

# Water Environmental Management in Japan

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環境省水・大気環境局水環境課  
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- II . Outline of the Measures concerning Water Environment Conservation
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# I . History of Water Pollution and Water Environment Administration

## ■ Before the Establishment of the Environment Agency

Late 19th century	Ashio Copper Pollution Affair
1956	Minamata disease
1958	Water Quality Preservation Law and Factory Effluent Control Law
1960s	Second Minamata disease and Itai-Itai disease

## High Economic Growth and Widespread Pollution Issues

- ← 1967 Basic Law for Environmental Pollution Control
- 1970 Water Pollution Control Law
- 1971 Establishment of the Environment Agency

## Beginning of Environmental Administration

- Pollution issues of enclosed water areas
  - ← Law Concerning Provisional Measures for Conservation of the Environment of the Seto Inland Sea 1973
  - Tokyo Bay and Ise Bay (areawide total pollutant load control) 1979
  - Law Concerning Special Measures for Conservation of Lake Water Quality 1979
- 1989 Amendment of the Water Pollution Control Law (for groundwater pollution)
- 1990 Amendment of the Water Pollution Control Law (for domestic effluent)
- 1993 Basic Environment Law
- 1994 Two laws related to headwater areas for the drinking water supply
- 1999 Law Concerning Special Measures Against Dioxins
- 2001 Establishment of the Ministry of the Environment

## II . Outline of the Measures concerning Water Environment Conservation

- Goals of the water environment conservation policy  
Environmental quality standard for water pollution  
(health items, living environment items and DXNs)
- Measures concerning water environment conservation
  - Wastewater regulation for factories & establishments (uniform regulation)
  - System to notify specified facilities
  - Water quality monitoring (continuous monitoring, voluntary measurement by enterprises)
  - Measures for domestic effluent
  - Measures for closed water areas

## Legal System concerning Water Environment Conservation

Environment Basic Law Establishment of Environmental Quality Standard

### [Implementation of concrete measures]

#### - Measures Common to the Whole Country

##### Water Pollution Control Law

System to notify specified facilities, wastewater regulation common to the whole country, continuous monitoring of water quality, total pollutant load control for closed sea areas, measures for domestic effluent such as the designation of priority areas for domestic effluent measures

##### Law concerning Special Measures against Dioxins (only the part relevant to water quality)

Establishment of environmental quality standards for water pollution (sediment), effluent control, system to notify specified facilities, formulation of emission reduction plan, continuous monitoring of water quality (sediment)

#### - Special Measures for Specified Water Areas

##### Law concerning Special Measures for the Conservation of Lake Water Quality

Basic Policy for the Conservation of Lake Water Quality, designation of certain lakes (10 lakes such as Lake Biwa), regulation based on the Plan for the Conservation of Lake Water Quality, implementation of projects, etc.

##### Law concerning Special Measures for the Conservation of the Environment of the Seto Inland Sea

Basic Plan for the Conservation of the Environment of the Seto Inland Sea, license system for the installation of specified facilities, Natural Seashore Conservation Area System (notification of action and recommendation), consideration for environmental conservation in reclamation

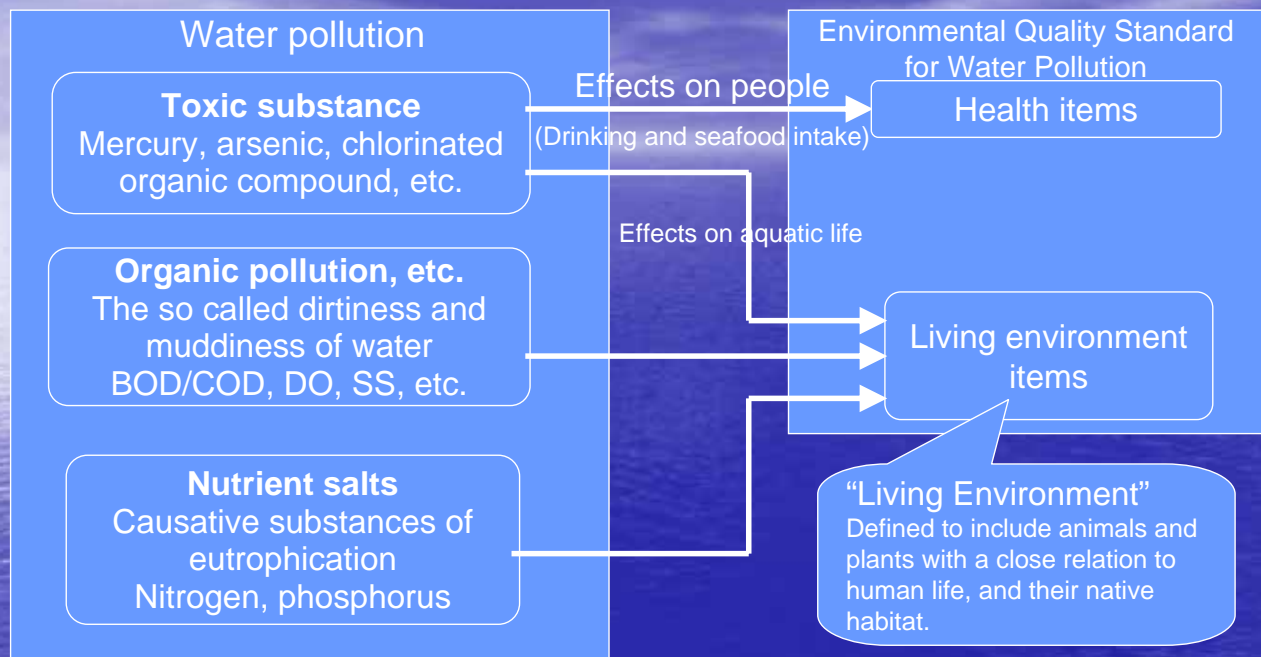
##### Law concerning Special Measures for the Rejuvenation of the Ariake Sea and Yatsushiro Sea

Basic Policy for the Rejuvenation of the Ariake Sea and Yatsushiro Sea, Prefectural Plan for the Rejuvenation of the Ariake Sea and Yatsushiro Sea, establishment of comprehensive survey assessment committee

##### Law concerning Special Measures for Water Quality Conservation at Water Resources Area in Order to Prevent the Specified Difficulties in Water Utilization

This is to regulate the precursors (bio-refractory organic substances) of disinfection by-products in limited areas in order to prevent difficulties arising from disinfection by-products (chloroform, etc.) that are generated in the unavoidable process of chlorine disinfection for water service. Basic policy: continuous monitoring (generative capacity for disinfection by-products (trihalomethane generative capacity))  
Designation of specific water areas, land areas and the formulation of a water quality conservation plan (with no designation record).

## ➤ Environmental Quality Standard for Water Pollution



### BOD/COD

One of the most fundamental forms of water pollution is oxygen depletion in water areas. A decrease in water oxygen generates malodor and other difficulties such as aquatic life being unable to survive. For this reason, besides the directly dissolved oxygen (DO), the oxygen demand (OD) that measures the oxygen consuming substance as an amount of oxygen is used. The oxygen demand includes the BOD, measured by means of microorganisms and the COD, measured by means of chemical substances. The Environmental Quality Standard adopts the former for rivers and the latter for lakes and sea areas.

## ➤ Environmental Quality Standard for Water Pollution

### [Environmental Quality Standard for Water Pollution]

- 1 Environmental Quality Standard for the Protection of Human Health  
(Health items: 26 items)
- 2 Environmental Quality Standard for the Conservation of Living Environment  
(Living Environment items: 10 items)

\* For concrete items and standard values, refer to the next page.

### [Environmental Quality Standard for Water Pollution by Dioxins]

Water Quality Standard: 1 pg-TEQ/L or less in annual average value

Sediment Standard: 150 pg-TEQ/g or less

# Items, Etc. of Environmental Quality Standard for Water Pollution

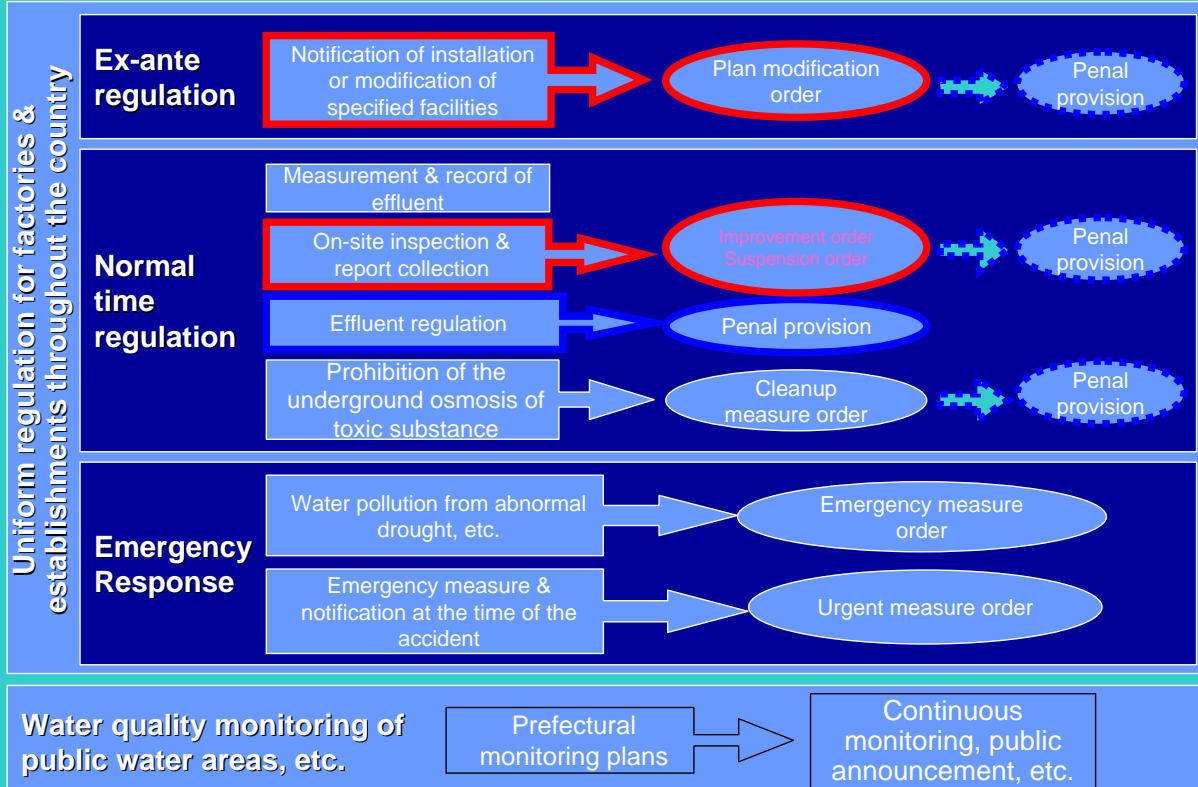
Health items	Item	Standard Value	Item	Standard Value
	Cadmium	0.01 mg/L or less	1,1,1-trichloroethane	1 mg/L or less
	Total cyanide	Undetected	1,1,2-trichloroethane	0.006 mg/L or less
	Lead	0.01 mg/L or less	Trichloroethylene	0.03 mg/L or less
	Hexavalent chromium	0.05 mg/L or less	Tetrachloroethylene	0.01 mg/L or less
	Arsenic	0.01 mg/L or less	1,3-dichloropropene	0.002 mg/L or less
	Total mercury	0.0005 mg/L or less	Thiuram	0.006 mg/L or less
	Alkylmercury	Undetected	Simazine	0.003 mg/L or less
	PCB	Undetected	Thiobencarb	0.02 mg/L or less
	Dichloromethane	0.02 mg/L or less	Benzene	0.01 mg/L or less
	Carbon tetrachloride	0.002 mg/L or less	Selenium	0.01 mg/L or less
	1,2-dichloroethane	0.004 mg/L or less	Nitrate nitrogen & Nitrite nitrogen	10 mg/L or less
	1,1-dichloroethylene	0.02 mg/L or less	Fluoride	0.8 mg/L or less
	Cis-1,2-dichloroethylene	0.04 mg/L or less	Boron	1 mg/L or less

Living environment items	Item	River	Lake	Sea Area
	BOD	≤ 1 - 10 mg/L	-	-
	COD	-	≤ 1 - 8 mg/L	≤ 2 - 8 mg/L
	pH	6.0 - 8.5	6.0 - 8.5	7.0 - 8.3
	SS	≤ 25 - 100 mg/L etc.	≤ 1 - 15 mg/L etc.	-
	DO	2-7.5 mg/L ≤	2-7.5 mg/L ≤	2-7.5 mg/L ≤
	Coliform bacteria count	≤ 50 - 5,000 MPN/100 mL	≤ 50 - 1,000 MPN/100 mL	≤ 1,000 MPN/100 mL
	N-hexane extracts	-	-	Undetected.
	Total nitrogen	-	≤ 0.1 - 1 mg/L	≤ 0.2 - 1 mg/L
	Total phosphorous	-	≤ 0.005 - 0.1 mg/L	≤ 0.02 - 0.09 mg/L
	All zinc	≤ 0.03 mg/L	≤ 0.03 mg/L	≤ 0.01 - 0.02 mg/L

## Measures for Water Environment Conservation

### Water Pollution Control Law (Common Measures)



# Measures for Environmental Conservation for Closed Water Areas

## Total Pollutant Load Control System

This system aims at reducing the total amount of the pollution load that flows into sea areas in order to improve the water quality of closed sea areas (Tokyo Bay, Ise Bay & Seto Inland Sea) for a set period (5 years)

Object sea areas: Tokyo Bay, Ise Bay & Seto Inland Sea

Object item: COD (1st -), nitrogen, phosphorus (5th -)

The 5th Total Pollutant Load Control (with Y2006 as the target year) has been completed, and the 6th Total Pollutant Load Control has been implemented.



### Basic Policy for Total Load Reduction

The Minister of the Environment determines the five year reduction goal for each target area



### Plan for Total Load Reduction

The Prefectural governor formulates the plan for the target amount of reduction according to source categories and for measures for reduction, etc., and acquires the agreement of the Minister of the Environment.

Measurement and Control of the Pollutant Load by the Standards for the Total Load Reduction  
(Factories and Establishments with 50m<sup>3</sup>/day or more)

Responsibility to measure & record the pollutant load, order to improve measures against the possibility of exceeding the pollutant load

Guidance, Advice & Recommendation for the Reduction of the Pollutant Load  
(Small-scale establishments, livestock raising, aqua-farming, agriculture, ordinary households, etc.)

Implementation of Projects such as Construction & Upgrading of Sewerage, Septic Tanks, Etc.

## III. Measures for Effluent

### Object Facility of Effluent Control

Any facility that discharges polluted water or wastewater is defined as a specified facility by the Water Pollution Control Law, and all factories or establishments in which specified facilities are installed are stipulated as the control subjects of Water Pollution Control Law.

Example :

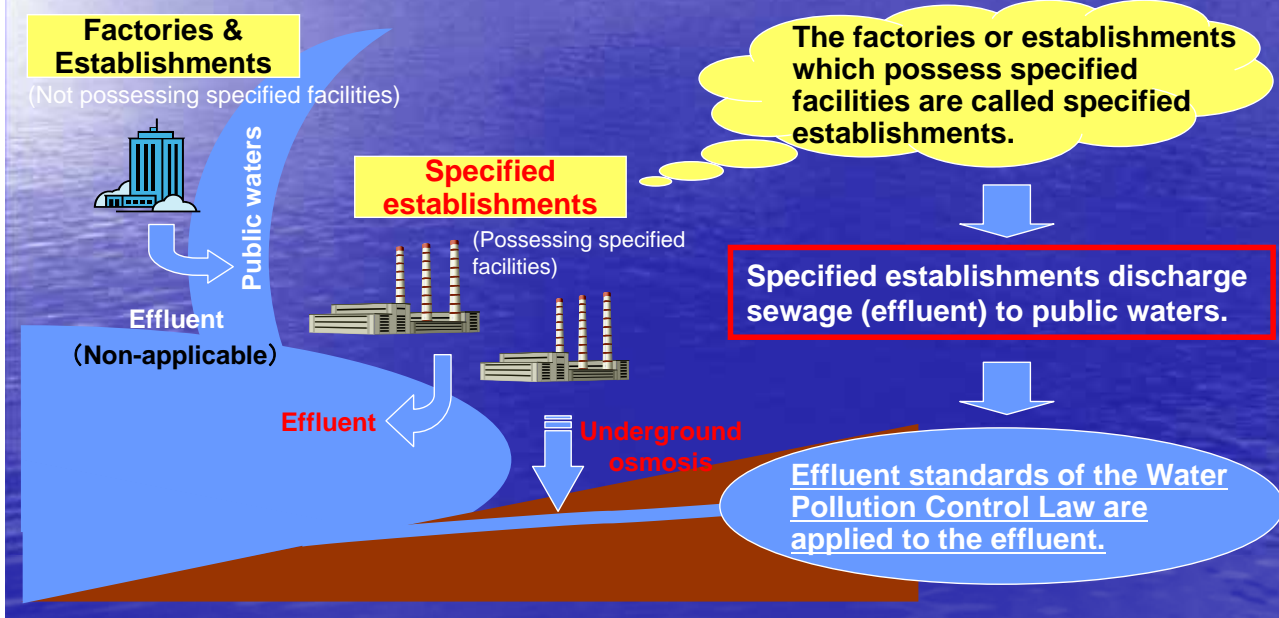
- Facilities to be used for mining, etc.
- Facilities devoted to stock raising, agriculture, etc.
- Facilities to be used for various types of food manufacturing, etc.
- Facilities to be used for forestry, etc.
- Facilities to be used for pulp manufacturing, etc.
- Facilities to be used for medical goods manufacturing, etc.
- Facilities to be used for cement products manufacturing, etc.
- Facilities to be used for steel or nonferrous metals manufacturing and facilities to be used for other types of manufacturing
- Hotel businesses, restaurants, laundry businesses, photograph development businesses, hospitals, scientific and technological research facilities
- Waste disposal sites
- Final sewage treatment facilities, joint waste water treatment plants,  
And so on...



As of the end of  
FY2005,  
approx. 290,000  
establishments  
are  
control subjects

# Uniform National Effluent Standards (Concentration Regulation)

The effluent control of the Water Pollution Control Law stipulates effluent standards (Uniform National Effluent Standards) that are uniform across all industries for the specified establishments throughout the country. The control is carried out using the so-called “**direct penalty system**” by which **penalties can be applied simply because of excess concentrations.**



## Wastewater standards

### 【Health item】

Kinds of harmful substances	Tolerable limit
Cadmium and its compounds	0.1 mg/L
Cyanide compounds	1 mg/L
Organic compound (limited to parathion, methyl parathion, methyl demeton and EPN (ethyl p-nitrophenyl phenylphosphorothioate))	1 mg/L
Lead and its compounds	0.1 mg/L
Hexavalent chromium compounds	0.5 mg/L
Arsenics and its compounds	0.1 mg/L
Mercury and alkyl mercury, and other mercury compounds	0.005 mg/L
Alkyl mercury compounds	Not detected
Polychlorinated biphenyl	0.003 mg/L
Trichloroethylene	0.3 mg/L
Tetrachloroethylene	0.1 mg/L
Dichloromethane	0.2 mg/L
Carbon tetrachloride	0.02 mg/L
1,2-dichloroethane	0.04 mg/L
1,1-dichloroethylene	0.2 mg/L
cis-1,2-dichloroethylene	0.4 mg/L
1,1,1-trichloroethane	3 mg/L
1,1,2-trichloroethane	0.06 mg/L
1,3-dichloropropene	0.02 mg/L
Thiram	0.06 mg/L
Simazine	0.03 mg/L
Thiobencarb	0.2 mg/L
Benzene	0.1 mg/L
Selenium and its compounds	0.1 mg/L
Boron and its compounds	Other than sea area: 10 mg/L Sea area: 230 mg/L
Fluorine and its compounds	Other than sea area: 8 mg/L Sea area: 1 mg/L
Ammonia, ammonium compounds, nitrite compounds and nitrate compounds	(*) 100 mg/L

(\*) 0.4 times the ammonia nitrogen compound, and the total of nitrite nitrogen and nitrate nitrogen

### 【Living environment item】

Kinds of harmful substances	Tolerable limit
Hydrogen ion concentration (pH)	Other than sea area: 5.8 – 8.6 Sea area: 5.0 – 9.0.
Biochemical oxygen demand (BOD)	160 mg/L (Daily mean value: 120 mg/L)
Chemical oxygen demand (COD)	160 mg/L (Daily mean value: 120 mg/L)
Suspended solids (SS)	200 mg/L (Daily mean value: 150 mg/L)
Normal-hexane extracts content (mineral oils content)	5 mg/L
Normal-hexane extracts content (animal and plant fats content)	30 mg/L
Phenols content	5 mg/L
Copper content	3 mg/L
Zinc content	2 mg/L
Soluble iron content	10 mg/L
Soluble manganese content	10 mg/L
Chromium content	2 mg/L
Coliform group number	Daily mean value: 3,000/cm <sup>3</sup>
Nitrogen content	120 mg/L (Daily mean value: 60 mg/L)
Phosphorus content	16 mg/L (Daily mean value: 8 mg/L)

#### Note

The effluent standard shown in this table is applicable to the effluent water discharged by a plant, factory, or business establishment which discharges 50m<sup>3</sup>/day or more of effluent water on daily average.

# Flat Wastewater Standards and Add-on Standards

Flat wastewater standards set by the national government  
(minimum control applied nationwide)

Health items  
Applied to all factories/establishments

Living environment items  
Applied to factories/establishments with wastewater  
discharge of 50 m<sup>3</sup>/day or more

Prefectural governments  
authorized to tighten controls,  
according to local conditions

Types of control tightening

**Add-ons by prefecture**

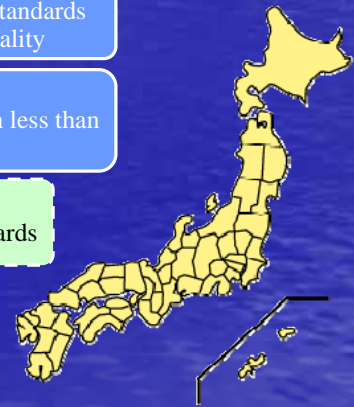
Prefectural ordinances to set more stringent wastewater standard values if the flat standards are not sufficient (for example, preventing the realization of Environmental Quality Standards)

**“Hem down” by prefecture**

Extend application of the Living Environment Items to factories/establishments with less than 50 m<sup>3</sup>/day wastewater discharge

**“Side stretch” by prefecture**

Introduce additional wastewater control items on top of the flat wastewater standards



## Control System at Establishments ①

### Pollution Control Manager System

At the time of the establishment of laws relating to pollution control such as the Water Pollution Control Law, etc., many factories were not sufficiently equipped with a pollution control system (human organization). Therefore, they were obliged to install human organizations that possessed expertise about pollution control.

#### [Purpose]

It aims at developing a pollution control structure at specified factories by installing a pollution control manager system, etc., thereby contributing to pollution control.

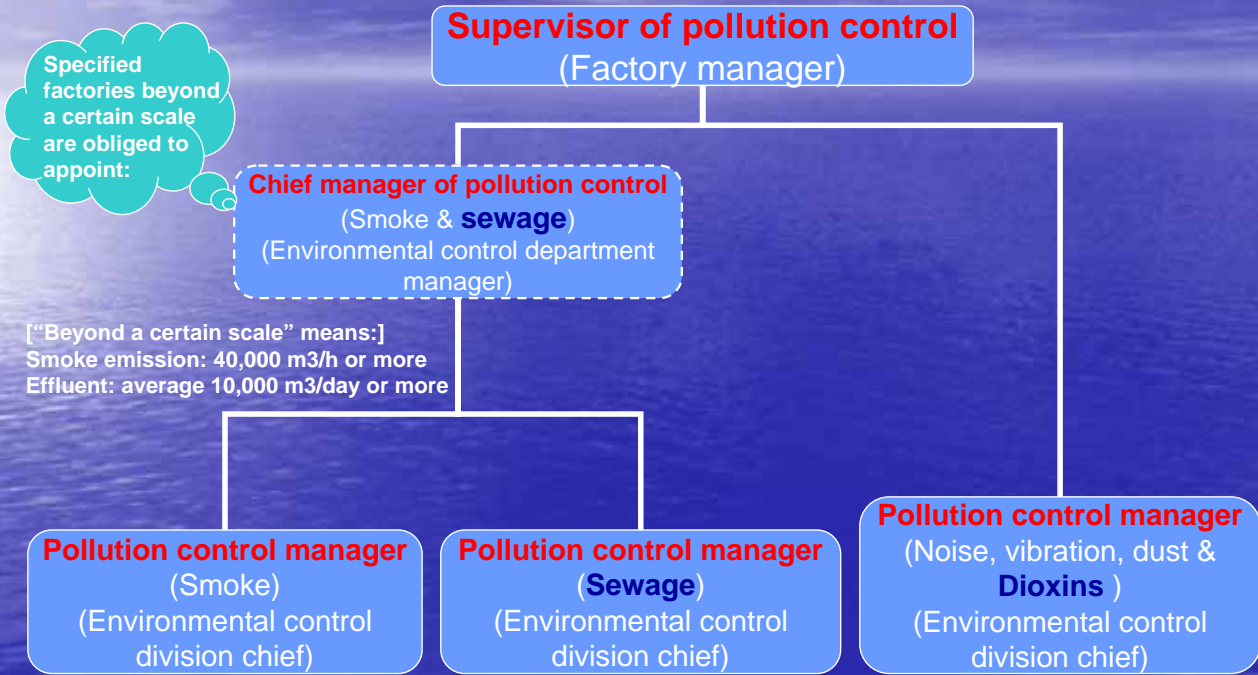
#### [Specified Factory]

Smoke, sewage or wastewater, excessive noise, specified dust or general dust, excessive vibration and dioxins.

Among the factories that discharge or generate the above items, certain ones are designated as specified factories.

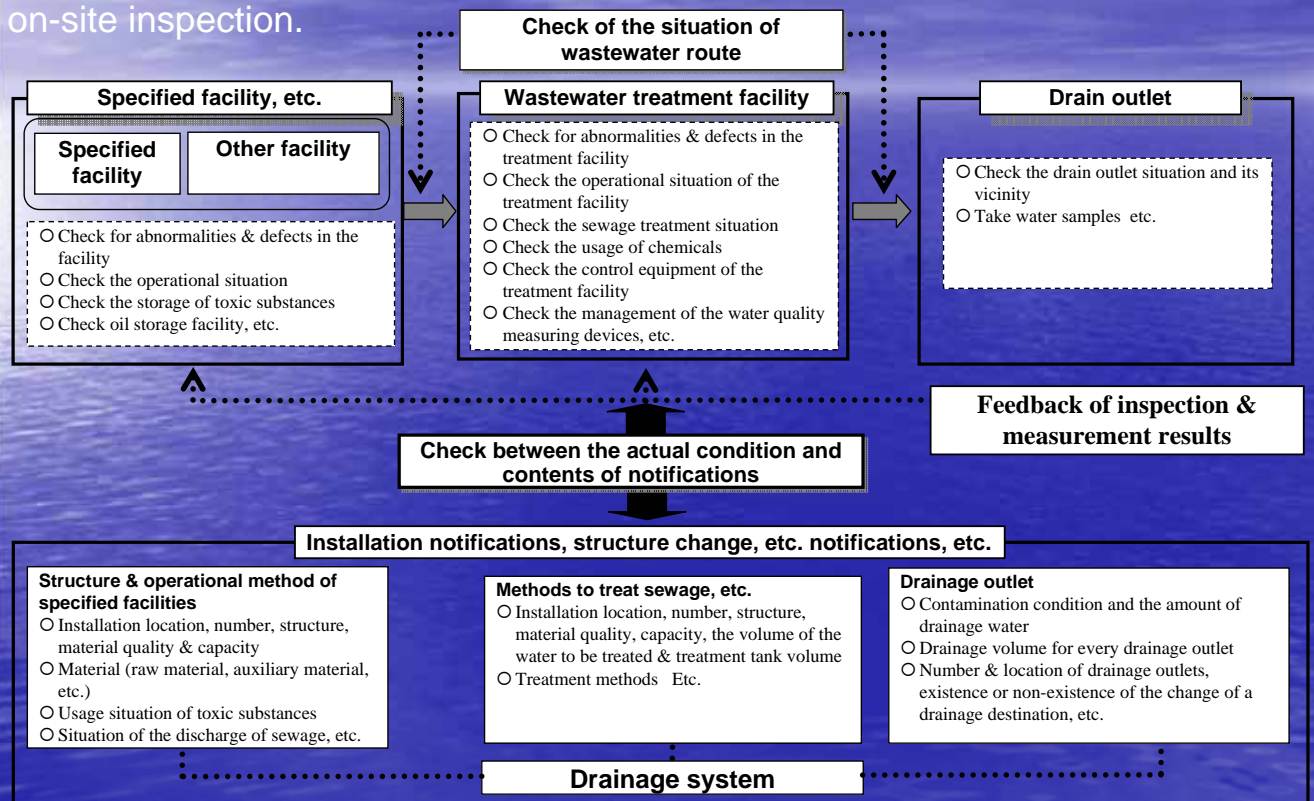
# Control System at Establishments ②

## Basic Concept of the Pollution Control Manager System



## On-site Inspection

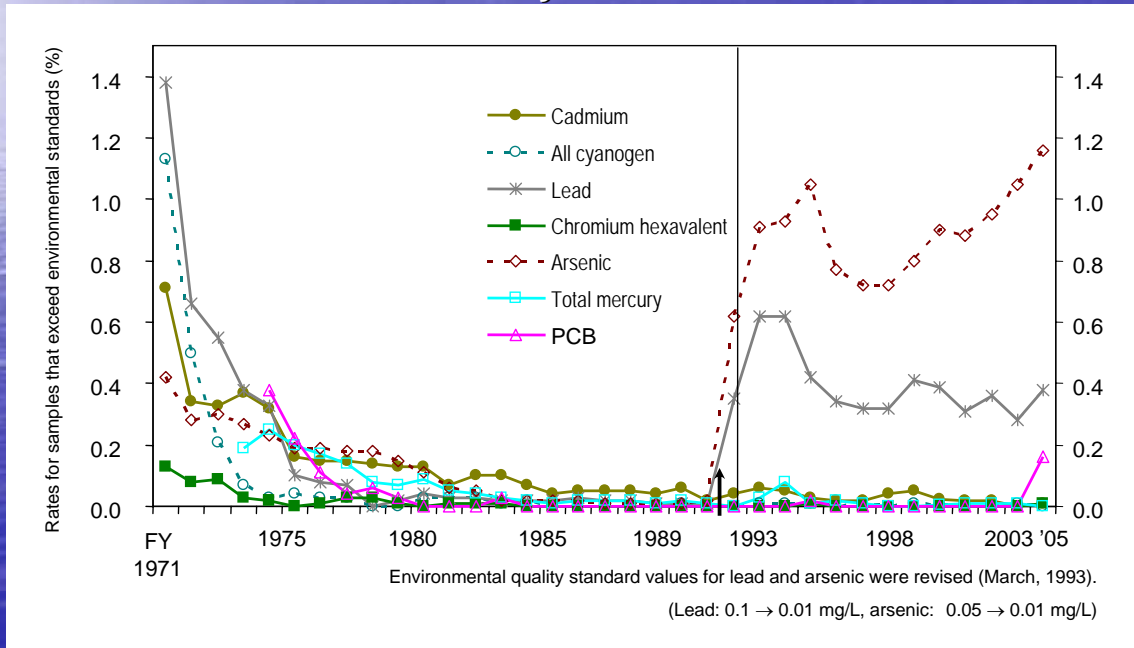
To the extent necessary for the enforcement of the Water Pollution Control Law, necessary data about the status of specified facilities, the sewage treatment situation, etc., are required, or visitation is made to specified establishments for on-site inspection.



# IV. Status of the Achievement of Environmental Quality Standards

## Status of the Achievement of Environmental Quality Standards (Health Items)

Currently, environmental standards have been achieved almost all over the country.



## Status of the Achievement of Environmental Quality Standards (Living Environment Items)

Although there is a trend of gradual improvement overall, achievement rates in closed water areas such as lakes, bays and inland seas are still low.

