

CHEMICALS IN THE ENVIRONMENT

Report on Environmental Survey
and Wildlife Monitoring of Chemicals
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Environmental Health and Safety Division

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Chapter 1.

The System of Investigation of Chemical Substances in the Environment

Chapter 1. The System of Investigation of Chemical Substances in the Environment

The Environmental Health and Safety Division of the Environment Agency of Japan has been conducting successive investigation concerning the level of chemical substances in the environment since fiscal year 1974, and is currently conducting the following 3 major investigation at present.

- Comprehensive Survey of Chemical Substances on Environmental Safety
- Investigation and Survey of Designated Chemical Substances etc.
- Follow-up Survey of the Pollution by Unintentionally Formed Chemical Substances

These surveys originate in historical terms from that the Resolution accompanying the Law Concerning the Examination and Regulation of Manufacture etc. of Chemical Substances (hereinafter referred to as the Chemical Substances Control Law) in 1973 stated that safety investigation of existing chemical substances (Approximately more than 20,000 substances which were manufactured or imported for commercial purposes at the time of enactment of the Law, listed in the Existing Chemical Substances Inventory.) should be conducted by the government. The Environment Agency initiated grasping the situation of existence of these substances in the general environment, based on this resolution. Later, substances subject to the survey were expanded to include designated chemical substances and unintentionally formed chemical substances.

(See Appendix A for the Chemical Substances Control Law)

1. Comprehensive Survey of Chemical Substances on Environmental Safety

From the First Comprehensive Survey of Chemical Substances on Environmental Safety during fiscal year 1979-1988, valuable data concerning environmental pollution by chemical substances had been accumulated and solid results had been obtained such as the application of various investigation methods for chemical substances. Moreover, many problems concerning analytical methods etc. were clarified, through the Surveys. Then, environmental pollution by dioxins which are formed unintentionally in the waste incineration process, and the possibility of ground water pollution by organochlorine compounds etc. had been pointed out. Although part of these problems had been solved by the amendment of the Chemical Substances Control Law, environmental pollution caused by new types of substances remained unresolved.

With this situation in the background, the Chemical Substances Investigation and Survey Committee consisting of experts reviewed the situation of the Surveys. New

measures for problems arising from chemical substances were considered, and the Second Comprehensive Survey was conducted from fiscal year 1989 on a 10 year plan. The system of this survey is indicated in Figure 1, and the main changes from the First Survey are as follows.

a. Expansion of Substances Subject to the Survey

In addition to the existing chemical substances, new chemical substances and unintentionally formed chemical substances could be included.

Actual substances subject to the survey are chosen from these 3 categories, from the revised Priority List (listing 1,145 substances).

b. Improvement of the Method for Environmental Monitoring

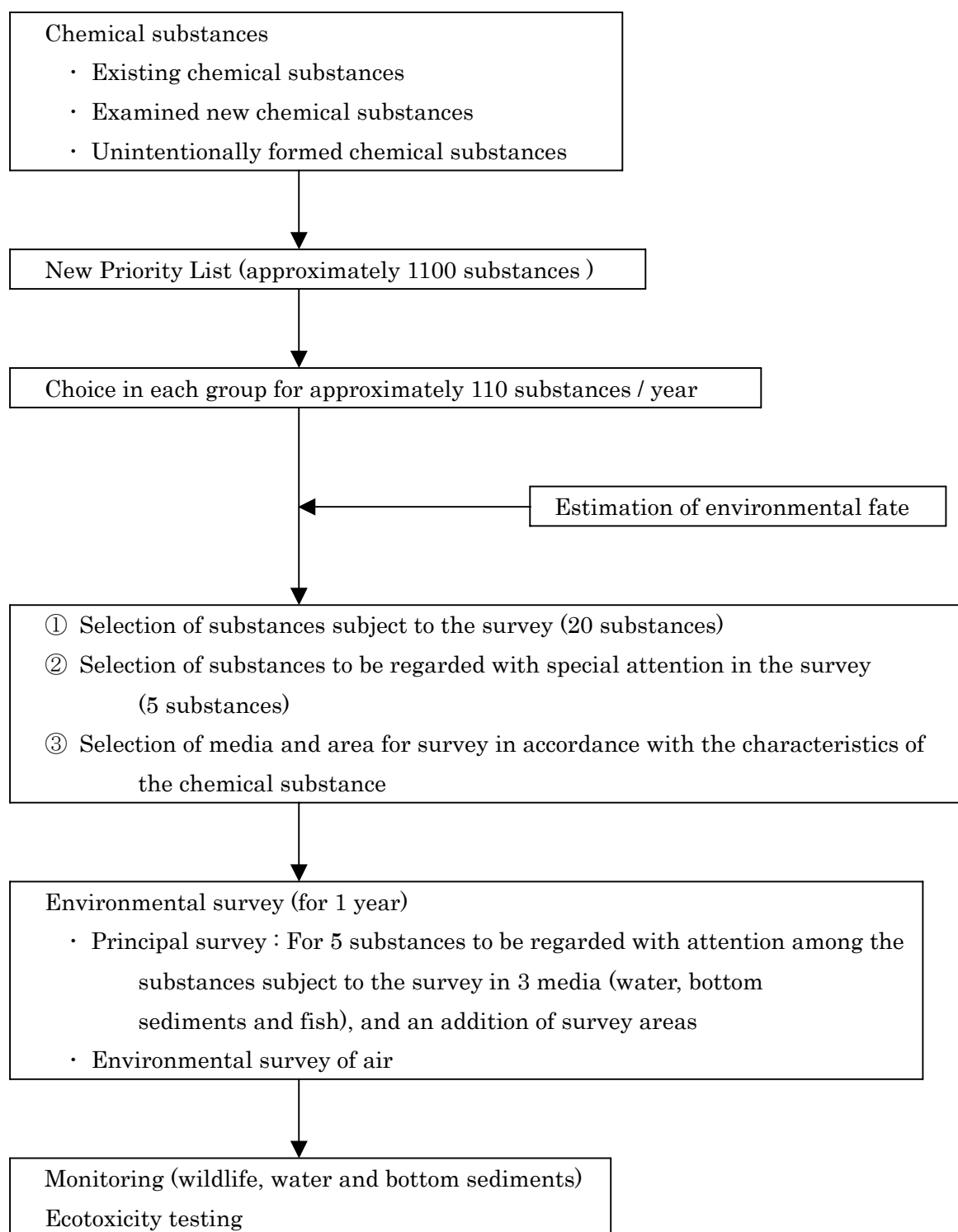
From the perspective of emphasizing the effectiveness of the survey and relation between environmental media, substances subject to the survey are selected according to clusters such as organochlorine compounds, polycyclic aromatic compounds, organometallic compounds, etc.

The method for environmental monitoring which was conducted for fixed environmental media and area was changed to a flexible type i.e. choosing media and area according to the characteristic of each substance, and emphasis was laid on higher accuracy in surveys for principal substances rather than conducting surveys in wide scope.

c. Assessment of Environmental Safety

The priority list was revised considering mainly the effects of chemical substances. Chemical substances were classified according to their structure etc., and representative substances for which environmental surveys should be conducted are chosen by the estimation of environmental fate. In the assessment based on the environmental survey, exposure is assessed based on the results of environmental survey, and effect assessment is conducted based on scientific information.

Fig. 1 The System of the Second Comprehensive Survey



775 substances were examined through the environmental survey since 1974 fiscal year to 1998, and 307 substances were detected from the general environment. Persisting substances judged to be in need of special attention by yearly observation and Class 1

Specified Chemical Substances designated in the Chemical Substances Control Law etc., are subject to the wildlife monitoring and water and bottom sediments monitoring.

The results of environmental surveys (fiscal year 1974~1998)

	Water	Bottom sediments	Fishes	Air	Total
Surveyed substances	748	725	232	213	775
Detected substances	141	223	91	130	307
Detection ratio (%)	18.9	30.8	39.2	61.0	39.6

2. Investigation and Survey of Designated Chemical Substances

Designated Chemical Substances could be designated as Class 2 Specified Chemical Substances if the substances are judged to be harmful from the result of the toxicity test instructed according to the situation of environmental pollution by the chemicals. Class 2 Specified Chemical Substances require prior notification of the scheduled production or importation volume. If necessary, their production or importation volume is regulated.

For this purpose, the Environment Agency started the Investigation and Survey of the Designated Chemical Substances in the Environment from 1988 F.Y., in order to grasp the situation of these substances in the environment. Furthermore, from 1990 F.Y., the Study of the Exposure Route (survey concerning the quantity of chemical substances exposed to humans in daily life via each media) was newly initiated. Consequently, the name of the survey was changed to the Investigation and Survey of Designated Chemical Substances.

In “the Future of the Second General Inspection Survey (Final report)”, this survey was to ‘provide sufficient consideration for Designated Chemical Substances and Class 2 Specified Chemical Substances as substances subject to the survey’. Thus this survey has been conducted separately as part of the Second General Inspection Survey.

3. The Follow-Up Survey on the Pollution by Unintentionally Formed Chemical Substances

Environmental pollution caused by harmful substances which are formed unintentionally in the process of manufacture or waste incineration (e.g. dioxins) or in the natural reaction process in the environment, became a social problem. Appropriate surveys

became necessary for these substances which were not directly subject to the Chemical Substances Control Law, in order to take measures.

For this reason, the existence in the environment of unintentionally formed substances which may affect human health and wildlife have been investigated since 1985 F.Y. This survey, named “the Follow-Up Survey on the Pollution by Harmful Chemical Substances,” was started in order to take preventive measures for environmental pollution by such chemical substances. Since fiscal year 1988, environmental surveys which are concluded for each year and monitoring surveys which are annually conducted have been separated.

So far, surveys have been conducted for polychlorinated dibenzo-p-dioxin (PCDD), polychlorinated dibenzofuran (PCDF), polybrominated dibenzo-p-dioxin (PBDD), polybrominated dibenzofuran (PBDF) and nitrosoamines etc.

In 1998 F.Y., a monitoring survey was conducted concerning dioxins which have been surveyed continuously since 1985 F.Y. An environmental survey was conducted for co-planar PCBs which are PCBs (polychlorinated biphenyl) with a planar structure (no chlorine substituent in the ortho position).

Since the purpose of this survey was to grasp the contamination level of unintentionally formed chemical substances, the name of the survey was revised to “the Follow-Up Survey on the Pollution by Unintentionally Formed Chemical Substances ” since 1993 F.Y.

4. Outcome of Surveys Conducted So Far

The main outcome of surveys conducted so far was the amendment of the Chemical Substances Control Law in May, 1986, taking into consideration the results of the Comprehensive Survey of Chemical Substances on Environmental Safety. Organotin compounds etc. were also designated as Class 1 Specified Chemical Substances, based on the results of surveys.

Main Outcome of the Environmental Survey of Chemical Substances

Name of survey	Substance	Surveyed FY	Outcome
<ul style="list-style-type: none"> • Comprehensive Survey (Investigation) 	Trichloroethylene Tetrachloroethylene Carbon tetrachloride (solvent)	1974-1983 1974-1983 1974-1983	Amendment of the Chemical Substances Control Law in May. '86 (Initiation of Class 2 Specified Chemical Substances, Designated Chemical Substances system)
<ul style="list-style-type: none"> • Comprehensive Survey (Investigation) (Wildlife monitoring) 	Chlordane (antitermite agent)	1981, 1982 1983-	Designation of Class 1 Specified Chemical Substances in Sep. '86
<ul style="list-style-type: none"> • Comprehensive Survey (Investigation) (Wildlife monitoring) • Investigation and Survey of Designated Chemical Substances 	Tributyltin compounds (paint for bottom of ships etc.)	1983, 1984 1985- 1988-	Designation as Designated Chemical Substances in Apr. '88 TBTO: Designation as Class 1 Specified Chemical Substances in Jan. '90 Other TBTs: Designation as Class 2 Specified Chemical Substances in Sep. '90
<ul style="list-style-type: none"> • Comprehensive Survey (Investigation) (Wildlife monitoring) 	Triphenyltin compounds (paint for bottom of ships)	1988 1989-	Designation as Designated Chemical Substances in Jul. '88 Designation as Class 2 Specified Chemical Substances in Sep. '90
<ul style="list-style-type: none"> • Follow-Up Survey of the Pollution by Unintentionally Formed Chemical Substances 	Dioxins (formed in the waste incineration process etc.)	1985-97	A problem of wastewater in pulp factories and in the surrounding area of waste incineration factories were raised.