

By Kate Cline

NAME:

Padre Dam Municipal Water District Water Recycling Facility

LOCATION:

Santee, Calif.

PLANT SIZE:

2 mgd

INFRASTRUCTURE:

Flocculation and sedimentation tanks, biological nutrient removal, chlorine disinfection

inspiring innovation

San Diego county water recycling plant finds success with creative staff inventions

The Padre Dam Municipal Water District's water recycling facility provides 2 million gal per day (mgd) of recycled water to areas of San Diego County, supplying approximately 1 mgd to the Santee Lakes and 1 mgd for irrigating local parks, schoolyards and greenbelts. The facility primarily treats residential wastewater, using an advanced tertiary treatment process that uses biological nutrient removal to treat pollutants and chlorine disinfection. An onsite lab ensures that the recycled water meets state and regional water quality requirements, keeping it in line with California Title 22 water quality standards for full-body contact recreation.

The plant's eight-person staff, led by Plant Manager Gary Canfield, does more than just keep the facility running at peak performance—it also has innovated several systems that improve the plant's efficiency.

Innovation & Invention

The plant faced major problems with rags clogging pumps and getting into mixer bearing housings. Repairs required many man-hours, so the staff decided to install a pretreatment system.

"The engineering firm quoted us a price to build it—it was going to be well over \$250,000," said Plant Operator Ryan Dawson. "But [Plant Operator] Ryan Hughes and [Operations Supervisor] Rob Northcote were able to draw up a whole design on our dry-erase board back in the garage and build it."

The system Hughes and Northcote created consists of a traveling belt with holes that allow water to flow through, leaving debris behind as the belt travels up and down. The water continues on to the treatment process, and solid debris is put back into the sludge waste line. The system cost the district approximately \$3,500 to create, and it saves an estimated 216 man-hours and \$50,000 in parts and materials per year over a commercially available system.

"Now when I go and rebuild the mixers and do my quarterly and annual maintenance, I'm having no issues with the rags anymore," Dawson said. "It's unbelievable what a difference this made."

When the plant needed to monitor nitrate levels throughout the treatment process, another in-house innovation saved the district more money. Instead of purchasing analyzers for each monitoring location, Maintenance Lead Don Denniston obtained permission to try out his idea for a portable nitrate analyzer that could be used throughout the plant.

"There is nothing of that kind in the industry. I researched it and we could not find it anywhere, so I made it myself," Denniston said.

To create the device, he outfitted a commercial analyzer with a radio transmitter and outfitted the plant's SCADA system with a receiver. The analyzer

can transmit information from anywhere in the plant, allowing the staff to stay up to date on the nitrate data. The system cost the district \$2,600, as opposed to \$45,000 for the commercial analyzers.

Positive Attitude

The staff insists that it is the attitude of the management and the camaraderie with fellow co-workers that keeps them motivated to continually improve plant operations. Canfield encourages all staff members to participate in ongoing education and recommends that operators attain grade-three operator certification. All staff members also take part in up to three Web-based training programs each month.

"When you have good leadership and it trickles down, from the plant manager all the way down to the last person who's been hired here, we're a family. We keep each other accountable," Dawson said. "It just feels good to be able to help them out and also know that we're doing good for the environment and for the ratepayers."

Planning for the Future

The staff's efforts have paid off: The San Diego section of the California Water Environment Assn. named the facility Plant of the Year in 2010 for the eighth time, putting it in the running for statewide Plant of the Year. Northcote, Hughes and Denniston also were recognized for their inventions.

The plant may soon build on its success, as a two-phase expansion is in the works. The first phase will increase plant capacity to 4.4 mgd, and the second will increase it to 10 mgd. According to Northcote, high demand for the recycled water during summers is maxing out the plant's capacity.

The expansion, which is currently in the design phase, includes a new headworks and odor control system, retrofits for existing empty tanks and a possible switch to ultraviolet disinfection. The upgrade also will include a commercial rag and debris removal system, Northcote said, which means abandoning the one he and Hughes created.

"We're at a point where we're either going to say we can get no more customers, or expand to be able to bring on more customers," Northcote said. "Our ultimate goal is to promote the use of recycled water, so that's our current plan—to take it to 4.4 mgd, and to keep the same process that we are currently running and double it." **WWD**

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The onsite lab allows for constant testing of potable water, recycled water and discharge to ensure that the plant complies with strict state and regional regulations.



The anoxic zone of the biological nutrient removal treatment process uses microorganisms to rid the water of pollutants.



The plant provides recycled water to the Santee Lakes for recreation and to local parks, schools and greenbelts for irrigation.