

UTILITIES ANNUAL REPORT

FOR BLOOMINGTON, MINNESOTA • 2015 YEAR END

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MESSAGE FROM THE SUPERINTENDENT

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The Utilities
Division
employed
more than
50 people,
with a
budget
of more
than \$21
million.

For many of us, 2015 will be remembered for the work by Utilities staff to identify and, in some instances, address performance, degradation and operational issues of the City's utilities infrastructure.



One of the largest utility rehabilitation projects in years was the Bloomington Area Regional Sewer Improvements that began in earnest in 2014 with the feasibility and design of a multi-million dollar sanitary sewer relining project of the Metropolitan Council's large-diameter sanitary sewer, located along 90th St., between 3rd Ave. S. and Old Cedar Ave. Details of this work can be found at page UAR2.

On a smaller scale, but still very important to the overall operation of the City's water distribution system, our operations and maintenance staff were able to accomplish the repair of five, separate large-diameter gate valves that were determined to be non-operational, when they were recently inspected as part of the Utilities preventative maintenance inspections. After careful planning by supervisors and staff, the work was scheduled and performed one at a time, over a several week period. For additional information regarding this activity, please note the story on page UAR4.

Our water treatment plant produces approximately 3 billion gallons of water each year. To do so, we must draw raw water from the six high-capacity wells we are permitted to utilize. In order to ensure that we are providing safe drinking water to the entire community, we are required to constantly monitor the entire water distribution system, as well as all of the components associated with it, including the water treatment

plant itself. In 2015, during a routine weekly inspection of one of our raw water wells, our highly-trained lab staff detected the presence of foreign bacteria in the raw water sample. This timely inspection, along with quick and decisive action by our staff, was able to first contain and then identify and eliminate this threat. For more information on this story, please turn to page UAR3.

With the hundreds of miles of watermains and sanitary sewer mains, along with the thousands of hydrants, gate valves, service connections and manholes, all approaching 60 years of age, the City has been working hard to move the asbuilt data from paper records to an updated Geographic Information System (GIS) and then integrate that information into an Asset Management Program. While the City has had a GIS for many years, it was just in the last 18 months that the decision was made to move away from the old system into a new one. More on this can be seen at page UAR4. This new GIS will serve to greatly enhance the continued efforts by our staff to integrate the many different software systems used to manage the utilities. The end goal will be a seamless repository of all available information pertaining to the costs associated with the installation, operation, maintenance and degradation of these assets. For a brief Asset Management 101 primer of these ongoing efforts, please refer to the article on Asset Management found on page UAR5.

The articles mentioned above are just a sample of the continued excellent work accomplished by the dedicated and professional Utilities' staff, who takes great pride in providing excellent service to the community. We are all looking forward to another great year in 2016!

ALSO IN 2015

- The **UTILITIES DIVISION** employed more than 50 people. Professionalism is a highly touted value within the Division. All operations staff are encouraged to continue to ascend their **STATE LICENSES**.
- Utilities continued its **TOTAL ASSET MANAGEMENT** plan with the global goal of institutionalizing the program.
- Both the *Water and Wastewater System Master Plans* were updated and integrated into the City's *Comprehensive Plan*.

The
Administrative
Section of Utilities
is committed to providing
a comprehensive water and
wastewater utility services package at
a rate that is less than the average cost of
other cities providing a similar level of service.
Each year, the Utilities Division is benchmarked
in our **ANNUAL RATE SURVEY** against similar
utilities. Rates are ultimately driven by the
WATER AND WASTEWATER FUNDS' EXPENSES.

BLOOMINGTON AREA REGIONAL SEWER IMPROVEMENTS

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Each day, the City's 28 pumping stations move more than 10.5 million gallons of wastewater out of the city.

During the 2015 construction season, Utilities staff assisted the Metropolitan Council Environmental Services (MCES) with completion of the Bloomington Area Regional Sewer Improvements – 90th St. E. project. The project consisted of rehabilitating approximately 2.5 miles of regional sanitary sewer interceptor pipes located in the city of Bloomington. The 24” to 60” pipes, some of which are up to 55 years old, were rehabilitated utilizing the cured-in-place-pipe (CIPP) method. The CIPP method is a trenchless technology where the pipes are rehabilitated by installing (and curing) a resin impregnated felt liner inside the existing pipes. The result of the process is that a new pipe is installed tightly inside the old existing pipe without the disruption and costs associated with a typical dig and replacement method. The CIPP process was instrumental in helping to reduce the project costs, duration, and impacts to homes and businesses. Several of the

manholes along the interceptor were also rehabilitated utilizing liners and chemical grouting. The rehabilitated interceptors were located generally in E. 90th St. from Valley View Park to Cedar Ave., 17th & 18th Aves. from 84th St. to 90th St., and Old Cedar Ave. and Hwy. 77 from 84th to 90th ([Link to Project Information/Map](#)). The sewers transport wastewater to the MCES's Seneca Wastewater Treatment Plant in Eagan. While all of the interceptors are currently owned by the MCES, two major segments (a little over a mile) will be re-conveyed to the City, as they no longer serve a regional purpose. The City will then take over ownership maintenance responsibility for these segments of the system.

One of the most complex details of the project involved providing bypass pumping of the wastewater flow in the interceptors while still allowing some level of traffic flow through the work sites. In some sections of the project this meant diverting the entire

City sewer flow for months. This was accomplished with a series of pumps and miles of large diameter pipes that, in some cases, had to be buried under the streets. The pumping systems were watched around the clock regardless of weather conditions. Locally, several property owners and businesses had to be displaced or provided with sewer service bypass for anywhere from two days to a week while the rehabilitation in those specific areas was completed. To the project teams' credit, there was a great communication system established that helped to reduce and respond to the relatively few complaints that developed.

While major construction activities were completed before winter, the contractor will return in the spring of 2016 to complete landscape and pavement restoration in the project areas. The CIPP rehabilitation process is anticipated to restore a minimum of another fifty years to the life of these interceptor pipes.

SOLIDS CONDITIONING

Solids conditioning is a fairly new term in waste water collection systems but, because of the increase in customers using the sewer system as a trash can (see below – Public Enemy #2), we needed to look for alternatives in dealing with materials that are not truly compatible with waste water conveyance and treatment systems.

Many companies have designed and built special equipment called “grinders” that are used in sewage pumping stations where the flow enters the station.

In Bloomington, the sewage lift station at Chalet Rd. and W. 84th St. (LS-14) is an example of one with increased problems with pumps plugging with rags and wipes.

In 2015, we purchased a “Sewer Chewer” and installed it directly into the trough where the flow comes in. It has a five-horsepower motor and is fully submersible. The “chewer” grinds all the solids to very small particles and allows wastewater to pass through the pumps without plugging. Since the installation, we have seen a dramatic reduction in pumping problems.

PUBLIC ENEMY #2 - FLUSHABLE WIPES

Flushable wipes first hit the market in about 2002 by big companies like Kimberly-Clark and Proctor & Gamble and sales have soared to \$6 billion a year. They claim the products are “the best way to get clean — and safe to toss in the toilet”. Toilet paper disintegrates almost immediately, but the strong-fiber wipes wreak havoc on city sewer collection systems and pumps according to the Department of Environmental Protection. As long as products like these are marketed as “flushable,” utilities will continue to have increased costs due to maintenance to address the impacts of these materials in sewer systems.

CLASS ACTION SUITS

Attorneys are investigating potential lawsuits on behalf of consumers who used flushable wipes and experienced plumbing problems, including clogged toilets. Although these wipes are often labeled as flushable, biodegradable, and sewer and septic safe, it is believed that some of these products do not actually break down in water and can cause serious plumbing problems. Reportedly, consumers have spent hundreds of dollars unclogging blocked pipes, while municipal collection systems and wastewater treatment plants have spent millions repairing and replacing machinery that could not process the wipes.

2015 WASTEWATER INFORMATION

Wastewater, also written as waste water, is any water that has been adversely affected in quality by anthropogenic influence. Wastewater can originate from a combination of domestic, industrial, commercial or agricultural activities, surface runoff or storm water, and from sewer inflow or infiltration.

Municipal wastewater (also called sewage) is usually conveyed in a combined sewer or sanitary sewer, and treated at a wastewater treatment plant.

Sewage is a type of wastewater that comprises domestic wastewater and is, therefore, contaminated with feces or urine from people's toilets, but the term sewage is also used to mean any type of wastewater.

Sewerage is the physical infrastructure, including pipes, pumps, screens, channels, etc., used to convey sewage from its origin to the point of eventual treatment or disposal.

The word “sewer” came from an Old French word *essouier* = “to drain,” which came from Latin *exaquāre*.

BLOOMINGTON AREA REGIONAL SEWER IMPROVEMENTS - 90TH ST. E.

About the Project

Metropolitan Council Environmental Services (MCES), operator of the metro-area wastewater collection and treatment system, is making improvements to aging and deteriorating regional sanitary sewer facilities that serve homes and businesses in the city of Bloomington. The sewer improvements include:

- Temporary pipes and pumps. We will set up temporary pumps and pipes to divert the wastewater while we work. Some temporary pipes will be above ground, and some will be buried to minimize disruption (along 90th St. E. and near Wrights Lake Park). Small excavations will be needed at several manholes to install the new sewer liner and rehabilitate manholes. The pumps will need to run 24 hours a day, 7 days a week during this sewer repair.
- Sewer pipe rehabilitation. We will rehabilitate approximately 13,000 feet of regional sanitary sewer pipe by installing a liner inside the existing sewer. Sewer manholes will be repaired or replaced as necessary along the way.

Typical Construction Process

- Remove pavement or turf where necessary to install temporary pipes
- Set up temporary pumps and pipes to divert wastewater around the repair area
- Clean the sewer
- Install a new lining inside the existing sewer
- Rehabilitate existing manholes
- Remove temporary wastewater pipes and pumps
- Restore any disturbed areas

How Construction May Impact You

We will do our best to minimize impacts during construction; however, some temporary inconveniences may occur, including:

- Parking and traffic restrictions
- Contractor equipment locations
- Extended work hours (including 24-hour operations)
- Lights, dust, noise, and vibrations
- Odors related to sewer work and liner resin

CIPP Project PDF link Page 1 • Page 2

Wastewater Collection strives to provide the continuous conveyance of wastewater into the regional treatment system. One benchmark used to evaluate Utilities' performance is the number of **POSITIVE SEWER STOPPAGES** – our goal continues to be zero stoppages. The Division used routine operational and maintenance activities, such as **SEWER JETTING AND RODDING**, and **CLOSED CIRCUIT TELEVISION** to keep the sewage flowing in 2015.

RETHINK WHAT YOU DRINK

Remember the drinking fountain, that once universal and free, source of H₂O? It seems antiquated now. Instead, bottled water is everywhere- in offices, airplanes, stores, homes and restaurants across the country.

Drinking plenty of water is a necessity of life; it maintains bodily functions, carries nutrients to cells and helps you stay hydrated and energized.

Of course, many people buy bottled water for its taste, portability and often times for its chic and trendiness, reliant on the bottle label, of course. But if you're buying it because you believe it's

safer than tap, you may want to start heading to the sink to fill up your glass.

Consumers drink billions of gallons of bottled water each year and spend a thousand times more to get the same refreshing, calorie-free, healthy drink that they could simply acquire from the kitchen tap.

An interesting fact - it takes billions of gallons of water a year to make the empty bottles. People are beginning to ask if the convenience is worth the potential environmental impact.

Another fact – while some bottled

water is supplied by sparkling springs and other pristine sources, the majority of the water used to fill the bottles comes from municipal water supplies.

Bloomington continues to produce “award” winning water that continues to provide safe and high quality water that provides and promotes good health at the tap.

Without water, there would be no beer; without water, there would be no coffee; without water, fill in your own thought.

Cheers to quality water!

WELL 3 AND SOUTHMORE WELL: IMPORTANCE OF SEALING ABANDONED WELLS

We all depend on safe drinking water to flow from our taps and it is the City's job to make sure this happens continuously without interruption and free from contamination. The summer of 2015, one of the six wells that supply the City's drinking water tested positive for bacteria. Thankfully, weekly testing by lab staff detected the problem and notified plant operators who shut down the well. The test results detected total coliform bacteria. The lab used its capabilities and identified two distinct bacterium: E. coli and Salmonella arizonae. E. coli is commonly associated with fecal matter from warm-blooded species, while Salmonella is said to be a possible contamination from the skin secretions of frogs, toads and lizards. After isolating the well from service, the first priority was to track down the source of contamination. Following numerous lab tests, contamination was traced to an old community well adjacent to the City's ground water supply. It was hypothesized that rain events and snow melts over the years caused sediment to build in the manhole that housed the Southmore well casing and runoff was recently able to leach into the water source. Next, we needed to stop the contamination from continuing while disinfection took place, so a sandbag barricade was placed outside the perimeter of the manhole, to prevent further contamination. Water plant staff was unrehearsed with well disinfection, so lab staff pursued advice from Dave Hanson, an outside contractor, who had made a career out of detecting contamination in wells and Keys Well Drillers, who had the equipment to perform the huge undertaking. It was suggested that “timed tests” be used to determine if the contamination was in the well itself or the aquifer. The tests ruled out the aquifer and confirmed the suspicion that the contamination was being introduced to Well 3 by contaminated water permeating from the old, unsealed well.

An innovative, non-corrosive product called Sterilene was used to disinfect the well. After numerous pumping and disinfection cycles, lab tests confirmed the well was finally free of bacteria. The decontamination process was uncharted territory for many of us and it took over a month to resolve. As of right now, the old Southmore well is scheduled be sealed in 2016.

We were fortunate to detect the issue early on and prevent bacteria from entering the water plant and treatment process. I can't stress how important everyone's role was in the detection, prevention and ultimately the sealing of the old well!

Water Supply and Treatment strives to provide a sustainable supply of water that meets or exceeds all federal and state standards.

A benchmark of this endeavor is the results reported in the federally mandated **WATER QUALITY REPORT**. In 2015, water usage fell short of the **PROJECTED DEMAND**.

Between
October 6
and October
21, 2015,
18,593 tons
of ALM were
transported
and spread
over 3,165
acres of
farm fields.

INFOR EAM & ESRI GIS INTEGRATION PROJECT

Bloomington Utilities had a long running dream to integrate the work order management system (Infor EAM) with our geographic information system (GIS). The migration of the GIS from Smallworld to Esri ArcGIS made this goal much easier to attain. In late 2014, the Utilities Division retained Infor Consulting Services to begin the integration project. Early 2015 was a busy time for the Utilities Technical Support staff, as a huge data cleanup process was begun to make sure that data in both systems were in sync with one another. This needed to

be completed before the consultant arrived on site in March 2015.

Early on, the project involved a lot of configuration of system settings to get both systems to “talk” to each other. Then, GIS maps were created and sample data was uploaded from the GIS into the Infor test database. Once the proof of concept was successful in the test database, the process was repeated in the production database. The consultant’s work was done in the fall of 2015, when three asset classes were integrated in the production database. The Utilities staff

is now working on its own to integrate the remaining assets.

The integration of the GIS and Infor EAM will now require the Utilities field staff to run only one system, instead of both. Work orders can now be viewed and created from either system. Asset creation no longer has to be done separately in each system, which often led to the data being out of sync and required double entry of data. Re-syncing the data is now just a few clicks away. The dream is now reality!

The water distribution system’s 4,600 hydrants and 6,900 valves require constant vigilance.

LARGE GATE VALVE REPAIR PROJECT

When performing scheduled preventative maintenance inspections of utility assets in 2014, utility operators found five 16-inch gate valves inoperable and in need of repair or replacement. All valves in the group were installed in the early 1970’s during rapid growth within the City, and all five were from the same manufacturer. Funds were allocated in the 2015 budget for replacement, but early that year utility operators took the initiative to investigate repairing the valves in place. This approach, if possible, would achieve significant savings for the City, allow for much shorter out-of-service times, and not require any pavement restoration.

Large gate valves are located in rectangular vault structures below the street, which aside from being a confined space, are a convenient place to work. Extensive planning began in February, 2015, to acquire the needed replacement parts, and a disciplined process of visiting each vault to replace corroded fasteners on the valves and cleaning of the vault structures ensued. Only one residential property was out-of-service for the first two repairs done in April, and both occupants were away during the repair. The final three repairs involved larger numbers of properties out-of-service that required mailings to each affected property, followed by door-to-door notification by utility operators the day before the repair was scheduled to take place. Residents were urged to plan ahead by filling bathtubs or buckets with water for personal hygiene or toilet flushing.

All valves were successfully repaired in one day by early July, with the last repair having 63 homes out of service for approximately six hours. It’s a tribute to resourcefulness of our utility operators to have accomplished these repairs for approximately \$3,500.00 per valve, including parts, labor, and traffic control. Replacement would easily have been four to five times that amount, and made a much bigger impact on City infrastructure and the community.

Water Distribution strives to provide an uninterrupted flow of high quality potable water for both domestic and firefighting purposes. The largest potential disruption to service occurs as a result of main breaks. There were **27 MAIN BREAKS REPAIRED** in 2015. The **10-YEAR AVERAGE** for main breaks is 21 per year.

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ASSET MANAGEMENT TOOLS

Managing hundreds of miles of underground pipelines, thousands of hydrants, valves and manholes - equating to millions of dollars in infrastructure is challenging; however, utilizing effective management tools can provide a systematic, efficient and successful approach.

The Utilities Division is expanding their existing infrastructure management program by embracing the concepts of total asset management. Utilizing a new tool that integrates the above/below-ground infrastructure information with its present condition, performance and reliability will provide Utilities' staff additional insight into the current "state of the utility infrastructure."

This reliability tool enhances the Utilities Division's ability to actively and effectively track, monitor, analyze

and determine the remaining life of the utility assets. The tool aids in the prediction of equipment failure and/or potential equipment breakdown through a series of methodologies that identify and determine the criticality and the reliability for each asset. The process also ensures a formal and systematic approach is consistently utilized to predict and determine the potential risk of an asset breakdown or failure.

Division staff developed a series of reliability ranking measurements for each asset group, through a set of questions that determine the overall risk assessment, condition and performance of those assets. The questions were based on a series of themes, which included: environment, quality, capacity, customer satisfaction, operating cost and safety

for personnel and property.

The results from the responses were translated into priority ratings/ rankings for each asset. The rankings provide staff with the ability to uniformly plan, prioritize and prepare a variety of options for repair, replacement or rehabilitation of the infrastructure. The information will also be utilized for budget preparation and capital improvement projections.

The overall benefits in utilizing a total asset management program is to consistently track, manage, evaluate and plan for asset renewal and/or replacement at end of life. Utilizing a systematic approach to managing the City's infrastructure ensures the continued excellent stewardship of these utility assets.

Customer Service processes more than 170,000 meter readings per year and manages approximately 27,000 accounts

OUT WITH THE OLD, IN WITH THE NEW



The Utilities Division is actively exchanging the remaining pulse-generating water meters in the water system with encoder meters. The existing meters utilize an electrical pulse that captures the reading based on each unit of measured water. The electrical pulse is transmitted over a two-conductor cable to the remote readout module.

The replacement encoder meters utilize a technology that provides the ability to easily, quickly and accurately collect meter reads. The register on the meter converts the reading into a digital data format that can be collected without manual data entry.

The meters can be fitted with a radio or a touch pad to help facilitate the reading collection process. With touch-based reading, a meter reader carries a handheld computer or data collection device equipped with a wand or probe. The device

automatically collects the readings from the meter by touching or placing the read probe in close proximity to a reading coil enclosed in the touchpad. The probe sends an interrogate signal to the touch module to collect the meter reading.

The software in the device matches the serial number to one in the route database, and saves the meter reading for later download and utilization with the billing system. The radio reading process utilizes a similar process except the interrogate signal and returned meter reading are transmitted on a Federal Communications Commission (FCC) licensed frequency.

THE PROCESS FOR SAFE EXCAVATION (PDF LINK)

Don't assume you know what's below. Protect yourself and those around you. Use GSOC this time and every time.

Whether you are a professional excavator or homeowner, in accordance with Minnesota State law, you must contact Gopher State One Call (GSOC) before starting any excavation project if you are using any machine-powered equipment of any kind, or explosives. You may be simply installing a new mail box or planting a tree, whatever the project may be, contacting GSOC before starting your project may allow you to avoid costly damages to underground facilities.

FILING LOCATE REQUESTS: HOW IT WORKS

- Beginning online using ITIC, over the phone by calling GSOC, or from a mobile device using ITIC Mobile, you can file a locate request.
- Specific information about the work site and the surrounding area, as well as marking instructions for the work site must be provided. Other information can also be included.
- GSOC processes the provided information, and the area gets mapped out using specialized software that detects possible conflicts with underground utilities.
- GSOC then contacts each underground facility operator in the excavation area identified in the locate request.
- The underground facility operators that requested notification in the excavation area dispatch locators to the described excavation site.
- Locators use specialized equipment to determine the underground utilities in the excavation area. They locate and mark the horizontal location of underground facilities within the excavation site with different colored flags and paint that correspond to the specific underground facility
- Remember to wait 48 hours (excluding holidays and weekends) after submitting the locate request. Check facility operator response using positive response on ITIC and inspect the work site for marks. Contact the facility operator if you have questions regarding their marks.
- To practice safe excavation, always hand dig within the tolerance zone.

Call GSOC

Greater MN Area: (800)252-1166

Twin Cities Metro: (651)454-0002

Or go online at www.gopherstateonecall.org

Customer Service continually strives to meet or exceed our customers' expectations. In addition to the permitting duties, staff is charged with mandated **ONE-CALL UTILITY LOCATING**. Customer Service also oversees the water meter maintenance program, and has read over 135,000 residential readings and 41,000 commercial/multi-family readings in 2015.