

New Plant Will Secure Garnett's Future Water Supply

"When the well is dry we will know the worth of water." - Benjamin Franklin

Over 100 years ago, the original water treatment plant and distribution system for Garnett, Kansas, was constructed on Crystal Lake. It was 1915, the year Alexander Graham Bell made the first transcontinental telephone call and Woodrow Wilson served his third year as president. Another important action occurred a few years earlier that gets little mention in the history books is the chlorination of drinking water. The development of this process in or around 1908 has contributed to prevention of more deaths than all the vaccinations combined.

Consider this every time you turn on your tap: Water must be impounded, pumped, conveyed to the water treatment plant, treated with an extensive network of processes, stored, pumped again through a network transmission pipes, stored again, travel through another network of distribution pipes and finally arrive at your home as clean, drinkable water. All of this must be done every second, minute, hour, day, week, and month of every year, year after year. A hundred years ago a feat of this magnitude was considered as revolutionary as one person talking to another person hundreds of miles away.

A lot has changed since 1915. Federal and state requirements have been regularly updated and made more stringent, and advances in treatment methods have yielded more efficient processes that save time, money, and energy. These advancements have contributed to a more reliable and safe supply for customers.

Challenges

To meet these demands, the Garnett water supply system has been modified several times including the water treatment plant in 1936, 1948, and 1995. During this time, the plant has performed well in providing safe drinking water to its customers. Those customers include residential, commercial and industrial water consumers both inside and outside the city limits of Garnett, plus 3 rural water districts and the city of Greeley.

Now, the question is, will the water treatment plant serve the customers and future economic growth for the City of Garnett for the next 100 years?

Recently, the only backwash pump used to clean the Garnett's Water Treatment Plant filters was replaced. Without this pump water cannot be produced from the plant. This pump was installed in 1948. How many people drive a car from 1948 today? If you did, would you rely on that car to take your family safely to and from places? Would you rely on that car for the next 5 years; 10 years, or 20 years?

"That is just one example of the aging equipment at the Garnett Water Treatment Plant that puts producing clean water at risk," states Ken Amaya, Director of Gas and Water. "A review of the existing facility finds more equipment in need of replacement and layout limitations that prevent fixing key processes without compromising the water flow."

The facility is a three-story building with chemicals stored on the top floor, processes on the middle floors, and finished water storage in the basement. Since the processes are located vertically, the layout prohibits construction activity at one area without disrupting the surrounding processes. Any of the

extensive construction needed would require an extended shutdown period where the plant could not produce drinking water. These extended periods of shut down would not be accepted or tolerated by the Kansas Department of Health and Environment or the customers of the City of Garnett.

A vertical layout causes other concerns, too. This layout increases the risk of contamination from a chemical spill, as there is little to protect the processes and finished water below. Also, the facility floors are only accessed by stairs, which presents accessibility issues.

The treatment plant's concrete structures are worn, the pumps, mixers and steel components are nearing their useful serviceable life, which increases the risk of equipment or process failures that can ultimately interrupt water service to customers.

Like most things, a treatment plant can only be fixed so many times before the investment is better spent on a new plant. The plant's poor condition combined with its restrictive layout are reasons to consider a new plant instead of "band-aiding" a facility that has served Garnett well-past its intended life.

While the condition of the plant's infrastructure does not necessarily mean it will fail soon, this condition does present an unacceptable risk if not addressed in its future ability to be able to serve Garnett's population and economic growth.

Solution

The City of Garnett is looking to construct a new water treatment plant. To meet the current and future drinking water needs of the community, Garnett must consider some hard questions, such as costs (capital, operational and maintenance), constructability, serviceability, reliability and its ability to meet current and potential future drinking water regulations.

The proposed new plant would allow for uninterrupted water service from the existing water treatment plant during construction. The proposed plant offers a linear layout, where each process is easily accessible and can be expanded as needed in the future. The new plant will be sized to provide 1.5 million gallons per day, compared to the existing plant's capacity of 1.0 million gallons per day. The increased capacity will make water production more reliable and decrease the risk of interrupting water service to customers. Having multiple basins for each step creates redundancy, which allows for routine maintenance and emergency repairs without stopping production of drinking water.

Providing processes that can efficiently treat the water will ultimately save money for customers. Capital cost is a onetime expense, but operational cost is a reoccurring expense. The multiple conventional water treatment plant processes, with long retention times, allow for efficient chemical usage while minimizing the risk of upsets. This type of approach would be comparable to purchasing a vehicle that you know you will use for the next 20 to 40 years that is fuel efficient, maximizes the use of tires, batteries, wiper blades, etc., and has low insurance costs.

The proposed new plant will use the 2012 raw waterline and will connect to the existing distribution system. It will use the existing power plant as a source for stand-by power. The selected location in the area west of the current plant will maximize the use of existing infrastructure and minimize the capital costs of the proposed plant. A compact, linear layout also minimizes the impact to the adjacent park. Above ground basins reduce the excavation costs associated with rock removal. Alternative layouts and sites were considered but would require modifications to the transmission system, increased capital costs

from land purchases and a new location could ultimately cause water quality issues within the distribution system.

No person can predict future drinking water regulations. However, looking forward to potential future regulations ultimately leads to the design implementation that achieve alternative treatment schemes thus reducing the future regulatory treatment risk. Alternative disinfection schemes will allow operational staff to select the most effective disinfection scheme to meet the regulatory requirements of the day. The large retention time and multiple chemical feed locations will also increase the opportunities to treat the water before delivery to the customers. This approach provides for more tools for operational staff to meet various incoming or outgoing water qualities.

Investing in infrastructure is important to provide reliable water for the community and eliminate the risk posed by the current plant. The total project cost of a new plant for Garnett is estimated to be approximately \$13 million and would take 24 to 31 months to construct. The City of Garnett is currently researching all available funding resources and options.

Public Meetings

The Garnett City Commission and staff are hosting two public town hall meetings on Monday, February 26th, at 9:00 a.m. and 6:00 p.m. at Town Hall Center, 125 West 5th Avenue in Garnett. The purpose of these town hall meetings are to encourage Garnett water customers to provide opinion and input on the future of Garnett's water production facilities. Representatives from Professional Engineering Consultants (PEC) will also be on hand to answer questions. Please make plans to attend one of these meetings next Monday.

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