

# HOLTON Makes Water System Improvements

**H**olton, Kansas with a population of 3,266 is located about 30 minutes north of Topeka at the intersection of U.S. Highway 75 and State Highway 16. Holton was named after E.D. Holton who in May, 1856, along with others, traveled to this area from Milwaukee, Wisconsin to help anti-slavery forces to promote Kansas as a free state. Holton was chosen as the county seat in 1858 and was incorporated in 1859. The Holton/Jackson County Chamber of Commerce notes Holton as a city with no traffic jams, clean air and safe neighborhoods with fast and easy access to an international airport only one hour away, at Kansas City, the jazz capital of the world.

## City water supply system

Holton is supplied with water from three sources consisting of two wells located about eight miles north of town; surface water from a 40-acre lake known as Prairie Lake located northeast of town and Public Wholesale Water District No. 18 (PWUSD No.18) with a water plant located southwest of town. The city water plant consisting of clarifier and rapid sand filters was constructed in 1947 and was last upgraded in 1981. Elevated storage is provided by a 300,000-gallon standpipe and a 750,000-gallon storage tank. The distribution system includes 30-plus miles of water lines ranging from 2-inch to 12-inch and consisting of both cast iron and PVC. The distribution system also contains more than 100 fire hydrants. The city water plant with a production capacity of 1.0 MGD has operated well since the last upgrade but after 38 years, there were issues that needed to be addressed. The city hired the engineering firm of EBH & Associates from Pratt, Kansas, to address those needs.

The city has a total of 1,050,000 gallons of elevated storage between two tanks. This is a photo of the city's elevated storage tank which has a capacity of 750,000 gallons.

### Well upgrades:

Upgrades at the wells include installation of Variable Frequency Drives (VFDs) along with radio controls for more efficient control of well pump operation. Upgrades also included replacement of the electrical wiring at the well houses. Lastly, standby power was provided in the event of power failure.

### Treatment plant upgrades:

The water treatment plant consists of a clarifier and two rapid sand filters. The rapid mix was eliminated and replaced with a new inline static mixer. Originally, the plan was to not touch the clarifier until a later date; however, while construction was ongoing at other plant units, the center shaft in the clarifier failed (rusted off). The result was that rehabilitation of the clarifier was added to the overall project. New mechanical equipment consisting of new center shaft with bottom bearing, new drive mechanism, and new troughs were installed. Don Hellar with EBH Engineering, stated that he had never completely rebuilt a clarifier as done here and that city employees noted that they will need to visually check the clarifier to confirm that it is operating. In the past, they could listen from a distance to confirm operation.

Rehabilitation of the filters included new media and new control valves. A new backwash pump was provided replacing the original backwash pump which was no longer operable. A 25,000 gallon clearwell serves exclusively as source water for backwashing the filters. Finished water from the filters drains into a 214,000 gallon clearwell. There are two high service pumps to deliver treated water to the distribution system. High service pump capacity is 400 gpm but the actual pumping rate will probably be around 100 gpm. The plant has been in rehabilitation for the past year and while it can be operated manually, operation has not yet started because the automatic controls are not yet totally functional. Even though the city has a contract with the wholesale



This photo shows the line with the static mixer with a section of line with mixing elements installed inside the pipe. The static mixer is a replacement for the flash mix unit which has been bypassed and will not be used.



This is a close-up of the drive mechanism at the clarifier.



A new center shaft, drive mechanism, and troughs were installed in the existing clarifier. The center shaft of the original clarifier failed while rehab work was being done on other parts of the plant.



This model shows a cross section of the filter media with four inches of gravel at the bottom, twelve inches of sand above the gravel, and eighteen inches of anthracite coal at the top.



PWWSD No. 18's water plant treats water from Banner Creek Reservoir immediately southwest of Holton. City employees operate this plant for the district. The district is the main supplier for the city supplying up to 9.0 MG per month.

district to purchase 8.0 MG per month, the city usually purchases up to 9.0 MG per month. To satisfy the total demand, the city plant will produce anywhere from 2.0 to 5.0 MG per month depending on the time of the year. Dennis Ashcraft, Water/Wastewater Superintendent noted that plans are to operate the plant at low flow but adjusting the flow rate to run 24/7.

All electrical equipment was upgraded and new chemical feed pumps were provided. Ammonia will be injected into the water to allow combined chlorine to be maintained throughout the distribution system. Since water from Prairie Lake can be used as a source, the city decided to run combined chlorine to reduce the chance of exceeding the contaminant levels for disinfection byproducts. The city-owned power plant, located next to the water plant, provides the water plant with backup power as needed.



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**Dennis Ashcraft, Water Superintendent, and Don Hellar, EBH Engineering, along with other city employees gather at the filter control panel preparing to test run the backwash pump.**

### Public Wholesale Water Supply District No. 18

The city of Holton and Jackson County Rural Water District No. 3 are the only two members of PWWS District No. 18. The wholesale district treats water from Banner Creek reservoir located just to the west of the water plant. The plant began operation in 2002 and has a design capacity of 2.0 MGD. Operation of the water plant is provided by the

city of Holton via a contract with the wholesale district. More detailed information about the wholesale district is documented in *The Kansas Lifeline* articles dated March and July, 2013. These articles were prepared by Rita Clary and can be viewed online at the KRWA website by browsing previous articles. Links to the articles are noted as follows: <https://krwa.net/portals/krwa/lifeline/1303/20.pdf> <https://krwa.net/portals/krwa/lifeline/1307/108.pdf>

### Cost of upgrades:

The cost of this project was \$997,000 and was funded entirely with city funds. Kerwin McKee, City Manager, noted that the city raised 50 percent of the cost with a quarter cent sales tax to fund infrastructure improvements and the remaining 50 percent was from Capital Improvements. He stated also that water rates to customers did not increase as a result of this project and the current rate to residential customers is \$47.00 for 5,000 gallons.

With three different water sources and backup power to allow operation during emergencies, the city has positioned itself in a very good position for providing a dependable water supply for customers.

*Bert Zerr is currently a consultant with KRWA. He has been with KRWA since 2005. Prior to that, Bert was a District Engineer with the KDHE in the Salina District Office for 32 years.*



### Contractors on the project:

- ❖ Primary contractor - The Osborne Company, Topeka, KS;
- ❖ Davin Electric, Topeka, KS, performed the electrical upgrades;
- ❖ Alelco, Inc., New Bloomfield, MO, installed the controls;
- ❖ Hawkins Chemical, Garnett, KS; provided the chlorination equipment and chemicals;
- ❖ Mid-America Valve, Leewood, KS provided the pneumatic valves;
- ❖ JCI Industries, Lee's Summit, MO, provided the chemical feed pumps;
- ❖ Gray & Company, Topeka, KS performed the painting; and
- ❖ Ray Lindsey Company, Belton, MO, performed the work on the clarifier.

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