

2016 Annual Summary

Water & Wastewater Departments

Submitted by

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2016 Summary

One of the challenges in making an annual summary of the Garrettsville Water and Wastewater Departments is the difficulty in balancing and comparing the work and events between the two facilities during the year, some of which are very similar, others not so much. Both departments are administrated by the Board of Public Affairs (BPA), both are operated by the same staff using some of the same equipment, and are barely a mile away from each other. However, besides the obvious differences in treatment responsibilities, the two are very different in other ways. The Wastewater Treatment Plant (WWTP) was put on line in the early 1960's and has been updated, expanded, reconstructed, and modernized, many times, with the latest improvements completed in 2012. In fact, only one building from the original 1958 design still exists and it is used only for back-up storage. On the other hand, the original Water Treatment Plant (WTP) went in service in 1907. The facility footprint has been expanded over the years but, the majority of the treatment process is still in operation using the original structure. The last major expansion and renovation work there occurred in 1991. Although one mile apart geographically, the two plants could not pose a more opposite problem physically. A new WWTP facility could be constructed in many different locations. Indeed, the Village looked at moving the plant across Eagle Creek in the late 1990's. But locating another drinking water source is a much more difficult task.

Field infrastructure of the two departments offer similar comparisons and contrasts. The sanitary sewer system was installed in the late 1950's/early 1960's. Almost every linear foot of it's piping network has been video-taped and areas of wear and tear have been patched, lined, replaced, or repaired as needed. The drinking water distribution system has been expanded and updated. The Village has actively replaced sections of the piping where repeated main breaks have occurred and has also made many water main loops, replaced all the fire hydrants that were 35 years or older, and removed almost all of the 4" cast iron and under sized piping. But much of the existing water lines are still from 1907.

In 2016, some of the differences between the two departments played an important role in the work that was performed during the year, influenced many of the plans for future projects, and made the Village reevaluate it's financial approaches.

When comparing the two departments an interesting place to start is the weather and its repercussions. 2016 was milder, warmer, and drier than recent years. Precipitation amounts in the Village (which are measured at the WWTP) tallied 39.90" during the year which is the first time total rainfall dipped below 40" since 2009. Dry conditions are less challenging for wastewater treatment due to the decrease in infiltrated storm water. But 2016 was also an unexpectedly unusually low production year for the Water Plant. While the WWTP treated just over 82 million gallons (a daily average of 225,000 gallons per day) the WTP pumped just under 69 million gallons (a daily average of 189,000 gallons per day). 2016 annual water production was the lowest for the Garrettsville water system since the data has been tracked -1982- and it is more than 35 million gallons less then the 1999 total of 104 million gallons. In fact, annual water production has steadily decreased since 2009, the year the Village began installing the AMR water meter system and implemented monthly utility billing. And these totals occurred during a year when "Unaccounted Water Use" was a bit higher than normal at 9%.

Probably the most significant area of the two department's differences, though, is in the financial picture. The WWTP last increased its user rates in 2011 and in 2016 the department easily met all

financial obligations and ended with a healthy carryover balance. For the Water Department, the overall outlook was not as stable. Even though 2016 was the last of three years where water rates were raised 7% to help finance improvements and provide a stable budget the year turned out to being very challenging financially. Between major building repairs, treatment refurbishment, equipment replacement that totaled over \$150,000, the BPA found a budget trend that had reduced carry-over amounts below normal operating levels. By year-end the Village had again increased the water rates by 5% for the next few years.

One of upcoming financial obligations the BPA approved was the Phase II North Street Water Main Replacement Project. The Village applied for and obtained both a \$365,000 grant from the Ohio Public Works Commission and a less than 1% loan for the balance of the project from the Ohio Water Supply Revolving Loan Account. After both sources of funding were approved the Board increased the project scope to the Village limits - approximately 1,800 feet overall. Design for the project began in the fall of 2016 with plans to have the project ready for bidding by February 2017.

Comparing the two departments' field infrastructure, the BPA, in an effort to protect its drinking water supply, continued to review monthly area hydro-fracking issues, and for the fifth year in a row financed the bi-annual Tier 3 testing on raw well #20 and 16 area wells, using those test results to update the Village Source Water Baseline Testing Plan. And on the sanitary sewer side, continued efforts were made to deal with challenges regarding elevated copper levels in the collection system. Repeated sampling and system wide monitoring results showed that the Village WWTP may be able to meet the newly imposed copper limits on the facilities discharge permit. A request for a nine month extension which would allow the Village time to verify the plant's ability to operate within the copper limits imposed was submitted to the district Ohio EPA. The Board again hired the Village consulting engineer to update the Village local metal limitations to reflect the new EPA imposed limits and began updating the Village Rules and Regulations using the federal EPA module for discharge non-compliance.

Also in 2016 the Board contributed \$20,000 to the purchase of a new Village dump truck, reviewed updates for their Rules & Regulations backflow prevention section, and continued to work with a local developer by providing a "Deficiency Report" for the Fox Hollow Subdivision. The BPA also sold four new residential water/sewer permits and only one sanitary permit for the carwash at 10519 Liberty Street (which was the last delayed sanitary tap-in allowed from the 2006 Liberty Street Sanitary Sewer Project).

Water Treatment Department Highlights

As mentioned previously, 2016 was an expensive year at the Water Plant. As the facility moved into it's 110th year of operation, work was needed both inside and outside. Roof leaks in the Filter and Pump Rooms required complete roof replacements during the year. Interior work included rebuilding both #1 and #4 rapid sand filters. A local contractor was hired to perform the work which included filter metal support systems and media removal and replacement. By early spring #2 filter also began to exhibit signs of uneven distribution and was taken out of service, and media removed by Village personnel. Unfortunately, during the rebuild process major damage to the concrete floor and underdrain system was discovered and removed. By year end, replacement underdrain piping and a new floor had been installed.

Also replaced in 2016 was the fire alarm system which included a new 3G/4G tech panel and all new wiring and sensors. After an electrical storm damaged the raw well control floats, and two electrical relays, a new a submersible level probe was installed in their place. The Village also rebuilt both high service pump control valves and chemical solution pumps. During the course of the year work began on electric light fixture replacements. Trees and foliage were cut back along the wellfield driveway and near the three phase electric poles at the plant.

In June the Ohio EPA performed a sanitary survey of the Village drinking water system which included the raw wells, treatment facility, and the water storage units, finding no violations and recommending some improvements that the Village already had planned. During the year the Water Department updated and submitted to the District EPA the Water Contingency Plan, the Total Coliform Sample Plan, a Non-revenue/Water Loss Report, and a Consumer Confidence Report. The Water Department participated in the 28th round of the Ambient Ground Water Testing with the Ohio EPA, performed daily chlorine residuals, weekly iron & manganese and bacterial testing, and performed required sampling of drinking water for twelve inorganics, Volatile Organic Chemicals, radiologicals (Gross Alpha & Radium-228), TTHM, HAAS5, and nitrate.

Both raw wells were again tested in 2016. Number 19 well was sampled in June and had hardness at 332 mg/l, iron at 1.730 mg/l, manganese at 0.249, E. coli and Total Coliform results as Negative (safe). Well number 20 was sampled in July and had hardness levels at 300 mg/l, iron at 1.352 mg/l, manganese at 0.160 mg/l, E. coli and Total Coliform Negative (safe).

Other Work at the Water Treatment Plant

- Personnel performed 295 manual backwashes on the sand filters in 2016.
- Repaired, primed, and painted water damaged areas of the ceilings and walls in various buildings.
- Performed two tests of the newly installed fire alarm system.
- Cleaned potassium permanganate system.
- For the seventeenth year in a row, a water quality report was prepared and mailed out to all Village water customers.

Water Distribution Work Performed

In year two, of a ten-year maintenance contract with a local painting company, both metal drinking water storage tanks were inspected and the Industrial Drive water standpipe was drained, cleaned, sand blasted and a new interior coating and cathodic protection systems were installed. The Village experienced continued operating difficulties with the Park Avenue altitude valve throughout the year. After repeated efforts by staff to clean, repair, and even rebuild the unit it still periodically failed creating an overflow situation which has to be addressed during the upcoming year. Personnel also performed 74 system wide distribution chlorine tests. And to improve water quality, flushed dead end fire hydrants 22 times, and all three water storage tanks were allowed to overflow at least monthly during the warmer months.

Besides the distribution work highlighted above, the department also had to rebuild two fire hydrants that were struck by automobiles, replace a faulty fire hydrant in the Garfield Plaza, rebuilt a leaking 6" water main valve on South Street, repaired a 6" water main break and one leaking 3/4" water service line, as well as rebuilt three different yard hydrants in the Village Parks. Departmental personnel also repaired eight different fire hydrants, primed and painted a total of 35 fire hydrants, had all nine Village backflow devices tested, performed two Village-wide hydrant flushings with the local Fire Department, and updated the water meter reading laptop. In addition, department personnel exercised all 228 water main valves, located and exercised all 213 fire hydrant watch valves, and relocated and marked curb boxes through-out the Village. Water Department staff prepared and presented "water use graphs" 150 times at the request of customers.

Main Goals of the Water Department for 2017

- Rebuild filter media on both #2 and #3 rapid sand filters.
- Install 8" water main for the North Street Phase II Replacement Project.
- Repair Brosius Road Reservoir and sedimentation basin south wall.
- Rebuild flow control valves in both the Park Avenue tower and the Brosius Road reservoir.
- Wash-out and inspect both metal water storage tanks.
- Update Village Contingency mapping of utility infrastructure using GPS/GIS programming.
- Perform rehabilitation/maintenance work on both high service pumps.
- Continue baseline ground water monitoring.
- Complete phase II of wellfield electric line burial project.
- Create backup copies of Village water plant, well storage, wellfield, and distribution system blueprints.

Wastewater Treatment Department Highlights

As mentioned previously, the WWTP benefitted from a relatively dry year, which allowed the facility to achieve record high treatment removal efficiencies of 99.7% BOD (Biochemical Oxygen Demand removals) and suspended solids reductions of 99.8%. The year also showed a steady decrease in copper levels to the point where the Village returned to land application of 282,000 gallons of biosolids by late July. To prevent water damage, new shingle roof systems were installed on both the 1988 blower building and the 1960 digester structure. Other upgrades at the facility included two new door openers on both the main office building and the lower garage, and light fixture replacements in the main office and many exterior lights. During the course of the year five different replacement pumps were purchased - two for the EQ basin, one as a back-up for the influent pump station, and one each for the Industrial Drive and Center Street lift stations.

Other Work Performed at Wastewater Treatment Plant

- Cleaned flow equalization basin, grease trap, influent pump station & influent piping.

- Cleaned all four waste holding basins and replaced numerous damaged diffusers.
- Replaced all six level-floats in the influent pump station.
- Replaced two solenoid valves (one for the waste pump and one for the seal water system).
- Performed preventative maintenance work on the Andritz screening equipment.
- Re-calibrated flow meters and analytical balance.
- Replaced faulty cellular device and alarm panel in the fire alarm system.
- Updated and reprogrammed PLC (control) unit to operate the waste pumps based on flow.
- Preventative maintenance was performed on both facility standby generators.

Collection System Work Performed

During the course of the year all five lift stations were cleaned twice, as well as cleaning trouble areas within the collection system, which included all of Maple Avenue, Park Avenue, sections of State Street, South Street, Freedom Street, Liberty Street, Windham Street, Center Street, High Street, and the north main interceptor between Liberty Street and the Wastewater Treatment Plant.

The Village also replaced the concrete top for the Industrial Drive lift station, including new aluminum hatch, stainless hardware, safety grating, and a new level probe. Submersible level probes were also installed in the Davis and Center Street lift stations replacing old control float systems. The Center Street lift station also had a faulty trickle charger, a broken annunciator alarm panel, and a broken 3 phase conduit replaced during the year. Upgrades also occurred in the Shawnee Trail lift station where new guide rails, stainless steel discharge piping, check, and isolations valves were installed along with a level probe. For the third year in a row a contractor was hired to perform annual preventative maintenance testing on all Village sludge pumps located in the lift stations, the WTP waste basin, the WWTP influent pump station, and the flow equalization basin. The company also removed and rebuilt one of the sludge pumps in both the Center Street and Industrial Drive lift stations.

Starting late in the summer personnel began smoking the collection system, completing the east and south sections (approximately 60% of the Village) and finding just over 30 violations. Of these violations, staff inspected and re-smoked ten repairs. Wastewater staff also responded to four requests for assistance related to backed-up laterals, and performed metals testing on industrial, commercial and residential sections of the Village collection system during March, June, and July.

Main Goals for the Wastewater Treatment Department for 2017

- Continue to monitor and reduce copper levels to ensure that the WWTP can meet discharge permit limits and that the Village can continue land application disposal practices.
- Remove and repair #1 HSI centrifugal blower.
- Finish smoking the balance of the Village collection system.
- Replace and refurbish one sludge pump from each of the pump stations located at Center Street, Industrial Drive, and at the WWTP influent pump station.
- Replace both 1989 sludge pumps in the EQ basin.
- Complete sanitary sewer contingency mapping update.
- Drain, clean, and inspect the north and south aeration tanks.
- Create backup copies of Village sanitary sewer blueprints.

WTP and WWTP Combined Efforts

In addition to normal monthly meter reading and water termination processing, staff load-tested standby generators at all five lift stations as well as the WTP and wellfield periodically. Personnel operated both the lift stations and WTP on standby power six times during commercial power outages. The staff responded to five low water pressure calls (all of which were caused by interior plumbing issues) and 170 different utility location-markings including all of Liberty Street and the Foxwood Hollow subdivision four times each, plus all along the North Street Water Main Project site twice. The staff also helped a neighboring community locate a major water break, and the local school district locate a faulty solenoid valve that created a high water use.

In the area of plant personnel, employees attended eight workshops or classes as a requirement for licensing renewal. In May, the Board hired a full-time employee. Personnel gave three different tours, one to 30 Hiram College students and volunteers who used the WWTP as a base camp for an Earth Day event which included cleaning Eagle Creek River from the facility to the dam located on State Route 82.

The intention of this report is to briefly outline and record significant events that occurred at the Garrettsville Water and Wastewater Treatment Facilities in 2016. For more detailed information and/or any questions related to this report, please contact Jeff Sheehan, Utilities Superintendent.