Transition Up to the Present time: from the Emergence of Factories and the Occurrence of Pollution Problems to the Countermeasures (Summary)

Western Calendar	Japanese Calendar	Matters Related to Kawasaki City (Factory Operation)	Occurrence of Environmental Pollution Problems and the establishment of the related Monitoring Systems	The Moves of Pollution Control Measures and Regulations: Key Events
		•Establishment and operation of factories began		＊(C): City= Kawasaki City, (S): State=National
1906	m39	Established sugar factories		
1908	M41	Established electric machine/device factories		
1913	T2	Began operation of open-hearth furnaces and Ajinomoto Plant		
1915	T4	Began operation of a spinning factory		
1916	T5		Damage to agricultural crops and compensation issues occured	
1917	T6	Began operation of cement factories	Damage to fruits by dust occured	
1923	T12		Damage to seaweed by factory wastewater occured	
1925	T14	Began operation of electric machines, sugar, and milling factories		
1932	S7		Submitted a petition regarding the damage to seaweed by factory wastewater	
			to the municipal, prefectural, and national governments	
1936	S11		Submitted a petition regarding compensation for damage to the fishing industry	
			by factory wastewater	
1940	S15			(C) The municipal assembly submitted the written opinion regarding the
1941	S16	Completed reclamation in Mizue and Yakocho		smoke damage to the national government
1950	S20		Complaints about the air pollution from citizens started to increase	
1953	S28		Damage to agricultural crops caused by air pollution	
1955	S30		-Petitioned the municipan assmbly for air pollution and damage to agricultural crops	(C) The municipal assembly established "Special Council for Pollution
				Control Measures"
			-A civic movement for establishing smoke regulations began	
1956	S31		Began measuring fall dast at 16 locations within the city	
1957	S32	Reclamation in Kojimashinden began	Began measuring sulfur oxides at 15 locations within the city (lead oxide method)	
1958	S33	Commencement ceremony for reclamation in Ogishima		(S) Promulgated the act on the water quality conservation
				(S) Promulgated the act on the factory effluent control
1959	S34	Completed reclamation in part of Suehiro/Ukishima		
1960	S35	Completed reclamation in part of Chidoricho	A civic movement for establishing an pollution control ordinance	Promulgated and enforced the (former)Kawasaki City Pollution Control ordinance
		(Chidori) A petrochemical complex was formed		(C) Established the Pollution Section in the Economic Affairs Bureau
1962	S37	(Ukishima) A petrochemical complex was formed		(S) Promulgated the act on smoke regulations
1964	S39		Installed automatic sulfur oxide monitoring devices (Kawasaki Health Center)	
1965	S40		Installed automatic sulfur oxide monitoring devices (Daishi/Nakahara Health Center)	
1966	S41		Installed a smoke monitoring TV on the roof of the city hall	Formed the Kawasaki City Civic Council for Expelling Pollution
1968	S43		Installed a centralized pollution monitoring device in the city hall	(S) Promulgated and enforced the Basic Law for Environmental Pollution Control
			- Transmitted the measured values of sulfur oxide via telemeter	(S) Promulgation and partially enforced Air Pollution Control Act
1969	S44	Intention to transfer the ironworks to the reclaimed waterfront area		Set up a council for countermeasures by Kanagawa Prefecture, Yokohama City
		in Ogishima		and Kawasaki City
				(S) Cabinet approval of the environmental quality standards for sulfur oxides
				(S) Applied Special Emission Standards to Keihin District
1970	S45		First photochemical smog formation in the city; many were affected	
			Installed photochemical oxidant concentration monitoring devices in the	
			4 monitoring stations	

The resolution **to attract factories** was passed at a town assembly.

•Many reports of damage and complaints on factory wastewater and smoke were submitted

Towns and villages merged and **Kawasaki City** was born on July 1, 1924

•**Reclamation of the waterfront** waterfront areas **began**

•**Petrochemical complexes in the reclaimed waterfront area were formed and began operation**

The first case of Minamata disease was found in December, 1953

The cause of the itai-itai disease was investigated in December, 1957

◎Various countermeasures for smoke and water contamination began

14 pollution-related acts, such as the Amended Basic Law for Environmental Pollution Control, etc., **were passed into law** at the 64th Extraordinary Diet Session (Pollution Diet)
-Water Pollution Control Law, Law concerning Entrepreneurs' Bearing of the Cost of Public Pollution Control Works, Agricultural Land Soil Pollution Prevention Law, Waste Management and Public Cleansing Law, etc.

◎Pollution Control Agreement: Promotion of remediation measures for environmental pollution caused by factories, etc.
Concluded the agreement with 37 major companies in the city (39 factories) and exchanged the memorandums with 8 companies (8 factories), that accounted for 95% of the total amount of emissions from factories and workplaces in the city
-Factories with the agreement: Amount of SO_2 emission per factory is 10 Nm^3/h or more
-Factories with memorandums: Amount of SO_2 emission per factory is 5 Nm^3/h - 10 Nm^3/h
○Response to air pollution emergency: Report the amount of fuel used and result of measurement of emission gas concentration

Upgrading the automatic environmental pollution monitoring system
○Environmental monitoring
○Monitoring the source of generation

Establishment of the Environmental Pollution Monitoring Center: Current Local Environment and Pollution Monitoring Section of the Environmental Research Institute

Environmental Pollution Control Measures

-Air Pollution Control Measures-

(1) Making of high quality fuel (low-sulfur heavy oil and gasification)
(2) Flue-gas treatment facilities
-Installation of dust collectors, desulfurization and denitrification equipment, etc.
(3) Improvement of the manufacturing processes
(4) Introduction of energy-saving technologies

-Water Pollution Control Measures-

(1) Upgrading of effluent treatment facilities
(2) Improvement of the manufacturing processes
(3) Upgrading of the public water and sewerage systems

Since 1980,
☆All of the environmental quality standards for SO_x have been achieved

Promotion of PM reduction measures for diesel-powered automobiles

Since 2003,
☆Environmental quality standards for NO_x in the ambient environment have been achieved

☆The effect of the PM reduction measures for diesel-powered automobiles

Achieved the environmental quality standards for SPM in all monitoring stations

1971	S46	Issued the first photochemical smog advisory in the city	○The city was designated an **Ordinance-Designated City** ○Environmental Pollution Department of the Health Bureau was **promoted to Environmental Pollution Bureau** (increased the personnel in charge)
		Installed an electroluminescence display in front of the city hall	
		(Started to display the sulfur oxides)	
1972	S47	Completed the Environmental Pollution Monitoring Center	**Development and enforcement of the Kawasaki City Pollution Control Ordinance (former ordinance)** -September, 1971- -Control the total amount of sulfur oxide emission from factories, workplaces, etc. -Set the permissible amounts according to the districts (Administrative targets)
		/Automatic Environmental Pollution Monitoring System	
		Completed the Automatic Monitoring system for generation source	
		of Sulfurous Acid Gas (42 factories)	
		Set up the Roadside Air Pollution Monitoring Stations in front of the city hall	
		Issued the first photochemical smog warning in the city	
1973	S48		(C) Established the Environmental Pollution Research Institute
			(S) Announced the environmental quality standards for NO_2 and O_x
			(S) Announced the revision of the environmental quality standard for SO_2
			(S) Established the emission standards for NO_x (Primary total volume control)
1974	S49	Initiated ph. measurement in 7 locations in the city as countermeasures	(C) Total volume control standards for SO2/smoke dust by the Pollution
		for acid rain	Control Ordinance
		Approved Kawasaki Ward and Saiwai Ward by the Law Concerning	(C) Council for Environment Pollution Control
		Pollution-Related Health Damage Compensation and other Measures	(Advices and reports on the countermeasures for NOx)
		The total number of officially certified victims of pollution-related diseases	(S) Announced the permissible limit of gas emissions by the Japanese
		in the City exceeded 2,000	version Muskie law
		Completed the broadcast devices for photochemical pollution	
1975	S50	Issued the second photochemical smog warning in the city	
		Completed the Environmental Air Pollution information Reporting System	⇔ Provision of information for self-regulation (33 major companies in the city)
1976	S51	The environmental quality standard of SO_x was achieved in areas north of	(C) Strengthened the regulations of the city ordinance to achieve the target
		Saiwai Ward	in Kawasaki Ward
		The total number of officially certified victims of pollution-related diseases	(C) Promulgated the City Ordinance on Environmental Impact Assessment
		exceeded 3,000	
1977	S52		(C) The Council reported the Countermeasures for Hydrocarbons
1978	S53	Completed the Automatic Monitoring System for generation source of	(C) Applied the total volume control for NO_x
		NO_X (32 factories)	
1980	S55	Achieved the environmental quality standard for SO2 concentration	(C) Partially revised the control criteria for Nox
		in the entire city	
1981	S56	-Established Water quality monitoring stations in rivers within the city and installed COD measuring devices in factories and workplaces -"Automatic Water Quality Monitoring System" that connects the environmental water quality monitoring stations (9 locations) and factories/workplaces via telemeter was completed	
1982	S57	Began measuring SPM in the Ambient Environment Stations	Shifted to the countermeasures for automobiles to achieve the environmental criteria for NOx
1989	H1	Main countermeasures were shifted from the regulation of the gemeratiom source in factories/workplaces to automobiles. -Methanol vehicles, electric vehicles, hybrid buses, and CNG vehicles -Promoted countermeasures for diesel-powered automobiles-introduced clean diesel oil ☆Promoted the designated low-emission vehicles in 8 municipalities	(S) Promulgated the Automobile NOx Reduction Law (7 municipalities) Promoted the designated low-emission vehicles
2003	H15	○**Suspended Particle Matter (SPM)** -All of the Ambient Environmental Monitoring Stations have achieved the environmental quality standards for the fourth consecutive year --All of the Roadside Air Pollution Monitoring Stations achieved the environmental quality standards ●**Nitrogen Dioxide (NO2)** -All of the Ambient Environmental Monitoring Stations have achieved the environmental quality standards for the fifth consecutive year -For the Roadside Air Pollution Monitoring Stations, 7 out of 9 stations achieved the environmental quality standards	(The Tokyo Metropolitan area including 3 prefectures) Regulations on the operation of diesel-powered automobiles began -Installed PM reduction devices to the old type diesel-powered automobiles -Prohibited operation of automobiles failing to conform to the criteria in the Tokyo Metropolitan area
2007	H19		