

NAME:

Prior Lake Water Treatment Facility

LOCATION:

Prior Lake, Minn.

PLANT SIZE:

7.5 mgd

INFRASTRUCTURE:

The city has seven wells—six of which will be run through the facility and the last one being used to meet peak demand. Three of the wells are located on site, and three other wells have raw water transmission lines running to the site.



A view of the facility post-construction. Neighborhood residents voted to have the facility be residential-like in appearance.



The site during the construction phase. The building took place very near residential homes, leading to increased citizen participation in the planning.



The pipe gallery in the new facility.

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PLANTPROFILE

By Clare Pierson

From Brown to Blue

Good preparation allows a Minnesota town to build a water treatment facility and additional storage with minimal hassle

Too many “brown episodes”—where Prior Lake, Minn., residents experienced water staining, odor and taste issues in their drinking water—are what prompted city officials to recognize the need for a new water treatment facility (WTF).

Although the water was safe to drink, the episodes indicated high levels of iron and manganese, which also caused mineral buildup and diminished capacity of the supply system. What’s more, the area’s abundant supply of lakes provided a natural barrier to water circulation in the water mains, heightening the effects of the brown water episodes.

The city’s drinking water, drawn from the nearby Jordan and Franconia Iron-ton-Galesville aquifers, is supplied by seven wells. Prior to the facility, water was treated at the wellhead source with chlorine, fluoride and polyphosphate.

In Preparation

The city’s Capital Improvement Program had been planning a new WTF since the mid-1990s. In 2005, the city raised water rates in anticipation of the facility and in 2006, it budgeted \$13 million for the entire project. This early planning allowed the project to be fully funded by the time construction began, without using any tax dollars.

The project committee, created by the City Council, chose Bolton & Menk, Inc. (BMI) as the engineering design firm due to its low bid offering and low man-hours presented, which saved the city time and money.

“BMI employs three licensed water treatment plant operators who are also construction managers,” said Jennifer Wittkopf, the Prior Lake public works coordinator. “This helps with city staff training and facility startup. By using licensed construction managers instead of project engineers, a substantial cost savings is realized.”

The city also chose Rice Lake Construction Group of Deerwood, Minn., at a bid of \$12,746,500.

Community Participation

Prior Lake residents had a lot to say in all aspects of the project, from startup to the committee to the design and size of the facility.

Two residents served on the project planning committee and several meetings were held to gather people’s input. Neighborhood residents voted to construct the facility to appear as a residential building, Wittkopf said, with brick walls, windows and a pitched roof. Residents also gave opinions on how the area surrounding the facility should be landscaped. Additionally, the project committee distributed informative newsletters, gave media interviews and updated its website frequently to keep residents informed.

Additional Features

The operation of the wells and the treatment facility is automatically controlled by programmable logic controllers. The PC-compatible SCADA system software enables the staff to operate the facility directly from the control room or remotely. It allows operators to monitor the status of the treatment facility at any time and informs the operator of any critical alarms.

Another feature of the project was an additional storage facility for water supply. While the city’s water supply system is capable of producing more than 8 million gal per day (mgd), the storage capacity was previously limited to a combined capacity of only 1.75 mgd.

“To ensure adequate supply for high usage periods, fire protection and system pressure, it became necessary to explore options for additional water storage. Such a storage facility became much more cost-effective when included with the construction of the treatment facility,” Wittkopf said.

The Final Product

Construction began in August 2007. The concrete was poured from October 2007 until April 2008. Interior and exterior finishings, as well as landscaping, were the final touches.

Facility testing began in February 2009, and the system began distributing water on March 2, 2009. The city is still conducting testing and fine-tuning the system, which will officially go online later this spring.

Challenges that the project committee had to face were budget, scheduling and neighborhood involvement. Wittkopf said public involvement was achieved through neighborhood meetings and several forms of communication with residents, and the issues of budget and schedule were minimized by working with an experienced, successful project team.

Raw water is now run through the WTF where it is aerated, detained, treated with sodium permanganate and filtered—all to help remove the iron and manganese particles.

“It is expected that the vast majority of brown water problems in the city will be minimized and substantially diminished over time as built-up iron and manganese are flushed from the underground water distribution system,” Wittkopf said.

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