Water Utility Information (FY 2014)

Basics

Name of utility:	Osaka Water Supply Authority		Service type:	Wholesale water supply	
Administrative population*1:	6.2 million people		Start of service*2:	2011	
Population served*1:	6.1 million people		Service area*3:	1100.46	km^2

Volume of water supply

Average daily water supply:	1.4 million	m^3/d	Breakdown	Household use	–	m^3/d
				Commercial and institutional use:	–	m^3/d
				Others:	–	m^3/d
				Wholesale water supply	1.4 million	m^3/d
Average daily water supply per person*4:	252.3	L/person/d	Service coverage:		–	%
Effectiveness:	100.0	%	Revenue water:		100.0	%
NRW:	0.0	%	Water loss		0.0	%

Note: as a wholesale supplier, service coverage is not applicable. NRW and water loss are both 0%.

Water rates

Water rates for 10m3/month:			–	yen	(including taxes)
Water production cost:	64.35	yen/m^3	Water supply cost:	75	yen/m^3

Water Utility Information (FY 2014)

Facilities

	Name	Capacity	Water source	Treatment process
Water Treatment Plants:	Murano WTP	1,797,000 m^3/d	Surface water	Coagulation/sedimentation + Rapid filtration + Ozone + Granular activated carbon + Chlorine disinfection
	Niwakubo WTP	203,000 m^3/d	Surface water	Coagulation/sedimentation (only in the event of high turbidity events) + Biological treatment (contact filtration) + 2nd coagulation + Rapid filtration + Ozone + Granular activated carbon + Chlorine disinfection
	Mishima WTP	330,000 m^3/d	Surface water	Biological treatment (honeycomb tube) + Coagulation/sedimentation + Rapid filtration + Ozone + Granular activated carbon + Chlorine disinfection
	Total	2,330,000 m^3/d		

Pipes

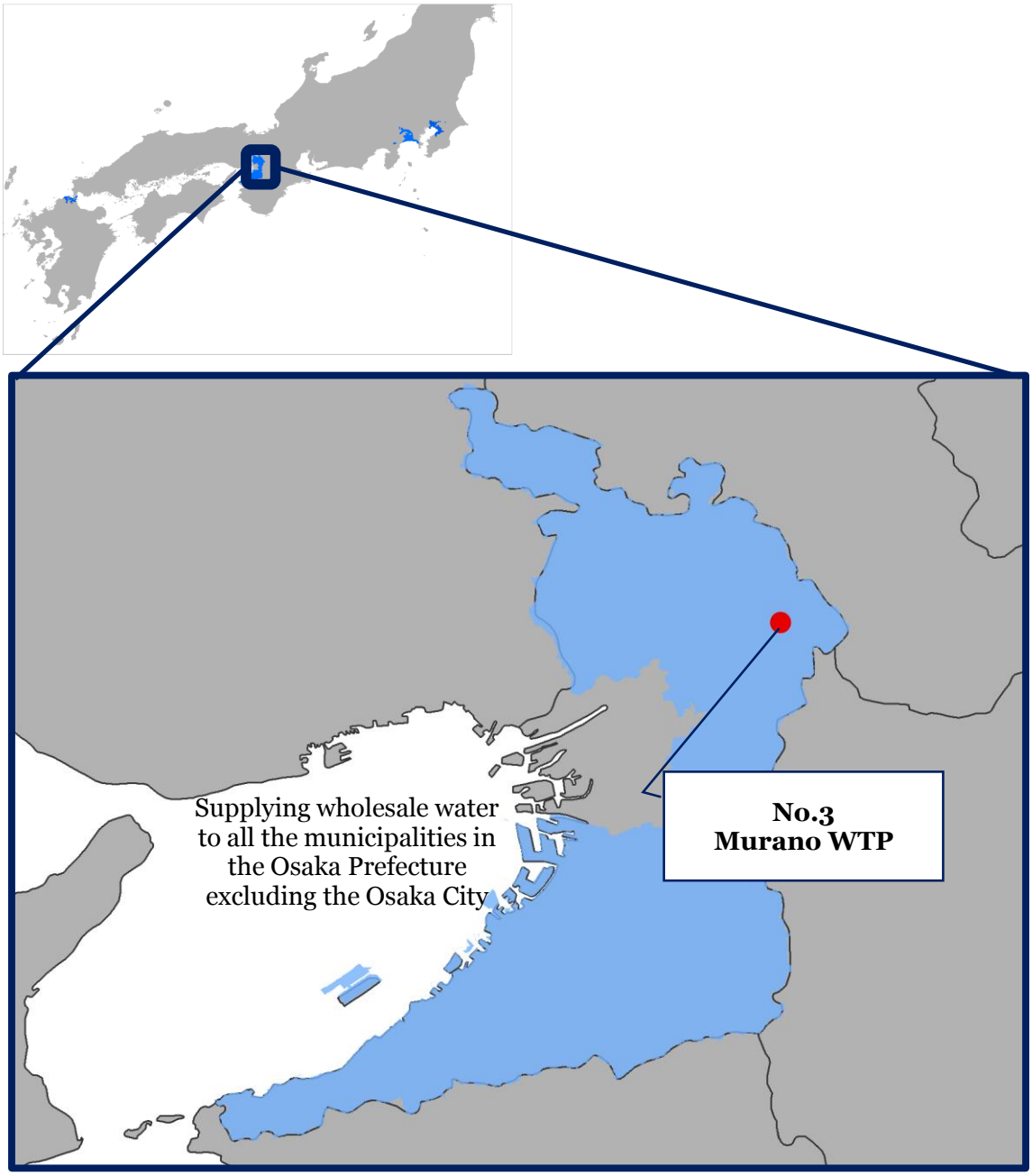
Pipeline length:	573.19 km	Conveyance:	16.698	km	Transmission:	549.363	km
		Distribution:	0	km	Others:	7.129	km
Type of material:	・Cast iron 35.560 km ・Ductile iron 435.630 km ・Steel 101.999 km ・Stainless 0.025 km						

Others

Other information:	・Number of employees: 376 ・Seismic reinforcement rate of pumping stations: 100% ・Seismic reinforcement rate of distribtuion reservoirs: 10.4% ・Maximum daily supply: 1.56 million m3 ・Maxiumum facility utilization rate: 66.9% (Maximum daily supply/treatment capacity) ・Facility utilization rate: 60.7% (Average daily water supply/treatment capacity)
Remarks:	●Primary reference materials ・Osaka Prefectural Government. Water Supply Service in the Osaka Prefecture in FY2014. http://www.pref.osaka.lg.jp/kankyoeisei/suido/genkyo-26.html ・Osaka Water Supply Authority. Water Suply Statistics Annual Report FY2014. http://www.wsa-osaka.jp/siryoushu/toukei-nepo/26toukei_index.html *1 The administrative population and the population served are those of the 42 municipalities in the Osaka Prefecture (excluding the Osaka City) in FY2014. *2 The water supply department of the Osake Prefectural Government (the predecessor of the Osaka Wate Supply Authority) was created in 1940 and began water supply in 1951. *3 Of the 42 municipalities in the Osaka Prefecture (excluding the Osaka City) in FY2013. *4 Of the 42 municipalities in the Osaka Prefecture (excluding the Osaka City) in FY2012. *5 The water treatment plants for industrial users are not listed here.

Water Utility Information (FY 2014)

Service area



Case Study Report (Murano Water Treatment Plant)

Water Treatment Process

Case #3 Murano Water Treatment Plant

Key word:	Advanced water treatment (ozone + granular activated carbon), Multi-story water treatment facility, Water pressure differential power generation, Surface water (river)
Outline:	<Outline> ・The Murano Water Treatment Plant is responsible for approximately 80% of the utility's water production. ・Ozonation and granular acivated carbon (GAC) treatment was installed in 1998 to address issues of musty odor and trihalomethane. <Characteristics> ・One of the largest water treatment plants in Japan in terms of capacity ・One of the first water treatment plants in Japan that adopted ozone and GAC ・A very rare, multi-story water treatment facility <Multi-story water treatment facility> ・The multi-story water treatment facility contains the equipments for sedimentation, filtration, ozonation, GAC treatment etc. These equipments are located on the multiple stories of two connected buildings. Each building has a capacity of 275,000 m3/d. The operation started in July 1980. (The advanced water treatment process was installed in 1994 in the multi-story water treatment facility.) ・When a water demand increase in the 1970s required an enhancement of the utility's water supply capacity, there was not enough available area on the premises to build a new facility. The utility thought it better, however, if a new facility could use some of the existing Murano facilities so they wouldn't have to build new ones. Their answer was the multi-story water treatment facility that requires much smaller site space and thus allows for more efficient daily inspections and repair work of the equipments. ・The facility has a pressure differential power generation system. Using a 10-meter difference in water levels among basins, it provides a maximum electricity of 240 kw. The accumulated electricity in 2014 was 1.41 million kWh.
Address:	Murano Takamidai 7-2, Hirakata City, Osaka Prefecture
Land area:	317,756 m^2
Water treatment process:	Coagulation/sedimentation + Rapid filtration + Ozone + GAC + Chlorine disinfection
Capacity:	1,797,000 m3/d
Water source:	Surface water (Yodo River)
Raw water quality:	■Since the plant abstracts water from the downstream of the Yodo River, the raw water is affected by the use in the upstream side of the river. It used to contain much ammonia nitrogen but its concentration has decreased to a non-significant level in recent years due to a development of sewage infrastructure. ■Because of an influence from the Lake Biwa situated upstream of the Yodo River, the raw water tends to be adversely affected by musty odor, picoplankton growth, and algae growth during summer that increase the pH. <Average raw water quality in FY2014 (maximum)> ・Turbidity: 8 degrees (62 degrees) ・Hardness: 42.6 mg/L (45.1 mg/L) ・TOC: 1.8 mg/L (2.4 mg/L) ・ｐH: 7.4 (7.8) ・Color: 20 degrees (190 degrees) ・Geosmin: 0.001 μg/L (0.004 μg/L) ・2-MIB: 0.004 μg/L (0.014 μg/L) ・TON: 24 (30)
Chemical dose:	Sulfuric acid (pH adjustment), Sodium hydroxide (pH adjustment), Polyaluminum chloride (coagulation), Sodium hypochlorite (disinfection)
Start of service	1963/7/1

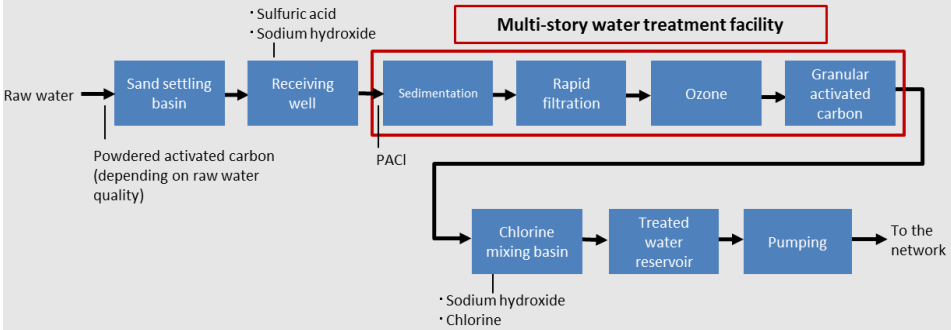
Case Study Report (Murano Water Treatment Plant)

Water Treatment Process

Layout

●Aerial view

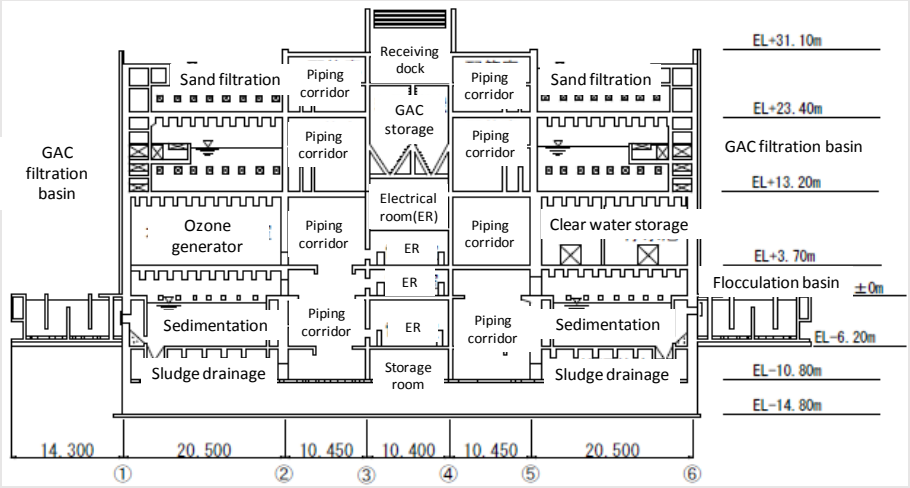
Treatment process flow diagram:



Pictures

●The multi-strory water treatment facility has 72.3 m in length, 88.8 m in depth and 31.1 m in height.

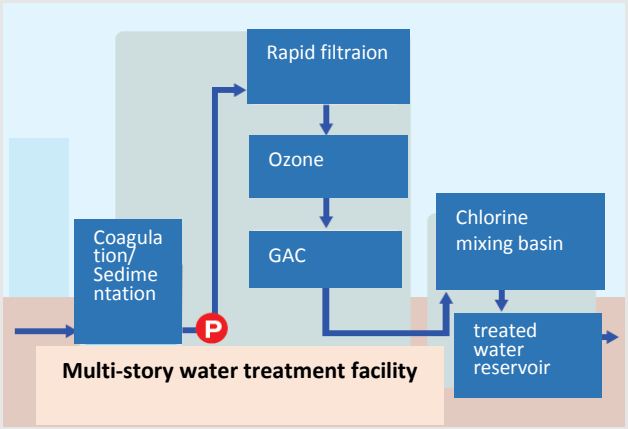
Sectioned diagram of the multi-stroy water treatment facility



Case Study Report (Murano Water Treatment Plant)

Water Treatment Process

Other facilities:	● A solar power generation system: installed on the top cover of sedimentation basins. The cover also helps prevent algae growth. The maximum output is 360 kW. ● A pressure differential power generation system: the multi-story water treatment facility generates power by utilizing the difference in water pressure between the chlorine mixiging basin and the treated water reservoir.



Pressure differential power generation system

	●Organic compound sensors in the intake station continuously monitor volatile organic compounds in the raw water. ●Carp Sensor is also installed in the intake station for continuous monitoring of the raw water quality.
Order/contract:	–
Expenses:	Unknown

Other information

Reference:
Osaka Water Supply Authority. Commemorative Publication for the Establishement of the Osaka Water Supply Authority. http://www.wsa-osaka.jp/event-pr/pamphlet/