



# OCEAN DAY FACT SHEET OCEAN DESALINATION

## Position Statement

Given its significant costs to ratepayers, high energy use, GHG emissions, and marine life impacts, ocean desalination should be considered only as an option of last resort. Jurisdictions should invest in ocean desalination only after they have pursued all other feasible water efficiency, stormwater capture, and water recycling investments. Any ocean desalination projects that are constructed should be scaled to meet demonstrated needs and these projects should be designed to use subsurface intakes and other approaches that minimize marine impacts

- ❖ Ocean desalination is the most expensive way to produce water, costing on average four to eight times more than other options.
- ❖ Ocean desalination is the most energy intensive water supply option, resulting in significant greenhouse gas emissions.
- ❖ Large ocean desalination projects are likely to have significant negative impacts to the valuable marine resources that California has spent millions of dollars to protect.
- ❖ Large ocean desalination projects are financially risky for ratepayers and taxpayers. Experiences in places like California and Tampa Bay in the U.S, as well as Sydney in Australia show that large scale ocean desalination plants take many years to build and bring into the drinking water system. Some of the largest of these plants have been shut down when droughts ended, and water agencies cannot justify the high cost of the desalinated water to their ratepayers.

## Ocean Desalination is Very Expensive , Putting an Unnecessary Burden on Disadvantaged Communities

Ocean desalinated water typically costs far more than preferred water sources such as conservation, efficiency, stormwater capture, and recycling. For example, the average price per acre-foot (af) of water produced by ocean desalination is four to eight times higher than alternative sources. These costs are passed on to consumers, some of whom, already struggle to meet their monthly utility bills.<sup>1</sup>

| <b>Water Supply</b>     | <b>Cost per acre-foot (af)<sup>2</sup></b> |
|-------------------------|--|
| Agricultural Efficiency | \$35 to \$900                              |
| Water Efficiency        | \$223 to \$522                             |
| Water Recycling         | \$300 to \$1,300                           |
| Ocean Desalination      | \$1,900 to more than \$3,000               |

According to independent studies, the Orange County Water Recycling Facility is between 35 percent and 75 percent less expensive than ocean desalination and will consume half the energy. Furthermore, in 2019, we now have several years of data on the Poseidon Resources (Poseidon) Carlsbad Desalination Plant near San Diego, where the cost of water has only risen, and serious questions remain about ecological harm and the salinity<sup>3</sup> of the

<sup>1</sup> In 2019, a report from UCLA scholars was released that addresses ongoing concerns about the impact that the desalination plant proposal at Huntington Beach will have on disadvantaged communities. The report can be found at [https://innovation.luskin.ucla.edu/wp-content/uploads/2019/04/Analyzing\\_Southern\\_CA\\_Supply\\_Investments\\_from\\_a\\_Human\\_Right\\_to\\_Water\\_Perspective.pdf](https://innovation.luskin.ucla.edu/wp-content/uploads/2019/04/Analyzing_Southern_CA_Supply_Investments_from_a_Human_Right_to_Water_Perspective.pdf)

<sup>2</sup> An acre-foot is a unit of volume equal to the volume of water one acre (0.405 hectare) in area and one foot (30.48 cm) in depth; 43,560 cubic feet (1233.5 m<sup>3</sup>). This is the typical volume measurement for water in the Southwest U.S.

<sup>3</sup> You can download a recent study of the Carlsbad ocean discharge at <https://www.mdpi.com/2073-4441/11/2/208>. Petersen,

discharged water. For example, in 2017, the cost/af was *projected* to be \$2,368. The *actual cost* ended up being \$2,412/af. In 2019, the *projected cost* was \$2,559/af and again, the *actual cost was higher* at \$2,685/af.<sup>4</sup> Currently, San Diego now has some of the highest water rates in the entire United States. In 2019, San Diegans will see a 6.28% total increase to their water bills due to “infrastructure investments, water quality testing, and costs that are passed down from other agencies.”<sup>5</sup>

### **Ocean Desalination is Unreliable**

One key claim of water agencies and private companies that are pushing desalination onto the agenda is that it is “reliable.” However, this claim has only become more problematic over the years, and especially now in light of the historical record of large-scale desalination globally. For example, in 1999, Florida approved the Tampa Bay desalination facility with a capacity of 25 million gallons per day (mg/d). Project proponent – Poseidon – claimed that the cost of water would be very low and competitive with other local sources. The project was fraught with difficulties, and after 7 years, was still not in operation due to serious management and technological failures. Tampa Bay Water, the regional drinking water utility, actually had to buy out Poseidon’s interest in the plant to complete it, which ended up saving the utility \$1 million/year in financing charges.<sup>6</sup> Now, after several years of redesign, the most recent Comprehensive Annual Financial Report indicates that Tampa Bay Water produced only 5.8 mg/d of desalinated water in 2018, which has been on the steady decline from the 2009 amount of 16.6 mg/d. The renovation of this plant was a joint venture of American Water and Acciona, a Spanish conglomerate headquartered in Madrid.

Poseidon resurfaced in California. In 2016, their project in Carlsbad failed to deliver nearly 20 percent of the water that San Diego ordered from it. During the same period, there were 46 days when it delivered no water at all, according to business and regulatory filings by the plant’s then-owner, Poseidon. The plant’s reliability has worsened since it first opened. In 2017, Poseidon only filled 70 percent of their promised allocation. In 2018, there was more than a 5,000 af shortage between the amount of water requested and the amount delivered. Finally, in October of 2019, it was announced that Poseidon transferred ownership of the plant to Aberdeen Standard Investments, headquartered in Aberdeen, Scotland.

### **We Do Not Oppose All Desalination**

Monterey’s CalAm project provides an example of how ocean desalination can be accomplished in a manner that is responsible to citizens and the environment. CalAm was required to reduce its dependence on the Carmel River; which it did by first implementing water efficiency and water recycling measures before considering desalination. By prioritizing water efficiency and recycling, CalAm scaled its facility appropriately based on need, thereby reducing cost and energy demand. The smaller sized facility allowed CalAm to use environmentally preferred alternatives that include subsurface intakes and brine dilution with treated wastewater. This type of planning and flexibility is what is needed in considering ocean desalination in California, not the one-size fits all business model that some private corporations are currently promoting. Currently, another proposal that is promising for its attention to ecology and local need is Doheny Beach near Dana Point, which the Orange County Coastkeeper and other environmental advocacy groups have supported. This project is being spearheaded by the South Coast Water District.

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Karen Lykkebo, Nadine Heck, Borja G. Reguero, Donald Potts, Armen Hovagimian, and Adina Paytan. "Biological and physical effects of brine discharge from the carlsbad desalination plant and implications for future desalination plant constructions." *Water* 11, no. 2 (2019): 208.

<sup>4</sup> All based upon the San Diego County Water Authority’s Fiscal Year 2017-2019 Reporting for the Carlsbad plant.

<sup>5</sup> See the full story on this issue here at <https://www.kpbs.org/news/2019/sep/02/san-diego-water-rates-going-63-percent-year/>

<sup>6</sup> Some of the history of the Tampa Bay project can be found at <https://www.water-technology.net/projects/tampa/>



## **Ocean Desalination Does Not Help the Delta, Colorado River, or Any Other Instream Flows**

Contrary to what one might expect, water agencies are not proposing to leave water in existing waterways if and when they implement desalination. Southern California's water demand is too great to be offset by desalination, and government agencies are not willing to pay for desalination to stop diversions from the Delta or the Colorado River. For example, the Metropolitan Water District of Southern California, the region's largest water utility, now provides subsidies for desalination projects, but does so on the condition that desalination does not replace imported water, because of already existing contractual agreements.

### **Learn from Australia's Mistakes**

When evaluating expensive desalination projects in response to the well-documented threats of climate extremes and the potential for future droughts, California should learn from the past mistakes of Australia. Severe drought from the mid-1990s until 2012 prompted Australia to construct six large-scale ocean desalination plants at a cost of \$10 billion Australian Dollars to provide an alternative source of drinking water, with the largest in Victoria costing 3.5 billion Australian dollars.<sup>7</sup> The plants took years to build. By the time they were operational, the drought had eased, and cheaper alternatives made the water from the desalination plants impractical. And, with the plants running, agencies using these plants saw increases to their water bills. One of the largest plants, in Sydney, only was run from 2010-2012. While that plant is now being restarted, which itself is a 9-month process, residents are looking at increases to their water bills in the range of 25-45 Australian dollars.

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<sup>7</sup> In 2019, one U.S. dollar is roughly equivalent to 1.45 Australian dollars. For example, the desalination plant in question here would have cost 2.41 billion U.S. dollars.