



OCWD FACTS

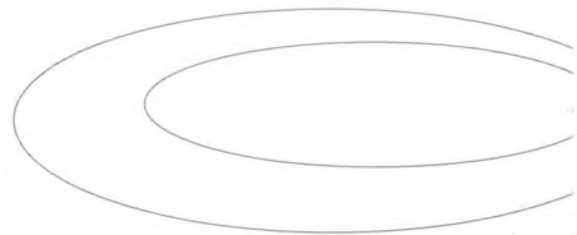
Orange County Water District (OCWD)

was formed in 1933 by a special act of the California Legislature. Created to protect Orange County's rights to Santa Ana River water, OCWD's primary responsibility is managing the vast groundwater basin under north and central Orange County.

Since 1933, OCWD has replenished and maintained the groundwater basin at safe levels while more than doubling the basin's annual yield. This important source provides local groundwater producers with a reliable supply of high-quality water.

Orange County's groundwater basin supplies water to more than 20 cities and water agencies, serving more than 2 million Orange County residents. OCWD primarily recharges the basin with water from the Santa Ana River and to a lesser extent with imported water purchased from the Metropolitan Water District of Southern California. OCWD currently holds rights to all Santa Ana River flows reaching Prado Dam. Water

enters the groundwater basin via settling or percolation ponds in the cities of Anaheim and Orange. Behind Prado Dam (constructed and owned by the U.S. Army Corps of Engineers for flood prevention), OCWD owns 2,400 acres in Riverside County, which OCWD uses for water conservation, water quality improvement and environmental enhancement.



OCWD carries out several key functions to manage and improve the groundwater basin.

OCWD monitors the groundwater taken out each year to ensure that the basin is not overdrawn; refills the basin; and carries out an assessment program to pay for operating expenses and the cost of imported replenishment water. The groundwater basin holds millions of acre-feet of water, of which about 1.25 to 1.5 million acre-feet is usable (an acre-foot satisfies the needs of two families for one year). The groundwater basin provides 75 percent of all water used within the District.

Protection, safety and enhancement of groundwater are OCWD's highest priorities. With one of the most sophisticated groundwater protection programs in the country, OCWD uses 646 wells providing more than 1,200 sampling points—from which OCWD takes more than 13,000 water samples and conducts more than 300,000 analyses every year. OCWD's monitoring program looks for more than 190 constituents—which is more than the requirements of health agencies.

Chemists in OCWD's state-certified laboratory use sophisticated instruments to test groundwater samples and protect public health.



Reverse osmosis membranes at OCWD's Water Factory 21 are the final purification step in turning wastewater into high-quality purified water—meeting drinking water requirements—that can be injected into the groundwater basin to prevent seawater contamination of Orange County's drinking water.

Since 1975, OCWD has operated Water Factory 21, a water purification plant that takes treated wastewater from the Orange County Sanitation District, purifies it to beyond drinking water standards, and then injects it into shallow aquifers near the coast to form a fresh water barrier, blocking seawater intrusion. This water eventually becomes a part of the groundwater basin and our water supply.

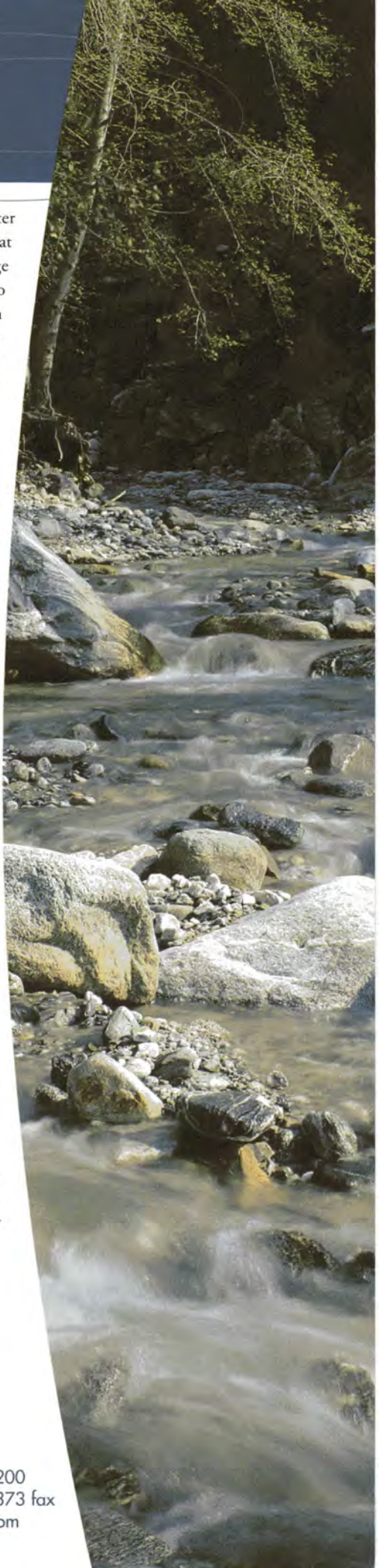
Water use efficiency is a major part of OCWD's ongoing efforts to increase available local water supplies. Examples of water use efficiency include providing ultra low-flush toilets for free and organizing a hotel towel and sheet program.

OCWD is leading the way in purification of wastewater for reuse to provide a reliable, new, drought-proof source of water. The Groundwater Replenishment System, a proposed project sponsored by OCWD and the Orange County Sanitation District, will produce enough near distilled quality water for 200,000 families.

Additional efforts to increase local water supplies include expanding the capacity of the existing percolation facilities, treating poor quality water to make it useable, studying methods to extend the life of filtration membranes, improving advanced purification technologies, using bacteria to remove contaminants, and studying the quality of Santa Ana River water and other water-related issues. Other OCWD groundwater management and water quality activities focus on expanding the Prado wetlands, groundwater treatment at well heads, computer modeling of the groundwater basin and conservation of endangered or threatened species.

Orange County's groundwater basin supplies 75% of the water needs for residents and businesses in Anaheim, Buena Park, Costa Mesa, Cypress, Fountain Valley, Fullerton, Garden Grove, Huntington Beach, Newport Beach, Irvine, La Palma, Los Alamitos, Orange, Placentia, Santa Ana, Seal Beach, Stanton, Tustin, Villa Park, Westminster, and Yorba Linda.

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A *safe*,

higher *quality*,

purified source

of *water* for

Orange County.



Water is the *essence* of life

Fresh water is one of Orange County's most precious natural resources and an integral part of our lives. It makes this semi-arid desert region one of the most envied places in the world to live. Whether it's for maintaining world-class golf courses, cultivating lush landscaping, washing cars, eating fresh fruits and vegetables from local irrigated crops, enjoying a backyard spa, taking a bath or shower, or quenching your thirst with an ice cold drink – water is the essence of life.

Within the next 20 years, Orange County's population is forecast to increase by more than 20 percent. As our population grows, so will our demand for safe, reliable drinking water. If Orange County does not take steps now, we will have a water crisis. We must look at innovative ways to secure a safe, reliable alternative source of water for the years ahead.

The Orange County Water District and the Orange County Sanitation District are developing a cost-effective solution to diversify Orange County's water supply by providing a supplemental source of high quality water.

The two agencies are sponsoring a proposed water purification project, known as the Groundwater Replenishment System. The System will take highly treated wastewater from the Orange County Sanitation District and purify it far beyond required drinking water standards using microfiltration, reverse osmosis and ultraviolet disinfection. The water will be percolated through the ground into Orange County's underground aquifers or storage basins where it will blend with groundwater from other sources, improving the overall quality of existing groundwater.

This water will also help to maintain an underground freshwater barrier to keep ocean water out of the underground storage basin and, ultimately, our drinking water.

The *future* is now

A new era has dawned in the water industry. No longer can we simply look to large dams and vast canal systems to redirect the natural water flow of the earth.

Societies today must look to new, creative and environmentally friendly methods to provide our future water. These methods include being much more efficient with the water that is available, storing water in underground basins to prevent evaporation, transferring water from areas where there is excess to where there are shortages, and purifying and reusing our limited water supplies.

The Groundwater Replenishment System is a landmark water project for the future. Environmentally sound, it will serve as a model to coastal, arid regions throughout the world, where fresh water is at a premium.

Purified drinking water

The water we drink today is essentially the same water that was here thousands of years ago – not a drop has been lost or gained. The population on earth, however, continues to grow rapidly – creating a significant increase in demand for water.

For decades, Orange County and other communities have been injecting purified water into seawater intrusion barriers and into the ground, where it blends with groundwater. From Los Angeles to the suburbs of our nation's capital and throughout the world, purified water has been used to recharge groundwater basins. Additionally, many people already drink purified wastewater that has been discharged into lakes and rivers.

Drinking water supplies are limited, so we must diversify our water supply through reuse and reduce demand through conservation. With the Groundwater Replenishment System and more efficient water practices, we can help ensure a safe, reliable, high quality drinking water supply for future generations. The Groundwater Replenishment System is just one part of the overall water plan for Orange County.





Benefits of the Groundwater Replenishment System

- 💧 The Groundwater Replenishment System will provide a new supply of purified water, enough for up to 200,000 north and central Orange County families annually.
- 💧 Groundwater Replenishment System water will be available regardless of rainfall levels or drought.
- 💧 The Groundwater Replenishment System will improve the quality of Orange County's groundwater by adding purified water to the natural underground storage basin.
- 💧 Purified water from the Groundwater Replenishment System will help soften Orange County's drinking water, reducing corrosion and scaling of plumbing fixtures and appliances.
- 💧 The Groundwater Replenishment System will diversify our water supply and lessen our future dependence on imported water from the Colorado River and Northern California.
- 💧 Producing Groundwater Replenishment System water requires 50 percent less energy than importing water to Orange County.

Safety

Public health and safety will be the primary focus of the Groundwater Replenishment System. Testing facilities have already been monitoring water from this process for several years. The water, treated far beyond state and national drinking water standards, will be continuously monitored by computerized equipment, with oversight by district and local laboratories and outside health and regulatory agencies. If the water does not meet the highest quality standards, the System simply shuts down.

Steps to *pure, clean* water

After having gone through three purification processes at the Orange County Sanitation District, the highly treated wastewater is clear. It is now ready to undergo an additional three-step, high-tech purification process of microfiltration, reverse osmosis and ultraviolet disinfection at the Orange County Water District. Once purified, it will be sent to percolation facilities or recharge injection wells for a final natural filtering process through the ground.

About Microfiltration (MF)

Microfiltration is a low-pressure membrane process that takes small suspended particles and other materials out of the water. MF provides the most efficient preparation of water for reverse osmosis. MF is used in commercial industries to process food, fruit juices and soda beverages; in computer chip manufacturing; and to sterilize medicines that cannot be heated.

About Reverse Osmosis (RO)

Reverse osmosis is a high-pressure membrane process that forces water through a thin membrane to filter out minerals and

contaminants, including salts, viruses, pesticides and other materials. The RO membrane is like a microscopic strainer that essentially allows only the water molecules to pass through.

About Ultraviolet (UV) Disinfection

During ultraviolet disinfection, water is exposed to ultraviolet (UV) light, which acts as concentrated sunlight to provide an additional barrier of protection. This step provides extra assurance that no unwanted contaminants will pass through the system and that the water will be the highest quality possible.

About Natural Filtering

The final phase of the purification process for water destined for the groundwater basin occurs as the water is filtered through the ground en route to deep aquifers in our underground basin – the same natural filtering path taken by rainwater. The water blends with groundwater from other sources, including Northern California and Colorado River water, for at least one year – and in most cases longer – before being extracted by wells into the drinking water supply.



Did you know?

- 💧 Water from the Groundwater Replenishment System will be more reliable and less expensive to produce than future imported water from Northern California and the Colorado River.
- 💧 Groundwater Replenishment System water will be safe and of higher quality than any other sources of water currently available.
- 💧 The Groundwater Replenishment System will have no adverse impacts on air quality, land or energy use, marine environment, endangered species or native habitat.
- 💧 Groundwater Replenishment System water will actually improve the quality of Orange County's groundwater.
- 💧 No new taxpayer dollars will be used to build or operate the Groundwater Replenishment System.
- 💧 The Orange County Water District and the Orange County Sanitation District have two of the finest water quality laboratories in the state, performing hundreds of thousands of analyses a year on thousands of water samples to ensure the safety of our water.
- 💧 Nearly 97 percent of the earth's water is salt water. Only three percent is fresh water, most of which is ice and snow at polar caps, leaving less than one percent of all fresh water for human use.
- 💧 In 1995 the Orange County Grand Jury issued a report entitled "Wider Use of Orange County Purified Water," which endorsed the search for new uses of purified wastewater.
- 💧 The proposed Groundwater Replenishment System was recognized as the California WaterReuse Association's "Planned Project of the Year" in 1998. The Award recognized the System as one of the best planned projects in the state due to the benefits it will provide in large-scale water purification research and in the further development of water purification membrane technology.
- 💧 The future of water purification in the world is membrane technology.



A joint effort of the Orange County
Water District and the Orange
County Sanitation District

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