NAME:

Fillmore Water Recycling Plant

LOCATION:

Fillmore, Calif.

PLANT SIZE:

1.8 mgd

INFRASTRUCTURE:

MBR system, UV disinfection, flow equalization

The water recycling facility emits no discharge into the Santa Clara River and reuses 100% of its effluent—a rare attribute of coastal water plants.

The plant currently treats about 1 mgd, but can be upgraded to 2.4 mgd in the future.

Approximately 200,000 gpd of reclaimed water is used for irrigating city parks and green areas throughout the city of Fillmore.

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By Clare Pierson

setting the standard

New facility treats and reuses 100% of its wastewater effluent; improves quality of life for community

In 2003, the city of Fillmore, Calif.'s wastewater plant was in dire straits. It was discharging wastewater effluent into the Santa Clara River, yet more stringent regulations set by the Los Angeles Regional Water Quality Control Board soon found the plant paying mandatory fines each year for excessive total dissolved solids, boron and chloride levels.

A consent decree was issued to the city, stating that the plant would have to drastically improve wastewater discharge quality. Faced with several options, the plant partnered with American Water for a design-build-operate (DBO) project and set out to build a brand-new, $42-million zero-discharge water recycling plant (WRP).

Forming an Alliance

In the public-private partnership (PPP) with American Water, the city had to take the lead in determining the scope, size and type of facility, the location, appearance—and had to secure funding. American Water, which has a 20-year operating contract with the city, then assembled a team of engineers, contractors and operating staff to construct, deliver and operate the plant.

"We are able to integrate a bunch of skills," said Mark Strauss, president of nonregulated operations for American Water. "We bring a presence from the start of their project to the end. We needed to make sure it functioned well and was efficient and workable because we're going to be responsible for it for a long period of time. This aligned with the municipality's goals. They want something that's going to last."

Through the DBO/PPP model, the city was able to save millions of dollars on the overall project by working through a single contract with a guaranteed cost, allowing city officials to effectively manage costs.

Efficient Technology

The plant's current configuration operates at approximately 1 million gal per day (mgd) to 1.8 mgd. The facility's recycled water tank has a storage capacity of 1 million gal. Variable-frequency drives maximize energy efficiency, helping to keep costs down. A flow-equalization system minimizes water flow during the day, when cost and energy use is highest. Wastewater is cycled back into the plant where it is treated during off peak hours, when power demand and cost is lower.

A Zenon membrane bioreactor system and a Trojan ultraviolet disinfection system help produce cleaner recycled water that is suitable for irrigation. A fiber-optic line was installed to connect the individual irrigation systems to a centrally located SCADA system. At final buildout, the Fillmore WRP is designed to 2.4 mgd.

"[American Water's] design and engineering expertise—I can't tell you how important that was," said Tom Peterson, plant manager. "This plant is upgradable to 50% more than what is there now with very minor changes needed. In the construction phase, decisions were made to put in technology that could be used later, which will save a fortune."

An Enlightened Approach

City and plant officials chose to build an innovative water recycling facility that would completely eliminate discharge into the river—a rare attribute of coastal water treatment facilities. About 200,000 gal per day (gpd) of the treated water irrigates schools, landscapes, city parks and green areas throughout Fillmore. About 800,000 gpd of treated water is discharged back into the nearby groundwater supply. This system has played a significant role in helping to stretch further the area's limited supply of quality potable water.

The scope of the water recycling program extended well beyond the wastewater treatment and discharge, though; it extended to the community as well.

Recycled water is used in school grounds, ball fields, parks and public-access sites. Two new stretches of bike path resulted from this program, one along a new 1,400-ft-long levee that protects the WRP and a business park from flooding. Recycled water will be provided to the levee areas to encourage plant growth for slope protection. The old plant was demolished, making room to expand a 20-acre public park and fields, all of which will be irrigated with recycled water. A wetland was created next to the plant, where reclaimed water will flow and increase dissolved oxygen levels in groundwater, all while providing a natural habitat for wildlife and vegetation.

"As other people catch on to the fact that this water is available, there are venues that may want to pick up on it," Peterson said. "There are a lot of agricultural applications in the neighborhood that may want it, and other large water users—churches with large lawn areas, other commercial areas, etc. It's considerably less expensive to use reclaimed water than potable water."

Recognition

Construction began in 2007, and the plant was completed in August 2009. Budget expectations and requirements were achieved even with additional enhancements and expansions.

The city's novel and unwasteful management approach, as well as the effort given by the engineers, operators and contractors, resulted in the Project of the Year award in the water/wastewater category from the Ventura County Chapter of the American Public Works Assn. The plant also recently won an Engineering Excellence Award from the American Council of Engineering Companies, California Chapter. WWD

Clare Pierson is managing editor of *Water & Wastes Digest*. Pierson can be reached at 847.391.1012 or by e-mail at cpierson@sgcmail.com.

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