



CITY OF SANTA BARBARA DESALINATION FAQs

About Santa Barbara's Desalination Plant

Why does the City need a desalination plant?

The City of Santa Barbara relies on multiple water sources to meet customer's needs – including surface water from Gibraltar Reservoir, Cachuma Reservoir, the State Water Project, groundwater, and conservation. With recurring droughts, some of these sources are less reliable or unavailable, making desal water a key addition.

How does desalination work?

Seawater enters the City's desalination facility from 2,500 feet offshore, passing through the wedge wire screens (see photo page 3) at velocities of less than half a foot per second (which is less than typical ocean currents). Once on shore, the seawater goes through a series of filters that remove sediment, bacteria, viruses, and minerals (including salt), to produce ultra-pure water. The City's desalination facility uses reverse osmosis treatment for removal of salt from seawater. Before the finished water is ready to be pumped into the water system and distributed to customers, natural minerals are reintroduced into the water to make it compatible with the City's other water supplies. The waste product from the desalination process, referred to as brine, is about twice as salty as normal seawater. The brine is blended with the City's treated wastewater and is discharged into the ocean over a mile and a half offshore. Discharge flow rates of brine and treated wastewater leaving the City's outfall pipe are controlled to protect sea life and comply with state regulations.

What percentage of the City's water supply will the desalination plant immediately provide?

The plant produces 3,125 acre-feet of water per year, which is approximately 30 percent of annual City demands. Extraordinary water conservation from residents and businesses will remain critical to meeting water demands during the current drought.

How much desalinated water should water customers expect to receive?

Depending on water supplies, water demands, and where customers are located in Santa Barbara, water customers should expect to receive some combination of surface water supplies from Cachuma and Gibraltar reservoirs, the State Water Project, groundwater supplies from City wells and desalinated water. Please see our [desalinated water distribution map](#).

What is the maximum permitted capacity of the desalination plant?

The desalination plant is currently designed to produce 3,125 acre-feet per year (AFY) or approximately 3 million gallons of water per day. The City's permits allow for up to 10,000 AFY of water supply. An increased plant capacity, up to 7,500 AFY, is currently estimated to cost an additional \$35 million and would require additional water rate increases.

Is conservation still needed now that we have desal water?

Desalinated water alone cannot solve all of our water challenges; the City continues to examine all opportunities to increase the quantity and improve the quality of our water supplies. Conservation will continue to be an important part of ensuring a sustainable water supply for Santa Barbara. The impacts of our current drought will last several years and our groundwater basins will take five to ten years to recharge.

Will the desalination plant be operated after the drought?

The City's current adopted policy considers desalinated water as a drought supply. However, the City's existing permits allow for a range of operating scenarios which could include non-drought operations. When the drought emergency ends and our groundwater supplies have recovered from drought-related pumping, the role of desalinated water in the City's Long Term Water Supply Plan will be considered by the City Council. The City Council is expected to engage in this policy discussion as part of a Long-Term Water Supply Plan update, which will begin after the current drought emergency has abated.

Is the desalination plant a regional facility?

Currently, the City is the sole owner of the plant and has continued to renew its permits since its original construction in 1991. The desalination plant could potentially be expanded to serve as a regional water supply facility to benefit other South Coast communities. Regionalizing the desal plant could be accomplished through approval of water supply agreements and exchanges with other South Coast water agencies. When constructed in 1991, Montecito Water District (Montecito WD) and Goleta Water District (Goleta WD) were partners in the temporary desal plant project. To make the facility a permanent water supply, an extensive environmental review and permitting process was required. When the review and permitting efforts were completed in 1996, Montecito Water District and Goleta Water District declined to participate in the project further and did not pay for the process of making the facility permanent.

Are plant tours available?

The desalination plant is configured to take as little space as possible on a relatively small lot. This reduced our impact to the surrounding area, but also makes public tours impractical at this time. City staff welcomes the opportunity to speak to groups or classes about the facility, and can be reached at (805) 564-5387.

Desal Water Quality

What changes should water customers expect related to desalinated water?

The most notable difference with desal water is that it is generally softer. Softer water contains lower levels of naturally occurring calcium and magnesium, meaning it could eliminate or reduce the use of water softeners for some customers, and may require some businesses to change their private water conditioning system settings. This [map](#) depicts the approximate region and percentages of desal water that will be delivered to City of Santa Barbara water customers. Some customers may also experience seasonal changes in their water quality when the blending of desal water, groundwater, and surface water supplies fluctuates.

How will the City treat desalinated water to ensure it does not cause corrosion or other negative impacts to water pipes or supporting infrastructure?

The desal treatment process includes conditioning the water to make it non-corrosive. The City is also performing additional lead and copper monitoring and corrosion testing in the distribution system to ensure the desal water has no negative impacts to the City's water pipes and supporting infrastructure.

Desalination Plant and Environmental Stewardship

What are the environmental impacts of desalination?

The City has conducted extensive environmental reviews to assess potential impacts of desalination, and has also incorporated new designs and system into the plant upgrade to minimize impacts (see below).

Has desalination technology improved since the original plant was constructed?

The reactivated plant uses 40 percent less energy than the original plant by using high-efficiency pumps, motors and improved filter technology, which greatly reduces its electricity demand and carbon footprint.

What does the intake look like?

The ocean intake pipes are equipped with wedge wire screens recognized by the State Water Resources Control Board as a best available technology for screened ocean intakes. The screens are made of durable copper-nickel alloy and have 1 millimeter openings to minimize marine life entrainment and impingement. For comparison, the original ocean intake screens were approximately 3.5" by ¾" rectangular screens - a reduction of approximately 95 percent in screen size.



Desal Plant Reactivation and Long-Term Plans

Why did the City put the original plant into long-term storage?

When the original facility was constructed in 1991, the desalination process technology only allowed relatively short periods of inactivity before the reverse osmosis membranes (used for treatment) began to deteriorate. Due to sufficient surface supplies and significantly reduced demand following the drought, the City put the plant into long-term storage, since it was the most cost-effective option for ratepayers. Significant technological advances have been made since that time.

How much does desalination cost?

The costs for the desal plant and other water supplies are included in customer rates and charges. The cost to reactivate the plant is approximately \$70 million. With better loan terms and an improved design that saves on operating costs, the annual cost of desalination is less than originally estimated. Annual operating costs are estimated to be about \$4.1 million at full production (for 3,125 AFY of water supply), and about \$1.4 million in non-operation or standby mode. The plant could be put in standby mode during certain periods to reduce operating costs.

Why did the desalination plant construction and reactivation cost more than originally budgeted?

There were unforeseen conditions, such as contaminated soils that had to be remediated, and submerged infrastructure planned to be reused had to be replaced. The unanticipated construction challenges for the desal plant required an additional investment of \$15 million. While this is a substantial increase, these funds are necessary for successful plant completion, and an investment in securing Santa Barbara's water supply future.

How will the desalination costs be financed?

The City has taken out a State Revolving Fund Loan to finance the \$71 million capital cost to reactivate the desalination plant. The terms of this loan are a 20-year payback period with a 1.6 percent interest rate, which results in annual payments of approximately \$4.2 million.

What happened to the money when the City sold off the original membranes?

When the 1990s desalination plant was put into long-term storage, a portion of the reverse osmosis membrane treatment equipment was sold, reducing the capacity of the original regional facility to the capacity required for the City's needs only. The sale helped to recuperate the City's costs associated with permitting of the permanent facility, and also reduced the long-term costs to rate payers for maintaining the facility.