

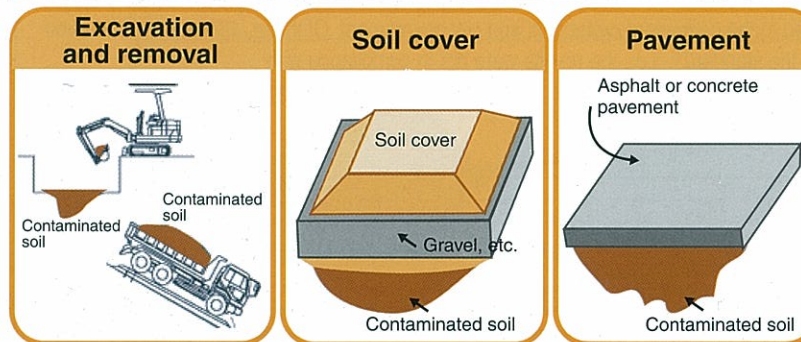
Soil Contamination Countermeasures Law

Outline of the Soil Contamination Countermeasures Law

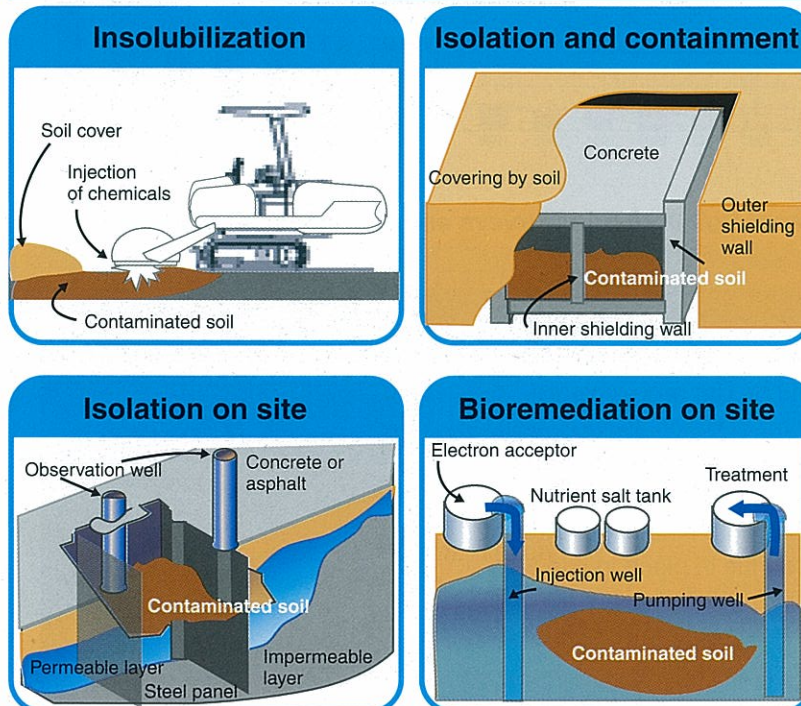
With soil contamination emerging as a problem, the need arose to legislate soil contamination countermeasures. Thus, a series of surveys and investigations were conducted to come up with a system to conserve the soil environment, which culminated in the Soil Contamination Countermeasures Law (promulgated on May 29, 2002 and enforced on Feb. 15, 2003).

This Law is designed to prevent adverse impacts on human health associated with, for example, neglected sites where plants handling toxic substances were previously located, for use as residential lands, parks, etc. for the general public, where the soil contamination levels of such sites are unknown. Specifically, surveys should be conducted on potentially contaminated sites when, for example, decommissioning plants handling toxic substances; where the sites are found to be contaminated and hence could have adverse impacts on human health, remediation measures should be taken.

1. Measures to prevent direct ingestion



2. Measures to prevent ingestion through groundwater



System of the Soil Contamination Countermeasures Law

- ◆ Survey based on Article 3 Decommissioning of special facilities handling toxic substances
- ◆ Survey based on Article 4 Where the competent prefectural governments consider that soil pollution could have an adverse effect on health

Soil contamination survey by landowners

Standard value

Fulfill

Non-designated areas

Not fulfill

- ◆ The competent prefectural governments designate and announce the areas where the soil is contaminated
- ◆ The results are placed on a public register

Where the competent prefectural governments consider that the soil contamination in the designated areas could have an adverse effect on health

The competent prefectural governments order landowners to remove contaminated soil, etc. (or polluters when they can be identified)

Removal of contaminated soil	Other measures
<ul style="list-style-type: none"> ◆ Excavation ◆ On-site clarification 	<ul style="list-style-type: none"> ◆ Off limits ◆ Pavement ◆ Soil cover ◆ Soil replacement ◆ Measurement of groundwater quality ◆ Insolubilization ◆ Containment (On-site, sealing, isolation)

Designation is cancelled when the contamination is removed. This information is announced.

Target substances (designated hazardous substances)

1. Health effects caused by ingestion of contaminated soil (heavy metals, etc.)
2. Health effects caused by ingestion of contaminated groundwater (soil leachate standard)

Restrictions on changes in the properties of land

Notification should be made to the competent prefectural governments where work operation involve transfer of contaminated soil from designated areas or could have an impact on measures already in place (a change order is issued for plans deemed to be inappropriate)

List of designated hazardous substances specified by the Soil Contamination Countermeasures Law

Designated hazardous substances (Article 2)	Designation standards (Article 5)	
	<Risks associated with direct ingestion> Soil leachate standard (mg/1 kg of soil)	<Risks associated with ingestion of groundwater> Soil concentration standard (mg/1 liter of sample)
VOC (Class 1) Volatile organic compounds (Class 1 special toxic substances)	Carbon tetrachloride	≤ 0.002
	1,2-Dichloroethane	≤ 0.004
	1,1-Dichloroethylene	≤ 0.02
	cis-1,2-Dichloroethylene	≤ 0.04
	1,3-Dichloropropene	≤ 0.002
	Dichloromethane	≤ 0.02
	Tetrachloroethylene	≤ 0.01
	1,1,1-Trichloroethane	≤ 1
	1,1,2-Trichloroethane	≤ 0.006
	Trichloroethylene	≤ 0.03
	Benzene	≤ 0.01
Heavy metals, etc. (Class 2) Heavy metals, etc. (Class 2 special toxic substances)	Cadmium and its compounds	≤ 150
	Hexavalent chromium compounds	≤ 250
	Cyanide compounds	Free cyanide ≤ 50
	Mercury and its compounds	≤ 15
	Alkyl mercury	Not detectable in samples
	Selenium and its compounds	≤ 150
	Lead and its compounds	≤ 150
	Arsenic and its compounds	≤ 150
	Fluorine and its compounds	≤ 4000
	Boron and its compounds	≤ 4000
Agrochemicals, etc. (Class 3) Agrochemicals, etc. (Class 3 special toxic substances)	Simazine	≤ 0.003
	Thiram	≤ 0.006
	Thiobencarb	≤ 0.02
	PCB	Not detectable in samples
	Organic phosphorous compounds	Not detectable in samples

Soil Contamination State Investigation

Substances that should be included in the investigation are those that were used in the facilities concerned, where Article 3 is applicable, and those that are considered by the competent prefectural governments to have adverse impacts on human health, where Article 4 is applicable. The survey covers "soil content," "soil elution" and "soil gas," and the items to be surveyed are specified according to the substance category (the list shown above).

Designated hazardous substances (Article 2)	Soil content survey	Soil elution survey	Soil gas survey
VOCs (Class 1 special toxic substances)		Where designated hazardous substances are detected in soil gas	○
Heavy metals, etc. (Class 2 special toxic substances)	○	○	
Agrochemicals, etc. (Class 3 special toxic substances)		○	

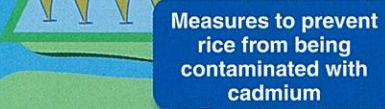
Countermeasures for Soil Contamination in Agricultural Land

The Agricultural Land Soil Pollution Prevention Law, which was enacted in 1970, is designed to "prevent the production of agricultural/livestock products that could harm human health, and inhibit the growth of agricultural crops" due to soil contaminated with toxic substances. This law mandates prefectural governments to designate areas where the soil is or could potentially be polluted and develop remediation measures.

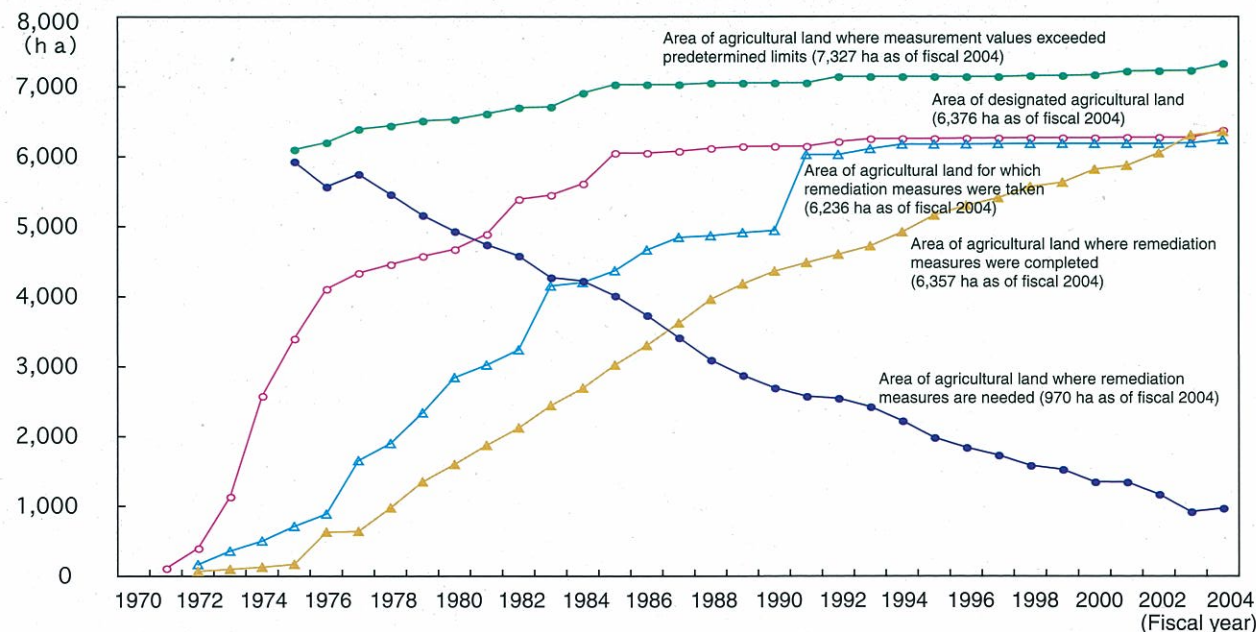
History of soil contamination in agricultural land

Agricultural land soil contaminated with toxic substances originating from human activities involves several risks. For example, it could produce agricultural/livestock products with the potential to harm human health, or inhibit the growth of agricultural crops.

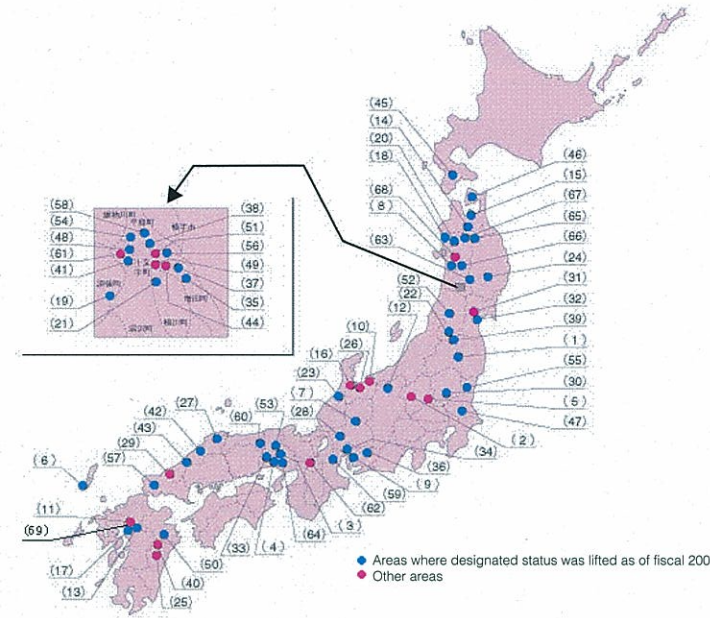
In Japan, the history of soil contamination dates back to around 1877, when polluted effluent from the Ashio Copper Mine flowed into the Watarase River basin (which stretches between Tochigi and Gunma prefectures); the agricultural land soil was contaminated and crops were severely damaged, causing a serious problem. In 1968, moreover, the chronic ingestion of rice, water, etc. contaminated with cadmium caused Itai-Itai disease in the Jinzu River basin.



Status of agricultural land soil remediation measures

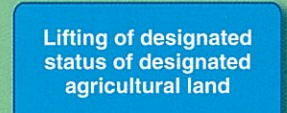


Areas that have been designated as targets for agricultural land soil remediation measures



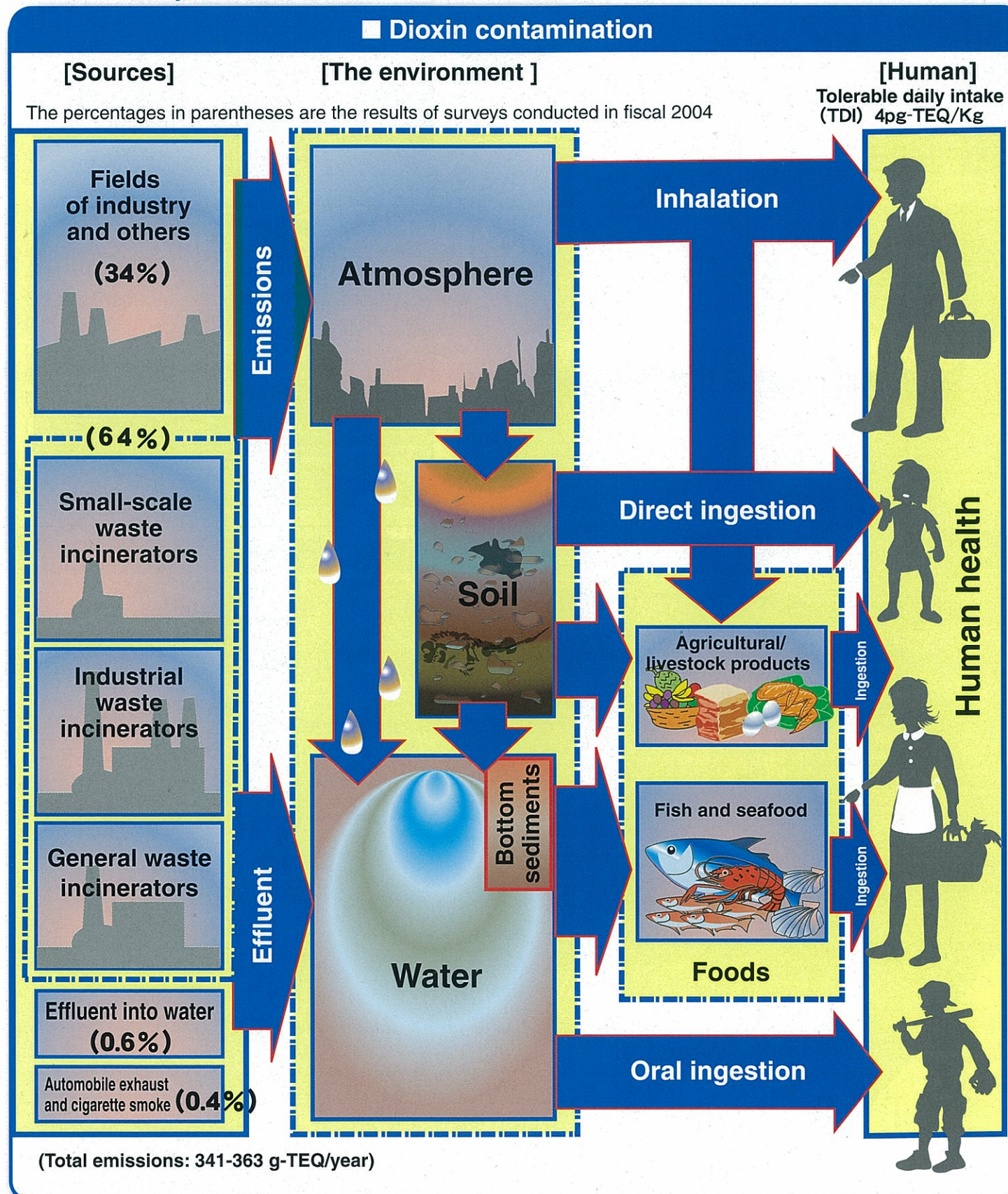
Prefecture	Area name	Number	Prefecture	Area name	Number
Hokkaido	Zenigamezawa	45	Tochigi	Oyama/Nogi	30
Aomori	Tsubo River basin	15	Gunma	Usui River basin	2
Aomori	Shukunobe River	46	Gunma	Watarase River basin	5
Iwate	Sibanuma	24	Toyama	Kurobe	10
Iwate	Shitamae	63	Toyama	Jinzu River basin (left bank)	16
Miyagi	Nihasama River	31	Toyama	Jinzu River basin (right bank)	26
Miyagi	The upper reaches of the Sotatsu/Daki River	32	Ishikawa	Kakehashi River basin	23
Akita	Sugisawa/Yanagisawa	8	Nagano	Nakano	12
Akita	Kosaka	14	Gifu	Hataosa	7
Akita	Noshiro	18	Gifu	Motosu	28
Akita	Shinjo/Tokomai	19	Aichi	Onda River (Kariya-shi)	9
Akita	Takanosu	20	Aichi	Kudamatsu River, Benten River	9
Akita	Tofukuji	21	Aichi	Iwakura	34
Akita	Masuda	35	Aichi	Inuyama	36
Akita	Oginofukuro	37	Mie	Nishinabe	59
Akita	Tobu-Daigo	38	Kyoto	Kameoka	62
Akita	Kaminabekura	41	Hyogo	Area around the Ikuno Mine	3
Akita	Tatehana	44	Hyogo	Area around the Taishi plant of Toshiba	4
Akita	Daini-Kaminabekura	48	Hyogo	Area around the Ariga Mine	33
Akita	Yagi	49	Hyogo	Kamiwatsu	53
Akita	Fukushima/Kitahara	51	Hyogo	Kuchiganaya/southern Awaga	64
Akita	Asamai	54	Tottori	Oda River	60
Akita	Kameda	56	Shimane	Houmanzan	27
Akita	Daigo/Yoshida	58	Shimane	The lower reaches of the Sasagatani Mine	29
Akita	Mie	61	Shimane	Isotake	42
Akita	Kazuno	65	Shimane	Hidarigayama	43
Akita	Kakunodate	66	Yamaguchi	Akitani	57
Akita	Hinai	67	Fukuoka	Omuta	11
Akita	Itayagoki	68	Fukuoka	Omuta (western and northern Showabiraki)	69
Yamagata	Yoshino River basin	22	Nagasaki	Sasu River/Shine River basin	6
Yamagata	Kamiirinashi River basin	39	Kumamoto	Seki River basin	13
Yamagata	Mazawa River basin	52	Kumamoto	Ura River basin	17
Fukushima	Area around the Atzu refinery of Nisso Metalchemical	1	Oita	Haseo	50
Ibaraki	Kamiinayoshi	47	Miyazaki	Iwato River basin (Touganji)	25
Ibaraki	Takahara	55	Miyazaki	Iwato River basin (Toroku)	40

69 target areas



Dioxins Control

Surveys and measures are underway (monitoring of water quality and soil, effluent regulations, soil remediation, etc.) in accordance with the Law Concerning Special Measures Against Dioxins, which was enacted in July 1999 to prevent or remove environmental pollution due to dioxins, and protect the health of the public.



■ Measures concerning soil

As for soil contaminated with dioxins, control measures are in place in accordance with the Law Concerning Special Measures Against Dioxins – e.g., monitoring of soil pollution and measures against soil contamination.

Where the results of monitoring show that the public areas being monitored are contaminated with dioxins (i.e., soil containing more than 1,000 pg-TEQ/g of dioxins), the prefectural governors concerned may designate those areas as "controled areas," followed by the establishment of "plans of measures against soil contamination by dioxins" Accordingly, measures such as remediation/removal of contaminated soil are implemented. The designation, meanwhile, is canceled upon the completion of soil remediation.

Four areas had been designated as "controled areas" in accordance with the Law Concerning Special Measures Against Dioxins as of the end of March 2006, followed by the establishment of plans of measures against soil contamination by dioxin and the implementation of measures. As a result, the designation of two of the four areas was canceled upon the completion of remediation measures.

■ Soil contamination by dioxins

Giving the toxicity of dioxins, it is imperative that measures be taken immediately to prevent adverse impacts on human health.

Responsibilities of prefectural governors

- Survey of soil pollution
- Designation of target areas
- Designation of controled areas

Implementation of measures according to the plans

- Allocation of costs to polluters in accordance with the Pollution Control Public Works Cost Allocation Law
- Government subsidies to support municipalities' measures

■ Techniques to purify soil contaminated with dioxins

Well-proven techniques (e.g., the efficacy of the treatments and their possible impacts on the environment) are the keys to successful remediation of soil contaminated by dioxins. The Ministry of the Environment, therefore, solicits soil remediation techniques and demonstrates them in terms of safety, effectiveness and viability for demonstration purposes, with the results of demonstration is evaluated by experts and subsequently made public to promote practical techniques.

■ Controled areas based on the Law Concerning Special Measures Against Dioxins

Location	Ota-ku, Tokyo	Hashimoto-shi, Wakayama	Takamatsu-shi, Kagawa	Kita-ku, Tokyo
Designated in	Jul. 2001	Apr. 2002	Mar. 2005	Mar. 2006
Plans established in	1st: Oct. 2001 2nd: May 2003	May 2002	Jun. 2005	Being established (as of Mar. 2006)
Remarks	Removal completed in fiscal 2005	Removal completed and designated status canceled (Aug. 2005)	Removal completed and designated status canceled (Aug. 2005)	

■ Countermeasures Against Water Pollution

As with the Water Pollution Control Law, the following regulatory measures are in effluent containing dioxins.

1. Notification of installation, structural change, change of ownership of specified facilities
2. Plan change orders and regulation of business operation
3. Regulation of effluent discharge
4. Improvement orders, etc
5. Corrective action after accidents
6. Voluntary wastewater testing by facility installer
7. In-person reporting and on-site inspection

These discharge regulations applied to about 2,000 factories and other commercial facilities as of end- fiscal 2005