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Projects set to tap the ocean for water

Desalination facilities planned for the county

By [Michael Burge](#), Union-Tribune Staff Writer

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MAJOR FACILITIES

The world's largest ocean-water desalination plants in operation or in the planning stages include:

Camp Pendleton: Proposed for 150 million gallons per day, starting in 2018.

Oran, Algeria: Proposed for 132 mgd, starting in 2011.

Melbourne, Australia: Proposed for 108 mgd, starting in 2011.

Sydney, Australia: Proposed for 66 mgd, starting next year.

Ashkelon, Israel: Started in 2005, generates 86 mgd.

Carlsbad: Proposed for 50 mgd, starting in 2012.

Fujairah, United Arab Emirates: Started in 2003, generates 45 mgd.

SOURCE: *Water Desalination Report*

With a large-scale desalination plant approved for the Carlsbad coast and others possibly on tap nearby, San Diego County is positioned to become a global leader in turning ocean water into drinking water.

If planned desalination facilities go forward, nearly one out of every five gallons of the region's tap water will come from the ocean by 2020.

Besides Poseidon Resources' envisioned plant in Carlsbad, which is scheduled to churn out 50 million gallons of purified ocean water each day starting in 2012, the San Diego County Water Authority has just completed a feasibility study on a potential 150 million-gallon-a-day operation at Camp Pendleton.

The second project would take a decade and nearly \$2 billion to complete. It would likely begin as a smaller complex and gradually expand.

“If they go ahead with (the full-sized version), it will be the biggest seawater desalination plant in the world,” said Tom Pankratz, editor of the Water Desalination Report and an industry consultant.

The largest saltwater desalination complex under development is a site in Algeria that would generate 132 million gallons per day starting in 2011.

While desert nations in the Middle East and elsewhere have long depended on desalinated seawater, U.S. demand has emerged only during the past decade.

In California, about 20 projects have been proposed from San Diego to Marin counties.

Aside from analyzing the Camp Pendleton prospect, the county water authority has teamed up with the International Boundary and Water Commission to explore the idea of building a plant in Rosarito Beach, about 15 miles south of the U.S.-Mexico border.

San Diego has always stood at the forefront of the desalination business because the industry was born here, Pankratz said.

“It probably has the biggest concentration of desalination experts in the United States,” he said.

The first desalination plant to successfully demonstrate the reverse-osmosis technology in wide use today was installed in 1969 at the Stardust golf course in Mission Valley (now called Riverwalk Golf Course). It demineralized brackish groundwater, Richard Sudak said.

Sudak was the reverse-osmosis engineering manager at the time for San Diego-based General Atomics, which pioneered the field of reverse osmosis. In general, the method involves using specialized membranes to filter salt, impurities or other substances out of water.

“A number of other companies started membrane manufacturing as a result of” General Atomics' advances, said Gerry Filteau, president of Separation Processes of Carlsbad, a company that Sudak founded in 1980.

Local membrane manufacturers include Hydranautics in Oceanside, Toray in Poway and Koch Membrane Systems in San Diego. Desalination-related chemical companies include Professional Water Technologies in Vista, King Lee Technologies in San Diego and Avista Technologies in San Marcos.

But it's only coincidence that San Diego County was both an early center of the desalination industry and the likely future home to some of the world's major desalination projects.

The region gets nearly 90 percent of its water from Northern California and the Colorado River.

Those supply lines are crimped by ongoing drought in California and restraints on transferring water from Northern California to Southern California through the Sacramento-San Joaquin Delta.

“It's significant because it shows you've run out of alternatives,” Pankratz said.

Seawater desalination is a logical step for the San Diego area because of its geographic constraints, said Ken Weinberg, the county water authority's director of water resources.

“The fact that there's no large groundwater basin limits our opportunities,” he said. “We have very limited sources – you have recycling, you have conservation and you've got the ocean.”

While ocean-water desalination has the biggest potential, two local water agencies – Oceanside and the Sweetwater Authority in South Bay – have been desalinating brackish groundwater for years.

Oceanside's 2 million-gallon-a-day output is expected to triple to 6 million gallons on Tuesday.

Sweetwater desalinates 3.8 million gallons a day and has teamed up with the Otay Water District to explore boosting that amount.

The city of San Diego is considering desalination of groundwater wells in places such as the San Pasqual and San Diego River valleys.

“Ideally, you want to find those locations where there's the highest water quality that you can bring up and utilize,” said Marsi Steirer, deputy director of water resources and planning for San Diego.

The county water authority projects that at least 89,600 acre-feet of the region's supply – 10 percent of total demand – will come from the ocean by 2020.

If the Camp Pendleton plant produces 100 million gallons a day, the region would get 168,000 acre-feet – or about 19 percent of its supply – from the ocean.

The water authority began looking at the base as a potential site for a desalination facility after a possible marriage with the San Onofre Nuclear Generating Station fell through. San Onofre was attractive because it has an existing system for drawing in and expelling ocean water.

Camp Pendleton has enough land at two prospective sites – 26 to 30 acres – to build a desalination complex.

Bob Yamada, the authority's water resources manager, said a desalination plant offers the base several benefits, “one of which would be a core water supply or emergency water supply.” Camp Pendleton currently depends on groundwater.

Yamada said his agency would build an outfall to discharge salty water from the desalination facility, and that base officials could use the same pipe to discharge wastewater.

Camp Pendleton's leaders have no official position on the proposal but are discussing it with the San Diego County Water Authority, said base spokesman Lt. Riley Whaling.

A major issue would be the seawater intake system, which is also the most controversial aspect of Poseidon Resources' project in Carlsbad. An open intake can crush small organisms and pin fish and other marine animals against filter screens, killing them.

Yamada said the county water authority is considering subsurface intakes for the proposed complex at Camp Pendleton. The method, which uses pipes or wells buried beneath the ocean, avoids sucking in marine life because seawater is filtered through sand and rock on the ocean floor. The sand also acts as a natural pretreatment agent for the desalination process by preventing large particles from entering the pipes or wells.

If the county water authority decides to go with the open-intake option, Yamada said, it would use the latest technology to reduce environmental harm.

Mexico's Rosarito proposal is being studied by the county water authority, the Metropolitan Water District, Southern Nevada Water Authority and Central Arizona Water Conservation District.

The agencies are working under the umbrella of the International Boundary and Water Commission, which addresses border issues. They are hoping to take pressure off the Colorado River, which supplies water to seven states and Mexico.

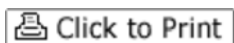
Issues such as how large the project would be, who would pay for it and how the water would be distributed have yet to be worked out, said David Fogerson, a senior engineer for the county water authority.

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