

Table 1: Enterprise or Sewage System Test Report Items

I. Reported items based on original wastewater or sewage and effluent water quality

Enterprise or sewage system category	Water quality items to be reported	
(1) Sugar refining industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids	
(2) Textile industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine	
(3) Printing, dyeing and finishing industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine , *anionic surfactants	
(4) Leather making industry (see footnote 7)	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine, *total chromium, *grease	Commonly applicable
	Ammonia nitrogen	Applicable to both manufacturers making finished leather from rawhide and manufacturers making finished leather from wet blue
(5) Paper pulp industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, true color, free residual chlorine, *dioxin	
(6) Paper making industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine	
(7) Photograph developing industry and plate-making industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids	
(8) Chemical engineering industry (see footnote 7)	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true	Commonly applicable

	color, ammonia nitrogen, free residual chlorine, *grease, *nitrate nitrogen, *villiaumite, *anionic surfactants, *phenols, *nitrobenzene, *trichloroethylene, *formaldehyde,	
	*total chromium, *cadmium, *nickel, *copper, *total mercury, *lead, *arsenic, *zinc, *manganese, * iron, *hexavalent chromium, *boron, *tin, *molybdenum	Applicable to basic chemicals, other chemical substances, other chemical products and battery manufacturing industries
	*cobalt	Applicable to basic chemicals, other chemical substances, coating materials, dyes and paints, other chemical products and battery manufacturing industries
	*barium, *dichloromethane, *chloroform	Applicable to basic chemicals, artificial fibers, synthetic resins, plastic and rubber, other chemical substances, coating materials, dyes and paints, cleaning products, cosmetics, other chemical products and battery manufacturing industries
	*benzene, *ethylbenzene, *vinyl chloride, *1,2- dichloroethane, *dimethyl phthalate (DMP), *diethyl phthalate (DEP), *dibutyl phthalate (DBP), *butyl benzyl phthalate (BBP), *di-n- octyl phthalate (DNOP), *di(2-ethylhexyl) phthalate (DEHP)	Applicable to basic chemicals, synthetic resins, plastic and rubber, other chemical substances, coating materials, dyes and paints, cosmetics, other chemical products and battery manufacturing industries

	*dioxin	Applicable to vinyl chloride manufacturers and industries that are equipped with waste incinerators and have air pollution control equipment with wet or semi-dry scrubbers
(9) Pharmaceutical manufacturing industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine	
(10) Pesticide and environmental and sanitation agent manufacturing industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine, *phenols, *total organophosphates (Parathion, Diazinon, Methamidophos, Monocrotophos, EPN, etc.), *total carbamates (Fenobucarb, Carbofuran, Methomyl, Undam, Isoprocarb), *herbicides (Butachlor, Paraquat, 2,4-D, Alachlor, Imazapyr, Glyphosate, etc.)	
(11) Petrochemical industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, true color, ammonia nitrogen, free residual chlorine, *grease, *phenols, *nitrate nitrogen, *benzene, *ethylbenzene	Commonly applicable
	*vinyl chloride, *1,2-dichloroethane, *chloroform, *methylene chloride, *dimethyl phthalate (DMP), *diethyl phthalate (DEP), *dibutyl phthalate (DBP), *butyl benzyl phthalate (BBP), *di-n-octyl phthalate (DNOP), *di(2-ethylhexyl) phthalate (DEHP)	Applicable to petrochemical basic chemicals manufacturing industry, petrochemical midstream products manufacturing industry, petrochemical downstream products manufacturing industry
	*dioxin	Applicable to industries that are equipped with waste incinerators and have air pollution control equipment with wet or

		semi-dry scrubbers
(12) Rubber manufacturing industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids	
(13) Ceramic industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids	
(14) Glass manufacturing industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids	
(15) Cement industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids	
(16) Primary metal industry (see footnote 7)	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, *grease, *total chromium, *cadmium, *nickel, *copper, *total mercury, *lead, *arsenic, *zinc, *villiaumite, *nitrate nitrogen, *hexavalent chromium, *boron, *tin, *molybdenum	
(17) Shipbreaking industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, *grease	
(18) Metal finishing industry (see footnote 7)	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, ammonia nitrogen, *total chromium, *cadmium, *hexavalent chromium, *zinc, *nickel, *copper, *total mercury, *lead, *arsenic, *cyanide, *nitrate nitrogen, *villiaumite, *boron, *tin, *molybdenum	
(19) Electroplating industry (see footnote 7)	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, ammonia nitrogen, *cyanides, *total chromium, *cadmium, *zinc, *nickel, *copper, *total mercury, *lead, *arsenic, *nitrate nitrogen, *villiaumite, *hexavalent chromium, *boron, *tin, *molybdenum	
(20) Wafer and semiconductor manufacturing industry (see footnote 7)	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, ammonia nitrogen, total phosphorus, *cyanides, *total chromium, *cadmium, *hexavalent chromium, *zinc, *nickel, *copper, *total mercury, *lead, *arsenic, *nitrate nitrogen, *anionic surfactants, *boron, *villiaumite, *tin, *molybdenum	
(21) PCB manufacturing industry (see footnote 7)	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, ammonia nitrogen, *hexavalent chromium, *nickel, *copper, *total mercury, *lead, *arsenic, *cadmium, *cyanides, *total chromium, *zinc, *nitrate nitrogen, *villiaumite, *boron, *tin, *molybdenum	
(22) Shipbuilding and repairing	Hydrogen ion concentration index, water	

industry	temperature, chemical oxygen demand, suspended solids
(23) Tap water treatment facilities	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, residual chlorine
(24) Environmental analysis and testing organizations	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, *total mercury
(25) Waste landfills	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, ammonia nitrogen
(26) Waste incinerators and other waste treatment plants (facilities)	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, *dioxin (industries that are equipped with waste incinerators and have air pollution control equipment with wet or semi-dry scrubbers)
(27) Wastewater treatment service industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, coliform group, free residual chlorine
(28) Nightsoil treatment plants (facilities)	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, coliform group
(29) Wool washing industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine
(30) Power plants (see footnote 2 and 3)	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, residual chlorine (or chlorine produced oxidants), ammonia nitrogen, *total chromium, *zinc, *nitrate nitrogen, *villiaumite *nickel, *copper, *total mercury, *lead, *arsenic, *cadmium, *hexavalent chromium, *selenium, *boron
(31) Meat markets (see footnote 7)	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine, ammonia nitrogen, *grease
(32) Fish markets	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids
(33) Car washes	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, *anionic surfactants
(34) Ship cleaning industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, *anionic surfactants, *grease
(35) Experimental, testing (chemical) and research	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand,

laboratories	suspended solids, *zinc, *total mercury, *hexavalent chromium	
(36) Zoos	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, coliform group	
(37) Mining industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids	
(38) Earth and gravel extraction industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids	
(39) Earth and gravel processing industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids	
(40) Earth and gravel storage (disposal)sites	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids	
(41) Cargo container distributors	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids	
(42) Food manufacturing industry (not including fermentation industry, milling industry, or sugar refining industry)	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, *grease	Commonly applicable
	coliform group	Applicable to animal carcass processing
(43) Slaughter industry (see footnote 7)	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine, ammonia nitrogen, *grease	
(44) Milling industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids	
(45) Fermentation industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine	
(46) Vehicle repair plants	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, *grease	
(47) Amusement parks	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, coliform group, *grease	
(48) Laundry industry	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids	
(49) Other industries	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine	
(50) Due recycled waste	Hydrogen ion concentration index, water temperature,	

recycling and processing industry		chemical oxygen demand, suspended solids
(51) Stock farming		Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids
(52) Aquaculture		Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids
(53) Hospitals and medical institutions (see footnote 7)		Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, coliform group, free residual chlorine, ammonia nitrogen
(54) Coal storage sites		Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, free residual chlorine
(55) Catering industry and tourist hotels (see footnote 7)	1. Mixed wastewater	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, coliform group, total nitrogen, total phosphorus, *grease
	2. Hot springs wastewater that is collected and treated separately	Water temperature, suspended solids
(56) Optoelectronic materials and components manufacturing industry (see footnote 7)		Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, ammonia nitrogen, total phosphorus, *cyanide, *total chromium, *cadmium, *hexavalent chromium, *zinc, *nickel, *copper, *total mercury, *lead, *arsenic, *nitrate nitrogen, *anionic surfactants, *boron, *villiaumite, *gallium, *indium, *molybdenum, *tin
(57) Animal excreta or bioenergy treatment center (or biogas center)		Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids
(58) Reclaimed water industry (see footnote 7)		Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, coliform group, total nitrogen, total phosphorus
(59) Seawater desalination plant (see footnote 3)		Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids, residual chlorine (or chlorine-produced oxidants)
(60) Steam supply industry		Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids

(61) Other industries designated by the central competent authority	1. Storage sites for specific substances	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, *villiaumite, *nitrate nitrogen, *cyanide, *cadmium, *lead, *total chromium, *hexavalent chromium, *total mercury, *methyl mercury, *copper, *silver, *nickel, *selenium, *arsenic, *polychlorinated biphenyls, *total organophosphates (Parathion, Diazinon, Methamidophos, Monocrotophos, EPN, etc.), *total carbamates (Fenobucarb, Carbofuran, Methomyl, Undam, Isoprocarb), *herbicides (Butachlor, Paraquat, 2,4-D, Alachlor, Imazapyr, Glyphosate, etc.), *Endosulfan, *Endrin, *Lindane, *Heptachlor and derivatives, *DDT and derivatives, *Aldrin and Dieldrin, *Pentachlorophenol and its salts, *Toxaphene, *Pentachloronitrobenzene, *Folpet, *Captafol, *Captan
	2. Dredged material (water containing mud and sand) water quality purification sites	Hydrogen ion concentration index, water temperature, chemical oxygen demand, suspended solids
	3. Retail mass merchandise industry	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, *anionic surfactants, *grease
(62) Industrial park sewage systems	1. Petrochemical industrial parks	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, ammonia nitrogen, free residual chlorine, *cyanides, *total chromium, *cadmium, *hexavalent chromium, *zinc, *nickel, *copper, *total mercury, *lead, *arsenic, *grease, *phenols, *nitrate nitrogen, *benzene, *ethylbenzene, *vinyl chloride, *1,2-dichloroethane, *chloroform, *methylene chloride, *boron, *tin, *molybdenum, *dimethyl phthalate (DMP), *diethyl phthalate (DEP), *dibutyl phthalate (DBP), *butyl benzyl phthalate (BBP), *di-n-octyl phthalate (DNOP), *di(2-ethylhexyl) phthalate (DEHP), *nitrobenzene, *trichloroethylene
	2. Science parks (see footnote 7)	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, ammonia nitrogen, free residual chlorine, total phosphorus, *cyanides, *total chromium, *cadmium, *hexavalent chromium, *zinc, *nickel, *copper, *total mercury, *lead, *arsenic, *grease, *phenols, *nitrate nitrogen, *anionic surfactants, * boron, *

		villiaumite, *gallium, *indium, *molybdenum, *tin
	3. Other industrial parks other than petrochemical industrial parks and science parks	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, true color, ammonia nitrogen, free residual chlorine, *cyanides, *total chromium, *cadmium, *hexavalent chromium, *zinc, *nickel, *copper, *total mercury, *lead, *arsenic, *grease, *phenols, *anionic surfactants, *boron, *tin, *gallium, *indium, *molybdenum
(63)	Public sewage systems (see footnote 7)	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids, coliform group, total nitrogen, total phosphorous, ammonia nitrogen, free residual chlorine
(64)	Community sewage systems (see footnote 4)	Hydrogen ion concentration index, water temperature, biological oxygen demand, suspended solids, coliform group
(65)	Special use sewage systems for designated areas or sites	Hydrogen ion concentration index, water temperature, biological oxygen demand, chemical oxygen demand, suspended solids

II. Reported items on water discharged into soil

Enterprise or sewage system category	Water quality items to be reported
Stock farming, zoos, sugar refining industry, public sewage systems	Hydrogen ion concentration index, water temperature, biological oxygen demand, suspended solids, total nitrogen, sodium absorption ratio, copper (applicable to stock farming), zinc (applicable to stock farming)

III. Soil monitoring reported items

Enterprise or sewage system category	Items to be reported
Stock farming, zoos, sugar refining industry, public sewage systems	Hydrogen ion concentration index, copper, zinc, conductivity of extracted fluids from saturated soil, *arsenic, *cadmium, *chromium, *total mercury, *nickel, *lead, *total nitrogen

IV. Groundwater monitoring reported items

Enterprise or sewage system category	Items to be reported
Stock farming, zoos, sugar refining industry, public sewage systems	Hydrogen ion concentration index, ammonia nitrogen, nitrate nitrogen, total phosphorous, conductivity, *arsenic, *cadmium, *chromium, *copper, *lead, *zinc, *iron, *manganese, *total hardness, *total dissolved solids, *sulfates, *total organic carbon

V. Reported items on water discharged into the sea via pipeline

Enterprise or sewage system category	Items to be reported
Enterprise or sewage system	It shall be treated following its initial reported items based on original wastewater or sewage and effluent water quality

VI. Reported items on marine environment around pipeline discharging wastewater

Enterprise or sewage system category	Items to be reported
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Enterprise or sewage system	<ol style="list-style-type: none"> 1. Sea water: It shall be treated following its initial reported items based on original wastewater or sewage and effluent water quality; dissolved oxygen, grease, quantity of settled solids, heavy metals, phenols, total organic carbon, total phosphorous, and total nitrogen shall also be reported. 2. Sediment: Total organic carbon, heavy metals. 3. Shellfish: Accumulated heavy metals, hydrocarbons, pesticides. 4. Marine life and benthic organisms: Fish, large invertebrates, floating organisms (with basic reproductive abilities)
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Note 1: Where an enterprise or sewage system does not use or produce any water quality items “*” during the process and wastewater or sewage treatment procedure, or the test result of the water quality items “*” is lower than the detection limit, such enterprise or sewage system may submit an application along with certifying documents to the municipality or county (city) competent authority for exemption from testing and reporting the said testing items. Individual compounds of total organophosphates, total carbamates, and herbicides may be exempted from testing and reporting if they meet the aforementioned exemption conditions, and individual applications for exemption from testing and reporting for each compound may be submitted.

Note 2: For discharged warm water that is cooled with seawater, it is allowed to report the water temperature at the inlet and outlet only.

Note 3: For power plants and seawater desalination plants, total residual chlorine shall apply when the salinity of the effluent is less than 10 psu (Practical Salinity Unit). When the salinity is greater than or equal to 10 psu (Practical Salinity Unit), chlorine-produced oxidants shall apply and shall be measured using the

chlorine-produced oxidants testing method.

Note 4: Community sewage systems exempt from appointing dedicated wastewater (sewage) treatment personnel shall conduct annual testing of the original wastewater (sewage) and effluent water quality.

Note 5: Enterprises or sewer systems located within tap water quality and quantity protection zones shall additionally test for ammonia nitrogen and orthophosphates in the general water quality items of original wastewater (sewage) and effluent.

Note 6: If the sewer management authority requires an increased frequency of testing, such requirements shall be followed.

Note 7: In Table 1, the testing and reporting items for original wastewater (sewage) and effluent water quality are based on the effluent standards and their implementation dates. Except for those designated by the competent authority under the proviso of Article 84, Paragraph 1, the testing and reporting subjects for each water quality item shall be those regulated by the effluent standards.

Table 2: Regulations on the Automatic Monitoring/Surveillance Facilities, Electronic Watt Hour Meter and Display Sign Boards to be Set Up by the Entities in Major Violation or Under Mandatory Installation

Item		Specification
Automatic water volume monitoring facilities	Location	<ol style="list-style-type: none"> 1. All the water sources in the work environment 2. The discharge point in case of draining into surface water bodies 3. Discharge point in case of draining sewage into sewage systems 4. Inflow and outflow points of the storage facilities if storage permit is acquired and only storage facilities are set up
	Requirements	Independent and exclusive cumulative water measuring facilities
Automatic water quality monitoring facilities	Location	<ol style="list-style-type: none"> 1. Inflow and outflow points of each pollution control units if wastewater or sewage treatment facilities are set up 2. The discharge point in case of draining into surface water bodies 3. Discharge point in case of draining sewage into sewage systems 4. Outflow points of the storage facilities if storage permit is acquired and only storage facilities are set up
	Monitoring	<ol style="list-style-type: none"> 1. Water temperature 2. Hydrogen ion concentration index 3. Electrical conductivity 4. Others water quality items that the competent authority designates
Video surveillance facilities	Location	<ol style="list-style-type: none"> 1. Each pollution control units if wastewater or sewage treatment facilities are set up 2. The discharge point in case of draining into surface water bodies 3. The storage facilities if storage permit is acquired and only storage facilities are set up
	Requirements	<ol style="list-style-type: none"> 1. Time recording function and sharp screen 2. Video recording 24 hours a day
Connection and transmission facilities		Monitoring/surveillance information of the automatic monitoring and video surveillance facilities shall be connected and transmitted to the municipality or county (city) competent authority via the Internet and the transmission module provided by the municipality or county (city) competent authority.
Electronic watt-hour meter		<ol style="list-style-type: none"> 1. Specifications in compliance with the requirements of national standards 2. The power consumption measurement range shall reach up to 1.2 times the overall maximum power consumption of the wastewater or sewage treatment/pre-treatment facilities and

Item		Specification
		<p>the power consumption can be recorded every 15 minutes continuously and automatically.</p> <p>3. The power consumption data shall be available to the competent authority, and shall be retained for five years.</p>
Display sign board	Installation circumstances	Discharge points are set up in the work environment and rerouted discharge is identified by the competent authority.
	Requirements	<ol style="list-style-type: none"> 1. The sign board shall be conspicuously installed on the outer wall at the front door. 2. The dimension shall be determined based on the specifications approved by the competent authority. 3. The sign board shall show at least the control number, enterprise name, date, time, effluent volume, water quality monitoring information, public hazard hot line. 4. The monitoring record values of all the monitored items shall be displayed simultaneously and no marquee display is allowed. 5. The texts must be clear and legible texts, and no other graphics shall be added without approval. 6. The sign board shall be mounted steadily and shall not be moved easily.

Table 3: Requirement and deadline for installation for those required for the installation of automatic monitoring facilities

Item	Required for installation of automatic monitoring facilities	Capacity of wastewater or sewage discharge from sewage system of industrial zone more than 1,500 m ³ daily	Enterprises other than power plants		Power plants		Sewerage	
			Permission for discharge of wastewater or sewage of more than 5,000m ³ daily.	Permission for discharge of wastewater or sewage of 1,500 m ³ to 5,000 m ³ daily	Discharge of uncontacted cooling water	Sea water flue-gas desulfurization air pollution control facility	Permission for discharge of wastewater or sewage of more than 5,000m ³ daily	Permission for discharge of wastewater or sewage of 1,500 m ³ to 5,000 m ³ daily
Water capacity automatic monitoring device	Location of installation	1. Inlet 2. Outfall	Outfall	Outfall	Outfall	Outfall	Outfall	Outfall
	Rules	Independent facility for measurement of water capacity in accumulation						
Water quality automatic monitoring device	Location of installation	Outfall	Outfall	Outfall	Outfall	Outfall	Outfall	Outfall
	Items for monitoring	1. Water temperature 2. H ⁺ concentration index 3. Conductivity 4. COD volume 5. Suspended solids 6. Other items designated by the competent authority	1. Water temperature 2. H ⁺ concentration index 3. Conductivity 4. COD volume 5. Suspended solids 6. Other items designated by the competent authority	1. Water temperature 2. H ⁺ concentration index 3. Conductivity	Water temperature	H ⁺ concentration index	1. COD volume 2. Suspended solids 3. Other items designated by the competent authority	1. COD volume 2. Suspended solids 3. Other items designated by the competent authority
CCTV device	Location of installation	1. Outfall 2. Rainwater runoff outfall designated by the competent authority	Outfall	----	----	Outfall	Outfall	Outfall
	Rules	1. With time recording function and sharp pictures on screen 2. Round-the-clock monitoring						
Online transmission facility		The data collected by the water capacity, water quality automatic monitoring devices and CCTV shall be transmitted to the competent authorities of the municipality or county (city) online via the Internet in the transmission module provided by the competent authorities of the municipality or county (city).						
Deadline for installation		Before December 31, 2016	Before December 31, 2016	Before September 30, 2017	Before December 31, 2014	Before December 31, 2014	Before December 31, 2018	Before July 31, 2019

Table 4. Liquor and fiber digestate as fertilizer for farmland users, and the frequency of monitoring underground water quality and soil quality

The use condition of farmland fertilizer	Approved irrigation volume (tons/year)	Frequency of monitoring underground water	Frequency of monitoring soil
Use the mix of liquor and fiber digestate for irrigation	$\leq 2,000$	1 time/2 years	1 time/2 years
	2,000~6,000	1 time/year	1 time/year
	$\geq 6,000$	1 time/half year	1 time/year
Use only liquor digestate for irrigation	$\leq 6,000$	1 time/2 years	1 time/2 years
	6,000~18,000	1 time/year	1 time/year
	$\geq 18,000$	1 time/half year	1 time/year

Table 5. Best available control technology for wastewater or sludge from enterprises or sewage systems

Enterprise or sewage system category	Scale	Best available control technology
Paper making industry, food manufacturing industry, fermentation industry, petrochemical industry	Wastewater or sewage with a COD concentration of 2,000 mg/L or more and an approved discharge or regulated flow of 1,000 m ³ /day or more, or a COD load of 2 metric tons/day or more.	Wastewater or sewage incorporated into anaerobic treatment units, with the biogas produced being collected, treated, or utilized.
Public sewage systems	Design treatment capacity of 30,000 m ³ /day or more.	Sludge treated by anaerobic digestion, with the biogas produced being collected, treated, or utilized.

Table 6. Testing and reporting requirements of enterprises or sewage system for emerging contaminants

Enterprise or sewage system category	Emerging contaminants		Testing frequency and implementation date		Effluent value (mg/L)
			Testing frequency	Implementation date	
<p>1. Hospitals and medical institutions: applicable to medical centers recognized by the competent authority and hospitals with an approved discharge flow of more than 1,000 m³/day.</p> <p>2. Applicable to sewage systems receiving discharge from medical centers recognized by the competent authority or hospitals with an approved discharge flow of more than 1,000 m³/day.</p>	Drugs	Acetaminophen	Original wastewater (sewage) and effluent shall be tested once annually	Jan. 1, 2027	4.2
		Sulfamethoxazole			0.0031
		Erythromycin			0.009
		Clarithromycin			0.00095
		17 β -estradiol			0.0035
		Ciprofloxacin	Original wastewater (sewage) and effluent shall be tested once annually	Jan. 1, 2029	0.0017
		Ceftazidime			0.0022
		Metformin			7.8
<p>1. Sewage systems dedicated to scientific parks and industrial zones.</p> <p>2. Wastewater discharged to surface water bodies from wafer manufacturing and semiconductor manufacturing industries, as well as optoelectronic</p>	Perfluoroalkyl and polyfluoroalkyl substances (PFAS)	Perfluorooctanesulfonic acid (PFOS)	Original wastewater (sewage) and effluent shall be tested once annually	Jan. 1, 2027	0.00012
		Perfluorooctanoic acid (PFOA)			0.0017

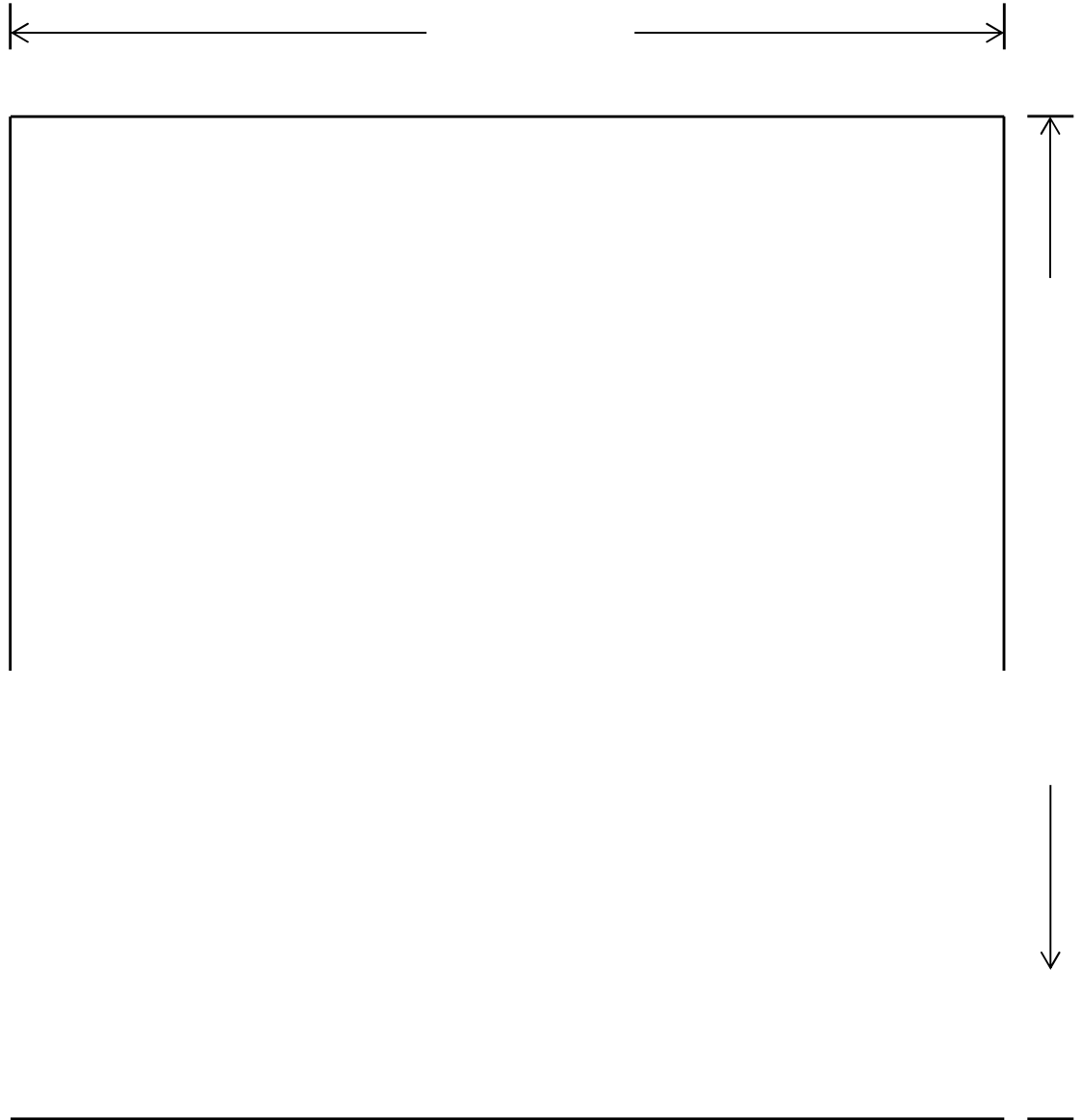
Enterprise or sewage system category	Emerging contaminants	Testing frequency and implementation date		Effluent value (mg/L)
		Testing frequency	Implementation date	
<p>materials and components manufacturing industries, where photoresists are used in the manufacturing process.</p> <p>3. Wastewater discharged to surface water bodies from electroplating industries and metal surface treatment industries, where chromium mist suppressants are used in the manufacturing process.</p> <p>4. Wastewater discharged to surface water bodies from dyeing and finishing industries, textile industries, leather industries, papermaking industries, and chemical industries, where water repellents or water-repellent chemicals with such functions are used in the manufacturing process.</p>	Perfluorohexanesulfonic acid (PFHxS)			0.0021

Note 1: For emerging contaminants, if the central competent authority has specified testing methods, these should be prioritized. If no testing method has been established, the following sources should be used in sequence:

1. U.S. Environmental Protection Agency (USEPA) methods.

2. National Institute for Occupational Safety and Health (NIOSH) methods.
3. American Public Health Association (APHA) water quality and wastewater standard methods.
4. Japanese Industrial Standards (JIS) by the Japanese Standards Association.
5. American Society for Testing and Materials (ASTM) methods.
6. Standard methods by the Association of Official Analytical Chemists (AOAC).
7. International Organization for Standardization (ISO) standard methods.
8. Testing methods approved by the European Union.

Note 2: Testing of emerging contaminants should be conducted by inspection and measurement institutions authorized by the central competent authority. If no certified testing institution exists for a particular item, academic research institutions may perform the testing with the consent of the central competent authority.



Note: The coordinates are preferably provided in the format of Google positioning system (WGS84 longitude and latitude). It is recommended to use a cell phone with GPS positioning function. Select “Options” in the camera program page, activate

“Geotagging” and take a photo of the sampling or discharge point. Select the “Details” of the photo taken and the latitude and longitude of the coordinates where the photo was taken will be shown.

Attachment 1. Automatic Monitoring/Surveillance Facilities Operation Regulations

I. Terms used in the Regulations are defined as follows:

- (I) Automatic Monitoring/Surveillance facilities: A device that can continuously and automatically take samples, analyze and record the concentration and flow ratio of the inflow (outflow) of wastewater or sewage treatment facilities. It also includes data mining and treatment system (DAHS).
- (II) Connection Facilities: The program, computer and telecommunication line that are connected to the competent authority to document, generate and transmit the files of monitoring data from automatic monitoring facilities.
- (III) Full Scale: The range between the maximum and minimum values within which the automatic monitoring facilities can measure.
- (IV) Span: The maximum value measurable within the setting range of the standardized product according to the status of the actual discharge situation based on the concentration and flow rate of the inflow (outflow) water of the wastewater or sewage treatment facilities.
- (V) Zero: The minimum value measurable by the standardized product of zero value according to the status of the actual discharge situation based on the concentration and flow rate of the inflow (outflow) water of the wastewater or sewage treatment facilities.
- (VI) Standard Product: Standard fluid or equipment used to calibrate the automatic monitoring facilities.
- (VII) Relative Accuracy Test Audit (RATA): The test audit conducted in accordance with the steps in Attachment 3.
- (VIII) Daily: The time span from 0:00 to 23:59 on each calendar day.
- (IX) Monitoring data: The data measured by the automatic monitoring

facilities.

(X) Monitoring record value: The monitoring data of the automatic monitoring facilities that has been calibrated to a standard state and has been calculated using an arithmetic average.

(XI) Data accumulation and handling system (DAHS): The software and hardware of the automatic monitoring facilities that can transmit, document and calculate its data, including programmable or remote controllers for signal transmission.

(XII) Normally functioned automatic monitoring facilities: The automatic monitoring facilities that are calibrated regularly according to Sections (IV) and (V) and its relative accuracy in the relative error test is within the range stated in Attachment 3.

(XIII) Normally functioned transmission: The effective monitoring record percentage of the automatic monitoring facilities or the normal video recording time percentage of the video surveillance facilities meet the requirements of Section (VII).

II. For the enterprise or sewage system that sets up automatic monitoring facilities and connects them to the competent authority for transmission, the monitoring record value of the water volume and temperature, hydrogen ion concentration index, and electrical conductivity shall be transmitted more than once every five minutes. The monitoring record value of the suspended solids, chemical oxygen demand, ammonia nitrogen, and other water quality items designated by the competent authority shall be transmitted at least once every hour. The time for transmission of the above-mentioned monitoring record values shall start on the hour.

III. Where all or part of the monitoring record values in the previous day is not uploaded successfully due to failure of the transmission module or network, and the failure is not removed and the record values are not uploaded before 17 o'clock on the same day, the enterprise or sewage

system shall report the monitoring record values in the previous day that have not been uploaded to the competent authority via emails, CDs or other electronic storage media before 17 o'clock on the current day.

IV. Enterprises and sewage systems shall calibrate automatic water quality monitoring facilities on a regular basis according to the brand's specifications or the cycle and method that the manufacturer specifies. However, the calibration cycle of the automatic monitoring facilities for hydrogen ion concentration index and electrical conductivity shall not more than one month; the calibration cycle of the automatic monitoring facilities for suspended solids, chemical oxygen demand and ammonia nitrogen shall not more than three months. Relevant calibration and maintenance records shall be retained as a reference for five years. The items of the calibration result that the competent authority specifies shall be reported online within seven workdays after the end date of the calibration.

Enterprises and sewage systems shall ensure the average calibration error of the automatic monitoring facilities for suspended solids, chemical oxygen demand and ammonia nitrogen is less than twenty percent.

V. The specification, setup, calibration, maintenance, records during the calibration and maintenance and their retention of automatic water volume monitoring facilities shall be subject to the requirements of Article 65 and Article 66, Paragraph 1, governing the cumulative water measuring facilities. Relevant calibration and maintenance records shall be retained as a reference for five years.

VI. Automatic monitoring facilities for suspended solids, chemical oxygen demand and ammonia nitrogen shall undergo relative error test audits more than once every quarter. However, the facilities operating on non-optical principles may undergo relative error test audits more than once every six months. Enterprises and sewage systems shall report the

result of the inspection test to the competent authority within 20 workdays after the end date of the test. The starting time for calculation of the above-mentioned implementation interval shall begin from the time at which the first relative error test audit is completed after the installation.

The competent authority at each level shall request enterprises or sewage systems to increase the frequency of the relative error test audit based on the inspection result of the monitored data, but no more than once every month shall be required.

Enterprises and sewage systems shall report the planned implementation period and the name of the inspection and testing institutions to the competent authority in writing or via the Internet 5 to 10 days before the relative error test audit is conducted. The implementation period may be extended to the 10th of the next month if the relative error test audit cannot be conducted in the month in which it should be completed due to weather or other uncontrollable factors. Where the test cannot be completed during the planned implementation period, the municipality or county (city) competent authority shall be informed in writing, by phone or via the Internet of the newly planned implementation period after the alteration. relative error test audits shall be conducted during the business hours of the competent authority. However, this is not applicable if the competent authority gives its consent otherwise.

VII. Enterprises and sewage systems shall maintain a percentage of effective monitoring record values of the automatic monitoring facilities for water temperature, hydrogen ion concentration index, electrical conductivity, and water volume and a percentage of normal video recording time of the video surveillance facilities to a monthly value of more than ninety percent. The percentage of effective monitoring record values of other automatic monitoring facilities shall reach more than

eighty percent every quarter. The formulas for calculating the percentage of effective monitoring record value and normal video recording time are described below respectively: (Unit of time: Minute)

P: The percentage of effective monitoring record value or normal video recording time.

T: Total time of a day (month, quarter).

T: The time at which automatic monitoring/surveillance facilities are replaced, changed or repaired and backup automatic monitoring/surveillance facilities have not been used.

c: The time at which (backup) automatic monitoring facilities are calibrated or maintained. (The maximum hours that can be deducted from the monthly calibration or maintenance time are 24 hours.)

w: The time at which facilities become failed due to natural disasters or other uncontrollable factors.

Du: The time at which (backup) automatic monitoring/surveillance facilities produce invalid data or do not record normally.

Dm: The time at which (backup) automatic monitoring/surveillance facilities lose data or recordings.

VIII. The monitoring data of the automatic monitoring facilities shall not be transmitted through any equipment that may affect the raw data. Where transmission of analogue signal and via a control encoding interface is involved, protection against power surge and magnetic interference in the field is required, and the error of the raw data shall not exceed two percent of the span. In case that a digital communication interface (e.g. RS-232, RS-485, USB or LPT) is used in the instrument control equipment of the monitoring facilities, hardware connection methods, connection parameters, and all the function documents referring to such interface shall be provided, and signal verification shall be conducted in cooperation with the competent authority.

IX. Where any one of the following circumstances occurs, the enterprise or sewage system shall report to the municipality or county (city) competent authority in writing, by phone or fax, or via the Internet within 24 hours after occurrence of the event. It shall also record the time of occurrence, the name and title of the caller and receiver during such reporting, and the reason for manual sampling and testing, and conduct such manual sampling and testing. However, manual sampling is not required if failure of the facilities is attributable to natural disaster or other uncontrollable factors:

- (I) The calibration or maintenance of the automatic monitoring facilities for hydrogen ion concentration index or electrical conductivity cannot be completed within two hours.
- (II) The calibration or maintenance of the automatic monitoring facilities for suspended solids, chemical oxygen demand or ammonia nitrogen cannot be completed within 12 hours.
- (III) The percentage of effective record values of the automatic monitoring facilities for water temperature, hydrogen ion concentration index or electrical conductivity in the previous day is below 95%.
- (IV) The percentage of effective record values of the automatic monitoring facilities for suspended solids, chemical oxygen demand or ammonia nitrogen in the previous day is below 50%. In case of the relative accuracy calculated after the enterprise or sewage system has failed a relative error test audit, natural disaster or uncontrollable factors may not exempt the enterprise or sewage system from the manual testing requirements in this subsection.
- (V) The automatic monitoring/surveillance facilities are being replaced, changed or repaired. This subsection does not apply to the replacement, change or repair of the automatic water volume monitoring or video surveillance facilities.

Under the exception defined in Subsection (V), the water volume of the period when the automatic water volume monitoring facilities is being replaced, changed or repaired shall be recorded with methods approved by the municipality or county (city) competent authority. During the period when the video surveillance facilities is being replaced, changed or repaired, inspection shall be carried out and photos shall be taken daily at the location where the video surveillance facilities is installed. Records shall be prepared and preserved for five years for reference.

In case of the circumstances in Subsection (V), before monitoring/surveillance restarts, a report shall be submitted in writing, by phone/fax or via the Internet to the municipality or county (city) competent authority.

X. In case of a test on manual sampling in accordance with the preceding section, the test shall be completed within the storage life of the samples. The sampling frequency and time shall meet the following requirements:

(I) In case of the circumstances in Subsections (I) and (II) of the preceding section, manual sampling shall be performed once within 24 hours after calibration starts.

(II) In case of the circumstances in Subsections (III) and (IV) of the preceding section, manual sampling shall be performed once on the day of the test.

(III) In case of the circumstances in Subsection (V) of the preceding section, manual sampling shall be performed once every day until the day when the automatic monitoring facilities are connected again.

The water quality items and locations of the tests on manual sampling shall be limited to those not meeting the standards of the Operation Regulations.

In the event that an enterprise or sewage system is unable to complete

manual sampling within the time limits in Subsections (I) to (III), the time limits may be extended, provided that the sampling shall at the latest be completed within seven working days from the day following the end of the specified sampling time.

XI. In the event an enterprise or sewage system conducts the test on manual sampling in accordance with the preceding two Sections, the test result shall be reported on-line within 10 working days from the sampling day. The result of sampling and testing conducted every single time shall be reported only once.

For any enterprise or sewage system in the areas of Penghu, Kinmen and Matsu, the test on manual sampling of water temperature, hydrogen ion concentration index or electrical conductivity may be conducted by the enterprise or sewage system on its own with the standard testing methods. The test result shall be reported on-line within 24 hours after completion of the test.

In the event that the last day of the on-line reporting period is a public holiday, the following day shall instead be the last day of that period.

XII. The monitoring data and record values of the automatic monitoring facilities shall be stored for more than five years. The surveillance videos of the video surveillance facilities shall be stored for more than 90 days. An enterprise or sewage system shall not alter the monitoring data, record values and surveillance videos in any ways.

In the event the competent authority has found defects in the data retrieval and processing system, correction shall be completed within the period specified by the competent authority, and a report shall be submitted to the competent authority for review and validation.

XIII. During the period when the automatic monitoring/surveillance facilities are being replaced, changed or repaired, the enterprise or sewage system may use backup facilities after sending a notice to the

municipality or county (city) competent authority. The enterprise or sewage system is also exempted from conducting the test on manual sampling, carrying out inspection and taking photos. The enterprise or sewage system shall use backup automatic monitoring/surveillance facilities in accordance with Attachment I.

In the event the enterprise or sewage system uses backup facilities for suspended solids, chemical oxygen demand or ammonia nitrogen, the enterprise or sewage system shall submit a report of a successful relative error test audit conducted within the most recent three months to the municipality or county (city) competent authority within three days after sending a notice to that competent authority.

The implementation of the report of a successful relative error test audit may be exempted from the requirements in Section VI.

In the event the enterprise or sewage system uses backup facilities for hydrogen ion concentration index, electrical conductivity, suspended solids, chemical oxygen demand or ammonia nitrogen, the calibration cycle during the period of use shall not exceed seven days.

Attachment II. Specifications for the Measuring and Monitoring Record Values of Automatic Monitoring Facilities

I. The measuring frequency of automatic monitoring facilities shall meet the following requirements:

- (I) A cycle of sampling and analyzing water temperature, hydrogen ion concentration index and electrical conductivity shall be completed using automatic monitoring facilities within one minute.
- (II) A cycle of sampling and analyzing suspended solids, chemical oxygen demand and ammonia nitrogen shall be completed using automatic monitoring facilities within 180 minutes.
- (III) Automatic water volume monitoring facilities shall finish a sampling and analysis cycle within one minute.
- (IV) The requirements in the preceding Sub-paragraphs do not apply to the measuring frequency during the period of routine calibration, testing and maintenance.
- (V) The measuring frequencies of other monitoring items shall be defined by the central competent authority.

II. Calculation of the monitoring record value of automatic monitoring facilities shall meet the following requirements:

- (I) The value shall be calibrated in accordance with the standard conditions under 25°C (with a margin of error of 1°C).
- (II) The mean of a 5-minute period shall be the monitoring record value for the monitoring data of the water temperature, hydrogen ion concentration index, and electrical conductivity from automatic monitoring facilities. The mean of a 5-minute period shall be the arithmetic mean of the monitoring data taken during at least 5 equal intervals. If the 5-minute period includes the time of routine calibration or maintenance, the mean of the 5-minute period may be calculated with more than one set of effective monitoring data.
- (III) The mean of a 60-minute period shall be the monitoring record

value for the monitoring data of the automatic monitoring facilities for suspended solids, chemical oxygen demand and ammonia nitrogen. The mean of a 60-minute period shall be the arithmetic mean of the monitoring data taken during at least one equal interval. If the 60-minute period includes the time of routine calibration or maintenance, the mean of the 60-minute period may be calculated with at least one set of effective monitoring data.

(IV) In the event that the automatic monitoring facilities are unable to complete the sampling and analysis of the suspended solids, chemical oxygen demand, and ammonia nitrogen within 60 minutes, the monitoring record value may be substituted with the most recent record value within 180 minutes.

(V) The monitoring record value of the water volume shall be the deviation over a span of 5 minutes of the cumulative flow as measured in the cumulative water measuring facilities.

III. A proper measuring range equal to or greater than the span shall be set for the automatic water quality monitoring facilities. The setting of the span shall meet the following requirements:

(I) The range of the effluent standard shall be included.

(II) The average per day of the effective monitoring data from automatic monitoring facilities during the most recent 90 days shall fall within the range between 10% and 90% of the span. These requirements do not apply to the automatic monitoring facilities for water temperature, water volume and hydrogen ion concentration index.

(III) In the event the span fails to meet the requirements of the preceding subsection, the enterprise or sewage system shall make adjustment/correction within 72 hours from the time the failure occurs to ensure the span meets the requirements of the preceding subsection. The requirements of this Subsection do not apply to the event that the

average per day of the effective monitoring data during the most recent 90 days and is lower than 10% of the effluent standard value and is validated by the municipality or county (city) competent authority. The correction shall be recorded.

(IV) In the event that the monitoring data of an enterprise or sewage system fluctuates significantly within a short period, the setting of the span may be conducted with methods approved by the municipality or county (city) competent authority after an application has been submitted to the competent authority.

IV. If at least one of the following circumstances applies to automatic monitoring facilities, the record values shall be deemed invalid, except for the event that the automatic monitoring facilities and its backup facilities are unable to conduct normal monitoring due to uncontrollable factors, and that the enterprise or sewage system has submitted relevant information to the competent authority for approval:

(I) The monitoring data does not meet the requirements in Sections I to III. In the event that the span has been corrected within 72 hours in accordance with Subsection (III) of Section III, the data outside the original span before correction shall still be deemed valid.

(II) The automatic monitoring facilities has not been calibrated in accordance with Sections IV and V of Attachment I. In this event, the record values during the period starting from 00:00 of the following day to the day of successful calibration test shall be deemed invalid.

(III) The result of a relative error test audit does not conform to the relative accuracy standards in Attachment III. In this event, the record values during the period starting from 00:00 of the day following the day of receipt of water quality test data report or the competent authority's notice to 00:00 of the day following the day on which the report of successful relative accuracy test audit has been submitted to the competent authority for reference shall be deemed

invalid.

V. If at least one of the following circumstances applies to automatic monitoring facilities, the record values shall be deemed as missing data, except for the event that the automatic monitoring facilities and its backup facilities have lost data due to uncontrollable factors, and that the enterprise or sewage system has submitted relevant information to the competent authority for approval:

- (I) During the operation period of treatment units, the automatic monitoring facilities has not functioned.
- (II) During the operation period of treatment units, the automatic monitoring facilities have functioned normally, but the monitoring data have not been recorded and preserved, or the monitoring data is unavailable despite having been recorded.

VI. In the event the monitoring record values are deemed invalid or missing data, the values shall be substituted with the higher values selected under the following circumstances, provided that the substitute values shall still be deemed as invalid or missing data:

- (I) The averages of monitoring values as the substitute values:
 - 1. If the percentage of the effective monitoring record values in the previous month is equal to or greater than 85%, the substitute value shall be the average of the valid values per hour in the previous month.
 - 2. If the percentage of the effective monitoring record values in the previous month is equal to or greater than 65% but less than 85%, the substitute value shall be the average of the first six highest of the maximum values per hour of the daily valid values in the previous month. In the absence of the sixth highest maximum value per hour, the substitute value shall be the average of the first five highest of the maximum values per hour. This rule applies to the absence of any of the remaining maximum values per each hour in sequence.
 - 3. If the percentage of the effective monitoring record values in

the previous month is less than 65%, the substitute value shall be the average of the first three highest of the maximum values per hour of the daily valid values in the previous month. In the absence of the third highest maximum value per hour, the substitute value shall be the average of the first two highest of the maximum values per hour. This rule applies to the absence of any of the remaining maximum values per hour in sequence. In the total absence of any valid value in the previous month, the substitute value shall be the average of the first three highest valid values per hour in the quarter prior to the last day in the previous month. In the event that the time lapse since the installation of the automatic monitoring facilities is less than a quarter, the substitute value may be the average of the first three highest of all the valid values per hour recorded after the automatic monitoring facilities has been validated.

4. In the event of identical values per hour of the daily valid values in the previous month as defined in the preceding two Subsections, the identical values shall be ranked separately.

(II) In case of the monitoring period of the invalid or missing data, the testing values of samples taken by the competent authority during that period shall be used as the substitute values.

VII. In case of invalid or missing data as defined in Section IV or V, the substitute values shall be transmitted along with the last monitoring data record of the day when invalid or missing data appears.

In any case other than that in the preceding subsection, validation shall be completed at the end of every month, and the substitute values shall be transmitted along with the last monitoring data record within two days from the beginning of the next month.

Attachment III. Specifications for the Installation of Automatic Water Quality Monitoring Facilities and Video Surveillance Facilities, and the Relative Error Test Audit

I. Depending on the conditions of on-site environment, a tank may be set up to store wastewater or sewage to maintain the monitoring equipment at the location where automatic water quality monitoring facilities are installed.

II. Requirements for the installation of automatic water quality monitoring facilities

(I) Water temperature

1. The water temperature shall be measured in °C and within the range between 0°C to 100°C (or any other appropriate range). The minimum unit on the scale shall be 0.1 °C.
2. Sufficient water samples shall be taken, or the thermometer shall be inserted into (or put in) the water body on site, to ensure the sensor area of the thermometer is below the water surface to balance the temperature.
3. In case of a reversing thermometer, the thermometer shall be put in the sampler. During the sampling process, the thermometer shall stay under the water surface for an adequate period to balance the temperature.
4. In the event other automatic monitoring facilities suitable for measuring temperature are used, the facilities shall be installed and operated in accordance with the manuals of the facilities.
5. The monitoring facilities shall be equipped with a protective device to avoid damage caused by corrosion or impact.

(II) Hydrogen ion concentration index: The monitoring facilities shall have a temperature compensating device, and the water temperature shall be recorded simultaneously along with the measuring value.

(III) Electrical conductivity

1. Water samples may be stored at room temperature or in water baths to maintain constant temperature. The temperature shall be 25°C (with a margin of error of 0.5°C); otherwise, calibration shall be conducted to correct the error.
2. The electrode of the monitoring facilities shall be inserted into (or put in) the water body to ensure the electrode is below the water surface.

3. The electrode shall be equipped with a protective device to avoid damage caused by corrosion or impact.

(IV) Automatic monitoring facilities for chemical oxygen demand, suspended solids and ammonia nitrogen: The facilities shall be installed in accordance with the methods designated by the equipment manufacturers.

III. Steps of relative error test audit

(I) Overview: Under the same conditions (such as temperature), the water samples on site shall be measured/tested simultaneously using the automatic monitoring facilities and by an environmental testing agency that has passed the water quality test (hereinafter the testing agency). Correlation analysis shall be conducted on the data of the measurement/test.

(II) Frequency of measurement/test: For each test audit, at least three batches and at most four batches of measurements/tests shall be conducted. Each batch shall include three sets of data, and each set shall include two parts, namely the measurement result of the automatic monitoring facilities and the test result of the testing agency.

(III) Measurement/test requirements:

1. Each batch of measurement/test shall be completed within a period three times the measurement cycle of the automatic monitoring facilities for any water quality item.

2. All the measurements/tests required for each test audit shall be completed within five days.

3. Regarding the part of the test conducted by a testing agency, after the water samples have been taken along with those of the automatic monitoring facilities, the test may be conducted within the storage life of the water samples. The test is not subject to the limits of measurement/testing time mentioned above.

(IV) Calculation: The arithmetic mean of deviations (Equation 1), standard deviation (Equation 2), confidence coefficient (Equation 3) and the relative accuracy of relative error test audit (Equation 4) shall be calculated with the deviations of the data from “measurement using the automatic monitoring facilities” and “test by testing agency” in each set. If the mean of the test

values of certain water quality items is too low, the mean deviation (Equation 5) shall be the standard of relative error test audit.

1. Arithmetic mean of deviations

$$\bar{d} = \frac{1}{n} \sum_{i=1}^n d_i \text{ (Equation 1)}$$

\bar{d} : Arithmetic mean of deviations between the test and measurement data

from the “testing institutions” and “automatic monitoring facilities”

d_i : Deviations between each set of test and measurement data from the from

the “testing institutions” and “automatic monitoring facilities”

2. Standard deviation

$$Sd = \left[\frac{\sum_{i=1}^n d_i^2 - \frac{(\sum_{i=1}^n d_i)^2}{n}}{n-1} \right]^{1/2}$$

3. Confidence coefficient: 2.5% error confidence coefficient (on-tailed)

$$CC = t_{0.975} \frac{Sd}{\sqrt{n}} \text{ (Equation 3)}$$

CC : Confidence coefficient

$T_{0.975;0.975}$: T -test value (as shown in the following table)

n	$t_{0.975}$
3	4.303
6	2.571
9	2.306
12	2.201

4. Relative accuracy of relative error test audit

$$\text{相對準確度} = \frac{|\bar{d}| + CC}{\text{檢測機構檢測平均值}} \times 100 \text{ (Equation 4)}$$

CC : Confidence coefficient

5. Mean deviation

$$\text{平均差值} = \frac{1}{n} \sum_{i=1}^n |d_i| \text{ (Equation 5)}$$

IV. Relative accuracy of relative error test audit

(I) Chemical oxygen demand

Testing institution Test mean value	Applicable as of January 1, 2015	Applicable as of January 1, 2018
$30\text{mg/L} \leq \text{Mean} < 60\text{ mg/L}$	—	40%
$60\text{ mg/L} \leq \text{Mean} < 100\text{ mg/L}$	40%	35%
$\text{Mean} \geq 100\text{ mg/L}$	30%	25%

(II) Suspended solids

Testing institution Test mean value	Applicable as of January 1, 2015	Applicable as of January 1, 2018
Mean < 15 mg/L	—	Mean deviation 6 mg/L
$15\text{ mg/L} \leq \text{Mean} < 30\text{ mg/L}$	45%	40%
$30\text{ mg/L} \leq \text{Mean} < 60\text{ mg/L}$	35%	30%
Mean $\geq 60\text{ mg/L}$	25%	20%

(III) Ammonia nitrogen

Testing institution Test mean value	Applicable as of January 1, 2015	Applicable as of January 1, 2018
Mean < 15 mg/L	—	Mean deviation 8 mg/L
$15\text{ mg/L} \leq \text{Mean} < 30\text{ mg/L}$		45%
$30\text{ mg/L} \leq \text{Mean} < 60\text{ mg/L}$	45%	40%
$60\text{ mg/L} \leq \text{Mean} < 100\text{ mg/L}$	40%	35%

Mean ≥ 100 mg/L	35%	30%
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V.Requirements for the installation of video surveillance facilities

(I) Specifications:

1. The resolution shall be higher than 640 x 480 with 5 frames per second, and video recordings shall be saved in an open video file format like MPEG, H.264 or AVI.
2. The facilities shall have night vision capability (and may be supported with infrared rays or other light sources).

(II) The video surveillance facilities shall be installed at a location where it is able to capture clear images of the automatic water quality monitoring facilities, inflow points, discharge points or rainwater discharge points. Video recording equipment shall be connected to the facilities through cables or digital networks.

(III) HTTP-based video browsing service shall be available. It is recommended to use TCP ports 80, 86 and 8080.