Osaka Municipal Waterworks Bureau

WATER SUPPLY SYSTEM IN OSAKA

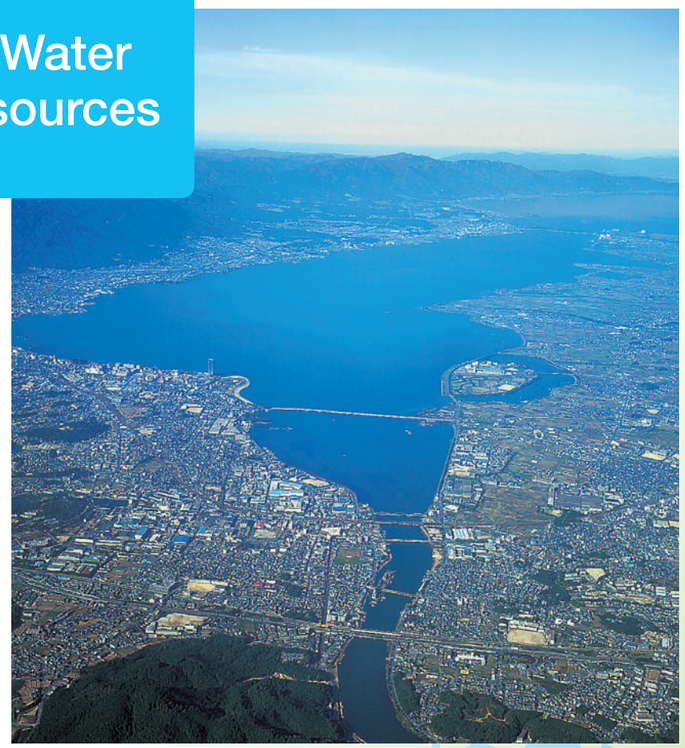
Waterworks information magazine

Special issue 2022

For your better understanding of water

01 Taking advantage of rich water sources to provide stable water supply

Water sources



Water sources of waterworks

Lake Biwa and the Yodo River are precious water sources for people living in the Kinki region. The Yodo River, which flows from the junction of the Kizu River, Katsura River, and Uji River, is one of the greatest rivers, while Lake Biwa, which feeds the Uji River, is the largest in Japan. The plentiful natural water sources have been supporting the lives of people living in Osaka and the other parts of the Kinki region and their urban activities since ancient times.

Water Source Development

Since early on, the City of Osaka has endeavored to secure water sources in response to an increasing demand and has been actively participating in a number of water source development projects, including a Lake Biwa development project. Today, the City secures water sources necessary to satisfy the demand. Through these water source development projects, Lake Biwa and the Yodo River have become highly stable water systems against droughts.

Water quality improvement of Yodo River

The water quality of the Yodo River, which had gone bad in the past, has been significantly improved due to institutional development and the efforts of neighboring municipalities in recent years. The river water is very clean today.

● Development projects in which the City of Osaka participates

02

For Safe and Secure Water Supply

Working 24 hours a day to produce safe and tasty water

Safe and high-quality water production

Purification plants

Our purification plants are “water manufacturing factories,” which take water from the Yodo River and turn it into safe and clean potable tap water. Water is essential to our daily lives. The purification plants operate all day and night every day throughout the year.

Maintenance of purification facilities

The purification plants and distribution plants must constantly send water to customers. Therefore, we are making constant efforts to provide safe water at any time, which include continuous facility inspections and the scheduled replacement of aging equipment, reinforcement of the quake resistance of existing facilities, development of distribution reservoirs, and advancement of the management system of the purification plants and distribution plants.

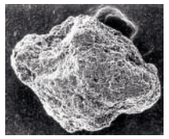
Advanced water treatment system

The advanced water treatment system was developed by adding ozone(*1) treatment and granular active carbon(*2) treatment to the conventional water purification processes so as to produce safer and tastier water.
The advanced water treatment completely removes foul and musty odors, substantially reduces trihalomethane, and improves safety against cryptosporidium and other pathogenic microorganisms, demonstrating effectiveness in improving the overall quality of tap water.

Three features of the advanced water treatment system

1. **No musty odors!**
   With ozone and granular active carbon, foul and moldy odors can be completely removed and organic substances that generate chlorine odors can also be reduced.
2. **Trihalomethane substantially reduced!**
   The advanced water treatment system has lowered the average annual trihalomethane level to around 10% of the standard level.
3. **Enhanced safety against micro-organisms!**
   The strong oxidizing power of ozone ensures the safety of water against microorganisms.

Ozone contact basins



Granular active carbon magnified by electron microscope

[(*1) Ozone] Ozone (O_3) has strong oxidizing power. It effectively eliminates foul and musty odors by decomposing of musty-odor causing organic substances and helps the oxidization of manganese in water and the sterilization of water.

[(*2) Granular activated carbon] Granular activated carbon is a porous particle of the size of sand. It effectively eliminates substances from which trihalomethane derives and odor-causing organic substances dissolved in water. Microorganisms that reside on the porous surface of granular activated carbon particles break down the offending particles.

Our purification plants

Kunijima Purification Plant

The oldest purification plant completed in 1914. It has a standard daily supply capacity of 1,180,000 m³ and supplies water to the central, northern, and northwestern areas of the city.

Location: 1-3-14 Kunijima, Higashi Yodogawa-ku, Osaka

Niwakubo Purification Plant

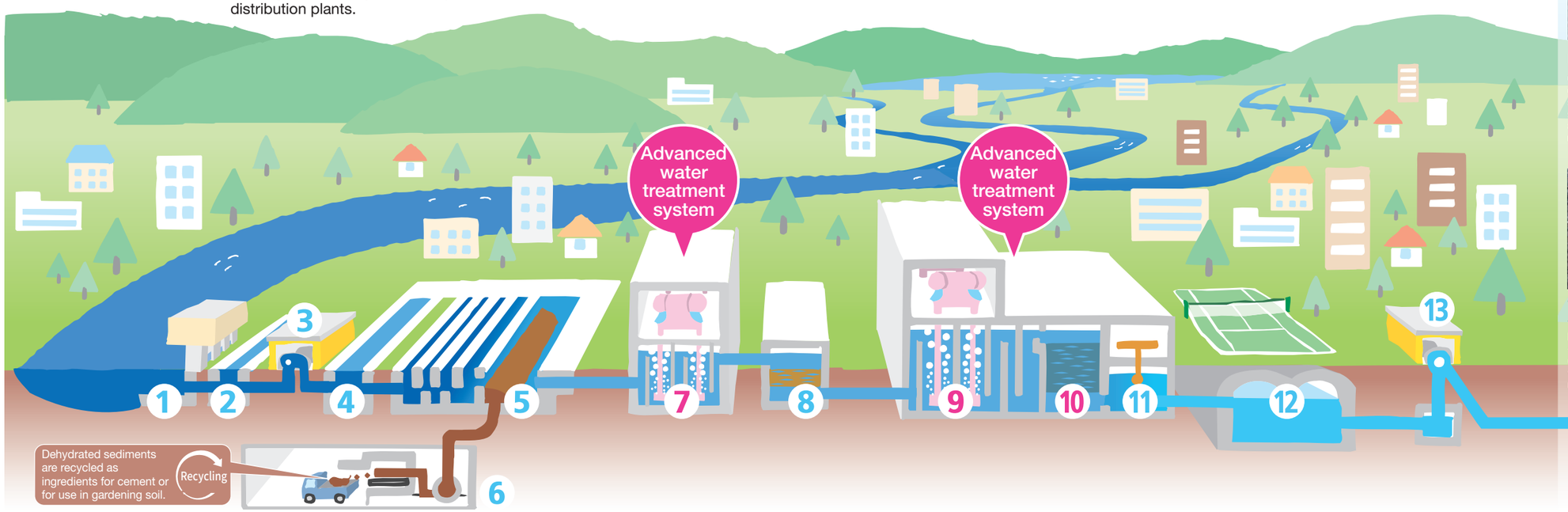
Completed in 1957. It has a standard daily supply capacity of 800,000 m³ and supplies water to the mid-western and southern areas of the city via the Oyodo and Tatsumi Distribution Plants.

Location: 11-31 Yodoe-cho, Moriguchi

Toyono Purification Plant

The newest plant completed in 1968. It has a standard daily supply capacity of 450,000 m³ and supplies water to the central and eastern regions of the city via the Joto Distribution Plant.

Location: 1-1 Uzumasa-Takatsuka-cho, Neyagawa



1. **Intake pipe** — Takes water from the Yodo River.
2. **Grit basins** — Remove waste and sand.
3. **Intake pumps** — Pump water from the grit basins.
4. **Receiving well** — Adjusts the level of intake water.
5. **Coagulo-sedimentation basins** — Facilitate micro-particle settling with aluminum sulfate introduced into the water.
6. **Wastewater treatment facilities** — Dehydrate and process sediment.
7. **Intermediate ozone contact basins** — Ozone exposed to water initiates manganese oxidization and organic substance decomposition.
8. **Rapid sand filters** — Filter water through layers of sand.
9. **Post ozone contact basins** — Ozone exposed to water decomposes organic substances that may generate musty odors and trihalomethane, and it sterilizes the water.
10. **Granular activated carbon filters** — Eliminate organic substances that may generate trihalomethane by absorbing them with granular activated carbon or breaking them down with microorganisms.
11. **Chlorine contact basins** — Add chlorine to water in order to ensure the disinfection of water until it reaches each faucet.
12. **Service reservoirs** — Treated water is stored in basins.
13. **Distribution pumps** — Apply pressure to water according to the amount of use, to distribute it to each faucet of customers.

Intake → **Purification** → **Distribution**

03 Prepared for any situation at any time to continue providing steady water supply

Water distribution

Water distribution plants and distribution pipes

Water treated in purification plants is sent to distribution reservoirs at purification plants or distribution plants located around the city. Storing water in the distribution reservoirs at these plants enables a steady supply of water even at peak usage times in the morning and evening. The water in the distribution reservoirs is delivered through a network of distribution pipes across the city and finally to each faucet of customers.

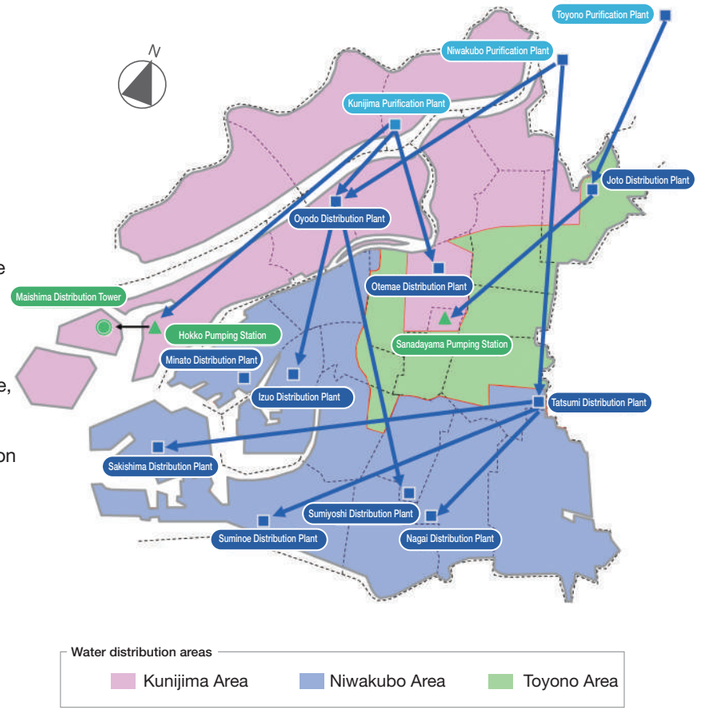
Maintenance of distribution pipes

Some of the city's distribution pipes, which are approximately 5,200 km in total length, are aged. In order to prevent leaks and ensure a stable supply of water as much as possible even in an emergency, such as an accident or disaster, and maintain the highly reliable lifeline, the Bureau continuously replaces aged pipes with seismic ones, improves its network of distribution pipes, and upgrades the distribution control system.

Around-the-clock preparedness

The Bureau collects water flow and water pressure data for 24 consecutive hours from telemeters installed in distribution pipes in all regions of the city in order to control the distribution of water meticulously. The waterworks centers prepare for emergencies, such as pipe leakages, around the clock and implement immediate repair works in case of emergency. Furthermore, the Bureau strives to prevent accidents by patrolling and inspecting the facilities around the city.

Water distribution areas



How water arrives at your tap

1 Branching off from distribution pipes

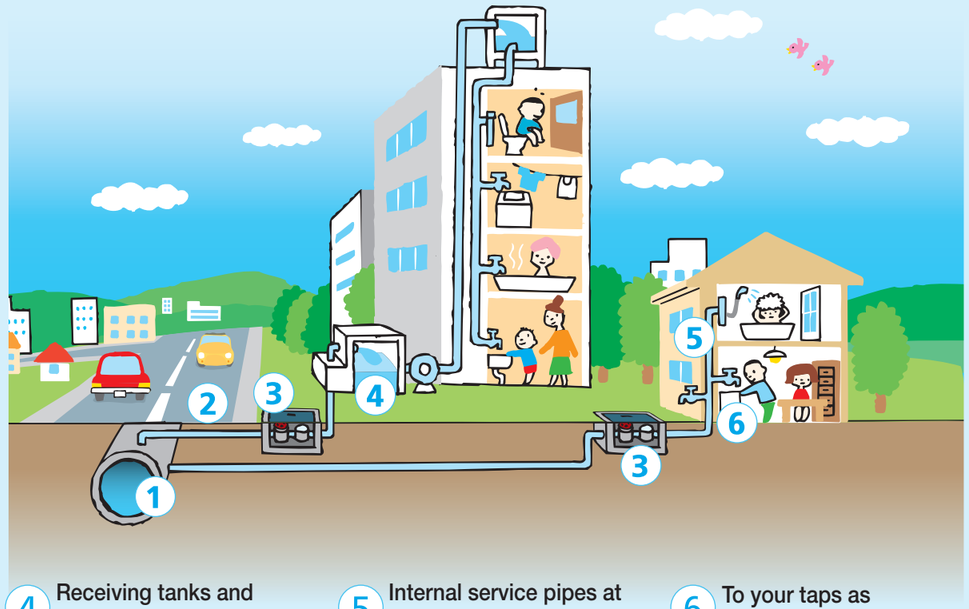
Tasty water flows past the doorstep of every customer through the network of distribution pipes spreading beneath roads. Service pipes branch off from the distribution pipes and allow the transfer of water to each tap. This branch point is the first step in the process.

2 Embedded service pipes

Service pipes connect the distribution pipes to water meters. Service pipes are the property of each customer even though they are buried under public roads. The Bureau provides various maintenance services, such as repair of pipes causing water leakage on roads and replacement of obsolete pipes.

3 Accurate water meters

Our waterworks business is funded by revenue collected from water fees paid by our customers. And a water meter is an instrument to measure the volume of water consumed by each customer. The greatest priority of the instrument is on its accuracy. Each meter is subjected to rigorous tests before it is installed and is replaced every eight years so as to ensure accuracy sufficient to gain trust of the customers.



4 Receiving tanks and direct booster pumps

Tap water is pressurized and supplied to customers. For high-rise condominiums and other tall buildings, water is delivered to customers by employing several methods to maintain supply water pressure, such as sending water stored in tanks using pumps, or sending water directly to customer faucets with booster pumps installed instead of water tanks.

5 Internal service pipes at each home

Water service pipes in a building are usually invisible. But if a leak or other problem arises, it will immediately make the life of the residents inconvenient. Only properly licensed engineers are permitted to work on water service installations that feed drinking water. So contact the waterworks companies designated by Osaka City for repair or installation work. It is recommended that you check the costs for work with several waterworks companies in advance.

6 To your taps as drinking water

Water has finally reached the tap, from which you can use the tasty water we serve you with confidence. You can trust and drink it with no worries. The Bureau is proud of the excellent taste of the water as well as its safety and reliability.

04 Comprehensive water quality testing to deliver safe drinking water

Watching the water
- Water quality inspection -

The safety of water is most important.

To ensure the safety of tap water for customers, the Water Examination Laboratory formulates the Osaka Municipal Water Quality Management Plan, based on which it regularly examines water quality from all aspects. This Plan details how the Bureau tests at various locations more than 200 different water quality items at every stage, from the water sources of Lake Biwa and the Yodo River to customer faucets. The Bureau welcomes suggestions and opinions from customers concerning water quality issues and reviews its operations annually. Furthermore, in order to ensure the safety of tap water in the future, the Bureau collects the latest scientific information and strives to develop and research various inspections and effective methods to eliminate contaminants.

Water supply GLP accreditation

Our Water Examination Laboratory became the first in Japan to receive Water Supply Good Laboratory Practice (GLP) accreditation. The Bureau makes every effort to provide customers with reliable results of water quality examinations by ensuring the accuracy of quality inspections and examinations. (GLP accreditation received on December 26, 2005)

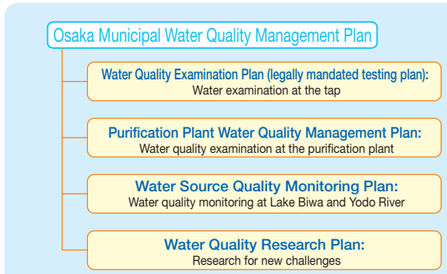
JWWA-GLP001
Water Quality GLP
Certified Testing Laboratory

Water quality examinations

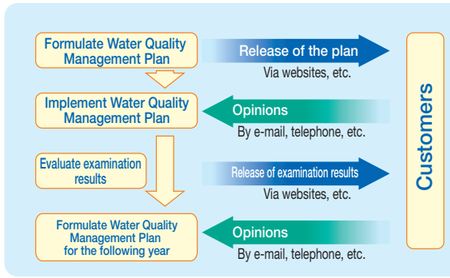
The Bureau ensures water quality by testing more than 200 different items, such as agricultural chemicals, endocrine disruptors, cyanogen, bromate or other ions, and heavy metals, using cutting-edge analytical equipment and advanced technology.

Osaka Municipal Waterworks Bureau Water Quality Management Plan

Structure of the Water Quality Management Plan



Publication of a Water Quality Management Plan



Source water quality control

The water quality of the Yodo River, Osaka's water source, has been greatly improved since the 1990s as a result of the tightening of regulations on discharge from factories and the development of sewers. Meanwhile, Lake Biwa's level of nitrogen, the main nutrient for plankton, has remained almost the same.
To protect the quality of our precious water source, each one of us should make a personal effort to keep the water clean while further advancing water quality conservation initiatives. The Water Quality Testing Laboratory works in cooperation with other waterworks that rely on Lake Biwa and the Yodo River to monitor, examine, and research the quality of water.

Water quality control at purification plants

At the purification plants, the Bureau checks that water is produced through appropriate purification processes and that the treated water to be sent to the city satisfies the criteria for drinking water.
If source water is affected by heavy rains or contaminated by an accident, etc., the Bureau conducts extraordinary water quality examination and promptly takes responsive action.

Water quality testing sites in Osaka City

Water quality is thoroughly tested once a month according to the water quality criteria and items on water taps at 21 sites in the city to ensure the safety and reliability of drinking water. Furthermore, 38 telemeters installed throughout the city constantly monitor the color, turbidity, and residual chlorine concentration of water 24 hours a day.

Locations of telemeters installed

◉ Water distribution plants

For Safe and Secure Water Supply

05 Creating earthquake-resistant waterworks

Earthquake countermeasures

The Osaka Municipal Waterworks Bureau aims to maintain a stable supply of water as much as possible even in the confusion following an earthquake. To this end, the Bureau has been developing comprehensive earthquake countermeasures, such as improving networks of waterworks facilities and making such facilities earthquake-resistant, while being ready to promptly provide emergency water supply and recovery if an earthquake occurs.

Establishing water supply and distribution centers

Large quantities of drinking water are stored in distribution reservoirs. In the event of a great earthquake, these reservoirs will serve as important centers to distribute water to the City or provide an emergency water supply. The waterworks bureau has a good balance of these water distribution ponds in the city.

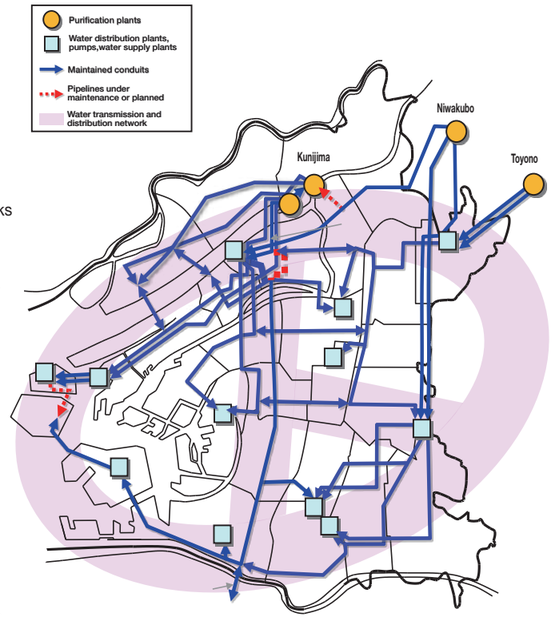
Reinforcement of water supply and distribution network

In order to efficiently and effectively enhance the reliability of the waterworks system as a lifeline, it is very important not only to strengthen disaster countermeasures at each facility, but also to ensure redundancy as a waterworks system by enhancing backup water supply functions. The waterworks bureau is working to strengthen the water supply and distribution network, including the development of pipelines that can enhance interconnectivity in each area.

Resilience of waterworks facilities

—Earthquake, power outage, storm and flood damage countermeasures—

To minimize damage to water facilities in the event of a great earthquake, it is necessary to increase the earthquake resistance of aging equipment by replacement or reinforcement. The Waterworks Bureau follows a comprehensive plan to improve the earthquake resistance of the purification plants, distribution plants, and distribution pipes.
In addition, efforts are being made to ensure stable power supply through measures such as earthquake-proofing of power receiving facilities, installation of multiple receiving lines, and measures to prevent transmission outages by installing in-house power generation facilities, as well as efforts to make facilities more flood-resistant in the event of storm and flood damage countermeasures.




Earthquake-proofing construction of water intake facilities (Kuzuha water intake plant)


Earthquake-proofing construction of pipelines (Tatsumi first water pipe)


Private power generation equipment for facility operation (Tatsumi water distribution plant)

Emergency water supply system at the time of disaster

The waterworks bureau has an emergency water supply system in place to provide citizens with the necessary amount of water for drinking and daily use, depending on the situation at the time, even if the water supply is cut off due to an earthquake or other disaster.

① Securing drinking water

The following approach will be used to secure drinking water and other resources after a disaster.

1	2	3
Immediately after a disaster Stockpile drinking water. Secure water using the transported water supply system.	**Post-disaster - Recovery** Secure necessary water using base water supply system and transported water supply system.	**Post-recovery** Normal volume of water is supplied. (Up to 3 weeks after a disaster)

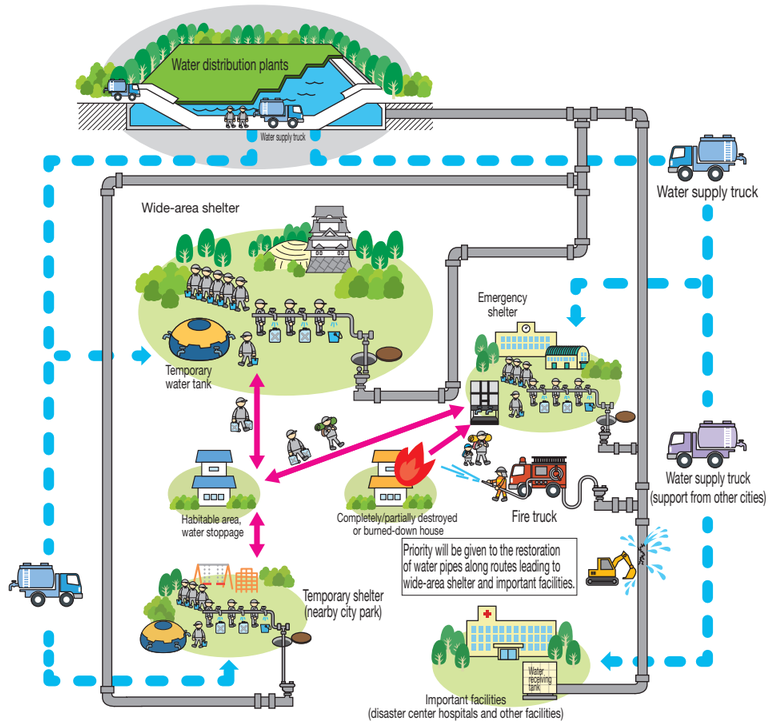
② Emergency water supply system at the time of disaster

▼ What is the base water supply system?

This is a system in which water trucks make rounds to supply water to temporary water tanks set up at evacuation shelters and other locations in the event of a disaster. Water is drawn from temporary water tanks.

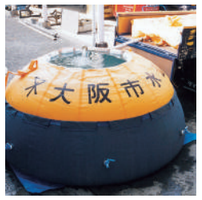
▼ What is the transported water supply system?

This is a method in which water is supplied directly by water supply truck to receiving tanks at base hospitals for disaster relief and other important facilities.

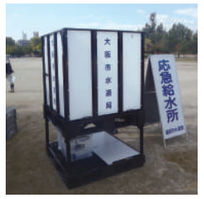


Planning and training for emergency measures

To ensure implementation of emergency measures in a disaster, the Bureau has formulated plans to stock materials for emergency water supply and restoration. The Bureau also holds emergency water supply and restoration training and simulation drills on a regular basis while maintaining a mutual support system with other municipalities.



Temporary water tank (4 t)



Temporary water tank (1 t)


Temporary water taps


Materials for restoration


Joint drill with other municipalities

Our Commitment

01 Services to please customers

About the waterworks

Contact our Customer Service Center

- When you start or stop using water due to a move, etc.
- When you change the registered name of your water service
- When you want an account transfer application form
- When you want a credit card settlement (continued payment) application form
- When you want notifications mailed in Braille
- When you find water leakage on the street or want consultation about water leakage at your home
  (For repair due to water leakage, etc. occurring at night or on holidays, recorded guidance will provide you with emergency contact information for a repair service provider.)

* For ease of procedure, have a water usage notice or other documentation from the Bureau at hand.

TEL : 06-6458-1132

FAX : 06-6458-2100

- Service hours for the installation or removal of water meters upon receiving notification of start or stop of the use of water service are from 9:00 AM to 5:30 PM on weekdays.
- The Customer Service Center provides recorded guidance on emergency contact information for people who discover water leakage in the street or in your home at night or on holidays.
- All calls will be recorded in order to grasp the content of customer calls accurately.

Service hours (calls will be answered)

- Weekday (Monday through Friday): 8:00 AM to 8:00 PM
- Saturday: 9:00 AM to 5:00 PM
- December 29 and 30: 9:00 AM to 5:00 PM

(Closed on December 31 through January 3)

- Open on Sundays and holidays in March and April: 9:00 AM to 5:00 PM

* Be careful not to call the wrong number.

This is a method in which water is supplied directly by water trucks to receiving tanks at base hospitals for disaster relief and other important facilities.

Communication with customers

For your better understanding of waterworks

Learn Water purification plant tours, Water Classrooms, and Water Museum

The Bureau hosts tours of its water purification plants and Water Classrooms as opportunities for people to learn the importance of water as a valuable resource and the mechanism of waterworks. Participants are able to learn how our tap water is produced through the facility tours and sand filtration experiments using granular activated carbon. The Water Museum shows fun videos with unique characters (“Josui Joe” and “Osaka Water Friends”) and displays graphic panels to communicate the history and role of the waterworks business, the importance of water, and the mechanism of water purification plants.

Know Pamphlets and bulletin boards

The Bureau produces pamphlets and promotional videos to inform customers of the Bureau’s work, water sources, and billing system. Furthermore, each major municipal subway station in Osaka has a Bureau-dedicated bulletin board to inform people of Bureau-related information in a timely manner through posters and flyers.

Familiarize “Water” painting contest

The Bureau holds a water-related painting contest for schoolchildren as an opportunity to encourage children to think about waterworks and the water environment. The contest invites paintings with unique and creative ideas and awards and displays excellent works.

Communicate Events

In order to inform customers about the production of safe, good-tasting water and emergency water supply initiatives in the event of a disaster, PR is carried out through opportunities such as exhibiting at ward festivals and other events.

Prepare Disaster drills

In the event of a disaster, cooperation with local residents and affected people will become indispensable to facilitate emergency water supply. The Bureau therefore conducts disaster drills jointly with various agencies concerned, including ward offices, and local residents on a regular basis.

Our Commitment

02 Striving for environment- and earth-friendly business management

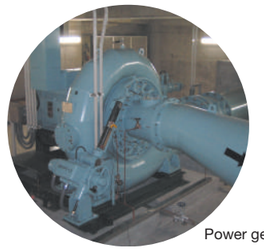
Environmental activities

Promoting various initiatives to maintain environment-friendly water development and protect nature

Solar power generation panels

Solar power generation

Osaka City introduced a solar power generation system with an output capacity of 150 kW in 1998 and a system with an output capacity of 250 kW in 2010 at the Kunijima Purification Plant, with the aim of contributing to the conservation of the global environment and promoting technology innovation, as well as to secure a power source for emergency water supply activity. The generated electricity is used for water purification treatment, part of which is stored in batteries so as to be available for the operation of emergency water supply pumps in the event of a long-time power failure due to a large-scale disaster. In fiscal 2015 and 2016, the solar power generation systems, with a total output capacity of 35 kW, were introduced at four waterworks centers in the city. The yearly output capacity of solar power generation by the Osaka Municipal Water Works Bureau is approximately 500,000 kW per hour (as of 2021 fiscal year), which is equivalent to the amount of power consumed by 116 general households.



Power generation facility

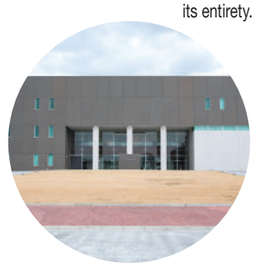
Hydroelectric power generation

Osaka City introduced at the Nagai water distribution plant a hydroelectric power generation system of an output capacity of 253 kW that utilizes the pressure of water flowing into the service reservoir in fiscal 2004 to make effective use of unused energy. Hydroelectric power generation system with an output of 110 kW were subsequently installed at the Izuo water distribution plant in 2013 and at the Sakishima water distribution plant in 2008. The annual amount of hydroelectric power generated by Osaka Municipal Waterworks Bureau is approximately 2.21 million kWh (2021 fiscal year's results), which is equivalent to the power generated by approximately 511 ordinary households. The electricity generated at the Nagai and Sakishima water distribution plants is used as part of the power for distribution pumps to reduce the consumption of commercial electricity, while the electricity generated at the Izuo water distribution plant is sold in its entirety.

Sludge facility

Sludge reuse

We are working to reduce the amount of soil generated in the water purification process and to recycle it through effective use. In addition, by utilising the know-how, technology and ideas for the effective use of soil generated from water purification held by private operators, a 100% effective utilisation rate has been achieved since 2013 as 'resources' such as backfill soil.



Kunijima Purification Plant Administration Building

The Kunijima Purification Plant Administration Building is designed to be environmentally friendly and features rooftop gardening, cooling with cool tubes, and energy conservation by cooling heat pumps with water spraying. The surrounding roads are paved with water retaining material.

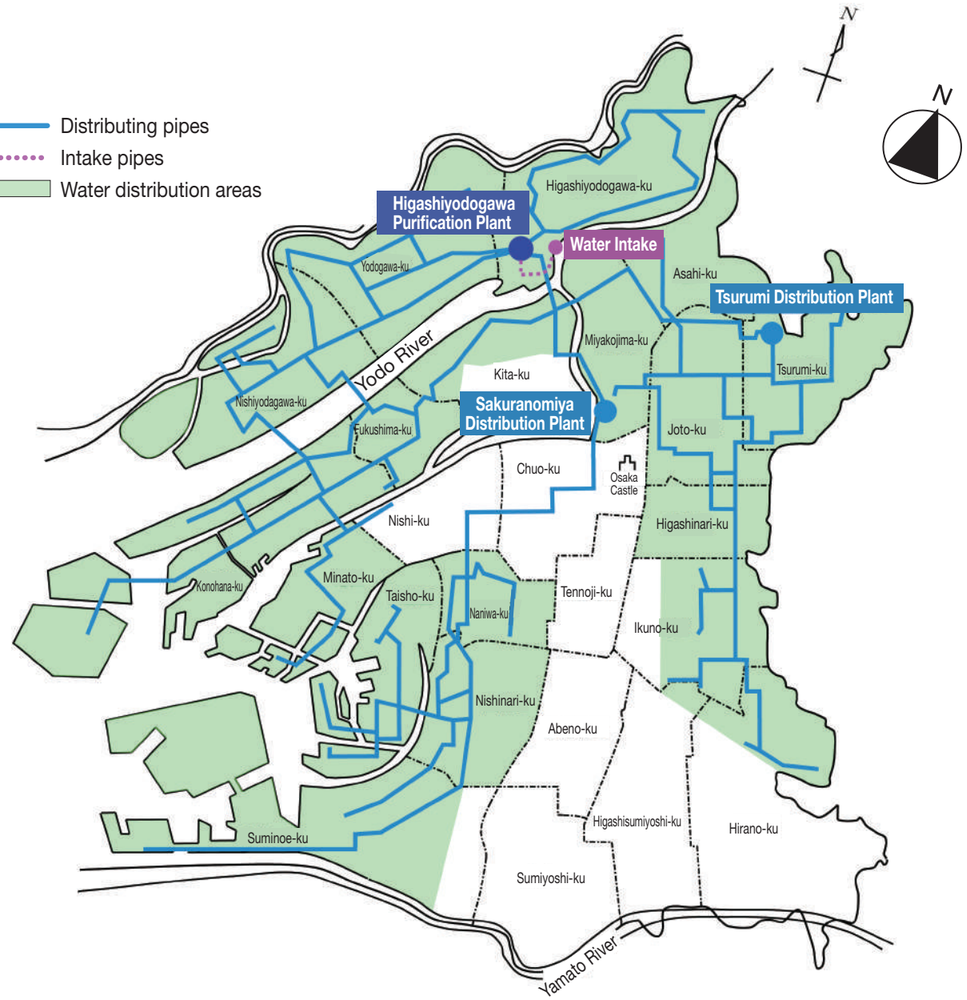
Environmental accounting

The Bureau identifies and assesses in monetary or material terms the costs and effects of its environmental preservation initiatives. The results have been published since 2003 to promote customers' greater understanding of the Bureau's environmental conservation activities.

Industrial water supply system

The over-pumping of underground water for industrial use was a major cause of land subsidence in the western part of Osaka City around the 1930s. The municipal government therefore launched a program of constructing new Industrial water supply to replace the pumping of underground water to prevent further land subsidence.
The industrial water supply has been operated by Miotsukushi Industrial Water Concession Corporation since April 2022 as the 'Osaka City Industrial Waterworks Specified Operation Project', utilising the public facility concession system under the law on the promotion of the development of public facilities through the use of private sector funds (PFI law).

Collapsed road due to land subsidence

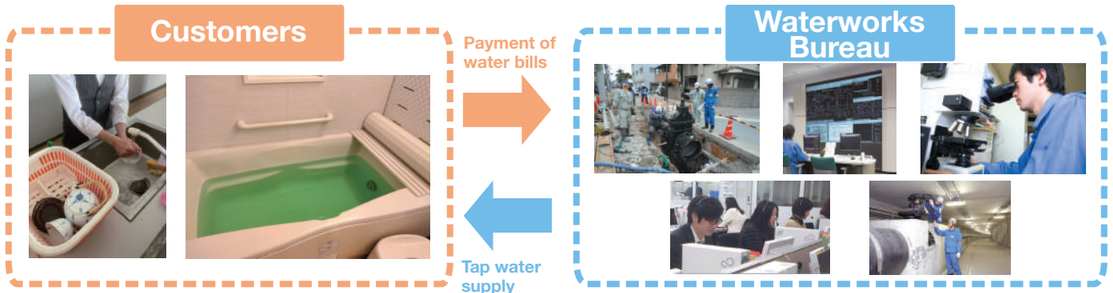


Our Commitment

03 Water supply business management

Water supply management

In water supply business, water utilities are managed on a self-financing basis, with the costs of running the business covered by the water charges paid by customers.



It is supported by water bills paid by customers in their homes, shops, offices and hospitals.

We carry out a range of operations to deliver safe, quality water.

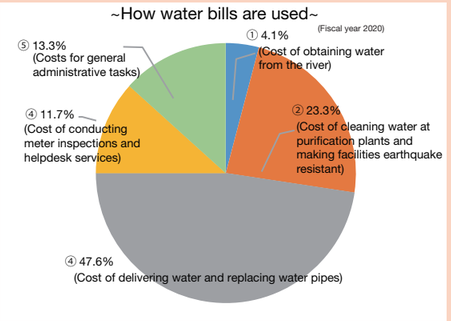
Water bills

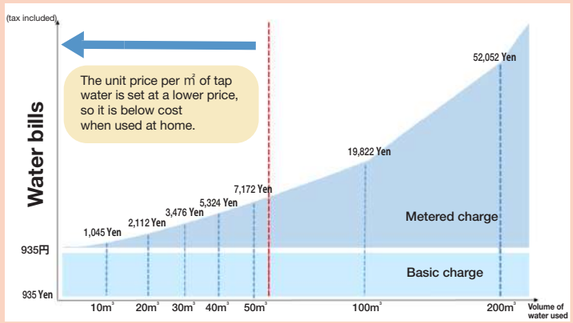
The water charges paid by customers are used to cover the various costs of producing and delivering water.

How water bills work

Water bills = Basic charge + Metered charge

~How water bills are used~





What is the basic charge?

【Charges to be paid by all customers】
All customers pay an equal share to cover part of the costs of meter reading and maintaining water pipes properly.

What is a metered charge?

【Charges according to the amount of water used】
The system uses "progressive water rate", whereby the higher the volume of water used by a customer, the higher the unit price, keeping rates low for households and other customers using small amounts of water.

Standard of water charges in Osaka City

Osaka City's water rates are the lowest in the major cities when assuming household use of 20 cubic meters per month, and even when assuming use of 10 cubic metres per month, the rates are lowest than the average.

(Lowest water rates in order of price...1st place as the lowest rates) As of April 1, 2022

	Large cities with a population of generally more than 1 million (Tokyo and government-designated cities with a water supply population of approximately 1 million or more.)	43 municipalities in Osaka
Per month **20 cubic meters** If used	**1st /13 cities** Osaka city : 2,112 Yen Metropolitan average : 2,958 Yen	**1st /43 municipalities** Osaka city : 2,112 Yen Prefectural average : 2,980 Yen
Per month **10 cubic meters** If use	**4th /13 cities** Osaka city : 1,045 Yen Metropolitan average : 1,273 Yen	**12th /43 municipalities** Osaka city : 1,045 Yen Prefectural average : 1,322 Yen

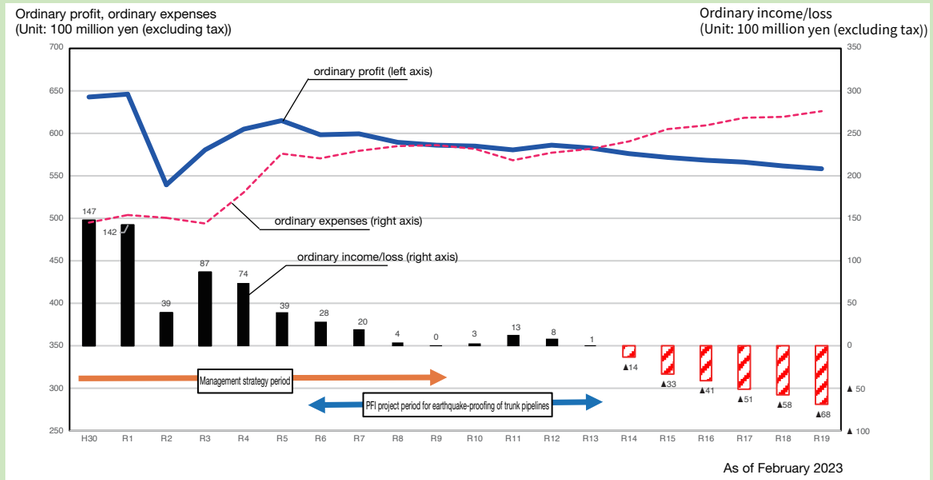
【notes】
① Amounts include consumption tax and local consumption tax equivalents.
② For cities on the charge system by diameter, the rate for a 20 mm diameter is applied.
③ For cities with metered rates, these are included in the price.

(Source: Osaka Municipal Waterworks Bureau)

Osaka City Water Supply Management Strategy (2018-2027)【Revised】

The Management Strategy, a medium- to long-term basic management plan, was formulated in March 2018 (revised in March 2022) and is based on the five basic policies of 'safe and strong water supply', 'convenient water supply', 'evolving water supply', 'contributing water supply' and 'sustainable water supply', and we work every day to ensure the stable delivery of safe, quality water in the future.

Income and expenditure forecast



As of February 2023

Renewal and earthquake-proofing upgrading of water pipes and water treatment plants involves significant project costs, and if electricity and price increases continue in the future, the business situation may become even worse. Although a review of current fee levels (price increases) is likely to be necessary to eliminate the deficit, we will first work to strengthen our management base by continuing to secure income and reduce expenditure through more efficient operations and other measures.

Waterworks Data

• Waterworks business

Operation start
November 13, 1895
(The fourth in Japan, following Yokohama, Hakodate, and Nagasaki)

Population served
2,744,847 People (As of April 1, 2022)

Number of households served
1,668,742 People (As of March 31, 2022)

Water supply coverage
100%

Daily water supply capacity
2,430,000 m³

Annual water supply
392,076,000 m³ (FY 2021)

Maximum daily supply
1,144,300 m³ (FY 2021)
(The largest maximum daily supply was 2,417,700 m³ in 1970.)

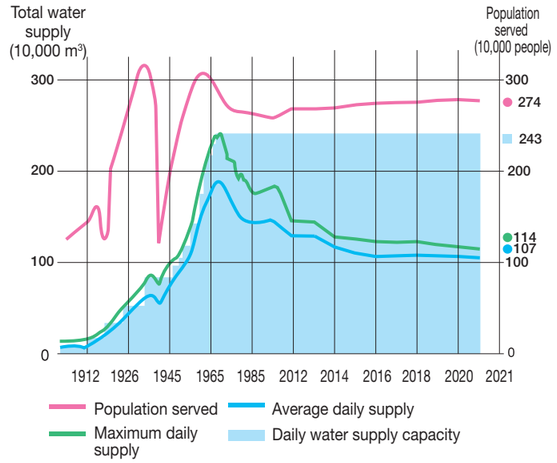
Average daily supply
1,074,181 m³ (FY 2021)

Average domestic daily water consumption per person
249 ℓ (FY 2021)

Total length of aqueducts, water pipes and distribution pipes
5,221 km (As of March 31, 2022)

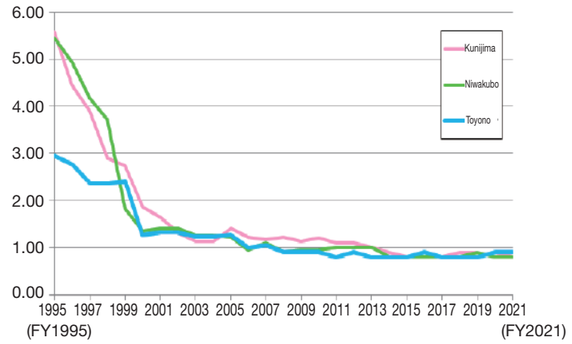
Annual waterworks budget
104,564 million yen (budget for FY 2022)

• Changes in population served, total water supply, and water supply capacity



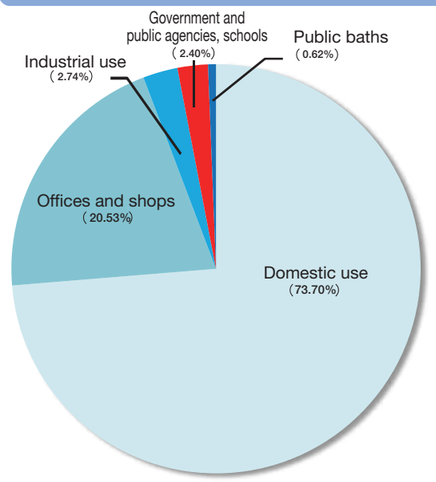
• Reduction of chlorine dosage rate at purification plants

The amount of chlorine used in the chlorination process has been greatly reduced by improvements in river water quality and the introduction of advanced water purification treatment.

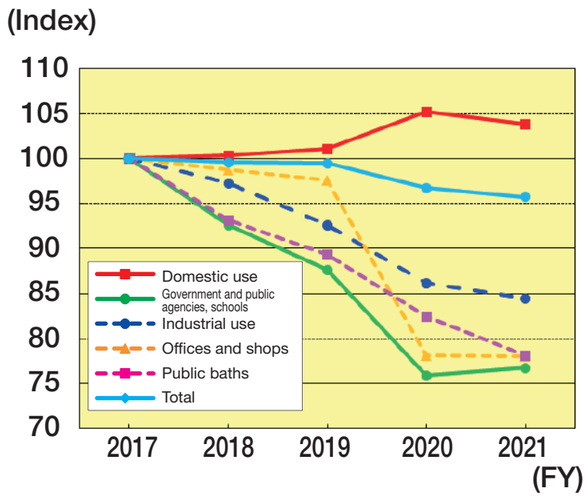


*Data from 2011 pamphlet for FY 1995 to 2004

• Settled water consumption rates by business category

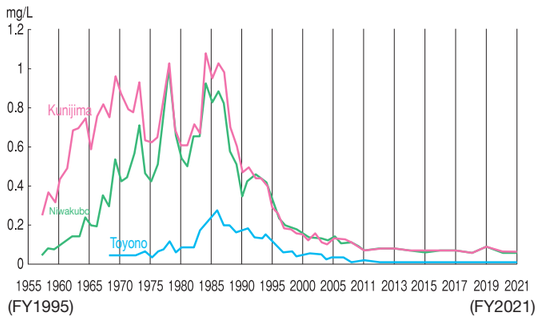


• Settled water consumption index by business category



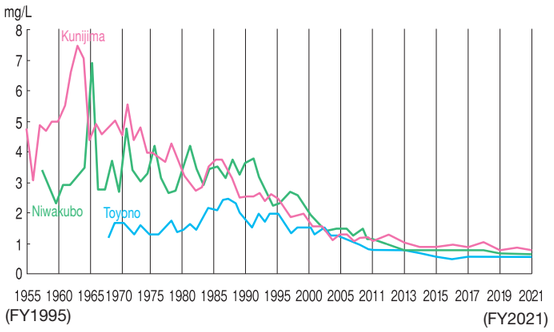
• Ammonia nitrogen

[Ammonia nitrogen]
Ammonia nitrogen is a compound found in industrial effluents and raw wastewater. Its concentration in water is used as an indicator of water contamination, and higher concentrations indicate higher water contamination values. At purification plants, high concentrations of ammonia nitrogen in the source water require larger doses of chlorine for disinfection.



• BOD

[Biochemical Oxygen Demand (BOD)]
BOD indicates the amount of oxygen required to decompose organic matter by microorganisms in a volume of water. A larger BOD figure signifies the presence of a larger volume of organic substances in the water, which means greater water contamination.



Osaka City water quality test results (FY 2021)

Water quality standard specifications

		Parameter	Standard value	Tap water (Average)
	1	Standart plate count bacteria	100colonies per 1 ml or less	0/mL
	2	E.coli	Not detected	Not detected
*	3	Cadmium and its compounds	0.003mg/L or less	Less than 0.0003mg/L
*	4	Mercury and its compounds	0.0005mg/L or less	Less than 0.00005mg/L
*	5	Selenium and its compounds	0.01mg/L or less	Less than 0.001mg/L
	6	Lead and its compounds	0.01mg/L or less	Less than 0.001mg/L
*	7	Arsenic and its compounds	0.01mg/L or less	Less than 0.0005mg/L
	8	Hexavalent chromium compounds	0.02mg/L or less	Less than 0.002mg/L
	9	Nitrite-nitrogen	0.04mg/L or less	Less than 0.004mg/L
	10	Cyanide ions and cyanide chloride	0.01mg/L or less	Less than 0.001mg/L
	11	Nitrate-nitrogen and nitrite-nitrogen	10mg/L or less	0.9mg/L
	12	Fluorine and its compounds	0.8mg/L or less	0.08mg/L
*	13	Boron and its compounds	1.0mg/L or less	0.02mg/L
*	14	Carbon tetrachloride	0.002mg/L or less	Less than 0.0001mg/L
*	15	1,4-Dioxane	0.05mg/L or less	Less than 0.002mg/L
*	16	Cis-1.2-dichloroethylene and trans-1 2-dichloroethylene	0.04mg/L or less	Less than 0.0004mg/L
*	17	Dichloromethane	0.02mg/L or less	Less than 0.001mg/L
*	18	Tetrachloroethylene	0.01mg/L or less	Less than 0.0001mg/L
*	19	Trichloroethylene	0.01mg/L or less	Less than 0.0003mg/L
*	20	Benzene	0.01mg/L or less	Less than 0.001mg/L
	21	Chloric acid	0.6mg/L or less	0.026mg/L
	22	Chloroacetic acid	0.02mg/L or less	Less than 0.0004mg/L
	23	Chloroform	0.06mg/L or less	0.001mg/L
	24	Dichloroacetic acid	0.03mg/L or less	Less than 0.001mg/L
	25	Dibromochloroethane	0.1mg/L or less	0.004mg/L
	26	Bromic acid	0.01mg/L or less	0.001mg/L
	27	Total trihalomethanes [2]	0.1mg/L or less	0.009mg/L
	28	Trichloroacetic acid	0.03mg/L or less	Less than 0.001mg/L
	29	Bromodichloromethane	0.03mg/L or less	0.003mg/L
	30	Bromoform	0.09mg/L or less	0.001mg/L
	31	Formaldehyde	0.08mg/L or less	Less than 0.002mg/L
	32	Zinc and its compounds	1.0mg/L or less	Less than 0.1mg/L
	33	Aluminium and its compounds	0.2mg/L or less	Less than 0.01mg/L
	34	Iron and its compounds	0.3mg/L or less	Less than 0.03mg/L
	35	Copper and its compounds	1.0mg/L or less	Less than 0.1mg/L
	36	Sodium and its compounds	200mg/L or less	16mg/L
	37	Manganese and its compounds	0.05mg/L or less	Less than 0.001mg/L
	38	Chloride ion	200mg/L or less	13mg/L
*	39	Calcium, magnesium, etc. (hardness)	300mg/L or less	42mg/L
*	40	Evaporated residue	500mg/L or less	99mg/L
*	41	Anionic surfactant	0.2mg/L or less	Less than 0.02mg/L
	42	Geosmin	0.00001mg/L or less	Less than 0.000001mg/L
	43	2-methylisoborneol	0.00001mg/L or less	Less than 0.000001mg/L
*	44	Non-ionic surfactant	0.02mg/L or less	Less than 0.002mg/L
*	45	Phenols	0.005mg/L or less	Less than 0.0005mg/L
	46	Organic matter (amount of total organic carbon, TOC)	3mg/L or less	0.7mg/L
	47	pH value	5.8~8.6	7.6
	48	Taste	Normal	Normal
	49	Odor	Normal	Chlorine smell
	50	Chromaticity	5 degrees or less	0.5 degrees or less
	51	Concentration	2 degrees or less	0.1 degrees or less

1) * This is the value measured at the outlet of the water purification plant. Other values are for 21 hydrants in the city

2) For total trihalomethanes, it is the sum of the respective concentrations of chloroform, dibromochloromethane, bromodichloromethane and bromoform.

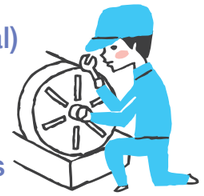
History of Waterworks

The Osaka City waterworks came into operation on November 13, 1895 as the fourth modern waterworks in Japan, following Yokohama, Hakodate, and Nagasaki. Since then, the waterworks system has been continuously supporting and improving the lifestyle of the city's population. In March 2000, the city started providing all customers in the city with water treated with the advanced water treatment system.

Year	Events for the Osaka Municipal Waterworks Bureau
1886	Requested H. S. Palmer to design the waterworks for Osaka.
1890	National ordinance for waterworks was enacted.
	Installation of waterworks was resolved by the City Council.
1895	The installation of waterworks was completed and service commenced from the Sakuranomiya Service Reservoir on November 13.
1914	The Kunijima Service Reservoir was completed.
1917	The Waterworks Department was set up.
1942	The Waterworks Department was promoted to the Waterworks Bureau.
1449	The Water Examination Laboratory was established as the first independent waterworks testing agency in Japan.
1952	The bureau was established as a local public enterprise upon the enactment of the Local Public Enterprise Act.
1954	Industrial water supply system partly came into operation.
1955	The construction of industrial water supply system was completed.
1957	The Waterworks Act was enacted.
	Niwakubo Purification Plant was completed.
1966	The Local Ordinance concerning Osaka Municipal Waterworks and Industrial Waterworks Operations was enacted.
1968	Toyono Purification Plant was completed.
1971	The pilot plant for the Kunijima Purification Plant Advanced Water Treatment System was completed.
1988	The water distribution information system was completed.
1989	Operation of the service office online system started.
1955	Celebrated the centennial anniversary of the waterworks operation and opened the Waterworks Museum.
2000	Started provision of water processed by the advancement water treatment system to all regions of the city.
2002	The Waterworks Bureau (WTC office) acquired ISO 14001 certification.
2004	The Osaka Bay Area Industrial Waterworks Enterprise was disbanded and the Osaka City government took over the business management.
2005	The Water Quality Test Laboratory became the first to acquire GLP accreditation in Japan. (Water supply GLP: Code of Good Laboratory Practice for Water Supply Quality Testing)
2006	Three purification plants acquired ISO 9001 certification.
2008	The Waterworks Bureau acquired ISO 22000 certification.
	(Became the first public water supply entity in the world to acquire this certification.)
2022	Start of the Osaka City industrial waterworks specific operation project, etc.
	Public utility management concessionaires operate industrial water supply (10 years in principle)

Waterworks Data (industrial water supply business)

● Industrial water supply business



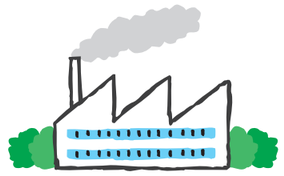
Operation start (partial)
June 15, 1954

Number of companies and factories served
277 companies and 341 factories (as of March 31, 2022)

Daily water supply capacity
151,000 m³ (as of March 31, 2022)

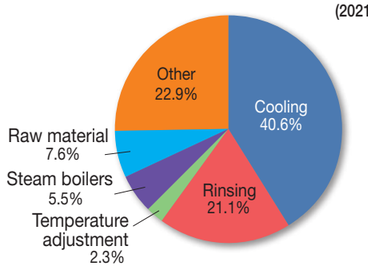
Maximum daily supply
65,090 m³ (FY 2021)
(The largest maximum daily supply was 471,640 m³ in 1970.)

Average daily supply
53,905 m³ (FY 2021)



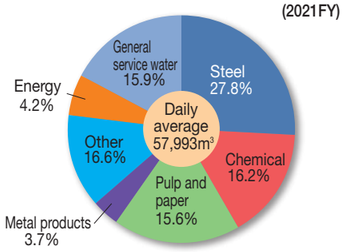
● Main applications

(2021FY)



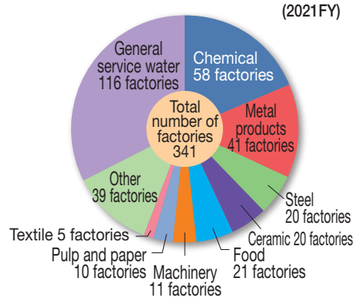
● Use rates by industrial category

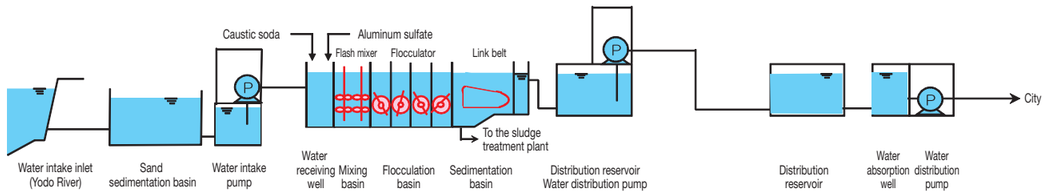
(2021FY)



● Number of factories by industrial category

(2021FY)





Paper manufacturing (for raw materials)

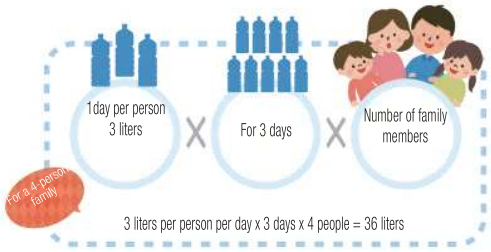
Steel (for cooling)

Miscellaneous water (for landscaping)

MEMO

Prepare drinking water and water containers!!

It is recommended that each household prepare drinking water and containers for water in case of a water outage due to an earthquake or other emergency.



Be careful of bogus Waterworks Bureau staff members and malicious water repairers!

Many fraud cases are occurring, in which bogus Waterworks Bureau staff members defraud customers for repair charges by skillfully deceiving people that their water pipes or sewer pipes are damaged.

The Waterworks Bureau will never conduct any water quality inspection, repair, or cleaning of water pipes unless requested or approved by customers in advance. We do not sell or procure water purifiers, either.

If you are in doubt, ask them to present a staff certificate or commissioned worker's certificate or contact the Customer Service Center or the nearest consumer center.

Contact us for starting or suspending water service and other inquiries.

Customer Center

TEL 06-6458-1132

FAX 06-6458-2100

Osaka Municipal Waterworks Bureau Search

http://www.city.osaka.lg.jp/suido/

- Service hours (reception hours) /
  - Weekday (Monday through Friday): 8:00 AM to 8:00 PM
  - Saturday: 9:00 AM to 5:00 PM
  - December 29 and 30: 9:00 AM to 5:00 PM
  - (Closed on December 31 through January 3)
  - Open on Sundays and holidays in March and April: 9:00 AM to 5:00 PM
- Work for the installation or removal of water meters or suspension of water service will be conducted from 9:00 AM to 5:30 PM on weekdays.
- The Customer Service Center provides recorded guidance on emergency contact information for people who discover water leakage in the street or in your home at night or on holidays.
- All calls will be recorded in order to grasp the content of customer calls accurately.

Water Supply System in Osaka

General Affairs Section, General Affairs Division, Osaka Municipal Waterworks Bureau 2-1-10 Nanko-kita, Suminoe-ku, Osaka 559-8558

TEL.06-6616-5404 FAX.06-6616-5409 Website: http://www.city.osaka.lg.jp/suido/

Mobile site of Osaka Municipal Waterworks Bureau is available.

* Scan the QR code on the right with the camera of your mobile phone to access.

March 2023