Desalination Project in Santa Cruz Makes Progress

Soquel Creek District Appears Ready to Share Project, Water and Cost

by Michael Thomas

With the City of Santa Cruz facing water shortages in drought years, and Soquel Creek Water District over-pumping aquifers and depleting underground water reserves, the plan to build a system that extracts tap water from the salty ocean is quickly progressing.

This month, the City of Santa Cruz took two major steps toward the County's first desalination project. The City Council approved building a $4 million experimental facility at Long Marine Lab, on the City's west side. They also approved embarking on a broad environmental study (EIR) of the City's plan to provide water in the coming decades.

The EIR will include detailed analysis of a desalination plant that could produce up to 4.5 million gallons of water per day.

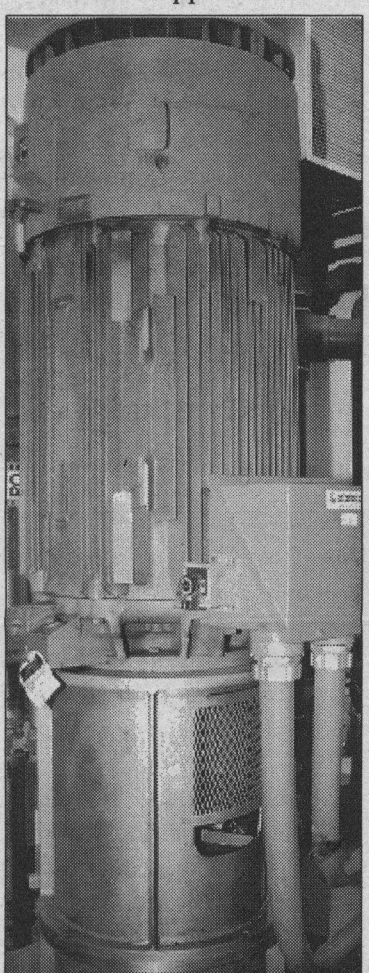
The system would serve the City of Santa Cruz during drought years and could supplement the Soquel Creek Water District's supply in other years allowing the District to pump water into depleted aquifers.

The cost of the full-scale desalination plant is in the range of $35 million to $40 million, and the City has already started boosting water rates to pay for it. According to the City's Water Director Bill Kocher, "It's funded, if it's a go."

Soquel Creek Poised to Join Project

According to Soquel Creek Water District Director Daniel Kriege, a cooperative desalination project may in fact be the answer to the District's water woes. The Soquel District serves residential and business customers in Aptos, Capitola, Soquel and communities through La Selva Beach.

"It would appear to be the only option that would provide us with the quantity [of new water supplies] that we need," Kriege said.



Desal unit at Marina

The District has previously considered another option — building a pipeline to take water from the Pajaro Valley Water Management Agency (PVWMA), which supplies non-potable water mostly for agricultural use near Watsonville.

Like Soquel, the PVWMA has been struggling with the potential for seawater intrusion as water levels in its aquifers recede. They have planned to build a $126 million pipeline to bring in more water from the Central Valley, thus having enough supply to sell water to the Soquel District.

But Kriege thinks that project is a long ways off, perhaps two decades. Part of the reason for the delay is that the Pajaro district has not needed as much water as expected, according to Kriege.

"That may mean the pipeline is not necessary [for the time being]," he said.

Soquel District Directors will get a staff report in January summarizing their options. Kriege said it will include an evaluation of the potential for using recycled water for irrigation, as Scotts Valley does. However, according to District officials, potential users of recycled irrigation are fewer than in Scotts Valley.

The District will also look at the potential for improving recharge of groundwater. But the desalination plant is looking like the best bet for the District's future needs, and Kriege made a presentation to the Santa Cruz City Council, encouraging them to approve the pilot plant and environmental work for the project.

"It is one of the few projects that come along that fits, hand in glove, with two agencies," he said.

Environmental Study is All Inclusive

Kocher said the EIR that the City approved is unique in that it incorporates efforts to reduce demand and increase supply in the same study. The EIR will include analysis of conservation efforts in the city, such as consumer education and distributing low-flow shower heads and hose fittings to residents. The Santa Cruz City Water department serves resi-

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dents and businesses in the City of Santa Cruz, Live Oak and eastern portions of Capitola and Soquel. Currently most of the water is supplied through above-ground reservoirs.

The study will also look at the environmental impacts of curtailing water use during droughts by giving users an allocation of water that's 15 percent less than their normal consumption. The target of a 15 percent reduction was a compromise, Kocher explains. It came about after local business owners and residents were convened in focus groups to determine what impacts curtailed consumption would have.

Another option was to have no provision for rationing and build a desal plant that could churn out 6 million gallons per day.

But "curtailment" is seen as a valuable strategy and it's very effective in an environmentally conscious community like Santa Cruz County. In fact, Kocher said that "generally in a drought, people conserve more than they need to."

When Would the Ocean Tap Be Turned On?

The plant that will be the focus of environmental studies would be capable of producing 2.5 million gallons per day and could be expanded to a maximum of 4.5 million gallons. If it isn't built, Kocher estimated that a drought in the year 2020 would require curtailing consumption by 60 percent.

The most severe drought in recent history was in 1976 and 1977. "It took two years to bring us to our knees, but it did," Kocher said.

The desalination plant would lie mostly dormant until a drought struck.

"The last time we would have used it was in 1990," Kocher said. "Statistically, we would probably fire it up once every six to seven years. That's why Soquel Creek's participation is so critical."

The City of Santa Cruz already approved a series of rate increases to pay for desalination and other projects. In May of 2004, the first increase hit residents' bills. Over five years, the cost of water will nearly double, going from $1.86 per unit to $3.80.

The City has yet to determine a location for the plant, which requires about two acres of space relatively close to the coast. Officials are looking at property on the City's west side, "somewhere out there where it's not going to be an eyesore to anyone," Kocher explained.

The ultimate size of the plant depends on the type of pretreatment facility used.

"The pre-treatment is critical. You are treating to a level where it looks like drinking water but it's full of salt," he said.

Then the water is forced through a series of membranes to remove the salt brine.

Pre-treatment can be accomplished with traditional settling pools or with another series of membranes. In Tampa, Florida, the city built a large, 15 million gallon per day desal plant, but had trouble using traditional pretreatment methods. The result initially was desalination membranes that frequently became clogged.

"It's very successful now, but it took a lot of work to get it there," Kocher said. He is hoping that the pilot project, which is almost ready for contractors' bids, will help avoid similar problems here.

Pilot Plant May Be Running Next Year

"There are desalination plants all over the Middle East," Kocher explained. "But it's fairly new technology to the United States."

Since the ocean is different everywhere, it's important to plan a facility that is suited to local currents, temperatures, and the suspended matter that's fed to the ocean by local rivers.

The City of Santa Cruz has secured a grant of $1.9 million for a small pilot plant that would filter about 50 gallons per minute. The City has now approved a contract with a consultant to design and build the test project. It would then run for about a year.

The cost of the pilot plant is estimated at $3.4 million, down significantly from early estimates in the $4 million range.

The plant will likely be located on property adjacent to Long Marine Lab, and could be up and running by June of next year. After a year of tests, including assuring that the brine generated could be adequately disposed of, the small desal plant would be shut down and decommissioned.

Then the City would embark on the larger project. But in the meantime, the full-scale plan needs the approval of an alphabet soup of regulatory agencies, including the Coastal Commission, the Regional Water Quality Control Board (RWQCB), NOAA Fisheries and the Monterey Bay Marine Sanctuary. "There's a lot of work to be done," Kocher said. ■