (7/7)	36	4.9～390 (16/16)	39	250～690 (2/2)	360	tr(0.10)～11 (37/37)	1.5	0.43～2.9 (37/37)	0.91
8-3	*trans*- Heptachlor epoxide	nd (0/47)	nd	nd (0/63)	nd	nd～37 (2/7)	nd	nd (0/16)	nd	nd (0/2)	nd	nd～1.2 (27/37)	tr(0.10)	nd～0.32 (3/37)	nd
9	Toxaphenes														
9-1	Parlar-26	nd (0/47)	nd	nd (0/63)	nd	nd～tr(28) (4/7)	nd	nd～900 (13/16)	tr(39)	nd～1,200 (1/2)	85	nd (0/37)	nd	nd (0/37)	nd
9-2	Parlar-50	nd (0/47)	nd	nd (0/63)	nd	nd～tr(38) (4/7)	nd	nd～1,400 (13/16)	tr(50)	nd～1,500 (1/2)	100	nd (0/37)	nd	nd (0/37)	nd
9-3	Parlar-62	nd (0/47)	nd	nd (0/63)	nd	nd (0/7)	nd	nd～830 (8/16)	nd	nd～460 (1/2)	tr(77)	nd (0/37)	nd	nd (0/37)	nd
10	Mirex	nd～1.0 (14/47)	nd	nd～5,300 (48/63)	1.5	tr(1.9)～20 (7/7)	5.7	tr(1.0)～78 (16/16)	12	41～180 (2/2)	76	tr(0.05)～0.24 (37/37)	tr(0.09)	nd～tr(0.08) (29/37)	tr(0.04)
11	HCHs														
11-1	α-HCH	16～660 (47/47)	90	3.4～7,000 (63/63)	120	tr(7.1)～1,100 (7/7)	24	nd～1,000 (16/16)	41	67～85 (2/2)	76	22～2,000 (37/37)	110	9.6～630 (37/37)	35
11-2	*β*-HCH	25～2,300 (47/47)	200	3.9～13,000 (63/63)	180	20～2,000 (7/7)	56	6.7～1,300 (16/16)	88	930～6,000 (2/2)	2,500	0.67～52 (37/37)	4.9	0.24～16 (37/37)	1.1
11-3	γ-HCH	tr(8)～250 (47/47)	48	tr(1.8)～6,400 (63/63)	44	tr(5.7)～370 (7/7)	15	nd～230 (16/16)	17	9.6～32 (2/2)	18	5.9～650 (37/37)	34	2.1～110 (37/37)	9.3
11-4	δ-HCH	nd～62 (23/47)	1.8	nd～6,200 (63/63)	46	nd～1,600 (6/7)	tr(2.5)	nd～32 (12/16)	tr(3.2)	10～30 (2/2)	16	0.29～35 (37/37)	1.7	nd～11 (36/37)	0.38

(Note 1) "Av." indicates the geometric mean calculated by assuming nd (below the detection limit) to be half the value of the detection limit.

(Note 2) "Range" is based on the number of samples and "Frequency" is based on the number of sites or areas. Therefore "range" can be shown as "nd～" even if a target chemical is detected in all sites (or areas).

Table 4-8-2 List of the quantification [detection] limits in the Environmental Monitoring in FY 2005 (Part 1: POPs and HCHs)

No	Target chemicals	Surface water (pg/L)	Sediment (pg/g-dry)	Wildlife (pg/g-dry)	Air (pg/m^3)
1	Polychlorinated biphenyls (PCBs)	10 [3.2]	6.3 [2.1]	69 [23]	0.38 [0.14]
2	HCB	15 [5]	3 [1]	11 [3.8]	0.14 [0.034]
3	Aldrin	0.9 [0.3]	1.4 [0.5]	3.5 [1.2]	0.08 [0.03]
4	Dieldrin	1.0 [0.34]	3 [1]	9.4 [3.4]	0.54 [0.24]
5	Endrin	1.1 [0.4]	2.6 [0.9]	17 [5.5]	0.5 [0.2]
6 6-1	DDTs *p,p'*-DDT	4 [1]	1.0 [0.34]	5.1 [1.7]	0.16 [0.054]
6-2	*p,p'*-DDE	6 [2]	2.7 [0.94]	8.5 [2.8]	0.14 [0.034]
6-3	*p,p'*-DDD	1.9 [0.64]	1.7 [0.64]	2.9 [0.97]	0.16 [0.05]
6-4	*o,p'*-DDT	3 [1]	0.8 [0.3]	2.6 [0.86]	0.10 [0.034]
6-5	*o,p'*-DDE	1.2 [0.4]	2.6 [0.9]	3.4 [1.1]	0.074 [0.024]
6-6	*o,p'*-DDD	1.2 [0.4]	1.0 [0.3]	3.3 [1.1]	0.10 [0.03]
7 7-1	Chlordanes *cis*-Chlordane	4 [1]	1.9 [0.64]	12 [3.9]	0.16 [0.054]
7-2	*trans*-Chlordane	4 [1]	2.3 [0.84]	10 [3.5]	0.34 [0.14]
7-3	Oxychlordane	1.1 [0.4]	2.0 [0.7]	9.3 [3.1]	0.16 [0.054]
7-4	*cis*-Nonachlor	0.5 [0.2]	1.9 [0.64]	4.5 [1.5]	0.08 [0.03]
7-5	*trans*-Nonachlor	2.5 [0.84]	1.5 [0.54]	6.2 [2.1]	0.13 [0.044]
8 8-1	Heptachlors Heptachlor	3 [1]	2.5 [0.8]	6.1 [2.0]	0.16 [0.054]
8-2	*cis*-Heptachlor epoxide	0.7 [0.2]	7 [2]	3.5 [1.2]	0.12 [0.044]
8-3	*trans*-Heptachlor epoxide	0.7 [0.2]	5 [2]	23 [7.5]	0.16 [0.05]
9 9-1	Toxaphenes Parlar-26	10 [4]	60 [30]	47 [16]	0.3 [0.1]
9-2	Parlar-50	20 [5]	90 [40]	54 [18]	0.6 [0.2]
9-3	Parlar-62	70 [30]	2,000 [700]	100 [34]	1.2 [0.4]
10	Mirex	0.4 [0.1]	0.9 [0.3]	3.0 [0.99]	0.10 [0.03]
11 11-1	HCHs α-HCH	4 [1]	1.7 [0.6]	11 [3.6]	0.074 [0.024]
11-2	*β*-HCH	2.6 [0.9]	2.6 [0.9]	2.2 [0.75]	0.12 [0.044]
11-3	γ-HCH	14 [5]	2.0 [0.7]	8.4 [2.8]	0.13 [0.044]
11-4	δ-HCH	1.5 [0.5]	1.0 [0.3]	5.1 [1.7]	0.13 [0.04]

(Note 1) Each quantification limit is shown above the corresponding [detection limit].
(Note 2) The quantification [detection] limit of polychlorinated biphenyls (PCBs) is the sum value for each congener (Cl_1～Cl_{10}).
(Note 3) The same quantification [detection] limit was employed for bivalves, fish and birds as wildlife for each target chemical.
(Note 4) The quantification [detection] limit for surface water offshore of Himeji was different from the value shown in the table.

Table 4-8-3 List of the quantification [detection] limits in the Environmental Monitoring in FY 2005 (Part 2: Target chemicals except POPs and HCHs)

No.	Target chemicals	Surface water (ng/L)		Sediment (ng/g-dry)		Wildlife (ng/g-wet)						Air (ng/m³)			
						Bivalves		Fish		Birds		First (Warm season)		Second (Cold season)	
		Range (Frequency)	Av.	Range (Frequency)	Av.	Range (Frequency)	Av.	Range (Frequency)	Av.	Range (Frequency)	Av.	Range (Frequency)	Av.	Range (Frequency)	Av.
12	BHT			nd～27 (23/63)	nd	nd～11 (7/7)	tr(2.1)	nd～16 (15/16)	2.8	nd～tr(1.9) (2/2)	tr(0.92)	nd～3,800 (33/37)	13	nd～210 (29/37)	6.3
13	Dibenzothiophene	nd (0/47)	nd	nd～230 (61/63)	3.1	nd～3.2 (4/7)	nd	nd～0.8 (7/16)	nd	nd (0/2)	nd				
14	Organotin compounds														
14-1	MBTs	nd～1.9 (11/45)	nd	nd～150 (54/63)	3.9	nd～65 (7/7)	7.2	nd～8.5 (11/16)	nd	nd～tr(3.7) (1/2)	nd				
14-2	DBTs	nd～170 (19/44)	tr(1.5)	nd～750 (56/63)	5.8	tr(2.3)～24 (7/7)	11	nd～14 (13/16)	tr(1.1)	nd～tr(2.3) (1/2)	nd				
14-3	TBTs	nd～0.76 (2/47)	nd	nd～590 (51/63)	2.1	tr(1.5)～25 (7/7)	6.7	nd～130 (11/16)	3.1	nd (0/2)	nd				
14-4	MPTs	nd (0/47)	nd	nd～280 (42/63)	0.47	nd (0/7)	nd	nd (0/16)	nd	nd (0/2)	nd				
14-5	DPTs	nd (0/47)	nd	nd～74 (39/63)	0.079	nd (0/7)	nd	nd (0/16)	nd	nd (0/2)	nd				
14-6	TPTs	nd～0.19 (2/47)	nd	nd～420 (39/63)	0.17	tr(0.6)～15 (7/7)	2.2	nd～34 (16/16)	4.1	nd～tr(0.5) (1/2)	nd				

(Note 1) "Av." indicates the geometric mean calculated by assuming nd (below the detection limit) to be half the value of the detection limit.
(Note 2) "Range" is based on the number of samples and "Frequency" is based on the number of sites or areas. Therefore "range" can be shown as "nd～" even if a target chemical is detected in all sites (or areas).
(Note 3) □ means the medium was not monitored.

Table 4-8-4 List of the detection ranges in the Environmental Monitoring in FY 2005 (Part 2: Target chemicals except POPs and HCHs)

No.	Target chemicals	Surface water (ng/L)	Sediment (ng/g-dry)	Wildlife (ng/g-wet)	Air (ng/m³)
12	BHT		1.3 [0.60]	2.3 [0.78]	8.7 [2.9]
13	Dibenzothiophene	4.0 [2.0]	0.50 [0.20]	0.3 [0.1]	
14	Organotin compounds				
14-1	MBTs	0.80 [0.30]	0.70 [0.30]	4.5 [1.5]	
14-2	DBTs	3.0 [1.0]	0.80 [0.30]	3.0 [1.0]	
14-3	TBTs	0.30 [0.10]	0.20 [0.080]	3.0 [1.0]	
14-4	MPTs	0.50 [0.20]	0.30 [0.10]	3.0 [1.0]	
14-5	DPTs	0.22 [0.080]	0.050 [0.020]	1.5 [0.50]	
14-6	TPTs	0.13 [0.050]	0.070 [0.030]	1.5 [0.5]	

(Note 1) Each quantification limit is shown above the corresponding [detection limit].
(Note 2) The same quantification [detection] limit was employed for bivalves, fish and birds as wildlife for each target chemical.
(Note 3) □ means the medium was not monitored.

(1) The Environmental Monitoring (POPs and HCHs)

The high-sensitivity analysis of POPs and HCHs was conducted in FY 2005, following the monitoring in FY 2002, 2003 and 2004. Except for cases of undetected *trans*-heptachlor epoxide and toxaphenes in surface water, *trans*-heptachlor epoxide and toxaphenes in sediment, toxaphenes (Parlar-62) in wildlife (bivalves), *trans*-heptachlor epoxide in wildlife (fish), aldrin, heptachlors, and *trans*-heptachlor epoxide in wildlife (birds), and toxaphenes in air, all chemicals were detected.

The monitoring results for each chemical (group) are described below.

[1] PCBs

- Monitoring results

The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 3.2 pg/L, and the detection range was 140～7,800 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 2.1 pg/g-dry, and the detection range was 42～690,000 pg/g-dry.

○ Stocktaking of the detection of PCBs (total amount) in suraface water and sediment

PCBs (total amount)	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site
Surface water (pg/L)	2002	460	330	11,000	60	※7.4 [2.5]	114/114	38/38
	2003	530	450	3,100	230	※9.4 [2.5]	36/36	36/36
	2004	630	540	4,400	140	※14 [5.0]	38/38	38/38
	2005	520	370	7,800	140	※10 [3.2]	47/47	47/47
Sediment (pg/g-dry)	2002	9,200	11,000	630,000	39	※10 [3.5]	189/189	63/63
	2003	8,200	9,500	5,600,000	39	※10 [3.2]	186/186	62/62
	2004	7,300	7,600	1,300,000	38	※7.9 [2.6]	189/189	63/63
	2005	7,500	7,100	690,000	42	※6.3 [2.1]	189/189	63/63

(Note) ※ indicates the sum value of the Quantification [Detection] limits of each congener, and therefore the detention range that did not exceed this value can be shown instead of “nd”.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 23 pg/g-wet, and the detection range was 920～85,000 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 23 pg/g-wet, and the detection range was 800～540,000 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 23 pg/g-wet, and the detection range was 5,600～19,000 pg/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in bivalves and fish, respectively.

○ Stocktaking of the detection of PCBs (total amount) in wildlife (bivalves, fish and birds) during FY 2002～2005 ii)

PCBs (total amount)	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2002	10,000	28,000	160,000	200	※25 [8.4]	38/38	8/8
	2003	11,000	9,600	130,000	1,000	※50 [17]	30/30	6/6
	2004	7,700	11,000	150,000	1,500	※85 [29]	31/31	7/7
	2005	8,200	13,000	85,000	920	※69 [23]	31/31	7/7
Fish (pg/g-wet)	2002	14,000	8,100	550,000	1,500	※25 [8.4]	70/70	14/14
	2003	11,000	9,600	150,000	870	※50 [17]	70/70	14/14
	2004	15,000	10,000	540,000	990	※85 [29]	70/70	14/14
	2005	13,000	8,600	540,000	800	※69 [23]	80/80	16/16
Birds (pg/g-wet)	2002	11,000	14,000	22,000	4,800	※25 [8.4]	10/10	2/2
	2003	18,000	22,000	42,000	6,800	※50 [17]	10/10	2/2
	2004	8,900	9,400	13,000	5,900	※85 [29]	10/10	2/2
	2005	10,000	9,700	19,000	5,600	※69 [23]	10/10	2/2

(Note) ※ indicates the sum value of the Quantification [Detection] limits of each congener, and therefore the detention range that did not exceed this value can be shown instead of “nd”.

The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.14 pg/m^3, and the detection range was 23～1,500 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.14 pg/m^3, and the detection range was 20～380 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2002, 2003 and 2004. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of PCBs (total amount) in air during FY 2002～2005

PCBs (total amount)	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m^3)	2002	100	100	880	16	※99 [33]	102/102	34/34
	2003 Warm season	260	340	2,600	36	※6.6 [2.2]	34/34	34/34
	2003 Cold season	110	120	630	17		34/34	34/34
	2004 Warm season	240	250	3,300	25	※2.9 [0.98]	37/37	37/37
	2004 Cold season	130	130	1,500	20		37/37	37/37
	2005 Warm season	190	210	1,500	23	※0.38 [0.14]	37/37	37/37
	2005 Cold season	66	64	380	20		37/37	37/37

(Note) ※ indicates the sum value of the Quantification [Detection] limits of each congener, and therefore the detention range that did not exceed this value can be shown instead of “nd”.

[2] Hexachlorobenzene

- Monitoring results

The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 5 pg/L, and the detection range was tr(6)～210 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 1 pg/g-dry, and the detection range was 13～22,000 pg/g-dry.

○ Stocktaking of the detection of hexachlorobenzene in suraface water and sediment during FY 2002～2005

Hexachlorobenzene	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2002	36	28	1,400	9.8	0.6 [0.2]	114/114	38/38
	2003	29	24	340	11	5 [2]	36/36	36/36
	2004	30	tr(29)	180	tr(11)	30 [8]	38/38	38/38
	2005	21	17	210	6	15 [5]	47/47	47/47
Sediment (pg/g-dry)	2002	210	200	19,000	7.6	0.9 [0.3]	189/189	63/63
	2003	140	120	42,000	5	4 [2]	186/186	62/62
	2004	130	100	25,000	tr(6)	7 [3]	189/189	63/63
	2005	160	130	22,000	13	3 [1]	189/189	63/63

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 3.8 pg/g-wet, and the detection range was 19～450 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 3.8 pg/g-wet, and the detection range was 29～1,700 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 3.8 pg/g-wet, and the detection range was 400～2,500 pg/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in fish.

○ Stocktaking of the detection of hexachlorobenzene in wildlife (bivalves, fish and birds) during FY 2002～2005 ii)

Hexachlorobenzene	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2002	23	22	330	2.4	0.18 [0.06]	38/38	8/8
	2003	44	27	660	tr(21)	23 [7.5]	30/30	6/6
	2004	30	31	80	14	14 [4.6]	31/31	7/7
	2005	38	28	450	19	11 [3.8]	31/31	7/7
Fish (pg/g-wet)	2002	140	180	910	19	0.18 [0.06]	70/70	14/14
	2003	170	170	1,500	28	23 [7.5]	70/70	14/14
	2004	220	210	1,800	26	14 [4.6]	70/70	14/14
	2005	170	160	1,700	29	11 [3.8]	80/80	16/16
Birds (pg/g-wet)	2002	1,000	1,200	1,600	560	0.18 [0.06]	10/10	2/2
	2003	1,700	2,000	4,700	790	23 [7.5]	10/10	2/2
	2004	970	1,300	2,200	410	14 [4.6]	10/10	2/2
	2005	980	1,100	2,500	400	11 [3.8]	10/10	2/2

The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.03 pg/m^3, and the detection range was 27～250 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2003, and 2004. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.03 pg/m^3, and the detection range was 44～180 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2002, 2003 and 2004. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of hexachlorobenzene in air during FY 2002～2005

Hexachlorobenzene	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m^3)	2002	99	93	3,000	57	0.9 [0.3]	102/102	34/34
	2003 Warm season	150	130	430	81	2.3 [0.78]	35/35	35/35
	2003 Cold season	94	90	320	64		34/34	34/34
	2004 Warm season	130	130	430	47	1.1 [0.37]	37/37	37/37
	2004 Cold season	98	89	390	51		37/37	37/37
	2005 Warm season	88	90	250	27	0.14 [0.034]	37/37	37/37
	2005 Cold season	77	68	180	44		37/37	37/37

[3] Aldrin

- Monitoring results

The presence of the substance in surface water was monitored at 47 sites, and it was detected at 32 of the 47valid 47 sites adopting the detection limit of 0.3 pg/L, and all the detected concentrations did not exceed 5.7 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 62 of the 63 valid sites adopting the detection limit of 0.5 pg/g-dry, and all the detected concentrations did not exceed 500 pg/g-dry.

○ Stocktaking of the detection of aldrin in suraface water and sediment during FY 2002～2005

Aldrin	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site
Surface water (pg/L)	2002	0.69	0.90	18	nd	0.6 [0.2]	93/114	37/38
	2003	0.9	0.9	3.8	nd	0.6 [0.2]	34/36	34/36
	2004	tr(1.5)	tr(1.8)	13	nd	2 [0.4]	33/38	33/38
	2005	tr(0.6)	tr(0.7)	5.7	nd	0.9 [0.3]	32/47	32/47
Sediment (pg/g-dry)	2002	12	12	570	nd	6 [2]	149/189	56/63
	2003	17	18	1,000	nd	2 [0.6]	178/186	60/62
	2004	9	10	390	nd	2 [0.6]	170/189	62/63
	2005	7.5	7.1	500	nd	1.4 [0.5]	173/189	62/63

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in 3 of the 7 valid areas adopting the detection limit of 1.2 pg/g-wet, and all the detected concentrations did not exceed 84 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in 5 of the 16 valid areas adopting the detection limit of 1.2 pg/g-wet, and all the detected concentrations did not exceed 6.4 pg/g-wet. For birds, the substance was monitored in 2 areas and not detected in all 2 valid areas adopting the detection limit of 1.2 pg/g-wet, and the detection range was 5,600～19,000 pg/g-wet.

○ Stocktaking of the detection of aldrin in wildlife (bivalves, fish and birds) during FY 2002～2005 ii)

Aldrin	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Area
Bivalves (pg/g-wet)	2002	tr(1.7)	nd	tr(34)	nd	4.2 [1.4]	12/38	4/8
	2003	tr(1.6)	tr(0.85)	51	nd	2.5 [0.84]	15/30	3/6
	2004	tr(1.7)	tr(1.6)	46	nd	4 [1.3]	16/31	4/7
	2005	nd	nd	84	nd	3.5 [1.2]	11/31	3/7
Fish (pg/g-wet)	2002	nd	nd	tr(2.0)	nd	4.2 [1.4]	1/70	1/14
	2003	nd	nd	tr(1.9)	nd	2.5 [0.84]	16/70	7/14
	2004	nd	nd	tr(2.4)	nd	4 [1.3]	5/70	2/14
	2005	nd	nd	6.4	nd	3.5 [1.2]	11/80	5/16
Birds (pg/g-wet)	2002	nd	nd	nd	nd	4.2 [1.4]	0/10	0/2
	2003	nd	nd	nd	nd	2.5 [0.84]	0/10	0/2
	2004	nd	nd	nd	nd	4 [1.3]	0/10	0/2
	2005	nd	nd	nd	nd	3.5 [1.2]	0/10	0/2

The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at 29 of the 37 valid areas adopting the detection limit of 0.03 pg/m^3, and all the detected concentrations did not exceed 10 pg/m^3. The detected concentrations in FY 2004 and 2005 were significantly lower than those in FY 2003. For air in the cold season, the substance was monitored at 37 sites, and it was detected at 9 of the 37 valid areas adopting the detection limit of 0.03 pg/m^3, and all the detected concentrations did not exceed 1.8 pg/m^3. The detected concentrations in FY 2004 and 2005 were significantly lower than those in FY 2003. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of aldrin in air during FY 2002～2005

Aldrin	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Site
Air (pg/m^3)	2002	tr(0.030)	nd	3.2	nd	0.060 [0.020]	41/102	19/34
	2003 Warm season	1.5	1.9	28	nd	0.023 [0.0077]	34/35	34/35
	2003 Cold season	0.55	0.44	6.9	0.030		34/34	34/34
	2004 Warm season	tr(0.13)	nd	14	nd	0.15 [0.05]	15/35	15/35
	2004 Cold season	tr(0.09)	nd	13	nd		14/37	14/37
	2005 Warm season	0.33	0.56	10	nd	0.08 [0.03]	29/37	29/37
	2005 Cold season	tr(0.04)	nd	1.8	nd		9/37	9/37

[4] Dieldrin

- Monitoring results

The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 0.34 pg/L, and the detection range was 4.5～630 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 1 pg/g-dry, and the detection range was tr(2)～4,200 pg/g-dry.

○ Stocktaking of the detection of dieldrin in suraface water and sediment during FY 2002～2005

Dieldrin	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Site
Surface water (pg/L)	2002	41	41	940	3.3	1.8 [0.6]	114/114	38/38
	2003	57	57	510	9.7	0.7 [0.3]	36/36	36/36
	2004	55	51	430	9	2 [0.5]	38/38	38/38
	2005	39	49	630	4.5	1.0 [0.34]	47/47	47/47
Sediment (pg/g-dry)	2002	63	51	2,300	4	3 [1]	189/189	63/63
	2003	59	56	9,100	nd	4 [2]	184/186	62/62
	2004	58	62	3,700	tr(1.9)	3 [0.9]	189/189	63/63
	2005	56	55	4,200	tr(2)	3 [1]	189/189	63/63

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 3.4 pg/g-wet, and the detection range was 34～39,000 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 3.4 pg/g-wet, and the detection range was 21～1,400 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 3.4 pg/g-wet, and the detection range was 500～1,800 pg/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in bivalves and fish, respectively.

○ Stocktaking of the detection of dieldrin in wildlife (bivalves, fish and birds) during FY 2002～2005 ii)

Dieldrin	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Area
Bivalves (pg/g-wet)	2002	490	390	190,000	tr(7)	12 [4]	38/38	8/8
	2003	410	160	78,000	46	4.8 [1.6]	30/30	6/6
	2004	510	270	69,000	42	31 [10]	31/31	7/7
	2005	320	140	39,000	34	9.4 [3.4]	31/31	7/7
Fish (pg/g-wet)	2002	280	270	2,400	46	12 [4]	70/70	14/14
	2003	210	200	1,000	29	4.8 [1.6]	70/70	14/14
	2004	240	230	2,800	tr(23)	31 [10]	70/70	14/14
	2005	220	250	1,400	21	9.4 [3.4]	80/80	16/16
Birds (pg/g-wet)	2002	1,200	1,100	1,700	820	12 [4]	10/10	2/2
	2003	1,300	1,400	2,200	790	4.8 [1.6]	10/10	2/2
	2004	590	610	960	370	31 [10]	10/10	2/2
	2005	810	740	1,800	500	9.4 [3.4]	10/10	2/2

The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.24 pg/m^3, and the detection range was 1.5～200 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.24 pg/m^3, and the detection range was 0.9～50 pg/m^3. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of dieldrin in air during FY 2002～2005

Dieldrin	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Site
Air (pg/m^3)	2002	5.6	5.4	110	0.73	0.60 [0.20]	102/102	34/34
	2003 Warm season	19	22	260	2.1	2.1 [0.70]	34/34	34/34
	2003 Cold season	5.7	5.2	110	tr(0.82)		34/34	34/34
	2004 Warm season	17	22	280	1.1	0.33 [0.11]	37/37	37/37
	2004 Cold season	5.5	6.9	76	0.81		37/37	37/37
	2005 Warm season	14	12	200	1.5	0.54 [0.24]	37/37	37/37
	2005 Cold season	3.9	3.6	50	0.88		37/37	37/37

[5] Endrin

- Monitoring results

The presence of the substance in surface water was monitored at 47 sites, and it was detected at 45 of the 47valid sites adopting the detection limit of 0.4 pg/L, and all the detected concentrations did not exceed 120 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 61 of the 63 valid sites adopting the detection limit of 0.9 pg/g-dry, and all the detected concentrations did not exceed 19,000 pg/g-dry.

○ Stocktaking of the detection of endrin in suraface water and sediment during FY 2002～2005

Endrin	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Site
Surface water (pg/L)	2002	4.7	5.5	31	nd	6.0 [2.0]	101/114	36/38
	2003	5.7	6.0	78	0.7	0.7 [0.3]	36/36	36/36
	2004	7	7	100	tr(0.7)	2 [0.5]	38/38	38/38
	2005	4.0	4.5	120	nd	1.1 [0.4]	45/47	45/47
Sediment (pg/g-dry)	2002	9	10	19,000	nd	6 [2]	141/189	54/63
	2003	11	11	29,000	nd	5 [2]	150/186	53/62
	2004	13	13	6,900	nd	3 [0.9]	182/189	63/63
	2005	10	11	19,000	nd	2.6 [0.9]	170/189	61/63

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 5.5 pg/g-wet, and all the detected concentrations did not exceed 2,100 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in 12 of the 16 valid areas adopting the detection limit of 5.5 pg/g-wet, and all the detected concentrations did not exceed 2,100 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 5.5 pg/g-wet, and all the detected concentrations did not exceed 64 pg/g-wet.

○ Stocktaking of the detection of endrin in wildlife (bivalves, fish and birds) during FY 2002～2005 ii)

Endrin	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2002	44	27	12,000	nd	18 [6]	35/38	7/8
	2003	36	21	5,000	6.3	4.8 [1.6]	30/30	6/6
	2004	54	25	4,600	tr(5.7)	12 [4.2]	31/31	7/7
	2005	30	19	2,100	nd	17 [5.5]	27/31	7/7
Fish (pg/g-wet)	2002	19	24	180	nd	18 [6]	54/70	13/14
	2003	14	10	180	nd	4.8 [1.6]	67/70	14/14
	2004	18	24	220	nd	12 [4.2]	57/70	13/14
	2005	tr(16)	tr(16)	2,100	nd	17 [5.5]	58/80	12/16
Birds (pg/g-wet)	2002	22	52	99	nd	18 [6]	7/10	2/2
	2003	21	30	96	5.4	4.8 [1.6]	10/10	2/2
	2004	tr(11)	25	62	nd	12 [4.2]	5/10	1/2
	2005	tr(16)	28	64	nd	17 [5.5]	7/10	2/2

The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at 27 of the 37 valid areas adopting the detection limit of 0.2 pg/m^3, and all the detected concentrations did not exceed 2.9 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2003. For air in the cold season, the substance was monitored at 37 sites, and it was detected at 8 of the 37 valid areas adopting the detection limit of 0.2 pg/m^3, and all the detected concentrations did not exceed 0.7 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2002 and 2003. All the values in the warm season were higher than corresponding values in the cold season.

Stocktaking of the detection of endrin in air during FY 2002～2005

Endrin	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m^3)	2002	0.22	0.28	2.5	nd	0.090 [0.030]	90/102	32/34
	2003 Warm season	0.74	0.95	6.2	0.081	0.042 [0.014]	35/35	35/35
	2003 Cold season	0.23	0.20	2.1	0.042		34/34	34/34
	2004 Warm season	0.61	0.68	6.5	tr(0.054)	0.14 [0.048]	37/37	37/37
	2004 Cold season	0.23	0.26	1.9	nd		36/37	36/37
	2005 Warm season	tr(0.4)	tr(0.3)	2.9	nd	0.5 [0.2]	27/37	27/37
	2005 Cold season	nd	nd	0.7	nd		8/37	8/37

[6] DDTs

- Monitoring results

p,p'-DDT, *p,p'*-DDE and *p,p'*-DDD

p,p'-DDT: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 1 pg/L, and the detection range was 1～110 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.34 pg/g-dry, and the detection range was 5.1～1,700,000 pg/g-dry.

p,p'-DDE: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 2 pg/L, and the detection range was 4～410 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.94 pg/g-dry, and the detection range was 8.4～64,000 pg/g-dry.

p,p'-DDD: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 0.64 pg/L, and the detection range was tr(1.8)～130 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.64 pg/g-dry, and the detection range was 5.2～210,000 pg/g-dry.

○ Stocktaking of the detection of *p,p'*-DDT, *p,p'*-DDE and *p,p'*-DDD in suraface water and sediment during FY 2002～2005

p,p'-DDT	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2002	12	11	440	tr(0.25)	0.6 [0.2]	114/114	38/38
	2003	14	12	740	tr(2.8)	3 [0.9]	36/36	36/36
	2004	15	14	310	nd	6 [2]	36/38	36/38
	2005	8	9	110	1	4 [1]	47/47	47/47
Sediment (pg/g-dry)	2002	270	240	97,000	tr(5)	6 [2]	189/189	63/63
	2003	240	220	55,000	3	2 [0.4]	186/186	62/62
	2004	330	230	98,000	7	2 [0.5]	189/189	63/63
	2005	280	230	1,700,000	5.1	1.0 [0.34]	189/189	63/63
p,p'-DDE	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2002	24	26	760	1.3	0.6 [0.2]	114/114	38/38
	2003	26	22	380	5	4 [2]	36/36	36/36
	2004	36	34	680	tr(6)	8 [3]	38/38	38/38
	2005	26	24	410	4	6 [2]	47/47	47/47
Sediment (pg/g-dry)	2002	660	630	23,000	8.4	2.7 [0.9]	189/189	63/63
	2003	710	780	80,000	9.5	0.9 [0.3]	186/186	62/62
	2004	630	700	39,000	8	3 [0.8]	189/189	63/63
	2005	630	730	64,000	8.4	2.7 [0.94]	189/189	63/63
p,p'-DDD	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2002	15	18	190	0.57	0.24 [0.08]	114/114	38/38
	2003	19	18	410	4	2 [0.5]	36/36	36/36
	2004	19	18	740	tr(2.4)	3 [0.8]	38/38	38/38
	2005	17	16	130	tr(1.8)	1.9 [0.64]	47/47	47/47
Sediment (pg/g-dry)	2002	540	690	51,000	tr(2.2)	2.4 [0.8]	189/189	63/63
	2003	590	580	32,000	3.7	0.9 [0.3]	186/186	62/62
	2004	550	550	75,000	4	2 [0.7]	189/189	63/63
	2005	520	570	210,000	5.2	1.7 [0.64]	189/189	63/63

p,p'-DDT: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 1.7 pg/g-wet, and the detection range was 66～1,300 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 1.7 pg/g-wet, and the detection range was tr(3.8)～8,400 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 1.7 pg/g-wet, and the detection range was 180～900 pg/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in bivalves and fish, respectively.

p,p'-DDE: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 2.8 pg/g-wet, and the detection range was 230～6,600 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 2.8 pg/g-wet, and the detection range was 230～73,000 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 2.8 pg/g-wet, and the detection range was 7,100～300,000 pg/g-wet.

p,p'-DDD: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 0.97 pg/g-wet, and the detection range was 13～1,700 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 0.97 pg/g-wet, and the detection range was 29～6,700 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 0.97 pg/g-wet, and the detection range was 45～1,400 pg/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in fish.

○ Stocktaking of the detection of *p,p'*-DDT, *p,p'*-DDE and *p,p'*-DDD in wildlife (bivalves, fish and birds) during FY 2002～2005 ii)

p,p'-DDT	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Area
Bivalves (pg/g-wet)	2002	200	200	1,200	38	4.2 [1.4]	38/38	8/8
	2003	290	290	1,800	49	11 [3.5]	30/30	6/6
	2004	280	340	2,600	48	3.2 [1.1]	31/31	7/7
	2005	180	170	1,300	66	5.1 [1.7]	31/31	7/7
Fish (pg/g-wet)	2002	330	450	24,000	6.8	4.2 [1.4]	70/70	14/14
	2003	210	400	1,900	tr(3.7)	11 [3.5]	70/70	14/14
	2004	310	330	53,000	5.5	3.2 [1.1]	70/70	14/14
	2005	250	330	8,400	tr(3.8)	5.1 [1.7]	80/80	16/16
Birds (pg/g-wet)	2002	380	510	1,300	76	4.2 [1.4]	10/10	2/2
	2003	540	620	1,400	180	11 [3.5]	10/10	2/2
	2004	330	320	700	160	3.2 [1.1]	10/10	2/2
	2005	410	550	900	180	5.1 [1.7]	10/10	2/2
p,p'-DDE	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Area
Bivalves (pg/g-wet)	2002	1,100	1,700	6,000	140	2.4 [0.8]	38/38	8/8
	2003	1,100	1,000	6,500	190	5.7 [1.9]	30/30	6/6
	2004	1,000	1,400	8,400	220	8.2 [2.7]	31/31	7/7
	2005	1,100	1,600	6,600	230	8.5 [2.8]	31/31	7/7
Fish (pg/g-wet)	2002	2,500	2,200	98,000	510	2.4 [0.8]	70/70	14/14
	2003	2,000	2,200	12,000	180	5.7 [1.9]	70/70	14/14
	2004	2,500	2,100	52,000	390	8.2 [2.7]	70/70	14/14
	2005	2,200	2,400	73,000	230	8.5 [2.8]	80/80	16/16
Birds (pg/g-wet)	2002	36,000	60,000	170,000	8,100	2.4 [0.8]	10/10	2/2
	2003	63,000	76,000	240,000	18,000	5.7 [1.9]	10/10	2/2
	2004	34,000	35,000	200,000	6,800	8.2 [2.7]	10/10	2/2
	2005	44,000	86,000	300,000	7,100	8.5 [2.8]	10/10	2/2
p,p'-DDD	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Area
Bivalves (pg/g-wet)	2002	340	710	3,200	11	5.4 [1.8]	38/38	8/8
	2003	380	640	2,600	tr(7.5)	9.9 [3.3]	30/30	6/6
	2004	300	240	8,900	7.8	2.2 [0.7]	31/31	7/7
	2005	300	800	1,700	13	2.9 [0.97]	31/31	7/7
Fish (pg/g-wet)	2002	610	680	14,000	80	5.4 [1.8]	70/70	14/14
	2003	500	520	3,700	43	9.9 [3.3]	70/70	14/14
	2004	640	510	9,700	56	2.2 [0.7]	70/70	14/14
	2005	470	650	6,700	29	2.9 [0.97]	80/80	16/16
Birds (pg/g-wet)	2002	560	740	3,900	140	5.4 [1.8]	10/10	2/2
	2003	590	860	3,900	110	9.9 [3.3]	10/10	2/2
	2004	310	520	1,400	52	2.2 [0.7]	10/10	2/2
	2005	300	540	1,400	45	2.9 [0.97]	10/10	2/2

p,p'-DDT: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.054 pg/m^3, and the detection range was 0.44～31 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.054 pg/m^3, and the detection range was 0.25～4.8 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2002. All the values in the warm season were higher than corresponding values in the cold season.

p,p'-DDE: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.034 pg/m^3, and the detection range was 1.2～42 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.034 pg/m^3, and the detection range was 0.76～9.9 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2002, 2003 and 2004. All the values in the warm season were higher than corresponding values in the cold season.

p,p'-DDD: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.05 pg/m^3, and the detection range was tr(0.07)～1.3 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at 28 of the 37 valid areas adopting the detection limit of 0.05 pg/m^3, and all the detected concentrations did not exceed 0.29 pg/m³. The detected concentrations in FY 2005 were significantly lower than those in FY 2002, 2003 and 2004. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of *p,p'*-DDT, *p,p'*-DDE and *p,p'*-DDD in air during FY 2002～2005

p,p'-DDT	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m³)	2002	1.9	1.8	22	0.25	0.24 [0.08]	102/102	34/34
	2003 Warm season	5.8	6.6	24	0.75	0.14 [0.046]	35/35	35/35
	2003 Cold season	1.7	1.6	11	0.31		34/34	34/34
	2004 Warm season	4.7	5.1	37	0.41	0.22 [0.074]	37/37	37/37
	2004 Cold season	1.8	1.7	13	0.29		37/37	37/37
	2005 Warm season	4.1	4.2	31	0.44	0.16 [0.054]	37/37	37/37
	2005 Cold season	1.1	0.99	4.8	0.25		37/37	37/37
p,p'-DDE	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m³)	2002	2.8	2.7	28	0.56	0.09 [0.03]	102/102	34/34
	2003 Warm season	7.2	7.0	51	1.2	0.40 [0.13]	35/35	35/35
	2003 Cold season	2.8	2.4	22	1.1		34/34	34/34
	2004 Warm season	6.1	6.3	95	0.62	0.12 [0.039]	37/37	37/37
	2004 Cold season	2.9	2.6	43	0.85		37/37	37/37
	2005 Warm season	5.0	5.7	42	1.2	0.14 [0.034]	37/37	37/37
	2005 Cold season	1.7	1.5	9.9	0.76		37/37	37/37
p,p'-DDD	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m³)	2002	0.12	0.13	0.76	nd	0.018 [0.006]	101/102	34/34
	2003 Warm season	0.30	0.35	1.4	0.063	0.054 [0.018]	35/35	35/35
	2003 Cold season	0.13	0.14	0.52	tr(0.037)		34/34	34/34
	2004 Warm season	0.24	0.27	1.4	tr(0.036)	0.053 [0.018]	37/37	37/37
	2004 Cold season	0.12	0.12	0.91	tr(0.025)		37/37	37/37
	2005 Warm season	0.24	0.26	1.3	tr(0.07)	0.16 [0.05]	37/37	37/37
	2005 Cold season	tr(0.06)	tr(0.07)	0.29	nd		28/37	28/37

- Monitoring results

o,p'-DDT, *o,p'*-DDE and *o,p'*-DDD

o,p'-DDT: The presence of the substance in surface water was monitored at 47 sites, and it was detected at 42 of the 47 valid sites adopting the detection limit of 1 pg/L, and all the detected concentrations did not exceed 39 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.3 pg/g-dry, and the detection range was 0.8～160,000 pg/g-dry.

o,p'-DDE: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 0.4 pg/L, and the detection range was 0.4～410 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 62 of the 63 valid sites adopting the detection limit of 0.9 pg/g-dry, and all the detected concentrations did not exceed 31,000 pg/g-dry.

o,p'-DDD: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 0.4 pg/L, and the detection range was tr(0.5)～51 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.3 pg/g-dry, and the detection range was tr(0.8)～32,000 pg/g-dry.

○ Stocktaking of the detection of *o,p'*-DDT, *o,p'*-DDE and *o,p'*-DDD in suraface water and sediment during FY 2002～2005

o,p'-DDT	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2002	5.1	4.6	77	0.19	1.2 [0.4]	114/114	38/38
	2003	6	5	100	tr(1.5)	3 [0.7]	36/36	36/36
	2004	4.5	5	85	nd	5 [2]	29/38	29/38
	2005	3	3	39	nd	3 [1]	42/47	42/47
Sediment (pg/g-dry)	2002	58	47	27,000	nd	6[2]	183/189	62/63
	2003	43	43	3,200	nd	0.8[0.3]	185/186	62/62
	2004	52	50	17,000	tr(1.1)	2 [0.6]	189/189	63/63
	2005	47	46	160,000	0.8	0.8 [0.3]	189/189	63/63

o,p'-DDE	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2002	2.3	2.1	680	nd	0.9 [0.3]	113/114	38/38
	2003	2.2	2.0	170	tr(0.42)	0.8 [0.3]	36/36	36/36
	2004	3	2	170	tr(0.6)	2 [0.5]	38/38	38/38
	2005	2.5	2.1	410	0.4	1.2 [0.4]	47/47	47/47
Sediment (pg/g-dry)	2002	46	37	16,000	nd	3[1]	188/189	63/63
	2003	43	39	24,000	tr(0.5)	0.6[0.2]	186/186	62/62
	2004	35	34	28,000	nd	3 [0.8]	184/189	63/63
	2005	35	32	31,000	nd	2.6 [0.9]	181/189	62/63

o,p'-DDD	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2002	5.5	6.0	110	nd	0.6[0.2]	113/114	38/38
	2003	7.1	5.0	160	1.1	0.8[0.3]	36/36	36/36
	2004	6	5	81	tr(0.7)	2 [0.5]	38/38	38/38
	2005	5.2	5.4	51	tr(0.5)	1.2 [0.4]	47/47	47/47
Sediment (pg/g-dry)	2002	140	150	14,000	nd	6 [2]	184/189	62/63
	2003	140	130	8,800	tr(1.0)	2 [0.5]	186/186	62/62
	2004	120	120	16,000	tr(0.7)	2 [0.5]	189/189	63/63
	2005	110	110	32,000	tr(0.8)	1.0 [0.3]	189/189	63/63

o,p'-DDT: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 0.86 pg/g-wet, and the detection range was 29～440 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 0.86 pg/g-wet, and the detection range was 5.8～1,500 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 0.86 pg/g-wet, and the detection range was 3.4～24 pg/g-wet.

o,p'-DDE: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 1.1 pg/g-wet, and the detection range was 12～470 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 1.1 pg/g-wet, and the detection range was tr(1.4)～12,000 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 1.1 pg/g-wet, and all the detected concentrations did not exceed tr(2.9) pg/g-wet.

o,p'-DDD: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 1.1 pg/g-wet, and the detection range was 10～1,800 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 1.1 pg/g-wet, and all the detected concentrations did not exceed 1,400 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 1.1 pg/g-wet, and the detection range was 4.7～9.7 pg/g-wet.

○ Stocktaking of the detection of *o,p'*-DDT, *o,p'*-DDE and *o,p'*-DDD in wildlife (bivalves, fish and birds) during FY 2002～2005 ii)

o,p'-DDT	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Area
Bivalves (pg/g-wet)	2002	100	83	480	22	12 [4]	38/38	8/8
	2003	130	120	480	35	2.9 [0.97]	30/30	6/6
	2004	130	140	910	20	1.8 [0.61]	31/31	7/7
	2005	75	57	440	29	2.6 [0.86]	31/31	7/7
Fish (pg/g-wet)	2002	110	130	2,300	tr(6)	12 [4]	70/70	14/14
	2003	80	120	520	2.9	2.9 [0.97]	70/70	14/14
	2004	130	140	1,800	3.7	1.8 [0.61]	70/70	14/14
	2005	94	110	1,500	5.8	2.6 [0.86]	80/80	16/16
Birds (pg/g-wet)	2002	tr(10)	tr(10)	58	nd	12 [4]	8/10	2/2
	2003	18	16	66	8.3	2.9 [0.97]	10/10	2/2
	2004	7.7	13	43	tr(0.9)	1.8 [0.61]	10/10	2/2
	2005	11	14	24	3.4	2.6 [0.86]	10/10	2/2
***o,p'*-DDE**	**Monitored year (FY)**	**Geometric mean**	**Median**	**Maximum**	**Minimum**	**Quantification [Detection] limit**	**Detection frequency Sample**	**Area**
Bivalves (pg/g-wet)	2002	88	66	1,100	13	3.6 [1.2]	38/38	8/8
	2003	84	100	460	17	3.6 [1.2]	30/30	6/6
	2004	70	69	360	19	2.1 [0.69]	31/31	7/7
	2005	66	89	470	12	3.4 [1.1]	31/31	7/7
Fish (pg/g-wet)	2002	77	50	13,000	3.6	3.6 [1.2]	70/70	14/14
	2003	48	54	2,500	nd	3.6 [1.2]	67/70	14/14
	2004	68	48	5,800	tr(0.9)	2.1 [0.69]	70/70	14/14
	2005	50	45	12,000	tr(1.4)	3.4 [1.1]	80/80	16/16
Birds (pg/g-wet)	2002	28	26	49	20	3.6 [1.2]	10/10	2/2
	2003	tr(2.0)	tr(2.0)	4.2	nd	3.6 [1.2]	9/10	2/2
	2004	tr(1.0)	tr(1.1)	3.7	nd	2.1 [0.69]	5/10	1/2
	2005	tr(1.4)	tr(1.9)	tr(2.9)	nd	3.4 [1.1]	7/10	2/2
***o,p'*-DDD**	**Monitored year (FY)**	**Geometric mean**	**Median**	**Maximum**	**Minimum**	**Quantification [Detection] limit**	**Detection frequency Sample**	**Area**
Bivalves (pg/g-wet)	2002	130	190	2,900	tr(9)	12 [4]	38/38	8/8
	2003	200	220	1,900	6.5	6.0 [2.0]	30/30	6/6
	2004	160	130	2,800	6.0	5.7 [1.9]	31/31	7/7
	2005	140	280	1,800	10	3.3 [1.1]	31/31	7/7
Fish (pg/g-wet)	2002	83	90	1,100	nd	12 [4]	70/70	14/14
	2003	73	96	920	nd	6.0 [2.0]	66/70	14/14
	2004	100	96	1,700	nd	5.7 [1.9]	68/70	14/14
	2005	77	81	1,400	nd	3.3 [1.1]	79/80	16/16
Birds (pg/g-wet)	2002	15	15	23	tr(8)	12 [4]	10/10	2/2
	2003	14	14	36	tr(5.0)	6.0 [2.0]	10/10	2/2
	2004	tr(5.6)	5.7	25	nd	5.7 [1.9]	9/10	2/2
	2005	7.1	7.5	9.7	4.7	3.3 [1.1]	10/10	2/2

o,p'-DDT: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.034 pg/m^3, and the detection range was 0.67～14 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2003 and 2004. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.034 pg/m^3, and the detection range was 0.32～3.0 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2002, 2003 and 2004. All the values in the warm season were higher than corresponding values in the cold season.

o,p'-DDE: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.024 pg/m^3, and the detection range was 0.33～7.9 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.024 pg/m^3, and the detection range was 0.24～2.0 pg/m^3. All the values in the warm season were higher than corresponding values in the cold season.

o,p'-DDD: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.03 pg/m^3, and the detection range was tr(0.07)～0.90 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2003. For air in the cold season, the substance was monitored at 37 sites, and it was detected at 35 of 37 valid areas adopting the detection limit of 0.03 pg/m^3, and all the detected concentrations did not exceed 0.21 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2002, 2003 and 2004. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of *o,p'*-DDT, *o,p'*-DDE and *o,p'*-DDD in air during FY 2002～2005

o,p'-DDT	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m^3)	2002	2.2	2.0	40	0.41	0.15 [0.05]	102/102	34/34
	2003 Warm season	6.9	7.7	38	0.61	0.12 [0.040]	35/35	35/35
	2003 Cold season	1.6	1.4	6.4	0.43		34/34	34/34
	2004 Warm season	5.1	5.4	22	0.54	0.093 [0.031]	37/37	37/37
	2004 Cold season	1.5	1.4	9.4	0.35		37/37	37/37
	2005 Warm season	3.0	3.1	14	0.67	0.10 [0.034]	37/37	37/37
	2005 Cold season	0.76	0.67	3.0	0.32		37/37	37/37

o,p'-DDE	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m^3)	2002	0.60	0.56	8.5	0.11	0.03 [0.01]	102/102	34/34
	2003 Warm season	1.4	1.5	7.5	0.17	0.020 [0.0068]	35/35	35/35
	2003 Cold season	0.50	0.47	1.7	0.18		34/34	34/34
	2004 Warm season	1.1	1.2	8.9	0.14	0.037 [0.012]	37/37	37/37
	2004 Cold season	0.53	0.49	3.9	0.14		37/37	37/37
	2005 Warm season	1.6	1.5	7.9	0.33	0.074 [0.024]	37/37	37/37
	2005 Cold season	0.62	0.59	2.0	0.24		37/37	37/37

o,p'-DDD	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m^3)	2002	0.14	0.18	0.85	nd	0.021 [0.006]	97/102	33/34
	2003 Warm season	0.37	0.42	1.3	0.059	0.042 [0.014]	35/35	35/35
	2003 Cold season	0.15	0.14	0.42	0.062		34/34	34/34
	2004 Warm season	0.31	0.33	2.6	tr(0.052)	0.14 [0.048]	37/37	37/37
	2004 Cold season	0.14	tr(0.13)	0.86	nd		35/37	35/37
	2005 Warm season	0.22	0.19	0.90	tr(0.07)	0.10 [0.03]	37/37	37/37
	2005 Cold season	tr(0.07)	tr(0.07)	0.21	nd		35/37	35/37

[7] Chlordanes

- Monitoring results

cis-Chlordane and *trans*-Chlordane

cis-Chlordane: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 1 pg/L, and the detection range was 6～510 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.64 pg/g-dry, and the detection range was 3.3～44,000 pg/g-dry.

trans-Chlordane: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 1 pg/L, and the detection range was 3～200 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.84 pg/g-dry, and the detection range was 3.4～32,000 pg/g-dry.

○ Stocktaking of the detection of *cis*-chlordane and *trans*-chlordane in suraface water and sediment during FY 2002～2005

cis-Chlordane	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site
Surface water (pg/L)	2002	41	32	880	2.5	0.9 [0.3]	114/114	38/38
	2003	69	51	920	12	3 [0.9]	36/36	36/36
	2004	92	87	1900	10	6 [2]	38/38	38/38
	2005	53	54	510	6	4 [1]	47/47	47/47
Sediment (pg/g-dry)	2002	120	98	18,000	1.8	0.9 [0.3]	189/189	63/63
	2003	170	140	19,000	tr(3.6)	4 [2]	186/186	62/62
	2004	140	97	36,000	4	4 [2]	189/189	63/63
	2005	140	100	44,000	3.3	1.9 [0.64]	189/189	63/63
trans-Chlordane	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site
Surface water (pg/L)	2002	32	24	780	3.1	1.5 [0.5]	114/114	38/38
	2003	34	30	410	6	5 [2]	36/36	36/36
	2004	32	26	1,200	5	5 [2]	38/38	38/38
	2005	25	21	200	3	4 [1]	47/47	47/47
Sediment (pg/g-dry)	2002	130	110	16,000	2.1	1.8 [0.6]	189/189	63/63
	2003	120	100	13,000	tr(2.4)	4 [2]	186/186	62/62
	2004	95	80	26,000	3	3 [0.9]	189/189	63/63
	2005	98	81	32,000	3.4	2.3 [0.84]	189/189	63/63

cis-Chlordane: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 3.9 pg/g-wet, and the detection range was 78～13,000 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 3.9 pg/g-wet, and the detection range was 42～8,000 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 3.9 pg/g-wet, and the detection range was tr(5.8)～340 pg/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in bivalves and fish, respectively.

trans-Chlordane: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 3.5 pg/g-wet, and the detection range was 40～2,400 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 3.5 pg/g-wet, and the detection range was tr(9.8)～3,100 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 3.5 pg/g-wet, and the detection range was tr(4.5)～30 pg/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in bivalves and fish, respectively.

○ Stocktaking of the detection of *cis*-chlordane and *trans*-chlordane in wildlife (bivalves, fish and birds) during FY 2002～2005 ii)

cis-Chlordane	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2002	810	1,200	26,000	24	2.4 [0.8]	38/38	8/8
	2003	1,100	1,400	14,000	110	3.9 [1.3]	30/30	6/6
	2004	1,200	1,600	14,000	91	18 [5.8]	31/31	7/7
	2005	820	960	13,000	78	12 [3.9]	31/31	7/7
Fish (pg/g-wet)	2002	580	550	6,900	57	2.4 [0.8]	70/70	14/14
	2003	490	400	4,400	43	3.9 [1.3]	70/70	14/14
	2004	580	490	9,800	68	18 [5.8]	70/70	14/14
	2005	490	600	8,000	42	12 [3.9]	80/80	16/16
Birds (pg/g-wet)	2002	67	180	450	10	2.4 [0.8]	10/10	2/2
	2003	47	120	370	6.8	3.9 [1.3]	10/10	2/2
	2004	39	110	240	tr(5.8)	18 [5.8]	10/10	2/2
	2005	49	120	340	tr(5.8)	12 [3.9]	10/10	2/2

trans-Chlordane	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2002	420	840	2,300	33	2.4 [0.8]	38/38	8/8
	2003	550	840	2,800	69	7.2 [2.4]	30/30	6/6
	2004	510	770	2,800	53	48 [16]	31/31	7/7
	2005	370	660	2,400	40	10 [3.5]	31/31	7/7
Fish (pg/g-wet)	2002	180	160	2,700	20	2.4 [0.8]	70/70	14/14
	2003	150	120	1,800	9.6	7.2 [2.4]	70/70	14/14
	2004	190	130	5,200	tr(17)	48 [16]	70/70	14/14
	2005	150	180	3,100	tr(9.8)	10 [3.5]	76/80	16/16
Birds (pg/g-wet)	2002	14	14	26	8.9	2.4 [0.8]	10/10	2/2
	2003	11	12	27	tr(5.9)	7.2 [2.4]	10/10	2/2
	2004	tr(14)	tr(11)	tr(26)	nd	48 [16]	5/10	1/2
	2005	10	12	30	tr(4.5)	10 [3.5]	10/10	2/2

cis-Chlordane: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.054 pg/m^3, and the detection range was 3.4～1,000 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.054 pg/m^3, and the detection range was 1.4～260 pg/m^3. The detected concentrations in FY 2005 were lower than those in FY 2002 and 2003. All the values in the warm season were higher than corresponding values in the cold season.

trans-Chlordane: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.14 pg/m^3, and the detection range was 3.2～1,300 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.14 pg/m^3, and the detection range was 1.9～310 pg/m^3. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of *cis*-chlordane and *trans*-chlordane in air during FY 2002～2005

cis-Chlordane	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m^3)	2002	31	40	670	0.86	0.60 [0.20]	102/102	34/34
	2003 Warm season	110	120	1,600	6.4	0.51 [0.17]	35/35	35/35
	2003 Cold season	30	38	220	2.5		34/34	34/34
	2004 Warm season	92	160	1,000	2.3	0.57 [0.19]	37/37	37/37
	2004 Cold season	29	49	290	1.2		37/37	37/37
	2005 Warm season	92	120	1,000	3.4	0.16 [0.054]	37/37	37/37
	2005 Cold season	16	19	260	1.4		37/37	37/37

trans-Chlordane	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m^3)	2002	36	48	820	0.62	0.60 [0.20]	102/102	34/34
	2003 Warm season	130	150	2,000	6.5	0.86 [0.29]	35/35	35/35
	2003 Cold season	37	44	290	2.5		34/34	34/34
	2004 Warm season	110	190	1,300	2.2	0.69 [0.23]	37/37	37/37
	2004 Cold season	35	60	360	1.5		37/37	37/37
	2005 Warm season	100	130	1,300	3.2	0.34 [0.14]	37/37	37/37
	2005 Cold season	19	23	310	1.9		37/37	37/37

- Monitoring results

Oxychlordane, *cis*-Nonachlor and *trans*-Nonachlor

Oxychlordane: The presence of the substance in surface water was monitored at 47 sites, and it was detected at 46 of the 47 valid sites adopting the detection limit of 0.4 pg/L, and all the detected concentrations did not exceed 19 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 51 of the 63 valid sites adopting the detection limit of 0.7 pg/g-dry, and all the detected concentrations did not exceed 160 pg/g-dry.

cis-Nonachlor: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 0.2 pg/L, and the detection range was 0.9～43 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.64 pg/g-dry, and the detection range was tr(1.1)～9,900 pg/g-dry.

trans-Nonachlor: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 0.84 pg/L, and the detection range was 2.6～150 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.54 pg/g-dry, and the detection range was 2.4～24,000 pg/g-dry.

○ Stocktaking of the detection of oxychlordane, *cis*-nonachlor and *trans*-nonachlor in suraface water and sediment during FY 2002～2005

Oxychlordane	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2002	2.4	3.5	41	nd	1.2 [0.4]	96/114	35/38
	2003	3	2	39	tr(0.6)	2 [0.5]	36/36	36/36
	2004	3.2	2.9	47	tr(0.7)	2 [0.5]	38/38	38/38
	2005	2.6	2.1	19	nd	1.1 [0.4]	46/47	46/47
Sediment (pg/g-dry)	2002	2.2	1.7	120	nd	1.5 [0.5]	153/189	59/63
	2003	2	2	85	nd	1 [0.4]	158/186	57/62
	2004	tr(2.0)	tr(1.3)	140	nd	3 [0.8]	129/189	54/63
	2005	2.1	tr(1.9)	160	nd	2.0 [0.7]	133/189	51/63
cis-Nonachlor	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2002	7.6	6.7	250	0.23	1.8 [0.6]	114/114	38/38
	2003	8.0	7.0	130	1.3	0.3 [0.1]	36/36	36/36
	2004	7.5	6.3	340	0.8	0.6 [0.2]	38/38	38/38
	2005	6.0	5.9	43	0.9	0.5 [0.2]	47/47	47/47
Sediment (pg/g-dry)	2002	66	65	7,800	nd	2.1 [0.7]	188/189	63/63
	2003	59	50	6,500	nd	3 [0.9]	184/186	62/62
	2004	46	34	9,400	tr(0.8)	2 [0.6]	189/189	63/63
	2005	50	42	9,900	tr(1.1)	1.9 [0.64]	189/189	63/63
trans-Nonachlor	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2002	29	24	780	1.8	1.2 [0.4]	114/114	38/38
	2003	26	20	450	4	2 [0.5]	36/36	36/36
	2004	25	19	8,100	tr(3)	4 [2]	38/38	38/38
	2005	20	17	150	2.6	2.5 [0.84]	47/47	47/47
Sediment (pg/g-dry)	2002	120	83	13,000	3.1	1.5 [0.5]	189/189	63/63
	2003	100	78	11,000	2	2 [0.6]	186/186	62/62
	2004	83	63	23,000	3	2 [0.6]	189/189	63/63
	2005	89	72	24,000	2.4	1.5 [0.54]	189/189	63/63

Oxychlordane: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 3.1 pg/g-wet, and the detection range was 12～1,400 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 3.1 pg/g-wet, and the detection range was 20～1,900 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 3.1 pg/g-wet, and the detection range was 390～860 pg/g-wet.

cis-Nonachlor: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 1.5 pg/g-wet, and the detection range was 27～1,300 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 1.5 pg/g-wet, and the detection range was 27～6,200 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 1.5 pg/g-wet, and the detection range was 86～370 pg/g-wet.

trans-Nonachlor: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 2.1 pg/g-wet, and the detection range was 72～3,400 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 2.1 pg/g-wet, and the detection range was 80～13,000 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 2.1 pg/g-wet, and the detection range was 440～2,000 pg/g-wet.

From the beginning of the monitoring of each of those three substances, a trend of long-term decrease was observed in fish.

○ Stocktaking of the detection of oxychlordane, *cis*-nonachlor and *trans*-nonachlor in wildlife (bivalves, fish and birds) during FY 2002～2005 ii)

Oxychlordane	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Area
Bivalves (pg/g-wet)	2002	76	83	5,600	nd	3.6 [1.2]	37/38	8/8
	2003	90	62	1,900	11	8.4 [2.8]	30/30	6/6
	2004	110	100	1,700	14	9.2 [3.1]	31/31	7/7
	2005	81	79	1,400	12	9.3 [3.1]	31/31	7/7
Fish (pg/g-wet)	2002	160	140	3,900	16	3.6 [1.2]	70/70	14/14
	2003	140	160	820	30	8.4 [2.8]	70/70	14/14
	2004	150	140	1,500	25	9.2 [3.1]	70/70	14/14
	2005	140	150	1,900	20	9.3 [3.1]	80/80	16/16
Birds (pg/g-wet)	2002	640	630	890	470	3.6 [1.2]	10/10	2/2
	2003	750	700	1,300	610	8.4 [2.8]	10/10	2/2
	2004	460	450	730	320	9.2 [3.1]	10/10	2/2
	2005	600	660	860	390	9.3 [3.1]	10/10	2/2
cis-Nonachlor	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Area
Bivalves (pg/g-wet)	2002	190	300	870	8.6	1.2 [0.4]	38/38	8/8
	2003	290	260	1,800	48	4.8 [1.6]	30/30	6/6
	2004	280	380	1,800	43	3.4 [1.1]	31/31	7/7
	2005	220	220	1,300	27	4.5 [1.5]	31/31	7/7
Fish (pg/g-wet)	2002	420	420	5,100	46	1.2 [0.4]	70/70	14/14
	2003	350	360	2,600	19	4.8 [1.6]	70/70	14/14
	2004	410	310	10,000	48	3.4 [1.1]	70/70	14/14
	2005	360	360	6,200	27	4.5 [1.5]	80/80	16/16
Birds (pg/g-wet)	2002	200	240	450	68	1.2 [0.4]	10/10	2/2
	2003	200	260	660	68	4.8 [1.6]	10/10	2/2
	2004	130	150	240	73	3.4 [1.1]	10/10	2/2
	2005	160	180	370	86	4.5 [1.5]	10/10	2/2
trans-Nonachlor	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Area
Bivalves (pg/g-wet)	2002	510	1,100	1,800	21	2.4 [0.8]	38/38	8/8
	2003	780	700	3,800	140	3.6 [1.2]	30/30	6/6
	2004	710	870	3,400	110	13 [4.2]	31/31	7/7
	2005	570	650	3,400	72	6.2 [2.1]	31/31	7/7
Fish (pg/g-wet)	2002	970	900	8,300	98	2.4 [0.8]	70/70	14/14
	2003	880	840	5,800	85	3.6 [1.2]	70/70	14/14
	2004	1,000	760	21,000	140	13 [4.2]	70/70	14/14
	2005	910	750	13,000	80	6.2 [2.1]	80/80	16/16
Birds (pg/g-wet)	2002	880	980	1,900	350	2.4 [0.8]	10/10	2/2
	2003	1,100	1,400	3,700	350	3.6 [1.2]	10/10	2/2
	2004	680	780	1,200	390	13 [4.2]	10/10	2/2
	2005	850	880	2,000	440	6.2 [2.1]	10/10	2/2

Oxychlordane: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.054 pg/m^3, and the detection range was 0.65～8.8 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.054 pg/m^3, and the detection range was 0.27～2.2 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2002, 2003 and 2004. All the values in the warm season were higher than corresponding values in the cold season.

cis-Nonachlor: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.03 pg/m^3, and the detection range was 0.30～160 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.03 pg/m^3, and the detection range was 0.08～34 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2002. All the values in the warm season were higher than corresponding values in the cold season.

trans-Nonachlor: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.044 pg/m^3, and the detection range was 3.1～870 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.044

pg/m^3, and the detection range was 1.2～210 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2002, 2003 and 2004. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of oxychlordane, *cis*-nonachlor and *trans*-nonachlor in air during FY 2002～2005

Oxychlordane	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency: Sample	Detection frequency: Site
Air (pg/m^3)	2002	0.96	0.98	8.3	nd	0.024 [0.008]	101/102	34/34
	2003 Warm season	2.5	2.7	12	0.41	0.045 [0.015]	35/35	35/35
	2003 Cold season	0.87	0.88	3.2	0.41		34/34	34/34
	2004 Warm season	1.9	2.0	7.8	0.41	0.13 [0.042]	37/37	37/37
	2004 Cold season	0.79	0.76	3.9	0.27		37/37	37/37
	2005 Warm season	1.9	2.0	8.8	0.65	0.16 [0.054]	37/37	37/37
	2005 Cold season	0.55	0.50	2.2	0.27		37/37	37/37

cis-Nonachlor	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency: Sample	Detection frequency: Site
Air (pg/m^3)	2002	3.1	4.0	62	0.071	0.030 [0.010]	102/102	34/34
	2003 Warm season	12	15	220	0.81	0.026 [0.0088]	35/35	35/35
	2003 Cold season	2.7	3.5	23	0.18		34/34	34/34
	2004 Warm season	10	15	130	0.36	0.072 [0.024]	37/37	37/37
	2004 Cold season	2.7	4.4	28	0.087		37/37	37/37
	2005 Warm season	10	14	160	0.30	0.08 [0.03]	37/37	37/37
	2005 Cold season	1.6	1.6	34	0.08		37/37	37/37

trans-Nonachlor	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency: Sample	Detection frequency: Site
Air (pg/m^3)	2002	24	30	550	0.64	0.30 [0.10]	102/102	34/34
	2003 Warm season	87	100	1,200	5.1	0.35 [0.12]	35/35	35/35
	2003 Cold season	24	28	180	2.1		34/34	34/34
	2004 Warm season	72	120	870	1.9	0.48 [0.16]	37/37	37/37
	2004 Cold season	23	39	240	0.95		37/37	37/37
	2005 Warm season	75	95	870	3.1	0.13 [0.044]	37/37	37/37
	2005 Cold season	13	16	210	1.2		37/37	37/37

[8] Heptachlors

- Monitoring results

Heptachlor

The presence of the substance in surface water was monitored at 47 sites, and it was detected at 25 of the 47 valid sites adopting the detection limit of 1 pg/L, and all the detected concentrations did not exceed 54 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 48 of the 63 valid sites adopting the detection limit of 0.8 pg/g-dry, and all the detected concentrations did not exceed 200 pg/g-dry.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in 6 of the 7 valid areas adopting the detection limit of 2.0 pg/g-wet, and all the detected concentrations did not exceed 24 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in 8 of the 16 valid areas adopting the detection limit of 2.0 pg/g-wet, and all the detected concentrations did not exceed 7.6 pg/g-wet. For birds, the substance was monitored in 2 areas and not detected in all 2 valid areas adopting the detection limit of 2.0 pg/g-wet.

The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.054 pg/m^3, and the detection range was 1.1～190 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.054 pg/m^3, and the detection range was 0.52～61 pg/m^3. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of heptachlor in surface water, sediment, wildlife (bivalves, fish and birds) and air during FY 2002～2005 i ~iii)

Heptachlor	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Site or Area
Surface water (pg/L)	2002	tr(1.1)	1.0	25	nd	1.5 [0.5]	97/114	38/38
	2003	tr(1.8)	tr(1.6)	7	tr(1.0)	2 [0.5]	36/36	36/36
	2004	nd	nd	29	nd	5 [2]	9/38	9/38
	2005	nd	tr(1)	54	nd	3 [1]	25/47	25/47
Sediment (pg/g-dry)	2002	3.5	3.2	120	nd	1.8 [0.6]	167/189	60/63
	2003	tr(2.4)	tr(2.2)	160	nd	3 [1]	138/186	53/62
	2004	tr(2.5)	tr(2.3)	170	nd	3 [0.9]	134/189	53/63
	2005	2.5	2.8	200	nd	2.5 [0.8]	120/189	48/63
Bivalves (pg/g-wet)	2002	3.6	4.6	15	nd	4.2 [1.4]	28/38	6/8
	2003	tr(2.8)	tr(2.4)	14	nd	6.6 [2.2]	16/30	4/6
	2004	tr (3.5)	5.2	16	nd	4.1 [1.4]	23/31	6/7
	2005	tr(2.3)	tr(2.9)	24	nd	6.1 [2.0]	18/31	6/7
Fish (pg/g-wet)	2002	4.0	4.8	20	nd	4.2 [1.4]	57/70	12/14
	2003	nd	nd	11	nd	6.6 [2.2]	29/70	8/14
	2004	tr(1.9)	tr(2.1)	460	nd	4.1 [1.4]	50/70	11/14
	2005	nd	nd	7.6	nd	6.1 [2.0]	32/80	8/16
Birds (pg/g-wet)	2002	tr(2.1)	tr(2.8)	5.2	nd	4.2 [1.4]	7/10	2/2
	2003	nd	nd	nd	nd	6.6 [2.2]	0/10	0/2
	2004	nd	nd	tr(1.5)	nd	4.1 [1.4]	1/10	1/2
	2005	nd	nd	nd	nd	6.1 [2.0]	0/10	0/2
Air (pg/m^3)	2002	11	14	220	0.20	0.12 [0.04]	102/102	34/34
	2003 Warm season	27	41	240	1.1	0.25 [0.085]	35/35	35/35
	2003 Cold season	10	16	65	0.39		34/34	34/34
	2004 Warm season	22	36	200	0.46	0.23 [0.078]	37/37	37/37
	2004 Cold season	11	18	100	0.53		37/37	37/37
	2005 Warm season	25	29	190	1.1	0.16 [0.054]	37/37	37/37
	2005 Cold season	6.5	7.9	61	0.52		37/37	37/37

- Monitoring results

cis-Heptachlor epoxide

The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 0.2 pg/L, and the detection range was 1.0～59 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 49 of the 63 valid sites adopting the detection limit of 2 pg/g-dry, and all the detected concentrations did not exceed 140 pg/g-dry.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 1.2 pg/g-wet, and the detection range was 7.4～590 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 1.2 pg/g-wet, and the detection range was 4.9～390 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 1.2 pg/g-wet, and the detection range was 250～690 pg/g-wet.

The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.044 pg/m^3, and the detection range was tr(0.10)～11 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.044 pg/m^3, and the detection range was 0.43～2.9 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2003. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of *cis*-heptachlor epoxide in surface water, sediment, wildlife (bivalves, fish and birds) and air during FY 2003～2005 [i ~iii)]

cis-Heptachlor epoxide	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Site or Area
Surface water (pg/L)	2003	9.8	11	170	1.2	0.7 [0.2]	36/36	36/36
	2004	10	10	77	2	2 [0.4]	38/38	38/38
	2005	7.1	6.6	59	1.0	0.7 [0.2]	47/47	47/47
Sediment (pg/g-dry)	2003	4	3	160	nd	3 [1]	153/186	55/62
	2004	tr(4)	tr(3.0)	230	nd	6 [2]	136/189	52/63
	2005	tr(4)	tr(3)	140	nd	7 [2]	119/189	49/63
Bivalves (pg/g-wet)	2003	42	29	880	9.7	6.9 [2.3]	30/30	6/6
	2004	57	34	840	tr(9.8)	9.9 [3.3]	31/31	7/7
	2005	36	20	590	7.4	3.5 [1.2]	31/31	7/7
Fish (pg/g-wet)	2003	42	43	320	7.0	6.9 [2.3]	70/70	14/14
	2004	46	49	620	tr(3.3)	9.9 [3.3]	70/70	14/14
	2005	39	45	390	4.9	3.5 [1.2]	80/80	16/16
Birds (pg/g-wet)	2003	520	510	770	370	6.9 [2.3]	10/10	2/2
	2004	270	270	350	190	9.9 [3.3]	10/10	2/2
	2005	360	340	690	250	3.5 [1.2]	10/10	2/2
Air (pg/m^3)	2003 Warm season	3.5	3.5	28	0.45	0.015 [0.0048]	35/35	35/35
	2003 Cold season	1.3	1.3	6.6	0.49		34/34	34/34
	2004 Warm season	2.7	2.9	9.7	0.65	0.052 [0.017]	37/37	37/37
	2004 Cold season	1.1	1.1	7.0	0.44		37/37	37/37
	2005 Warm season	1.5	1.7	11	tr(0.10)	0.12 [0.044]	37/37	37/37
	2005 Cold season	0.91	0.81	2.9	0.43		37/37	37/37

- Monitoring results

trans-Heptachlor epoxide

The presence of the substance in surface water was monitored at 47 sites, and it was not detected at all 47 valid sites adopting the detection limit of 0.2 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was not detected at all 63 valid sites adopting the detection limit of 2 pg/g-dry.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in 2 of the 7 valid areas adopting the detection limit of 7.5 pg/g-wet, and all the detected concentrations did not exceed 37 pg/g-wet. For fish, the substance was monitored in 16 areas and not detected in all 16 valid areas adopting the detection limit of 7.5 pg/g-wet. For birds, the substance was monitored in 2 areas and not detected in all 2 valid areas adopting the detection limit of 7.5 pg/g-wet.

The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at 27 of the 37 valid areas adopting the detection limit of 0.05 pg/m^3, and all the detected concentrations did not exceed 1.2 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at 3 of the 37 valid areas adopting the detection limit of 0.05 pg/m^3, and all the detected concentrations did not exceed 0.32 pg/m^3.

○ Stocktaking of the detection of *trans*-heptachlor epoxide in surface water, sediment, wildlife (bivalves, fish and birds) and air during FY 2003～2005 [i～iii)]

trans-Heptachlor epoxide	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (pg/L)	2003	nd	nd	2	nd	2 [0.4]	4/36	4/36
	2004	nd	nd	nd	nd	0.9 [0.3]	0/38	0/38
	2005	nd	nd	nd	nd	0.7 [0.2]	0/47	0/47
Sediment (pg/g-dry)	2003	nd	nd	nd	nd	9 [3]	0/186	0/62
	2004	nd	nd	tr(2.5)	nd	4 [2]	1/189	1/63
	2005	nd	nd	nd	nd	5 [2]	0/189	0/63
Bivalves (pg/g-wet)	2003	nd	nd	48	nd	13 [4.4]	5/30	1/6
	2004	tr(4.0)	nd	55	nd	12 [4.0]	9/31	2/7
	2005	nd	nd	37	nd	23 [7.5]	5/31	2/7
Fish (pg/g-wet)	2003	nd	nd	nd	nd	13 [4.4]	0/70	0/14
	2004	nd	nd	tr(10)	nd	12 [4.0]	2/70	2/14
	2005	nd	nd	nd	nd	23 [7.5]	0/80	0/16
Birds (pg/g-wet)	2003	nd	nd	nd	nd	13 [4.4]	0/10	0/2
	2004	nd	nd	nd	nd	12 [4.0]	0/10	0/2
	2005	nd	nd	nd	nd	23 [7.5]	0/10	0/2
Air (pg/m^3)	2003 Warm season	tr(0.036)	tr(0.038)	0.30	nd	0.099 [0.003]	18/35	18/35
	2003 Cold season	nd	nd	tr(0.094)	nd		3/34	3/34
	2004 Warm season	nd	nd	tr(0.38)	nd	0.6 [0.2]	4/37	4/37
	2004 Cold season	nd	nd	nd	nd		0/37	0/37
	2005 Warm season	tr(0.10)	tr(0.12)	1.2	nd	0.16 [0.05]	27/37	27/37
	2005 Cold season	nd	nd	0.32	nd		3/37	3/37

[9] Toxaphenes

- Monitoring results

Parlar-26: The presence of the substance in surface water was monitored at 47 sites, and it was not detected at all 47 valid sites adopting the detection limit of 4 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was not detected at all 63 valid sites adopting the detection limit of 30 pg/g-dry.

Parlar-50: The presence of the substance in surface water was monitored at 47 sites, and it was not detected at all 47 valid sites adopting the detection limit of 5 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was not detected at all 63 valid sites adopting the detection limit of 40 pg/g-dry.

Parlar-62: The presence of the substance in surface water was monitored at 47 sites, and it was not detected at all 47 valid sites adopting the detection limit of 30 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was not detected at all 63 valid sites adopting the detection limit of 700 pg/g-dry.

○ Stocktaking of the detection of parlar-26, parlar-50 and parlar-62 in surface water and sediment during FY 2003～2005

Parlar-26	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site
Surface water (pg/L)	2003	nd	nd	nd	nd	40 [20]	0/36	0/36
	2004	nd	nd	nd	nd	9 [3]	0/38	0/38
	2005	nd	nd	nd	nd	10 [4]	0/47	0/47
Sediment (pg/g-dry)	2003	nd	nd	nd	nd	90 [30]	0/186	0/62
	2004	nd	nd	nd	nd	60 [20]	0/189	0/63
	2005	nd	nd	nd	nd	60 [30]	0/189	0/63
Parlar-50	**Monitored year (FY)**	**Geometric mean**	**Median**	**Maximum**	**Minimum**	**Quantification [Detection] limit**	**Detection frequency Sample**	**Site**
Surface water (pg/L)	2003	nd	nd	nd	nd	70 [30]	0/36	0/36
	2004	nd	nd	nd	nd	20 [7]	0/38	0/38
	2005	nd	nd	nd	nd	20 [5]	0/47	0/47
Sediment (pg/g-dry)	2003	nd	nd	nd	nd	200 [50]	0/186	0/62
	2004	nd	nd	nd	nd	60 [20]	0/189	0/63
	2005	nd	nd	nd	nd	90 [40]	0/189	0/63
Parlar-62	**Monitored year (FY)**	**Geometric mean**	**Median**	**Maximum**	**Minimum**	**Quantification [Detection] limit**	**Detection frequency Sample**	**Site**
Surface water (pg/L)	2003	nd	nd	nd	nd	300 [90]	0/36	0/36
	2004	nd	nd	nd	nd	90 [30]	0/38	0/38
	2005	nd	nd	nd	nd	70[30]	0/47	0/47
Sediment (pg/g-dry)	2003	nd	nd	nd	nd	4,000 [2,000]	0/186	0/62
	2004	nd	nd	nd	nd	2,000 [400]	0/189	0/63
	2005	nd	nd	nd	nd	2,000 [700]	0/189	0/63

Parlar-26: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in 4 of the 7 valid areas adopting the detection limit of 16 pg/g-wet, and all the detected concentrations did not exceed tr(28) pg/g-wet. For fish, the substance was monitored in 16 areas and detected in 13 of the 16 valid areas adopting the detection limit of 16 pg/g-wet, and all the detected concentrations did not exceed 900 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in 1 of the 2 valid areas adopting the detection limit of 16 pg/g-wet, and all the detected concentrations did not exceed 1,200 pg/g-wet. The substance was detected in all samples in 1 area of Kabu Is. (black-tailed Gull), while it was not detected in all samples in 1 area of a suburb of Morioka (gray starling).

Parlar-50: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in 4 of the 7 valid areas adopting the detection limit of 18 pg/g-wet, and all the detected concentrations did not exceed tr(38) pg/g-wet. For fish, the substance was monitored in 16 areas and detected in 13 of the 16 valid areas adopting the detection limit of 18 pg/g-wet, and all the detected concentrations did not exceed 1,400 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in 1 of the 2 valid areas adopting the detection limit of 18 pg/g-wet, and all the detected concentrations did not exceed 1,500 pg/g-wet. The substance was detected in all samples in 1 area of Kabu Is. (black-tailed Gull), while it was not detected in all samples in 1 area of a suburb of Morioka (gray starling).

Parlar-62: The presence of the substance in bivalves was monitored in 7 areas, and it was not detected in all 7 valid areas adopting the detection limit of 34 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in 8 of the 16 valid areas adopting the detection limit of 34 pg/g-wet, and all the detected concentrations did not exceed 830 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in 1 of the 2 valid areas adopting the detection limit of 34 pg/g-wet, and all the detected concentrations did not exceed 460 pg/g-wet. The substance was detected in all samples in 1 area of Kabu Is. (black-tailed Gull), while it was not detected in all samples in 1 area of a suburb of Morioka (gray starling).

○ Stocktaking of detection of parlar-26, parlar-50 and parlar-62 in wildlife (bivalves, fish, birds) in FY 2003～2005 ii)

Parlar-26	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2003	nd	nd	tr(39)	nd	45 [15]	11/30	3/6
	2004	nd	nd	tr(32)	nd	42 [14]	15/31	3/7
	2005	nd	nd	tr(28)	nd	47 [16]	7/31	4/7
Fish (pg/g-wet)	2003	tr(29)	tr(24)	810	nd	45 [15]	44/70	11/14
	2004	tr(40)	tr(41)	1,000	nd	42 [14]	54/70	13/14
	2005	tr(39)	53	900	nd	47 [16]	50/75	13/16
Birds (pg/g-wet)	2003	110	650	2,500	nd	45 [15]	5/10	1/2
	2004	71	340	810	nd	42 [14]	5/10	1/2
	2005	85	380	1,200	nd	47 [16]	5/10	1/2

Parlar-50	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2003	tr(13)	tr(12)	58	nd	33 [11]	17/30	4/6
	2004	tr(16)	nd	tr(45)	nd	46 [15]	15/31	3/7
	2005	nd	nd	tr(38)	nd	54 [18]	9/31	4/7
Fish (pg/g-wet)	2003	34	34	1,100	nd	33 [11]	55/70	14/14
	2004	54	61	1,300	nd	46 [15]	59/70	14/14
	2005	tr(50)	66	1,400	nd	54 [18]	55/80	13/16
Birds (pg/g-wet)	2003	110	850	3,000	nd	33 [11]	5/10	1/2
	2004	83	440	1,000	nd	46 [15]	5/10	1/2
	2005	100	480	1,500	nd	54 [18]	5/10	1/2

Parlar-62	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2003	nd	nd	nd	nd	120 [40]	0/30	0/6
	2004	nd	nd	nd	nd	98 [33]	0/31	0/7
	2005	nd	nd	nd	nd	100 [34]	0/31	0/7
Fish (pg/g-wet)	2003	nd	nd	580	nd	120 [40]	9/70	3/14
	2004	nd	nd	870	nd	98 [33]	24/70	7/14
	2005	nd	nd	830	nd	100 [34]	23/80	8/16
Birds (pg/g-wet)	2003	tr(96)	200	530	nd	120 [40]	5/10	1/2
	2004	tr(64)	110	280	nd	98 [33]	5/10	1/2
	2005	tr(77)	130	460	nd	100 [34]	5/10	1/2

Parlar-26: The presence of the substance in air in the warm season was monitored at 37 sites, and it was not detected in all 37 valid areas adopting the detection limit of 0.1 pg/m^3. The detected concentrations in FY 2005 (nd) were significantly lower than those in FY 2003 and 2004. For air in the cold season, the substance was monitored at 37 sites, and it was not detected in all 37 valid areas adopting the detection limit of 0.1 pg/m^3. All the values in the warm season were higher than corresponding values in the cold season.

Parlar-50: The presence of the substance in air in the warm season was monitored at 37 sites, and it was not detected at all 37 valid areas adopting the detection limit of 0.2 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was not detected at all 37 valid areas adopting the detection limit of 0.2 pg/m^3.

Parlar-62: The presence of the substance in air in the warm season was monitored at 37 sites, and it was not detected at all 37 valid areas adopting the detection limit of 0.4 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was not detected at all 37 valid areas adopting the detection limit of 0.4 pg/m^3.

○ Stocktaking of the detection of parlar-26, parlar-50 and parlar-62 in air during FY 2003～2005

Parlar-26	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Sample
Air (pg/m^3)	2003 Warm season	0.31	0.31	0.77	tr(0.17)	0.20 [0.066]	35/35	35/35
	2003 Cold season	tr(0.17)	tr(0.17)	0.27	tr(0.091)		34/34	34/34
	2004 Warm season	0.27	0.26	0.46	tr(0.17)	0.20 [0.066]	37/37	37/37
	2004 Cold season	tr(0.15)	tr(0.15)	0.50	tr(0.094)		37/37	37/37
	2005 Warm season	nd	nd	nd	nd	0.3 [0.1]	0/37	0/37
	2005 Cold season	nd	nd	nd	nd		0/37	0/37
Parlar-50	**Monitored year (FY)**	**Geometric mean**	**Median**	**Maximum**	**Minimum**	**Quantification [Detection] limit**	**Detection frequency Sample**	**Detection frequency Sample**
Air (pg/m^3)	2003 Warm season	nd	nd	tr(0.37)	nd	0.81 [0.27]	2/35	2/35
	2003 Cold season	nd	nd	nd	nd		0/34	0/34
	2004 Warm season	nd	nd	nd	nd	1.2 [0.4]	0/37	0/37
	2004 Cold season	nd	nd	nd	nd		0/37	0/37
	2005 Warm season	nd	nd	nd	nd	0.6 [0.2]	0/37	0/37
	2005 Cold season	nd	nd	nd	nd		0/37	0/37
Parlar-62	**Monitored year (FY)**	**Geometric mean**	**Median**	**Maximum**	**Minimum**	**Quantification [Detection] limit**	**Detection frequency Sample**	**Detection frequency Sample**
Air (pg/m^3)	2003 Warm season	nd	nd	nd	nd	1.6 [0.52]	0/35	0/35
	2003 Cold season	nd	nd	nd	nd		0/34	0/34
	2004 Warm season	nd	nd	nd	nd	2.4 [0.81]	0/37	0/37
	2004 Cold season	nd	nd	nd	nd		0/37	0/37
	2005 Warm season	nd	nd	nd	nd	1.2 [0.4]	0/37	0/37
	2005 Cold season	nd	nd	nd	nd		0/37	0/37

[10] Mirex

- Monitoring results

The presence of the substance in surface water was monitored at 47 sites, and it was detected at 14 of the 47 valid sites adopting the detection limit of 0.1 pg/L, and all the detected concentrations did not exceed 1.0 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 48 of the 63 valid sites adopting the detection limit of 0.3 pg/g-dry, and all the detected concentrations did not exceed 5,300 pg/g-dry.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 0.99 pg/g-wet, and the detection range was tr(1.9)～20 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 0.99 pg/g-wet, and the detection range was tr(1.0)～78 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 0.99 pg/g-wet, and the detection range was 41～180 pg/g-wet.

The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.03 pg/m^3, and the detection range was tr(0.05)～0.24 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at 29 of the 37 valid areas adopting the detection limit of 0.03 pg/m^3, and all the detected concentrations did not exceed tr(0.08) pg/m^3. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of mirex in surface water, sediment, wildlife (bivalves, fish and birds) and air during FY 2003 ～2005 i ~iii)

Mirex	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Site
Surface water (pg/L)	2003	tr(0.13)	tr(0.12)	0.88	nd	0.3 [0.009]	25/36	25/36
	2004	nd	nd	1.1	nd	0.4 [0.2]	18/38	18/38
	2005	nd	nd	1.0	nd	0.4 [0.1]	14/47	14/47
Sediment (pg/g-dry)	2003	tr(1.8)	tr(1.6)	1,500	nd	2 [0.4]	137/186	51/62
	2004	2.1	tr(1.6)	220	nd	2 [0.5]	153/189	55/63
	2005	1.5	1.2	5,300	nd	0.9 [0.3]	134/189	48/63
Bivalves (pg/g-wet)	2003	4.8	4.2	19	tr(1.1)	2.4 [0.81]	30/30	6/6
	2004	4.5	4.3	12	tr(1.1)	2.5 [0.82]	31/31	7/7
	2005	5.7	5.2	20	tr(1.9)	3.0 [0.99]	31/31	7/7
Fish (pg/g-wet)	2003	7.9	9.0	25	tr(1.7)	2.4 [0.81]	70/70	14/14
	2004	11	11	180	3.8	2.5 [0.82]	70/70	14/14
	2005	12	13	78	tr(1.0)	3.0 [0.99]	80/80	16/16
Birds (pg/g-wet)	2003	110	150	450	31	2.4 [0.81]	10/10	2/2
	2004	61	64	110	33	2.5 [0.82]	10/10	2/2
	2005	76	66	180	41	3.0 [0.99]	10/10	2/2
Air (pg/m^3)	2003 Warm season	0.11	0.12	0.19	0.047	0.0084	35/35	35/35
	2003 Cold season	0.044	0.043	0.099	tr(0.091)	[0.0028]	34/34	34/34
	2004 Warm season	0.099	0.11	0.16	tr(0.042)	0.05	37/37	37/37
	2004 Cold season	tr(0.046)	tr(0.047)	0.23	tr(0.019)	[0.017]	37/37	37/37
	2005 Warm season	tr(0.09)	tr(0.09)	0.24	tr(0.05)	0.10	37/37	37/37
	2005 Cold season	tr(0.04)	tr(0.04)	tr(0.08)	nd	[0.03]	29/37	29/37

[11] HCHs

- Monitoring results

α-HCH: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 1 pg/L, and the detection range was 16～660 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.6 pg/g-dry, and the detection range was 3.4～7,000 pg/g-dry.

β-HCH: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 0.9 pg/L, and the detection range was 25～2,300 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.9 pg/g-dry, and the detection range was 3.9～13,000 pg/g-dry.

γ-HCH: The presence of the substance in surface water was monitored at 47 sites, and it was detected at all 47 valid sites adopting the detection limit of 5 pg/L, and the detection range was tr(8)～250 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.7 pg/g-dry, and the detection range was tr(1.8)～6,400 pg/g-dry.

δ-HCH: The presence of the substance in surface water was monitored at 47 sites, and it was detected at 23 of the 47 valid sites adopting the detection limit of 0.5 pg/L, and all the detected concentrations did not exceed 62 pg/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at all 63 valid sites adopting the detection limit of 0.3 pg/g-dry, and all the detected concentrations did not exceed 6,200 pg/g-dry.

○ Stocktaking of the detection of α-HCH, *β*-HCH、γ-HCH and δ-HCH in suraface water and sediment during FY 2002～2005

α-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site
Surface water (pg/L)	2002	84	76	6,500	1.9	0.9 [0.3]	114/114	38/38
	2003	120	120	970	13	3 [0.9]	36/36	36/36
	2004	150	145	5,700	13	6 [2]	38/38	38/38
	2005	90	81	660	16	4 [1]	47/47	47/47
Sediment (pg/g-dry)	2002	130	170	8,200	2.0	1.2 [0.4]	189/189	63/63
	2003	140	170	9,500	2	2 [0.5]	186/186	62/62
	2004	140	180	5,700	tr(1.5)	2 [0.6]	189/189	63/63
	2005	120	160	7,000	3.4	1.7 [0.6]	189/189	63/63
β-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site
Surface water (pg/L)	2002	210	180	1,600	24	0.9 [0.3]	114/114	38/38
	2003	250	240	1,700	14	3 [0.7]	36/36	36/36
	2004	260	250	3,400	31	4 [2]	38/38	38/38
	2005	200	170	2,300	25	2.6 [0.9]	47/47	47/47
Sediment (pg/g-dry)	2002	200	230	11,000	3.9	0.9 [0.3]	189/189	63/63
	2003	220	220	39,000	5	2 [0.7]	186/186	62/62
	2004	220	230	53,000	4	3 [0.8]	189/189	63/63
	2005	180	220	13,000	3.9	2.6 [0.9]	189/189	63/63
γ-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site
Surface water (pg/L)	2003	92	90	370	32	7 [2]	36/36	36/36
	2004	91	76	8,200	21	20 [7]	38/38	38/38
	2005	48	40	250	tr(8)	14 [5]	47/47	47/47
Sediment (pg/g-dry)	2003	45	47	4,000	tr(1.4)	2 [0.4]	186/186	62/62
	2004	46	48	4,100	tr(0.8)	2 [0.5]	189/189	63/63
	2005	44	46	6,400	tr(1.8)	2.0 [0.7]	189/189	63/63
δ-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site
Surface water (pg/L)	2003	14	14	200	tr(1.1)	2 [0.5]	36/36	36/36
	2004	24	29	670	tr(1.4)	2 [0.7]	38/38	38/38
	2005	1.8	nd	62	nd	1.5 [0.5]	23/47	23/47
Sediment (pg/g-dry)	2003	37	46	5,400	nd	2 [0.7]	180/186	61/62
	2004	48	55	5,500	tr(0.5)	2 [0.5]	189/189	63/63
	2005	46	63	6,200	nd	1.0 [0.3]	188/189	63/63

α-HCH: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 3.6 pg/g-wet, and the detection range was tr(7.1)～1,100 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 3.6 pg/g-wet, all the detected concentrations did not exceed 1,000 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 3.6 pg/g-wet, and the detection range was 67～85 pg/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in bivalves and fish, respectively.

β-HCH: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 0.75 pg/g-wet, and the detection range was 20～2,000 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 0.75 pg/g-wet, and the detection range was 6.7～1,300 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 0.75 pg/g-wet, and the detection range was 930～6,000 pg/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in bivalves and fish, respectively.

γ-HCH: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 2.8 pg/g-wet, and the detection range was tr(5.7)～370 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 2.8 pg/g-wet, and all the detected concentrations did not exceed 230 pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 2.8 pg/g-wet, and the detection range was 9.6～32 pg/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in fish.

δ-HCH: The presence of the substance in bivalves was monitored in 7 areas, and it was detected in 6 of the 7 valid areas adopting the detection limit of 1.7 pg/g-wet, and all the detected concentrations did not exceed 1,600 pg/g-wet. For fish, the substance was monitored in 16 areas and detected in 12 of the 16 valid areas adopting the detection limit of 1.7 pg/g-wet, and all the detected concentrations did not exceed 32pg/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 1.7 pg/g-wet, and the detection range was 10～30 pg/g-wet.

○ Stocktaking of the detection of α-HCH, *β*-HCH, γ-HCH and δ-HCH in wildlife (bivalves, fish and birds) during FY 2002～2005 ii)

α-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2002	65	64	1,100	12	4.2 [1.4]	38/38	8/8
	2003	45	30	610	9.9	1.8 [0.61]	30/30	6/6
	2004	35	25	1,800	tr(12)	13 [4.3]	31/31	7/7
	2005	24	25	1,100	tr(7.1)	11 [3.6]	31/31	7/7
Fish (pg/g-wet)	2002	51	56	6,500	tr(1.9)	4.2 [1.4]	70/70	14/14
	2003	41	58	590	2.6	1.8 [0.61]	70/70	14/14
	2004	57	55	2,900	nd	13 [4.3]	63/70	14/14
	2005	41	43	1,000	nd	11 [3.6]	75/75	16/16
Birds (pg/g-wet)	2002	160	130	360	93	4.2 [1.4]	10/10	2/2
	2003	70	74	230	30	1.8 [0.61]	10/10	2/2
	2004	120	80	1,600	58	13 [4.3]	10/10	2/2
	2005	76	77	85	67	11 [3.6]	10/10	2/2

β-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2002	89	62	1,700	32	12 [4]	38/38	8/8
	2003	77	50	1,100	23	9.9 [3.3]	30/30	6/6
	2004	69	74	1,800	22	6.1 [2.0]	31/31	7/7
	2005	56	56	2,000	20	2.2 [0.75]	31/31	7/7
Fish (pg/g-wet)	2002	99	120	1,800	tr(5)	12 [4]	70/70	14/14
	2003	78	96	1,100	tr(3.5)	9.9 [3.3]	70/70	14/14
	2004	100	140	1,100	tr(3.9)	6.1 [2.0]	70/70	14/14
	2005	88	110	1,300	6.7	2.2 [0.75]	80/80	16/16
Birds (pg/g-wet)	2002	3,000	3,000	7,300	1,600	12 [4]	10/10	2/2
	2003	3,400	3,900	5,900	1,800	9.9 [3.3]	10/10	2/2
	2004	2,200	2,100	4,800	1,100	6.1 [2.0]	10/10	2/2
	2005	2,500	2,800	6,000	930	2.2 [0.75]	10/10	2/2

γ-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2003	19	18	130	5.2	3.3 [1.1]	30/30	6/6
	2004	tr(19)	tr(16)	230	nd	31 [10]	28/31	7/7
	2005	15	13	370	tr(5.7)	8.4 [2.8]	31/31	7/7
Fish (pg/g-wet)	2003	16	22	130	tr(1.7)	3.3 [1.1]	70/70	14/14
	2004	tr(27)	tr(24)	660	nd	31 [10]	55/70	11/14
	2005	17	17	230	nd	8.4 [2.8]	78/80	16/16
Birds (pg/g-wet)	2003	14	19	40	3.7	3.3 [1.1]	10/10	2/2
	2004	34	tr(21)	1,200	tr(11)	31 [10]	10/10	2/2
	2005	18	20	32	9.6	8.4 [2.8]	10/10	2/2

δ-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Area
Bivalves (pg/g-wet)	2003	7.2	tr(2.6)	1,300	nd	3.9 [1.3]	29/30	6/6
	2004	tr(3.0)	tr(2.1)	1,500	nd	4.6 [1.5]	25/31	6/7
	2005	tr(2.5)	tr(2.1)	1,600	nd	5.1 [1.7]	23/31	6/7
Fish (pg/g-wet)	2003	tr(3.5)	4.0	16	nd	3.9 [1.3]	59/70	13/14
	2004	tr(4.1)	tr(3.5)	270	nd	4.6 [1.5]	54/70	11/14
	2005	tr(3.2)	tr(3.1)	32	nd	5.1 [1.7]	55/80	12/16
Birds (pg/g-wet)	2003	18	18	31	12	3.9 [1.3]	10/10	2/2
	2004	16	14	260	6.4	4.6 [1.5]	10/10	2/2
	2005	16	15	30	10	5.1 [1.7]	10/10	2/2

α-HCH: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.024 pg/m^3, and the detection range was 22～2,000 pg/m^3. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.024 pg/m^3, and the detection range was 9.6～630 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2004. All the values in the warm season were higher than corresponding values in the cold season.

β-HCH: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.044 pg/m^3, and the detection range was 0.67～52 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2003. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.044 pg/m^3, and the detection range was 0.24～16 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2003 and 2004. All the values in the warm season were higher than corresponding values in the cold season.

γ-HCH: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.044 pg/m^3, and the detection range was 5.9～650 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2003 and 2004. For air in the cold season, the substance was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.044 pg/m^3, and the detection range was 2.1～110 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2004. All the values in the warm season were higher than corresponding values in the cold season.

δ-HCH: The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at all 37 valid areas adopting the detection limit of 0.04 pg/m^3, and the detection range was 0.29～35 pg/m^3. The detected concentrations in FY 2004 and 2005 were lower than those in FY 2003. For air in the cold season, the substance was monitored at 37 sites, and it was detected at 36 of all 37 valid areas adopting the detection limit of 0.04 pg/m^3, and all the detected concentrations did not exceed 11 pg/m^3. The detected concentrations in FY 2005 were significantly lower than those in FY 2003 and 2004. All the values in the warm season were higher than corresponding values in the cold season.

○ Stocktaking of the detection of α-HCH, β-HCH、γ-HCH and δ-HCH in air during FY 2003～2005

α-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m³)	2003 Warm season	210	120	5,000	38	0.71 [0.24]	35/35	35/35
	2003 Cold season	49	35	1,400	13		34/34	34/34
	2004 Warm season	160	130	3,200	24	0.33 [0.11]	37/37	37/37
	2004 Cold season	68	52	680	11		37/37	37/37
	2005 Warm season	110	78	2,000	22	0.074 [0.024]	37/37	37/37
	2005 Cold season	35	22	630	9.6		37/37	37/37

β-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m³)	2003 Warm season	9.6	11	97	1.1	0.19 [0.063]	35/35	35/35
	2003 Cold season	2.1	1.6	57	0.52		34/34	34/34
	2004 Warm season	6.6	7.7	110	0.53	0.12 [0.041]	37/37	37/37
	2004 Cold season	2.6	2.6	78	0.32		37/37	37/37
	2005 Warm season	4.9	5.7	52	0.67	0.12 [0.044]	37/37	37/37
	2005 Cold season	1.1	1.1	16	0.24		37/37	37/37

γ-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m³)	2003 Warm season	63	44	2,200	8.8	0.57 [0.19]	35/35	35/35
	2003 Cold season	14	12	330	3.1		34/34	34/34
	2004 Warm season	46	43	860	4.5	0.23 [0.076]	37/37	37/37
	2004 Cold season	19	16	230	2.6		37/37	37/37
	2005 Warm season	34	24	650	5.9	0.13 [0.044]	37/37	37/37
	2005 Cold season	9.3	6.6	110	2.1		37/37	37/37

δ-HCH	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Air (pg/m³)	2003 Warm season	5.1	4.2	120	0.48	0.03 [0.01]	35/35	35/35
	2003 Cold season	0.97	0.76	47	0.11		34/34	34/34
	2004 Warm season	2.2	2.5	93	0.15	0.15 [0.05]	37/37	37/37
	2004 Cold season	0.76	0.77	18	tr(0.07)		37/37	37/37
	2005 Warm season	1.7	1.7	35	0.29	0.13 [0.04]	37/37	37/37
	2005 Cold season	0.38	0.41	11	nd		36/37	36/37

(2) The Environmental Monitoring (excluding POPs and HCHs)

Except for cases of undetected dibenzothiophene, MPTs and DPTs in surface water, MPTs and DPTs in wildlife (bivalves MPTs and DPTs in wildlife (fish), and dibenzothiophene, TBTs, MPTs and DPTs in wildlife (birds), all chemicals were detected.

The monitoring results for each chemical (group) are described below.

[12] 2,6-di-*tert*-butyl-4-methylphenol (BHT)

- Monitoring results

The presence of the substance in sediment was monitored at 63 sites, and it was detected at 23 of the 63 valid sites adopting the detection limit of 0.60 ng/g-dry, and all the detected concentrations did not exceed 27 ng/g-dry.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 0.78 ng/g-wet, and all the detected concentrations did not exceed 11 ng/g-wet. For fish, the substance was monitored in 16 areas and detected in 15 of the 16 valid areas adopting the detection limit of 0.78 ng/g-wet, and all the detected concentrations did not exceed 16 ng/g-wet. For birds, the substance was monitored in 2 areas and detected in all 2 valid areas adopting the detection limit of 0.78 ng/g-wet, all the detected concentrations did not exceed tr(1.9) ng/g-wet.

The presence of the substance in air in the warm season was monitored at 37 sites, and it was detected at 33 of the 37 valid areas adopting the detection limit of 2.9 ng/m³, and all the detected concentrations did not exceed 3,800 ng/m³. For air in the cold season, the substance was monitored at 37 sites, and it was detected at 29 of the 37 valid areas adopting the detection limit of 2.9 ng/m^3, and all the detected concentrations did not exceed 210 ng/m^3.

○ Stocktaking of detection of 2,6-di-*tert*-butyl-4-methylphenol (BHT) in sediment, wildlife (bivalves, fish, birds) and air in FY 2005

BHT	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site or Area
Sediment (ng/g-dry)	2005	nd	nd	27	nd	1.3 [0.60]	46/189	23/63
Bivalves (ng/g-wet)	2005	tr(2.1)	tr(2.0)	11	nd	2.3 [0.78]	29/31	7/7
Fish (ng/g-wet)	2005	2.8	3.2	16	nd	2.3 [0.78]	70/80	15/16
Birds (ng/g-wet)	2005	tr(0.92)	tr(1.0)	tr(1.9)	nd	2.3 [0.78]	7/10	2/2
Air (ng/m^3)	2005 Warm season	13	14	3,800	nd	8.7 [2.9]	84/111	33/37
	2005 Cold season	6.3	6.2	210	nd		76/112	29/37

[13] Dibenzothiophene

- Monitoring results

The presence of the substance in surface water was monitored at 47 sites, and it was not detected at all 47 valid sites adopting the detection limit of 2.0ng/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 61 of the 63 valid sites adopting the detection limit of 0.20 ng/g-dry, and all the detected concentrations did not exceed 230 ng/g-dry.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in 4 of the 7 valid areas adopting the detection limit of 0.1 ng/g-wet, and all the detected concentrations did not exceed 3.2 ng/g-wet. For fish, the substance was monitored in 16 areas and detected in 7 of the 16 valid areas adopting the detection limit of 0.1 ng/g-wet, and all the detected concentrations did not exceed 0.8 ng/g-wet. For birds, the substance was monitored in 2 areas and not detected in all 2 valid areas adopting the detection limit of 0.1 ng/g-wet.

○ Stocktaking of detection of dibenzothiophene in surface water, sediment, and wildlife (bivalves, fish, birds) in FY 2005

Dibenzothiophene	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency	
							Sample	Site or Area
Surface water (ng/L)	2005	nd	nd	nd	nd	4.0 [2.0]	0/47	0/47
Sediment (ng/g-dry)	2005	3.1	4.1	230	nd	0.50 [0.20]	173/189	61/63
Bivalves (ng/g-wet)	2005	nd	nd	3.2	nd	0.3 [0.1]	9/31	4/7
Fish (ng/g-wet)	2005	nd	nd	0.8	nd	0.3 [0.1]	27/80	7/16
Birds (ng/g-wet)	2005	nd	nd	nd	nd	0.3 [0.1]	0/10	0/2

[14] Organotin compounds

- Monitoring results

Monbutyltin compounds (MBTs) : The presence of the substance in surface water was monitored at 47 sites, and it was detected at 11 of the 45 valid sites adopting the detection limit of 0.30 ng/L, and all the detected concentrations did not exceed 1.9 ng/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 54 of the 63 valid sites adopting the detection limit of 0.30 ng/g-dry, and all the detected concentrations did not exceed 150 ng/g-dry.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 1.5 ng/g-wet, and all the detected concentrations did not exceed 65 ng/g-wet. For fish, the substance was monitored in 16 areas and detected in 11 of the 16 valid areas adopting the detection limit of 1.5 ng/g-wet, and all the detected concentrations did not exceed 8.5 ng/g-wet. For birds, the substance was monitored in 2 areas and detected in 1 of the 2 valid areas adopting the detection limit of 1.5 ng/g-wet, and all the detected concentrations did not exceed tr(3.7) ng/g-wet.

○ Stocktaking of detection of monobutyltin compounds (MBTs) in surface water, sediment, and wildlife (bivalves, fish, birds) in FY 2005

MBTs	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site or Area
Surface water (ng/L)	2005	nd	nd	1.9	nd	0.80 [0.30]	11/45	11/45
Sediment (ng/g-dry)	2005	3.9	5.2	150	nd	0.70 [0.30]	155/189	54/63
Bivalves (ng/g-wet)	2005	7.2	6.8	65	nd	4.5 [1.5]	29/31	7/7
Fish (ng/g-wet)	2005	nd	nd	8.5	nd	4.5 [1.5]	22/80	11/16
Birds (ng/g-wet)	2005	nd	nd	tr(3.7)	nd	4.5 [1.5]	1/10	1/2

Dibutyltin compounds (DBTs) : The presence of the substance in surface water was monitored at 47 sites, and it was detected at 19 of the 44 valid sites adopting the detection limit of 1.0 ng/L, and all the detected concentrations did not exceed 170 ng/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 56 of the 63 valid sites adopting the detection limit of 0.30 ng/g-dry, and all the detected concentrations did not exceed 750 ng/g-dry.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 1.0 ng/g-wet, and the detection range was tr(2.3)～24 ng/g-wet. For fish, the substance was monitored in 16 areas and detected in 13 of the 16 valid areas adopting the detection limit of 1.0 ng/g-wet, and all the detected concentrations did not exceed 14 ng/g-wet. For birds, the substance was monitored in 2 areas and detected in 1 of the 2 valid areas adopting the detection limit of 1.0 ng/g-wet, and all the detected concentrations did not exceed tr(2.3) ng/g-wet.

○ Stocktaking of detection of dibutyltin compounds (DBTs) in surface water, sediment, and wildlife (bivalves, fish, birds) during FY 2003～2005 [i, ii)]

DBTs	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site or Area
Surface water (ng/L)	2005	tr(1.5)	nd	170	nd	3.0 [1.0]	19/44	19/44
Sediment (ng/g-dry)	2003	5.5	6.3	640	nd	1.2 [0.4]	152/186	57/62
	2005	5.8	7.3	750	nd	0.80 [0.30]	157/189	56/63
Bivalves (ng/g-wet)	2003	14	14	53	tr(2)	3 [1]	30/30	6/6
	2005	11	15	24	tr(2.3)	3.0 [1.0]	31/31	7/7
Fish (ng/g-wet)	2003	tr(1)	tr(1)	7	nd	3 [1]	39/70	12/14
	2005	tr(1.1)	tr(1.1)	14	nd	3.0 [1.0]	43/81	13/16
Birds (ng/g-wet)	2003	nd	nd	tr(3)	nd	3 [1]	4/10	1/2
	2005	nd	nd	tr(2.3)	nd	3.0 [1.0]	1/10	1/2

Tributyltin compounds (TBTs) : The presence of the substance in surface water was monitored at 47 sites, and it was detected at 2 of the 47 valid sites adopting the detection limit of 0.10 ng/L, and all the detected concentrations did not exceed 0.76 ng/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 51 of the 63 valid sites adopting the detection limit of 0.080 ng/g-dry, and all the detected concentrations did not exceed 590 ng/g-dry. From the beginning of the monitoring, a trend of long-term decrease was observed in surface water.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 1.0 ng/g-wet, and the detection range was tr(1.5)～25 ng/g-wet. For fish, the substance was monitored in 16 areas and detected in 11 of the 16 valid areas adopting the detection limit of 1.0 ng/g-wet, and all the detected concentrations did not exceed 130 ng/g-wet. For birds, the substance was monitored in 2 areas and not detected in all 2 valid areas adopting the detection limit of 1.0 ng/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in bivalves and fish, respectively.

○ Stocktaking of detection of tributyltin compounds (TBTs) in surface water, sediment, and wildlife (bivalves, fish, birds) during FY 2002～2005 [i, ii]

TBTs	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Site or Area
Surface water (ng/L)	2005	nd	nd	0.76	nd	0.30 [0.10]	2/47	2/47
Sediment (ng/g-dry)	2002	4.9	4.0	390	nd	3.6 [1.2]	126/189	48/63
	2003	3.0	4.4	450	nd	1.2 [0.4]	127/186	46/62
	2005	2.1	4.5	590	nd	0.20 [0.080]	143/189	51/63
Bivalves (ng/g-wet)	2002	12	12	57	tr(2)	3 [1]	38/38	8/8
	2003	10	12	25	tr(2)	3 [1]	30/30	6/6
	2005	6.7	7.0	25	tr(1.5)	3.0 [1.0]	31/31	7/7
Fish (ng/g-wet)	2002	6	6	500	nd	3 [1]	55/70	13/14
	2003	7	6	72	nd	3 [1]	63/70	13/14
	2005	3.1	4.2	130	nd	3.0 [1.0]	49/80	11/16
Birds (ng/g-wet)	2002	nd	nd	nd	nd	3 [1]	0/10	0/2
	2003	nd	nd	tr(1)	nd	3 [1]	1/10	1/2
	2005	nd	nd	nd	nd	3.0 [1.0]	0/10	0/2

Monophenyltin compounds (MPTs) : The presence of the substance in surface water was monitored at 47 sites, and it was not detected at all 47 valid sites adopting the detection limit of 0.20 ng/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 42 of the 63 valid sites adopting the detection limit of 0.10 ng/g-dry, and all the detected concentrations did not exceed 280 ng/g-dry.

The presence of the substance in bivalves was monitored in 7 areas, and it was not detected in all 7 valid areas adopting the detection limit of 1.0 ng/g-wet. For fish, the substance was monitored in 16 areas and not detected in all 16 valid areas adopting the detection limit of 1.0 ng/g-wet. For birds, the substance was monitored in 2 areas and not detected in all 2 valid areas adopting the detection limit of 1.0 ng/g-wet.

○ Stocktaking of detection of monophenyltin compounds (MPTs) in surface water, sediment, and wildlife (bivalves, fish, birds) during FY 2003～2005 [i, ii]

MPTs	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Site or Area
Surface water (ng/L)	2005	nd	nd	nd	nd	0.50 [0.20]	0/47	0/47
Sediment (ng/g-dry)	2003	tr(1.9)	nd	1,000	nd	2.4 [0.8]	86/186	35/62
	2005	0.47	0.33	280	nd	0.30 [0.10]	110/189	42/63
Bivalves (ng/g-wet)	2003	nd	nd	nd	nd	15 [5]	0/30	0/6
	2005	nd	nd	nd	nd	3.0 [1.0]	0/31	0/7
Fish (ng/g-wet)	2003	nd	nd	nd	nd	15 [5]	0/70	0/14
	2005	nd	nd	nd	nd	3.0 [1.0]	0/80	0/16
Birds (ng/g-wet)	2003	nd	nd	nd	nd	15 [5]	0/10	0/2
	2005	nd	nd	nd	nd	3.0 [1.0]	0/10	0/2

Diphenyltin compounds (DPTs) : The presence of the substance in surface water was monitored at 47 sites, and it was not detected at all 47 valid sites adopting the detection limit of 0.080 ng/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 39 of the 63 valid sites adopting the detection limit of 0.020 ng/g-dry, and all the detected concentrations did not exceed 74 ng/g-dry. 。

The presence of the substance in bivalves was monitored in 7 areas, and it was not detected in all 7 valid areas adopting the detection limit of 0.50 ng/g-wet. For fish, the substance was monitored in 16 areas and not detected in all 16 valid areas adopting the detection limit of 0.50 ng/g-wet. For birds, the substance was monitored in 2 areas and not detected in all 2 valid areas adopting the detection limit of 0.50 ng/g-wet.

○ Stocktaking of detection diphenyltin compounds (DPTs) in surface water, sediment, and wildlife (bivalves, fish, birds) during FY 2003～2005 [i, ii)]

DPTs	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (ng/ L)	2005	nd	nd	nd	nd	0.22 [0.080]	0/47	0/47
Sediment (ng/g-dry)	2003	tr(0.14)	tr(0.10)	120	nd	0.16[0.06]	100/186	38/62
	2005	0.079	0.035	74	nd	0.050 [0.020]	97/189	39/63
Bivalves (ng/g-wet)	2003	nd	nd	1.6	nd	1.5 [0.5]	3/30	2/6
	2005	nd	nd	nd	nd	1.5 [0.50]	0/31	0/7
Fish (ng/g-wet)	2003	nd	nd	tr(1.3)	nd	1.5 [0.5]	3/70	2/14
	2005	nd	nd	nd	nd	1.5 [0.50]	0/80	0/16
Birds (ng/g-wet)	2003	nd	nd	nd	nd	1.5 [0.5]	0/10	0/2
	2005	nd	nd	nd	nd	1.5 [0.50]	0/10	0/2

Triphenyltin compounds (TPTs) : The presence of the substance in surface water was monitored at 47 sites, and it was detected at 2 of the 47 valid sites adopting the detection limit of 0.05 ng/L, and all the detected concentrations did not exceed 0.19 ng/L. The presence of the substance in sediment was monitored at 63 sites, and it was detected at 39 of the 63 valid sites adopting the detection limit of 0.03 ng/g-dry, and all the detected concentrations did not exceed 420 ng/g-dry. From the beginning of the monitoring, a trend of long-term decrease was observed in surface water.

The presence of the substance in bivalves was monitored in 7 areas, and it was detected in all 7 valid areas adopting the detection limit of 0.5 ng/g-wet, and the detection range was tr(0.6)～15 ng/g-wet. For fish, the substance was monitored in 16 areas and detected in all 16 valid areas adopting the detection limit of 0.5 ng/g-wet, and all the detected concentrations did not exceed 34 ng/g-wet. For birds, the substance was monitored in 2 areas and detected in 1 of the 2 valid areas adopting the detection limit of 0.5 ng/g-wet, and all the detected concentrations did not exceed tr(0.5) ng/g-wet. From the beginning of the monitoring, a trend of long-term decrease was observed in bivalves and fish, respectively.

○ Stocktaking of detection of triphenyltin compounds (TPTs) in surface water, sediment, and wildlife (bivalves, fish, birds) during FY 2002～2005 [i, ii)]

TPTs	Monitored year (FY)	Geometric mean	Median	Maximum	Minimum	Quantification [Detection] limit	Detection frequency Sample	Detection frequency Site
Surface water (ng/L)	2005	nd	nd	0.19	nd	0.13 [0.050]	2/47	2/47
Sediment (ng/g-dry)	2002	tr(0.69)	nd	490	nd	1.6 [0.55]	76/189	30/63
	2003	tr(0.27)	tr(0.16)	540	nd	0.28 [0.09]	96/186	37/62
	2005	0.17	0.12	420	nd	0.070 [0.030]	104/189	39/63
Bivalves (ng/g-wet)	2002	2.7	4.5	25	nd	1.5 [0.5]	31/38	7/8
	2003	2.8	3.6	27	nd	1.5 [0.5]	26/30	6/6
	2005	2.2	2.9	15	tr(0.6)	1.5 [0.50]	31/31	7/7
Fish (ng/g-wet)	2002	6.4	7.9	520	nd	1.5 [0.5]	69/70	14/14
	2003	5.3	5.4	30	nd	1.5 [0.5]	68/70	14/14
	2005	4.1	4.9	34	nd	1.5 [0.50]	76/80	16/16
Birds (ng/g-wet)	2002	nd	nd	nd	nd	1.5 [0.5]	0/10	0/2
	2003	nd	nd	nd	nd	1.5 [0.5]	0/10	0/2
	2005	nd	nd	tr(0.5)	nd	1.5 [0.50]	1/10	1/2

It was noted that some analytical problems remained for the accurate and precise quantification (and detection) of organotin compounds (particularly MBTs, DBTs, MPTs and DPTs) in sediment and wildlife.

(3) Analysis of preserved specimens

The results of the analysis of preserved specimens are shown in Tables 4-9-1 to 4-9-3. The specimens that had been stored for over 10 years as preserved specimens were again analysed by the high-sensitivity analytical method that was introduced in FY 2002. As a result, following the monitoring in FY 2002, it was confirmed that the characteristics of the relative proportions of some compounds that are confirmed in sea bass from Osaka Bay already existed 10 years or more ago, further expanding the basic database for the evaluation of the effectiveness of the Stockholm Convention.

Table 4-9-1 Results of high-sensitivity analysis of preserved specimens (Sea bass in Tokyo Bay) ix)

Unit: pg/g-wet

Target Chemicals		FY								Detection limit	
No	Name	1993	1994	1995	1997	1998	1999	2000	2001	in FY 2004	in FY 2005
1	PCBs	460,000	340,000	120,000	310,000	190,000	200,000	100,000	400,000	0.61 ～6.1	0.6 ～4.9
2	Hexachlorobenzene	1,400	1,400	770	750	840	890	440	500	4.6	3.8
3	Aldrin	tr(3.4)	1.4	nd	1.9	2.2	2.6	nd	nd	1.3	1.2
4	Dieldrin	4,100	2,100	1,300	2,200	1,500	1,300	630	800	10	3
5	Endrin	220	100	93	140	130	110	640	40	4.2	5.5
6	DDTs										
6-1	*p,p'*-DDT	1,800	1,400	670	1,500	1,000	720	700	2,400	1.1	1.7
6-2	*p,p'*-DDE	48,000	24,000	9,100	28,000	15,000	18,000	8,300	30,000	2.7	2.8
6-3	*p,p'*-DDD	7,700	6,400	2,400	4,800	3,200	2,700	2,000	6,400	0.7	0.97
6-4	*o,p'*-DDT	360	360	110	240	160	130	170	610	0.61	0.86
6-5	*o,p'*-DDE	12,000	4,000	790	4,200	1,500	4,000	940	3,400	0.69	1.1
6-6	*o,p'*-DDD	1,700	1,700	350	820	490	570	440	1,400	1.9	1.1
7	Chlordanes										
7-1	*cis*-Chlordane	9,200	8,800	5,000	6,700	5,000	3,600	2,200	5,900	5.8	3.9
7-2	*trans*-Chlordane	3,900	3,000	1,500	2,200	1,700	1,300	640	1,600	16	3.5
7-3	Oxychlordane	920	890	630	730	630	580	270	740	3.1	3.1
7-4	*cis*-Nonachlor	4,600	5,000	2,500	3,800	3,100	2,000	1,500	5,500	1.1	1.5
7-5	*trans*-Nonachlor	11,000	11,000	5,600	8,200	6,400	4,200	3,100	11,000	4.2	2.1
8	Heptachlors										
8-1	Heptachlor	24	9.4	6.7	6.8	5.6	5.5	2.1	3.2	1.4	2.0
8-2	*cis*-Heptachlor epoxide	460	270	170	250	260	170	92	89	3.3	1.2
8-3	*trans*-Heptachlor epoxide	tr (12)	5	nd	nd	nd	nd	nd	nd	4	7.5
9	Toxaphenes										
9-1	Parlar-26	49	—	—	—	—	—	—	—	14	16
9-2	Parlar-50	85	—	—	—	—	—	—	—	15	18
9-3	Parlar-62	nd	—	—	—	—	—	—	—	33	34
10	Mirex	31	—	—	—	—	—	—	—	0.82	0.99
11	HCHs										
11-1	α-HCH	280	220	170	200	260	99	64	66	4.3	3.6
11-2	*β*-HCH	360	310	180	370	330	170	130	150	2	0.75
11-3	γ-HCH	200	84	59	0,11	85	43	32	28	10	2.8
11-4	δ-HCH	36	14	7.2	27	26	12	6.0	7.2	1.5	1.7

(Note 1) ☐ indicates the analytical data measured in FY 2004.
(Note 2) "—" means not measured.

Table 4-9-2 Results of high-sensitivity analysis of preserved specimens (Sea bass in Osaka Bay) ix)

Unit: pg/g-wet

Target Chemicals		FY									Detection limit	
No	Name	1993	1994	1995	1996	1997	1998	1999	2000	2001	in FY 2004	in FY 2005
1	PCBs	680,000	340,000	490,000	490,000	330,000	670,000	660,000	270,000	150,000	0.61 ～6.1	0.6 ～4.9
2	Hexachlorobenzene	1,300	1,000	690	740	490	1,200	770	390	260	4.6	3.8
3	Aldrin	4.7	1.5	tr (1.7)	5.9	tr (1.9)	3.8	tr (2.6)	tr (1.8)	nd	1.3	1.2
4	Dieldrin	4,700	1,700	2,800	8,000	1,400	2,100	2,500	1,200	1,500	10	3
5	Endrin	200	62	150	170	110	110	160	74	37	4.2	5.5
6	DDTs											
6-1	*p,p'*-DDT	2,000	1,500	37,000	5,400	1,600	3,800	1,300	1,200	1,300	1.1	1.7
6-2	*p,p'*-DDE	17,000	13,000	15,000	19,000	9,600	17,000	15,000	11,000	6,100	2.7	2.8
6-3	*p,p'*-DDD	6,900	5,300	9,500	8,200	3,000	7,000	4,200	3,400	2,100	0.7	0.97
6-4	*o,p'*-DDT	570	390	11,000	1,800	410	1,100	350	350	360	0.61	0.86
6-5	*o,p'*-DDE	700	380	450	690	360	620	480	360	320	0.69	1.1
6-6	*o,p'*-DDD	2,500	1,900	3,000	2,500	880	3,000	1,500	850	870	1.9	1.1
7	Chlordanes											
7-1	*cis*-Chlordane	16,000	8,500	8,400	19,000	3,900	8,100	8,000	5,200	4,000	5.8	3.9
7-2	*trans*-Chlordane	6,800	300	3,800	7,500	1,600	3,300	3,400	2,000	1,700	16	3.5
7-3	Oxychlordane	1,500	1,400	650	1,700	660	1,100	840	630	400	3.1	3.1
7-4	*cis*-Nonachlor	7,000	4,400	3,800	7,400	2,400	5100	4,500	3,200	1,900	1.1	1.5
7-5	*trans*-Nonachlor	21,000	12,000	9,900	19,000	5,300	11,000	11,000	7,800	5,000	4.2	2.1
8	Heptachlors											
8-1	Heptachlor	44	8.9	29	50	8.8	11	20	tr (5.6)	5.2	1.4	2.0
8-2	*cis*-Heptachlor epxide	380	160	290	360	150	230	310	130	79	3.3	1.2
8-3	*trans*-Heptachlor epxide	nd	nd	nd	nd	nd	nd	nd	nd	nd	4	7.5
9	Toxaphenes											
9-1	Parlar-26	tr(44)	—	tr (19)	tr (27)	tr (22)	tr (18)	tr (21)	tr (21)	—	14	16
9-2	Parlar-50	59	—	tr (24)	tr (29)	tr (21)	tr (23)	tr (30)	tr (23)	—	15	18
9-3	Parlar-62	nd.	—	nd	nd	nd	nd	nd	nd	—	33	34
10	Mirex	10	—	17	56	28	110	76	14	—	0.82	0.99
11	HCHs											
11-1	α-HCH	660	140	310	360	550	480	450	130	86	4.3	3.6
11-2	*β*-HCH	3,000	930	3,000	1,800	2,100	2,900	2,200	780	390	2	0.75
11-3	γ-HCH	290	46	100	120	150	120	140	53	31	10	2.8
11-4	δ-HCH	110	18	62	61	64	86	99	24	11	1.5	1.7

(Note 1) ☐ indicates the analytical data measured in FY 2004.

(Note 2) "—" means not measured.

Table 4-9-3 High-sensitivity analytical results of preserved specimens (Hard-shelled mussel in Naruto) [ix)]

Unit: pg/g-wet

Target Chemicals		FY			Detection limit	
No	Name	1993	1994	1995	in FY 2004	in FY 2005
1	PCBs	190,000	18,000	9,500	0.61 ～6.1	0.6 ～4.9
2	Hexachlorobenzene	43	36	34	4.6	3.8
3	Aldrin	23	28	16	1.3	1.2
4	Dieldrin	30,000	140,000	110,000	10	3
5	Endrin	3,900	18,000	11,000	4.2	5.5
6	DDTs					
6-1	*p,p'*-DDT	200	94	170	1.1	1.7
6-2	*p,p'*-DDE	1,600	1,700	960	2.7	2.8
6-3	*p,p'*-DDD	45	23	22	0.7	0.97
6-4	*o,p'*-DDT	100	66	68	0.61	0.86
6-5	*o,p'*-DDE	150	120	110	0.69	1.1
6-6	*o,p'*-DDD	51	30	20	1.9	1.1
7	Chlordanes					
7-1	*cis*-Chlordane	30,000	37.000	30,000	5.8	3.9
7-2	*trans*-Chlordane	9,100	10,000	6,000	16	3.5
7-3	Oxychlordane	4,900	7,100	6,200	3.1	3.1
7-4	*cis*-Nonachlor	1,000	970	530	1.1	1.5
7-5	*trans*-Nonachlor	6,100	6,500	3,900	4.2	2.1
8	Heptachlors					
8-1	Heptachlor	41	42	22	1.4	2.0
8-2	*cis*-Heptachlor epxide	4,300	6,500	4,300	3.3	1.2
8-3	*trans*-Heptachlor epxide	56	110	100	4	7.5
9	Toxaphenes					
9-1	Parlar-26	—	tr(21)	tr (25)	14	16
9-2	Parlar-50	—	nd	tr (19)	15	18
9-3	Parlar-62	—	nd	nd	33	34
10	Mirex	—	4.1	3.4	0.82	0.99
11	HCHs					
11-1	α-HCH	1,200	830	470	4.3	3.6
11-2	*β*-HCH	270	130	180	2	0.75
11-3	γ-HCH	540	400	210	10	2.8
11-4	δ-HCH	16	9.7	13	1.5	1.7

(Note 1) ☐ indicates the analytical data measured in FY 2004.

(Note 2) "—" means not measured.

(4) The Environmental Monitoring (humans, trial)

The results of the Environmental Monitoring (humans, trial) are shown in Tables 4-10-1 and 4-10-2. From specimens of maternal blood, umbilical cord blood, and breast milk (23-42 years old) sampled between FY 2001 and 2003 in the monitoring research conducted by a medical organisation in the Tohoku District, 50, 70, and 70 samples were obtained, respectively. From the specimens of breast milk (24-44 years old) sampled between FY 2004 and 2005 in the monitoring research conducted by a medical organisation in Kanto-Koshinetsu District, 25 samples were obtained. These samples were provided without revealing any personal information. The concentrations of POPs and other chemicals were experimentally measured, and results similar to the concentration levels reported domestically and abroad were obtained.

Table 4-10-1 List of the detection ranges in The Environmental Monitoring (humans, trial) during FY 2004～2005 (Part 1: based on wet weight) ix)

Target Chemicals		Breast milk (pg/g-wet)				Umbilical cord blood (pg/g-wet)		Maternal blood (pg/g-wet)	
No	Name	Tohoku District 70 Samples		Kanto-Koshinetsu District 25 Samples		Tohoku District 70 Samples		Tohoku District 50 Samples	
		Range	Av. (Quantification limit)	Range	Av. (Quantification limit)	Range	Av. (Quantification limit)	Range	Av. (Quantification limit)
1	PCBs	960 ～ 21,000	4,100 (12)	1,600 ～ 17,000	4,400 (12)	34 ～ 580	120 (2.0)	160 ～ 1,100	520 (3.1)
2	Hexachlorobenzene	170 ～ 2,300	660 (3.7)	160 ～ 1,300	540 (3.7)	18 ～ 120	49 (0.61)	39 ～ 260	98 (0.91)
3	Aldrin	nd	nd (3.2)	nd	nd (3.2)	nd	nd (0.42)	nd ～ tr(0.14)	nd (0.17)
4	Dieldrin	47 ～ 800	180 (5.8)	53 ～ 330	130 (5.8)	3.9 ～ 24	9.7 (0.76)	9.8 ～ 72	24 (0.36)
5	Endrin	nd ～ 27	nd (14)	nd	nd (14)	nd	nd (1.8)	nd	nd (0.33)
6	DDTs								
6-1	*p,p'*-DDT	51 ～ 1,100	310 (8.3)	120 ～ 1,800	320 (8.3)	1.8 ～ 31	7.2 (1.4)	7.4 ～ 65	28 (2.1)
6-2	*p,p'*-DDT	1,100 ～ 18,000	5,100 (3.3)	1,200 ～ 14,000	5,300 (3.3)	41 ～ 1,600	180 (0.56)	120 ～ 1,800	560 (0.83)
6-3	*p,p'*-DDT	3.5 ～ 350	12 (3.4)	4.4 ～ 42	14 (3.4)	nd ～ 1.8	tr(0.35) (0.57)	tr(0.43) ～ 3.1	1.6 (0.85)
6-4	*o,p'*-DDT	12 ～ 210	50 (4.1)	21 ～ 170	50 (4.1)	tr(0.48) ～ 4.8	1.3 (0.69)	1.4 ～ 14	4.7 (1.0)
6-5	*o,p'*-DDT	4.5 ～ 49	16 (3.0)	6.4 ～ 35	14 (3.0)	tr(0.28) ～ 3.1	0.71 (0.50)	1.0 ～ 4.2	2.4 (0.74)
6-6	*o,p'*-DDT	nd ～ 12	tr(2.2) (3.1)	nd ～ 4.5	tr(2.3) (3.1)	nd ～ tr(0.29)	nd (0.52)	nd ～ tr(0.67)	tr(0.26) (0.78)
7	Chlordanes								
7-1	*cis*-Chlordane	6.7 ～ 140	21 (3.4)	9.3 ～ 49	20 (3.4)	0.58 ～ 2.8	1.3 (0.45)	1.7 ～ 16	4.4 (0.14)
7-2	*trans*-Chlordane	4.0 ～ 49	7.7 (3.1)	4.0 ～ 19	6.5 (3.1)	0.54 ～ 1.6	0.95 (0.41)	0.93 ～ 2.8	1.3 (0.13)
7-3	Oxychlordane	110 ～ 2,600	450 (8.7)	93 ～ 1,500	460 (8.7)	3.5 ～ 47	14 (1.1)	11 ～ 150	38 (0.26)
7-4	*cis*-Nonachlor	28 ～ 570	130 (2.6)	43 ～ 450	140 (2.6)	0.78 ～ 11	2.7 (0.34)	3.3 ～ 42	11 (0.25)
7-5	*trans*-Nonachlor	200 ～ 5,400	890 (3.2)	250 ～ 2,600	950 (3.2)	4.8 ～ 77	20 (0.42)	25 ～ 430	83 (0.17)
8	Heptachlors								
8-1	Heptachlor	nd ～ 31	nd (6.9)	nd ～ tr(3.2)	nd (6.9)	nd ～ tr(0.61)	nd (1.2)	nd	nd (1.7)
8-2	*cis*-Heptachlor epoxide	40 ～ 2,100	190 (2.0)	44 ～ 680	160 (2.0)	2.2 ～ 30	7.2 (0.27)	5.0 ～ 81	19 (0.20)
8-3	*trans*-Heptachlor epoxide	nd	nd (5.6)	nd	nd (5.6)	nd	nd (0.73)	nd	nd (0.47)
9	Toxaphenes								
9-1	Parlar-26	18 ～ 400	79 (2.9)	21 ～ 160	60 (2.9)	0.75 ～ 6.7	2.0 (0.49)	2.0 ～ 16	6.7 (0.35)
9-2	Parlar-50	32 ～ 700	130 (3.1)	35 ～ 300	100 (3.1)	0.76 ～ 9.2	2.6 (0.52)	3.4 ～ 27	10 (0.39)
9-3	Parlar-62	nd ～ 52	tr(9.5) (22)	nd ～ 32	tr(8.9) (22)	nd	nd (3.6)	nd ～ tr(2.1)	nd (2.7)
9-4	Parlar-40	nd ～ 4.6	tr(0.91) (2.2)	nd ～ 4.4	nd (2.2)	nd ～ tr(0.23)	nd (0.36)	nd ～ 0.46	tr(0.16) (0.27)
9-5	Parlar-41	nd ～ 43	9.0 (2.4)	2.7 ～ 19	6.9 (2.4)	nd ～ 0.71	tr(0.16) (0.40)	tr(0.23) ～ 1.5	0.70 (0.30)
9-6	Parlar-44	tr(1.3) ～ 47	9.2 (4.1)	tr(2.7) ～ 19	7.0 (4.1)	nd ～ 0.85	tr(0.22) (0.68)	tr(0.16) ～ 1.4	0.54 (0.39)
10	Mirex	7.9 ～ 86	29 (3.2)	15 ～ 150	40 (3.2)	tr(0.32) ～ 7.1	1.3 (0.54)	2.2 ～ 18	7.2 (0.81)
11	HCHs								
11-1	α-HCH	tr(3.4) ～ 65	12 (4.6)	tr(4.3) ～ 84	10 (4.6)	tr(0.33) ～ 6.0	0.92 (0.77)	tr(0.84) ～ 4.2	1.6 (1.2)
11-2	*β*-HCH	320 ～ 7,400	1,800 (3.4)	240 ～ 6,900	1,700 (3.4)	12 ～ 400	75 (0.57)	34 ～ 1,300	190 (0.85)
11-3	γ-HCH	tr(1.7) ～ 120	11 (3.5)	3.9 ～ 160	13 (3.5)	tr(0.41) ～ 15	1.2 (0.59)	tr(0.76) ～ 17	1.9 (0.88)
11-4	δ-HCH	nd ～ 7.6	nd (3.9)	nd ～ 35	tr(1.4) (3.9)	nd ～ tr(0.44)	nd (0.66)	nd ～ tr(0.34)	nd (0.99)
	Dioxins(TEQ)								
	PCDDs+PCDFs	0.047 ～ 1.9	0.37 (0.000007 ～0.06)	0.66 ～ 1.5	0.43 (0.000007 ～0.06)	0.00089 ～ 0.16	0.0068 (0.0000011 ～0.010)	0.023 ～ 0.17	0.058 (0.0000017 ～0.008)
	Coplanar PCBs	0.066 ～ 1.5	0.27 (0.0000020 ～0.004)	0.093 ～ 0.84	0.25 (0.0000020～ 0.004)	0.0021 ～ 0.036	0.0085 (0.0000004 ～0.0007)	0.0098 ～ 0.080	0.032 (0.0000004 ～0.00024)
	Dioxins (Total)	0.14 ～ 3.3	0.65 (0.0000020 ～0.06)	0.16 ～ 2.3	0.70 (0.0000020 ～0.06)	0.0031 ～ 0.17	0.017 (0.0000004 ～0.010)	0.036 ～ 0.21	0.091 (0.0000004 ～0.008)

(Note 1) "Av." indicates the geometric mean calculated by assuming nd (below the detection limit) as half the value of the detection limit.

(Note 2) Detection limits were based on " Standard manual for dioxin analysis in human blood " (December 12, 2000, Ministry of Health and Welfare, Japan).

(Note 3) Specimens sampled during the period of FY 2001～2005 were measured between FY 2004 and FY 2005.

Table 4-10-2 List of the detection ranges in The Environmental Monitoring (humans, trial) during FY 2004～2005 (Part 1: based on fat weight) [ix)]

Target Chemicals		Breast milk (pg/g-fat)				Umbilical cord blood (pg/g-fat)		Maternal blood (pg/g-fat)	
No	Name	Tohoku District 70 Samples		Kanto-Koshinetsu District 25 Samples		Tohoku District 70 Samples		Tohoku District 50 Samples	
		Range	Av. (Quantification limit)	Range	Av. (Quantification limit)	Range	Av. (Quantification limit)	Range	Av. (Quantification limit)
1	PCBs	31,000 ～ 280,000	100,000 (290)	42,000 ～ 320,000	100,000 (290)	12,000 ～ 130,000	42,000 (620)	20,000 ～ 160,000	76,000 (460)
2	Hexachlorobenzene	6,900 ～ 37,000	17,000 (87)	5,800 ～ 27,000	13,000 (87)	6,400 ～ 40,000	17,000 (180)	5,600 ～ 40,000	14,000 (140)
3	Aldrin	nd	nd (75)	nd	nd (75)	nd	nd (120)	nd ～ 25	nd (25)
4	Dieldrin	2,100 ～ 17,000	4,400 (140)	1,600 ～ 8,000	3,100 (140)	1,400 ～ 14,000	3,400 (230)	1,400 ～ 9,800	3,500 (54)
5	Endrin	nd ～ 490	nd (330)	nd	nd (330)	nd	nd (540)	nd	nd (49)
6	DDTs								
6-1	*p,p'*-DDT	2,300 ～ 19,000	7,900 (200)	4,100 ～ 36,000	7,400 (200)	560 ～ 7,300	2,500 (420)	1,100 ～ 10,000	4,200 (310)
6-2	*p,p'*-DDT	32,000 ～ 330,000	130,000 (79)	48,000 ～ 400,000	130,000 (79)	12,000 ～ 390,000	62,000 (170)	17,000 ～ 270,000	82,000 (130)
6-3	*p,p'*-DDT	100 ～ 15,000	310 (81)	150 ～ 1,100	330 (81)	nd ～ 590	tr(120) (170)	tr(63) ～ 430	240 (130)
6-4	*o,p'*-DDT	550 ～ 4,200	1,200 (98)	570 ～ 3,700	1,200 (98)	tr(190) ～ 1,400	450 (210)	200 ～ 2,100	680 (150)
6-5	*o,p'*-DDT	180 ～ 940	400 (71)	200 ～ 610	330 (71)	tr(85) ～ 600	250 (150)	170 ～ 730	350 (110)
6-6	*o,p'*-DDT	nd ～ 510	tr(55) (74)	tr(31) ～ 130	tr(56) (74)	nd ～ tr(100)	nd (160)	nd ～ tr(100)	nd (120)
7	Chlordanes								
7-1	*cis*-Chlordane	200 ～ 3,100	530 (81)	230 ～ 770	470 (81)	210 ～ 1,500	440 (130)	220 ～ 2,100	650 (20)
7-2	*trans*-Chlordane	83 ～ 1,400	190 (74)	91 ～ 270	150 (74)	120 ～ 770	330 (120)	130 ～ 490	200 (20)
7-3	Oxychlordane	2,700 ～ 47,000	11,000 (210)	3,500 ～ 26,000	11,000 (210)	1,300 ～ 18,000	4,700 (340)	1,500 ～ 17,000	5,500 (39)
7-4	*cis*-Nonachlor	860 ～ 11,000	3,300 (62)	1,700 ～ 9,000	3,300 (62)	280 ～ 2,800	950 (100)	470 ～ 4,900	1,700 (37)
7-5	*trans*-Nonachlor	6,600 ～ 100,000	23,000 (76)	9,200 ～ 58,000	22,000 (76)	1,700 ～ 26,000	6,900 (130)	3,600 ～ 52,000	12,000 (26)
8	Heptachlors								
8-1	Heptachlor	nd ～ 370	nd (170)	nd ～ tr(85)	nd (170)	nd ～ tr(170)	nd (350)	nd	nd (260)
8-2	*cis*-Heptachlor epoxide	1,800 ～ 24,000	4,800 (48)	1,700 ～ 9,800	3,800 (48)	670 ～ 13,000	2,500 (81)	730 ～ 13,000	2,800 (30)
8-3	*trans*-Heptachlor epoxide	nd	nd (130)	nd	nd (130)	nd	nd (220)	nd	nd (71)
9	Toxaphenes								
9-1	Parlar-26	760 ～ 7,000	2,000 (69)	790 ～ 3,500	1,400 (69)	230 ～ 3,000	680 (160)	300 ～ 2,500	980 (100)
9-2	Parlar-50	1,300 ～ 12,000	3,300 (73)	1,300 ～ 6,100	2,400 (73)	280 ～ 4,100	910 (180)	480 ～ 4,200	1,500 (110)
9-3	Parlar-62	nd ～ 820	tr(240) (500)	nd ～ 660	tr(240) (500)	nd ～ tr(510)	nd (1,300)	nd ～ tr(360)	nd (790)
9-4	Parlar-40	nd ～ 97	tr(22) (50)	nd ～ 82	nd (50)	nd ～ tr(73)	nd (130)	nd ～ tr(69)	nd (79)
9-5	Parlar-41	tr(24) ～ 560	230 (55)	82 ～ 370	160 (55)	nd ～ 240	tr(58) (140)	tr(37) ～ 220	100 (87)
9-6	Parlar-44	tr(58) ～ 640	230 (96)	tr(86) ～ 410	160 (96)	nd ～ 380	tr(72) (200)	nd ～ 200	tr(77) (110)
10	Mirex	170 ～ 1,900	740 (77)	350 ～ 2,600	930 (77)	tr(110) ～ 1,400	440 (160)	280 ～ 2,900	1,100 (120)
11	HCHs								
11-1	α-HCH	150 ～ 1,600	310 (110)	tr(78) ～ 1,300	230 (110)	tr(120) ～ 1,900	320 (230)	tr(120) ～ 580	230 (170)
11-2	*β*-HCH	12,000 ～ 210,000	46,000 (81)	6,300 ～ 160,000	40,000 (81)	4,900 ～ 90,000	26,000 (170)	4,700 ～ 200,000	27,000 (130)
11-3	γ-HCH	tr(52) ～ 2,300	270 (84)	95 ～ 3,300	310 (84)	tr(150) ～ 5,100	410 (180)	tr(99) ～ 2,200	270 (130)
11-4	δ-HCH	nd ～ 310	nd (94)	nd ～ 820	nd (94)	nd ～ tr(140)	nd (200)	nd	nd (150)
	Dioxins (TEQ)								
	PCDDs+PCDFs	0.35 ～ 25	8.5 (0.00016 ～2.0)	1.8 ～ 28	9.4 (0.00016 ～2.0)	0.26 ～ 56	2.6 (0.0004 ～3)	2.8 ～ 26	8.5 (0.00025 ～1.1)
	Coplanar PCBs	2.1 ～ 21	6.8 (0.00005 ～0.10)	2.5 ～ 16	5.9 (0.00005 ～0.10)	0.74 ～ 7.3	2.9 (0.00010 ～0.20)	1.4 ～ 11	4.7 (0.00006 ～0.04)
	Dioxins (Total)	2.5 ～ 45	16 (0.00005 ～2.0)	4.3 ～ 44	16 (0.00005 ～2.0)	1.1 ～ 59	6.2 (0.00010 ～3)	4.8 ～ 33	13 (0.00006 ～1.1)

(Note 1) "Av." indicates the geometric mean calculated by assuming nd (below the detection limit) as half the value of the detection limit.

(Note 2) Detection limits were based on " Standard manual for dioxin analysis in human blood " (December 12, 2000, Ministry of Health and Welfare, Japan).

(Note 3) Specimens sampled during the period of FY 2001～2005 were measured between FY 2004 and FY 2005.