

What about desalination?

Desalination is the process of removing salts from seawater or brackish water through distillation or filtration to produce fresh, drinkable water. This process is used in various arid regions around the world, from Israel to Carlsbad, California.

In order to meet the water needs of Silicon Valley, Santa Clara Valley Water District (Valley Water) conducts long-term planning to evaluate all options and select alternatives that would best enable us to provide a safe, clean, reliable water supply. One of the options we have evaluated is desalination.

Bay Area desalination

Valley Water has partnered with five other Bay Area water agencies since 2015 to examine whether desalination was feasible in the region. The evaluation criteria included the quality of water that would feed a desalination plant as well as the cost of power and infrastructure improvements, review of permitting and water rights issues, public acceptance and environmental justice.

The most desirable location for a regional plant would be a site that has the lowest salinity source water, which requires less energy to desalinate. The study found that a desalination plant near Pittsburg, California would be the most cost-effective and technically feasible. The site also offers source water that is generally brackish, with salinity well below that of sea water, thus lowering the treatment cost. Three South Bay sites were also evaluated for their suitability but the sites ranked poorly.

Earlier, the agencies built a pilot demonstration plant at the same site near Pittsburg to determine the feasibility of a

larger-scale desalination operation. This small plant operated for one year to collect pertinent data for the agencies to consider the best options to pursue for their water supplies.

Here's a brief look at the factors that must be considered for desalination to move forward.

Considering desal: environment, energy and economics

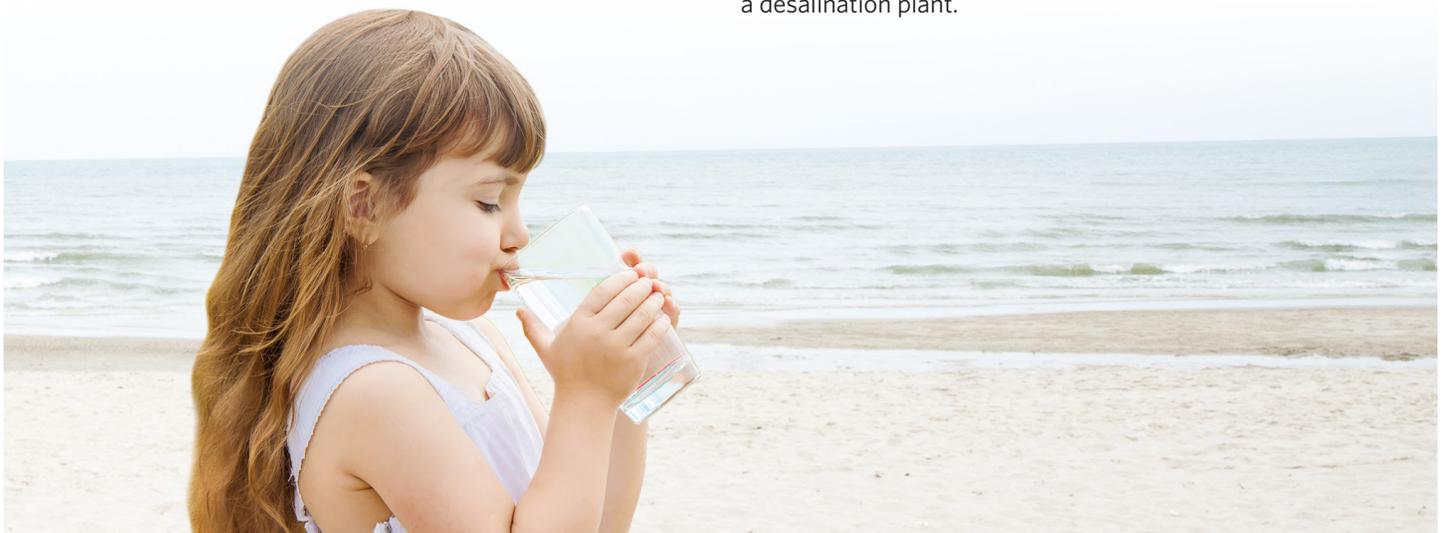
Environment

To desalinate water, the water must first be transferred from an ocean or brackish water source to the desalination plant. Once it is filtered, the treated water is moved through the water delivery system while the salts, solids and other matter, known as brine, that have been filtered out of the water must be properly managed.

The intake process and disposal of brine pose environmental challenges. Drawing water into a desalination plant, depending on where and how it is done, can threaten marine life. Special precautions are necessary to avoid trapping and killing sea life. Special precautions are also necessary when disposing of the highly saline brine. If it is returned to the sea or bay, it needs to be done carefully so the extremely salty water does not harm marine life.

Energy

The energy required in the desalination treatment process is also a major challenge. Filtering the salts and other compounds from sea water must be done at very high pressure, which requires a significant amount of energy. The impact to our carbon footprint must be considered in any proposal to develop a desalination plant.



Economics

Although the pilot demonstration plant near Pittsburg still exists, in order to provide a useful amount of water to the region, a larger, permanent plant would need to be constructed.

The cost to build a plant that would produce 20 million gallons a day is estimated at approximately \$200 million. It is currently estimated that this regional plant could provide about 5,500 acre-feet of water to Santa Clara County in dry years.



Focus on water recycling and purification

While we keep desalination as a possibility in our water supply portfolio, Valley Water has been moving steadily forward with plans to develop potable reuse of advanced purified water. Most notable among these has been the operation of the Silicon Valley Advanced Water Purification Center, launched in 2014, which is improving the quality of non-potable recycled water and serving as a demonstration facility for water purification technology for potable uses.

The focus on water recycling and purification takes a page from Mother Nature – all water on the planet is reused, and recycling water, just like recycling plastic and glass, is good for the environment. Recycling and purifying water allows

Valley Water to be more nimble in responding to a drought by providing a drought-resistant, locally controlled supply of water to meet our needs now and into the future.

Valley Water's goal is to expand recycled and advanced purified water to meet at least 10 percent of total water demands by 2028, and to do that, we are partnering with cities, recycled water producers, and water retailers around the county. Specific projects range from expanding non-potable recycled water (purple pipe) for landscaping and industrial purposes to projects that would use advanced purified water to replenish our groundwater basins for potable use. Through five proposed projects, we could deliver up to 45,000 acre-feet per year of additional water.

To learn more about the Silicon Valley Advanced Water Purification Center, visit www.purewater4u.org. We continue to evaluate desalination as an option to diversify our water supply.

Cost comparison

Regional desalination at Pittsburg:

\$1,600 – \$1,800/acre-foot (AF)

Water conservation:

\$50 – \$500/AF

Non-potable recycled water (purple pipe):

\$300 – \$2,800/AF

Potable reuse of advanced purified water:

\$1,600 – \$2,000/AF

CONTACT US

For more information, contact **Samantha Greene** at (408) 630-2275 or by email at SGreene@valleywater.org. Or use our **Access Valley Water** customer request and information system at <https://delivr.com/2yukx> to find out the latest information on Valley Water projects or to submit questions, complaints or compliments directly to a Valley Water staff person.



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