Water Utility Information (FY 2014)

Basics

Name of utility:	Chiba Prefectural Waterworks Bureau		Service type:	Water service provider
Administrative population:	3.5 million people		Start of service:	1936
Population served:	3 million people		Service area:	566.37 km²

Water supply volume

Average daily water supply:	870,000 m3/d	Breakdown	Household use	690,000 m³/d
			Commercial and institutional use:	120,000 m³/d
			Others:	50,000 m³/d
			From wholesale supplier	13,000 m³/d
Average daily water supply per capita:	292 L/person/d	Service coverage:		96.4 %
Effectiveness:	98.7 %	Revenue water:		94.7 %
NRW:	5.3 %	Water loss		1.6 %

Water rates

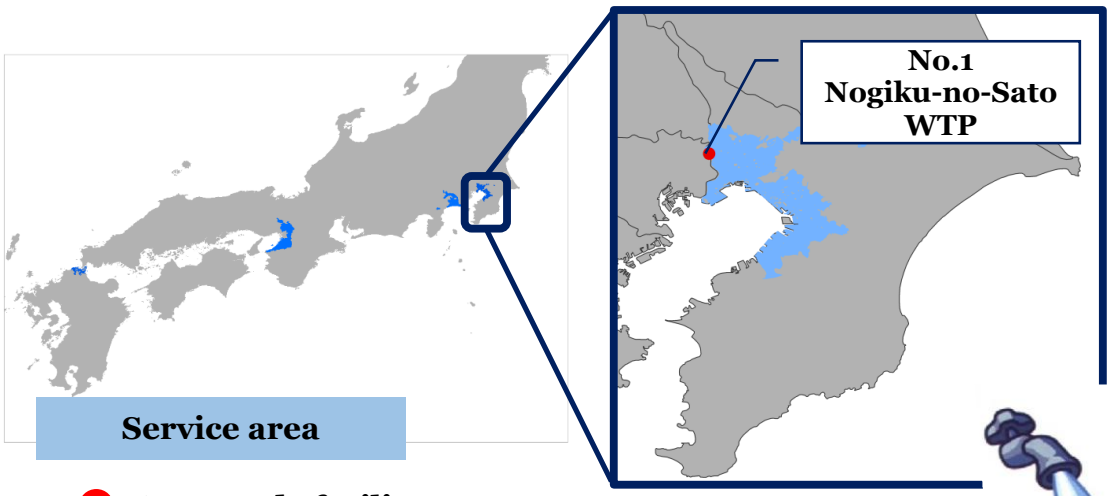
Water rates for 10m3/month:	1,020 yen (including taxes) *Calculation conditon: The service pipe has a 13-mm diameter. The fixed charge is 410.10 yen/month. The volumetric charge is 61.56 yen/m3 up to 10m3.
Water production cost: 181.85 yen/m³	Water supply cost: 202.39 yen/m³

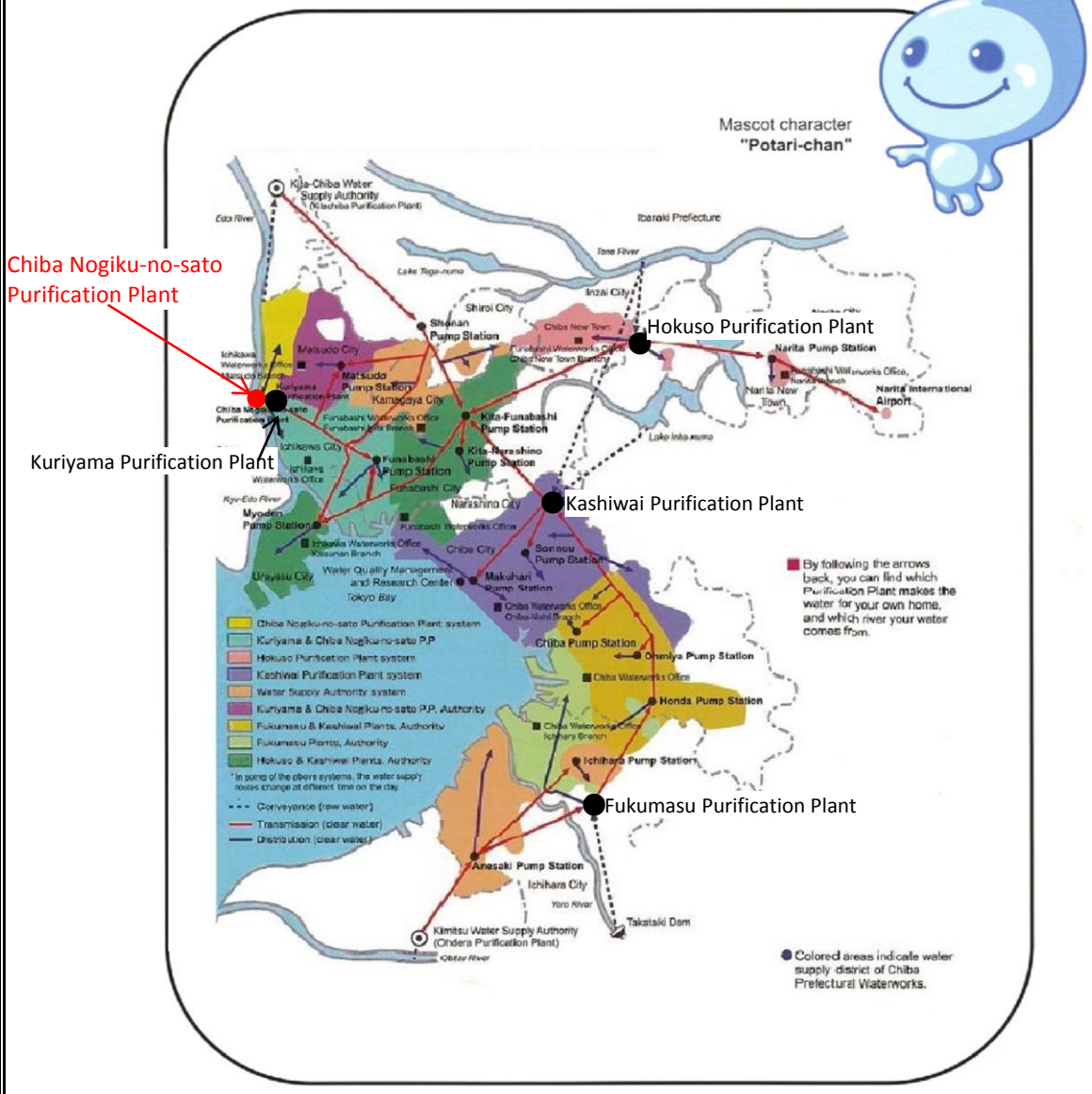
Facilities	Water Treatment Plant and Facilities (including water from wholesale supplier):	Name	Capacity	Water source	Treatment process
		Kuriyama WTP	186,000 m^3/d	Surface water (river)	Coagulation/Sedimentation + Rapid filtration + Chlorine disinfection
		Kashiwai WTP (west wing)	360,000 m^3/d	Surface water (river)	Coagulation/Sedimentation + Rapid filtration + Chlorine disinfection
		Kashiwai WTP (east wing)	170,000 m^3/d	Surface water (lake)	Coagulation/Sedimentation + Rapid filtration + Ozone + Granular activated carbon + Chlorine disinfection
		Hokuso WTP	126,700 m^3/d	Surface water (river)	Coagulation/Sedimentation + Rapid filtration + Chlorine disinfection
		Fukumasu WTP	90,000 m^3/d	Surface water (lake)	Coagulation/Sedimentation + Pre-ozonation + Rapid filtration + Ozone + Biological activated carbon + Chlorine disinfection
		Chiba Nogiku-no-Sato WTP	60,000 m^3/d	Surface water (river)	Coagulation/Sedimentation + Ozone + Biological activated carbon + Rapid filtration + Chlorine disinfection
		Water for wholesale supplly	261,300 m^3/d	–	–
		Total	1,254,000 m^3/d		

Pipes	Pipieline length:	8,970 km	Conveyance:	70 km	Transmission:	170 km
			Distribution:	8,730 km	Others:	– km
	Type of material:	・Cast iron: 8,530 km ・Asbest cement: 6.9 km ・Steel: 167 km				

Others	Other information:	・Number of employees: 875 ・Seismic reinforcement rate of pumping stations: 79.8% ・Seismic reinformcement rate of distribtuion reservoirs: 56.5% ・Maximum daily supply: 1 million m3 ・Maxiumum facility utilization rate: 82.8% (Maximum daily supply/treatment capacity) ・Facility utilization rate: 69.2% (Average daily water supply/treatment capacity)
	Remarsk:	・All the infromaiton above (except for the length of the lead service pipe) was cited from the Annual Report FY2014 of the Chiba Prefectural Waterworks Bureau. ・The length of the lead service pipe was cited from the Annual Report FY2013.

Water Utility Information (FY 2014)





Case Study Report (Chiba Nogiku-no-Sato Water Treatment Plant)

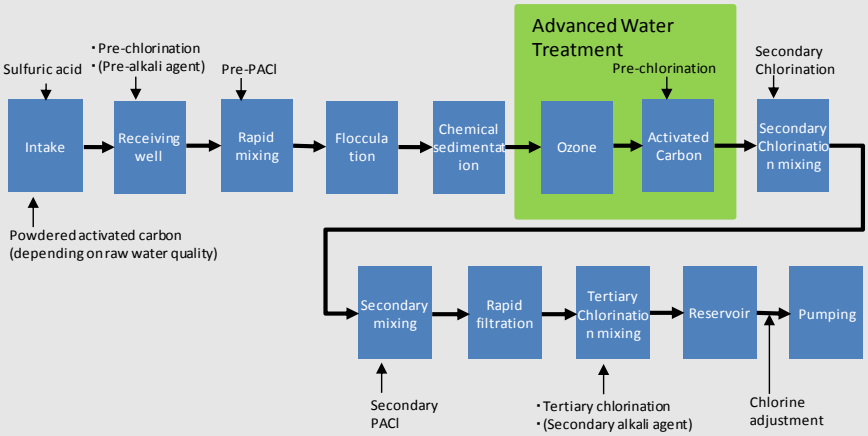
Water Treatment Process

Case #1: Chiba Nogiku-no-Sato Water Treatment Plant

Key word:	Advanced water treatment (ozone + biological activated carbon), Surface water (river), Odor control, Elimination and consolidation of facilities, Private sector involvement
Outline:	<Outline and characteristics> ● Purpose of construction The Chiba Nogiku-no-Sato Water Treatment Plant began operation in October 2007. It's a seismic resistant plant built to replace the old Kogasaki (1940) and Kuriyama (1958) Water Treatment Plants. Upon its completion, the Kogasaki was demolished in 2007. The Kuriyama will also be out of service in 2023, when the Chiba Nogiku-no-Sato will have completed an ongoing construction of a new water treatment facility that will fully replace the capacity of the Kuriyama. ● System features ・Safe and high quality water supply: Ozone + biological activated carbon (advanced water treatmet) to control musty odor as well as bad smells from fish eggs ・Emergency preparedness: Seismic resistance reinforcement of water facilities and preparation of on-site water supply stations for residents in the event of an emergency ・Private sector involvement: Private Finance Initiative (PFI) for the construction and operation of its drainage facility. The operation contract is for 20 years. Among others, the contract provides for the use of surplus soil from on-site excavations as raw materials of improved soil for reclamed land. ・Environmental measures: Solar power generation system for clean energy ・Recreational area for the public: areas on the top of reservoirs is open to public access for recreational use. ・Barrier-free design: assures all the visitors a comfortable access to the buildings and facilities on the premises <Others> The service area includes portions of the Matsudo City, Ichikawa City, and Funabashi City in the Chiba Prefecture.
Address:	Kuriyama 478-1, Matsudo City, Chiba Prefecture
Land area:	125,000 m^2
Water treatment process:	Coagulation/Sedimentation + Ozone + Biological Activated Carbon + Rapid filtration + Chlorine disinfection
Capacity:	・Final capacity: 246,000 m3/d (to be complete in 2023) ・Current capacity: 60,000 m3/d ・Additional capacity under construction: 186,000 m3/d
Water source:	Surface water (Edo River of the Tone River System)

Case Study Report (Chiba Nogiku-no-Sato Water Treatment Plant)

Water Treatment Process

Raw water quality:	■Affected by upstream river conditions because of the plant's downstream location ■Frequent oil spills ■Algae blooms tend to increase the pH and adversely affect the coagulation process ■An issue of musty odor and fish eggs flowing from upstream <Average raw water quality in FY2014 (maximum)> ・Turbidity: 11 degrees (24 degrees) ・Hardness: 60mg/L (68mg/L) ・TOC: 1.5 mg/L (2.9 mg/L) ・pH: 7.7 (8.7) ・Color: 10 degrees (64 degrees) ・Geosmin: 0.002 μg/L (0.004 μg/L) ・2-MIB: <0.001 μg/L (0.005 μg/L) ・TON: 21 (40)
Chemical dose:	Sulfuric acid (pH adjustment), Sodium hydroxide (pH adjustment), Polyaluminum chloride (coagulation), Sodium hypochlorite (disinfection)
Start of operation	Oct-07
Layout:	Aerial view 
Treatment process flow diagram:	

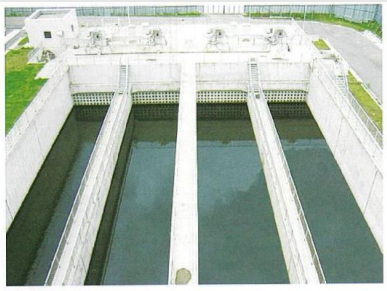
Case Study Report (Chiba Nogiku-no-Sato Water Treatment Plant)

Water Treatment Process

Pictures:

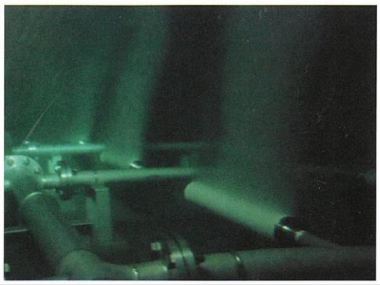
Intake point

Grit chamber

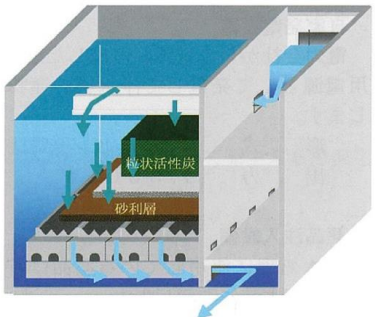


Sedimentation basin

Ozone diffusing pipe



Activated carbon adsorption basin



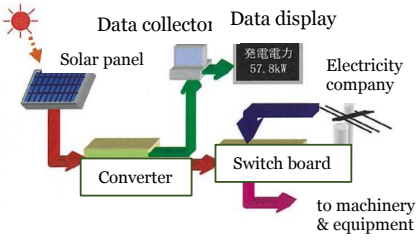
Rapid filtration basin

Case Study Report (Chiba Nogiku-no-Sato Water Treatment Plant)

Water Treatment Process

Other facilities:	●Solar Power Generation System for CO2 reduction Maximum output: 57.8 kw (daily output varies depending on the weather) Installation area: 410 m2 (324 solar power generation modules) Usage: suppies power for ventilation fans in the central control building
Order/contract:	PFI (drainage facility)

Solar panel



Other information:

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