

Atchison Cons. RWD No. 5 Pigs Lines to Improve Water Quality

Atchison County Consolidated Rural Water District No. 5 supplies water to 1,454 rural customers as well as supplying water to the city of Lancaster, the city of Nortonville, Doniphan RWD 2 and Doniphan RWD 3. The system can also supply water to the city of Valley Falls in an emergency. The water sources for the district are supplied through a purchase contract from the city of Atchison of nine million gallons per month at a charge of \$1.38 per thousand. The district also installed three wells that have capacity to produce 400 gallons per minute per well. Going online in 2013, the wells produce water at an estimated cost of \$0.90 per thousand. It however is the water quality from those wells that has been troubling to the district as the well water contains high levels of iron and manganese. According to the district's 2015 Consumer Confidence Report, the water has an iron level of 0.32 mg/L and manganese of 0.27 mg/l. The district also adds a polyphosphate in an attempt to keep the minerals in solution.

After the wells were put online, the district began experiencing discolored water in areas of the district. Operators were having to flush extensively to remedy the problem.



These pint jar samples were collected during the pigging process show the degree of iron and manganese removed from the pipeline.

This summer, the board of directors approved a project to pig eleven miles of 6-inch line to remove iron and manganese sediments.

The district has two elevated water storage tanks that have a capacity of 150,000 gallons each. The district also

has two booster stations that are equipped with rechlorination.

The first three miles of line pigged was from 286th Rd. to 262nd Rd. along Dickinson Rd. The project required the installation of two 6-inch Tee's and a 6-inch valve to allow for the pigging process. Twelve customers were affected along the line. All customer meters that were affected were removed and the service lines were flushed after the pigging process. It took approximately 31,000 gallons to pig the three miles.

The second segment of three miles that was pigged was from 262nd Rd. to 238th Rd. along Dickinson Rd. The district had to install one 6-inch valve and one 6-inch Tee to pig this section.

According to the district's 2015 Consumer Confidence Report, the water has an iron level of 0.32 mg/L and manganese of 0.27 mg/l.

Nine customers were affected on this line.

The second 3-mile segment that was pigged was from Dickinson Rd. to Clay Rd. along 238th Rd., then south one mile to Kansas Highway 116. Four customers were affected on this run. Approximately 31,000 gallons was used to clean this line. One 6-inch valve and one 6-inch Tee were installed to pig this line.

The last stretch of two miles of pipeline was from Clay Rd. to Chautauqua Rd. along Kansas Highway 116. Four customers were affected on this line and 21,000 gallons of water were used. One 6-inch valve and one 6-inch Tee had to be installed to do the pigging project on this segment.

Each line was pigged with three new foam pigs. A high chlorine solution was also added to the lines to disinfect them. The pigs were sent through the line at three feet per second. A 6-inch PVC pipeline contains 1.47 gallon per foot, so this required flushing at 265 gallons per minute. We opened the 6-inch valves 5.5 revolutions to obtain the required flow rate.

In summary, the pigging of the eleven miles required the installation of

five 6-inch valves and five 6-inch Tee's. Each Tee had a 36-inch pit around it to ensure enough room to install the pigs. Total cost of parts for this project came to \$9,268.00. Labor cost came in at \$11,272.00. Trautloff Excavating, LLC, Atchison, Kan., installed the valves, Tees, and pits.

There was an approximate total of 114,000 gallons used to pig the total of 11 miles of line. The estimated cost of water was \$160.

On the first run both operators John Brown and Jay Stribey, Office Manager Rhonda Snyder, and board member Adam Potts were present and assisted. On the last three runs John Brown, Jay Stribey, Rhonda Snyder, and Board Chairman Joe Elias assisted with the pigging process. Photos and videos were taken to present to the other board members at their monthly meeting. Samples were collected in pint jar to view how much of the iron



Operator Jay Stribey and Office Manager Rhonda Snyder review the pigging process. Board Chairman Joe Elias and Operator John Brown are in the background.

and manganese would settle out.

The board members were pleased with the pigging process and are considering pigging in the reverse direction to further clean the lines.

Prior to pigging, Rhonda Snyder sent out a letter to the customers warning them of possible discolored water during the process and that Kansas Rural Water Association would be assisting with the project.

The goal of KRWA in working with the district over the years has been to help improve the water quality. This pigging project is just one example of the type of work that is required to help water systems. KRWA's assistance on this project was funded through a contact between the Kansas Water Office and KRWA with the funding as a benefit of the Clean Drinking Water Fee.

If your city or water district has an issue with water quality or any facet of operations, give KRWA a call. If KRWA cannot help you, we'll find someone who can and will.



And here they are! This photo shows foam swab "pigs" exiting the water main. The flow rate was 265 gpm in order to achieve a three-foot per second flow velocity.

Tony Kimmi has worked as a Tech Assistance for KRWA since October 2009. He has extensive experience in the operation of construction equipment. He has assisted in the construction of many



rechlorination stations and ongoing monitoring of water quality issues.