

Mishawaka Utilities

James Schrader, General Manager

Mishawaka Utilities was founded in 1903 as the Mishawaka Public Utilities Company and consisted of a Water Works and Electric Light Plant. Wastewater treatment was added to the Utilities in 1952. From humble beginnings, Mishawaka Utilities has grown into a world class municipal utility that provides reliable electric service, clean and safe water, and effective wastewater treatment. The Sewer Maintenance Department is funded by Wastewater Division revenue however the department is under the guidance of the City's Engineering Department. The Utility's 130 employees are dedicated to keeping the utility infrastructure reliable and up to date, with capacity to attract growth and development, helping to support Mishawaka's quality of life.

The Utility Business Office provides customer service as well as support services to the three operating divisions. The Utilities are under the direction of General Manager Jim Schrader. Hometown services provided by Mishawaka Utilities mean that residents and businesses can count on reliable, efficient, and affordable water, electric, and wastewater treatment.

*...capacity to attract growth and
development, helping to support
Mishawaka's quality of life*

The Utility's offices and crews are local.

Personnel and can be dispatched quickly to

respond to problems and emergencies. When customer contact with the Utilities is required, a friendly human being is ready to take your call. The Business Office is conveniently located in downtown. The employees of Mishawaka Utilities are its customers too.

Mission

Mishawaka Utilities is committed to providing the community with the best products and services in electric, water and wastewater treatment.

Mishawaka Utilities strives to:

- Provide reliable service at competitive rates,
- Maintain high professional and ethical standards in a courteous atmosphere,
- Promote continuing education for a safety-conscious and well-trained staff,
- Cooperate with and promote our community, and
- Provide products and services that far exceed the expectations of our owners, our customers.

Utility Conclusion

Prosperous cities are built upon a foundation of sound infrastructure. Electric, water, and wastewater treatment are vital infrastructure elements that are necessary to preserve quality of life and promote and support growth and development. While a national crisis looms because of aging and neglected infrastructure, Mishawaka Utilities stands apart. Wise investments in maintaining and improving our utilities are critical to shaping Mishawaka's future.

Electric Division

Tim Erickson, Manager

Overview

Mishawaka Utilities Electric Division (MUE) is the second largest municipally owned electric utility in Indiana, providing service to 27,322 meters, an increase of 1.09 percent over last year. The electrical distribution system includes 11 substations located at strategic points throughout the City. Our 45-person staff, located at 1646 E. 12th Street, engineers, constructs and maintains the distribution system, consisting of nearly 127 miles of overhead and 176 miles of underground



Mishawaka Utilities Electric Department, 1646 East Twelfth Street

distribution lines, as well as nearly seven miles of transmission lines, primarily 34.5 kV. A small 69 kV section feeds our University Park substation. This system serves a population of 48,252 as of the 2010 census.

Mishawaka's electric consumers enjoy electric rates that are slightly below average for cities our size in Indiana, which is one of the nation's lowest-cost energy states.

*Mishawaka's electric consumers enjoy
electric rates that are slightly below average
for cities our size in Indiana*

While owned by the City of Mishawaka, our efforts are not supported by tax dollars. We are a Division of Mishawaka Utilities; our operation is totally financed by the rate payers we serve.

Operationally, we continue to aggressively rethink how we perform our work, how we allocate our limited resources, and how we maintain the reliability of our distribution system.

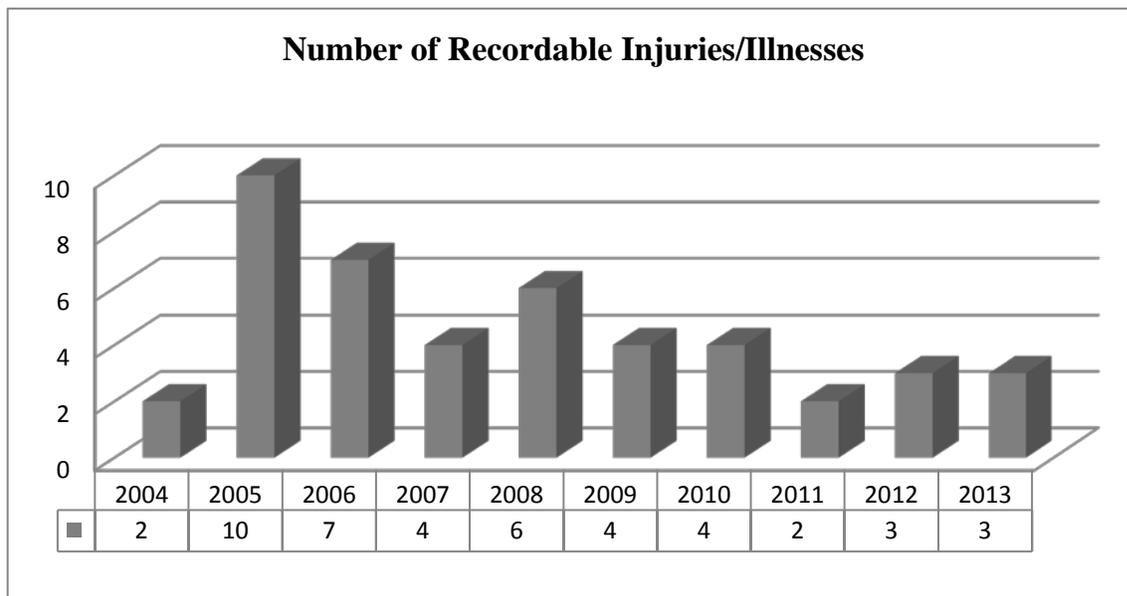
Electric Division Process Measures

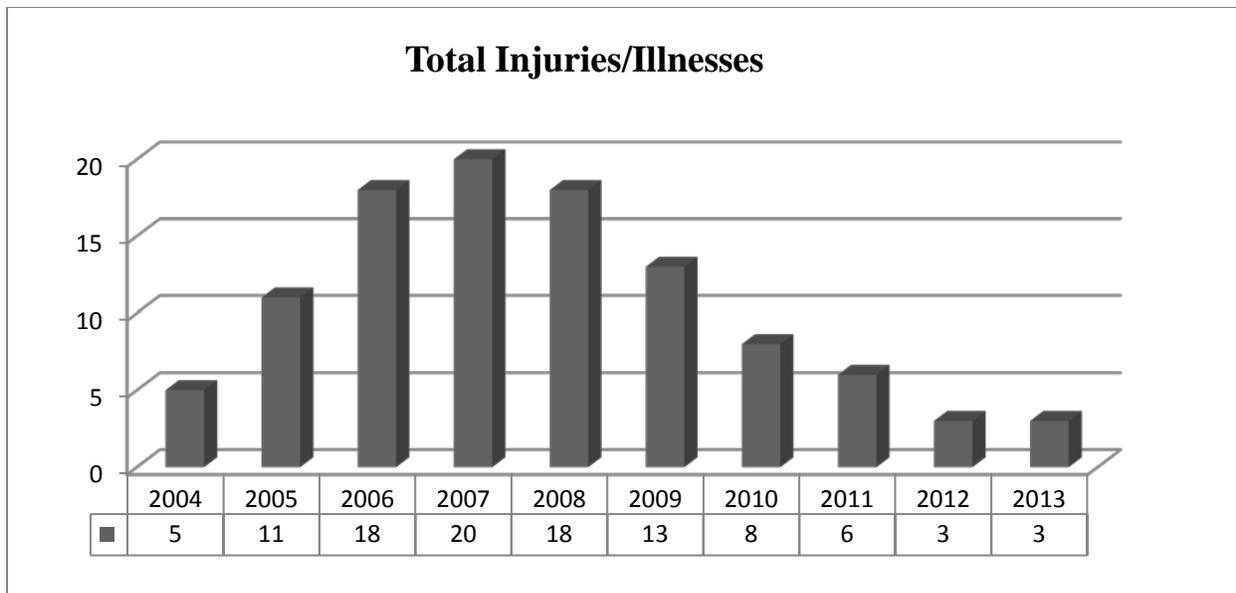
Process Measure	2012	2013	Percent Change
Peak Demand Month (month and kW peak demand)	July - 146,160	July - 137,681	-5.8
Total Energy Purchased (kWh)	624,569,719	621,372,256	-0.51
Total Energy Sold (kWh)	592,463,076	595,721,686	0.55
Total Number of Customers Billed	27,027	27,322	1.09
Engineering Projects Completed	148	170	14.9
Number of Transformers Set	29	59	103.4
Number of Metering Department Work Orders Completed	24,161	24,467	1.27

Personal Safety

In 2013 the Electric Department completed an annual inspection of 3,322 electric equipment components throughout the City to ensure, to the maximum extent practicable, the safety of the general public with respect to proximity to Electric Department energized equipment. Inspections ensured all equipment was properly secured by verifying locking and tagging of all equipment. At this time all equipment is properly secured.

All Construction personnel participated in bucket rescue and pole-top rescue at our Logan Street Training Facility. Training was administered by the Indiana Municipal Electric Association (IMEA). This is an annual training item. In addition, all metering and construction personnel attend monthly safety meetings administered by the IMEA.





The total number of injuries/illnesses this past year remained unchanged at three in both 2012 and 2013. Safety has been, and will continue to be, our main focus at the Electric Division.

System Energy Consumption

In July of 2013 we hit our annual peak demand of 137.7 MW which was 5.8 percent less than the 2012 peak and 6.5 percent less than the previous high of 147.3 MW set in August 2006. All distribution equipment operated within design constraints. SCADA provided continuous up-to-date information on transformer loading and system supply voltages. Also, our energy consumption, the total energy purchased for the year, was 621,372,256 kW, down 0.51 percent from the previous year.

Reliability/Performance Enhancements

The following is a list of system enhancements completed in 2013:

- Completed installation of high voltage breaker upgrades at Russ and Borley substations. Each substation construction upgrade took only five days to complete. Both H&G Services engineers and technicians, and Electric Division construction personnel worked together very effectively to make these upgrades happen in such a timely manner. The Bercado substation is scheduled for a similar upgrade in 2014.
- In conjunction with scheduled battery replacements, a comprehensive technical evaluation was performed by H&G Services engineering personnel to determine if gassing of the substation battery banks could generate sufficient hydrogen gas to warrant the need for a dedicated ventilation system. Their analysis determined that there are sufficient air changes in the existing control house buildings to preclude the need for such a system.
- Continued implementation of the Trip Coil Monitoring Panel (TCMP) design change at Virgil, Grape, Russ and Borley substations. To date this design change has been implemented at six of our 11 substations. The design change is being implemented

in response to a protective system fuse failure at Union substation that went undetected for a significant period of time.

Training

Our apprenticeship program is in its 25th year. In February of 1988 we started our Joint Apprenticeship Training Program and have graduated 24 apprentices to Journeyman Lineman.

Our apprenticeship program is in its 25th year

Our program is a cooperative effort between Local Union IBEW 1392 and the Mishawaka Utilities Electric Division. Our program is recognized and registered with the Department of Labor Bureau of Apprenticeship and Training. To graduate, an apprentice must have a minimum of 8,000 hours on the job training (four years) and 576 hours of classroom study.

Lineman rodeo competitions not only showcase the talents of the line worker both in an individual and team setting but also are judged on national APPA safety regulations at international levels. After a very successful 2012, including our apprentices finishing 1 and 2 in the State competition, the bar was set high. Construction department personnel participated in the following lineman rodeos:

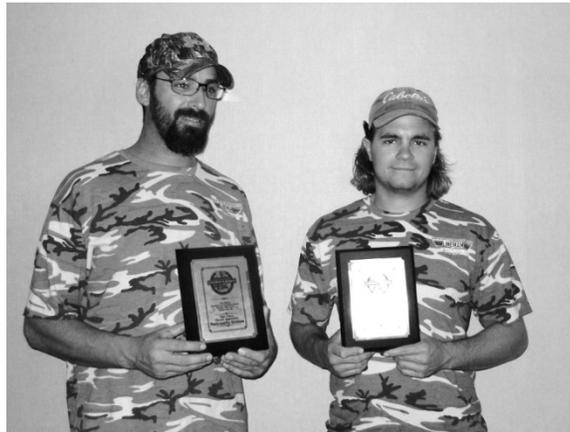
- At the 2013 APPA national rodeo held in Kissimmee Florida, we sent a journeyman team and two apprentices to compete. The Journeyman team consisted of Captain Chuck Bailey and Scott Flynn and Shane Reynolds. The apprentices were Jack Kudlacz and Nathan Prenkert.
- Next Mishawaka headed to the Inaugural Sisterhood United for Journeymen linemen benefit for fallen linemen in Pennsylvania. The team of Chuck Bailey, Shane Reynolds and Mat Stull took home a 1st place and a 3rd in two events.
- On August 9, Mishawaka again entered a two-man team made up of management and union. Competing in the Wisconsin State Rodeo, Shawn Bolinger and Chuck Bailey took home a 3rd place trophy.
- At the 2013 Indiana State competitions held in Richmond, IN on October 12th the Journeyman team of Chuck Bailey, Scott Flynn and Shane Reynolds took home two 3rd place trophies, 2nd place trophies and a 1st place in the Hurtman Rescue event keeping the coveted Chrome Transformer Trophy in our home display case at City Hall. Dave Cochran took home five trophies in the individual and our apprentices Jak Kudlacz won 2nd overall while Nathan Prenkert won the state overall for the 3rd straight year.



Mishawaka Lineman Rodeo Team

- On October 19th at the World Finals in Oklahoma City, teams from all over the world competed for the World title. Our Journeymen Chuck Bailey and Scott Flynn teamed up with Dave Drudy from Richmond to form a co-municipal team for the first time and the apprentices then amazed the world. With over 200 countries represented, our own Jack Kudlacz took 1st place, Mat Stull placed 2nd and Nathan Prenkert placed 6th IN THE WORLD! This continues to show that Mishawaka truly delivers world class service right here at home during outages and we possess the skill and desire to respond quickly and professionally.

*Mishawaka truly delivers
world class service right
here at home*



Best in World - Nathan Prenkert and Jack Kudlacz

Tim Erickson and Kevin McGann continue to serve on the Indiana State Lineman's Rodeo committee as well as the National Joint Apprenticeship and training committee while Tim also serves on the State Safety and Training Committee and chairs both the State IMEA rodeo committee and the NJATC.

Organizational Changes

Organizational changes this past year were as follows:

Engineering Department

- Todd Fizer was transferred from the Substation section to Projects to improve organizational response to electric circuit changes

Construction Department

- Jeff Skeeters was transferred from Construction-Lineman to Metering to assume the Meterman position vacated by Sedrick Springman

Metering Department

- Randy Nickerson retired as Metering Department Manager
- Sedrick Springman was promoted from Meterman to Metering Department Manager
- Jeff Skeeters assumed the Meterman position vacated by Sedrick Springman

Operations Department

None

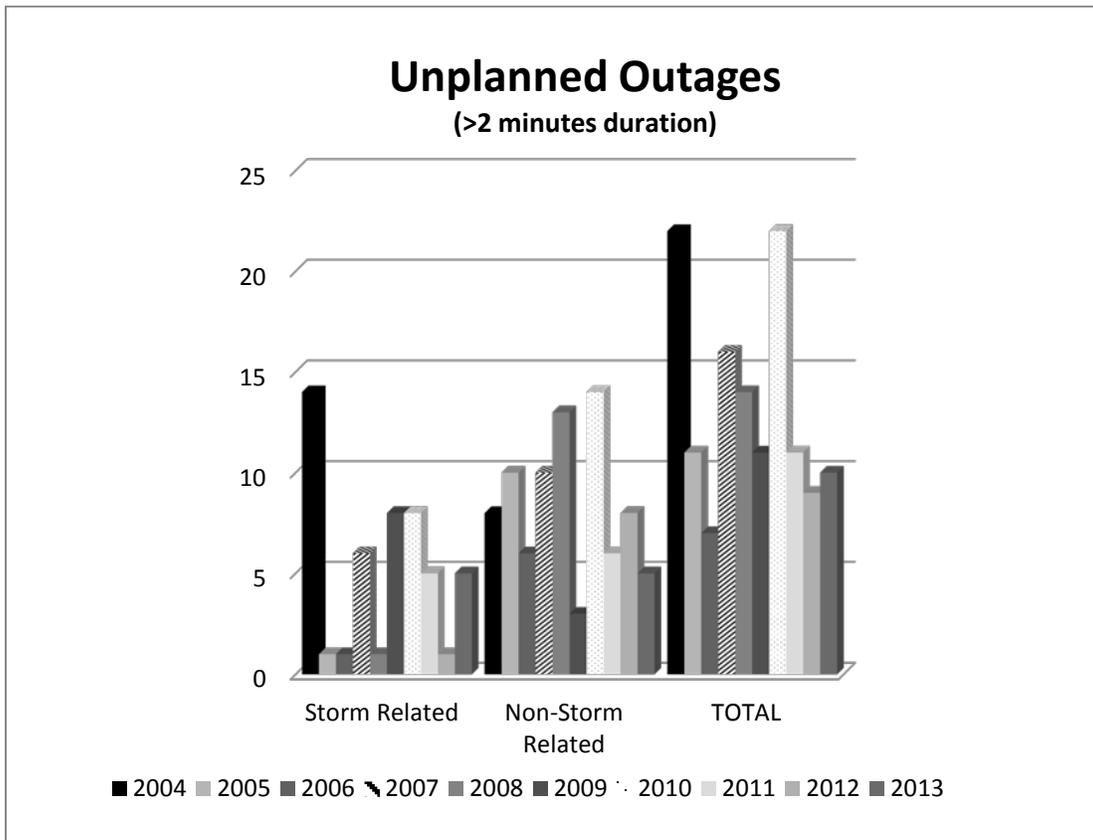
Engineering and Construction

Unplanned Outages

There were 10 unplanned circuit outages in 2013, with a cumulative outage time of 26 hours. There was one additional unplanned outage from last year. Seventeen of the 26 outage hours (i.e., 68 percent) were the result of a significant wind storm on November 17, 2013. The majority of the November 17th circuit outage hours were the result of failure of AEP's Russ switching equipment at the AEP Liberty Tap. The AEP equipment failure resulted in a loss of Russ and Borley circuits. Borley circuits had been transferred to Russ circuits because the Borley station was de-energized to install a new 34.5 kV breaker.

An analysis of 2013 recloser trip data identified that 57% of our circuits did not experience any trips. We also identified problem circuits – i.e., those that experienced significantly more trips than the others. To address these problem circuits we will be taking additional action, such as increasing our tree trimming efforts on the Clover 52-2 circuit.

The chart below depicts our unplanned circuit outage trend for the past 10 years.



The system as a whole continues to provide very reliable power. This is due to multiple reasons including ongoing reviews and analysis of system reliability and operational issues, with appropriate actions taken to address areas requiring improvement. Performance has also been positively affected by implementation of reliability driven design changes, an effective preventive maintenance (PM) program, effective implementation of the fuse coordination program, and effective preparation, review, and approval of technical procedures.

The system as a whole continues to provide very reliable power

Storm Response

We experienced a severe windstorm on November 17th. Division personnel worked diligently to restore the affected areas to service. The damage was extensive on the north end of town including our 34.5 kV line from Russ Substation to the Wastewater Treatment Plant. Our crews responded by restoring all power by the next morning while surrounding communities had areas out for up to 6 days.

Support Services

Annual support services were provided for Summerfest, Summer Concert Series, Memorial Day Parade (Beutter Park and Battell Park), Water Department Pump extraction and installations,

Kamm Island Festival, as well as decorations for the Holidays (wreaths and tree downtown and at Battell Park). Our support role includes providing both personnel and vehicle resources for setup and removal.

Substation and GIS Activities

All Substations

A comprehensive survey/evaluation of substation fence grounding was performed by H&G Services engineering personnel. The evaluation identified four areas in need of improvement. A detailed plan for 2014 has been developed to bring substation fence grounding up to standards.

Bercado Substation

A routine inspection uncovered a failed motor in the T-2 tap changer mechanism. We were able to obtain and install a replacement before it caused any circuit voltage problems.

All Substations

In February ABB issued a product advisory letter requiring all distribution protection unit (DPU) relays to have an upgrade installed to their operating firmware. The purpose is to prevent unexpected operations. This affected 39 of our installed and spare DPU's. So far this upgrade has been installed and tested in 33 of the 39. The remaining should be completed the first few weeks of 2014.

Bercado, Logan, 12th Street, and Russ Street Substations

The 20 year old wet battery systems at these four substations were replaced during 2013. These batteries are an extremely important part of our protection scheme. In 2014 we will be replacing batteries in three more substations. This will complete the battery replacement project.

SCADA (Supervisory Control and Data Acquisition System)

- Effectively being used to remotely monitor real-time status of equipment at all 11 substations. Key SCADA status and control components are tested on a regular basis.
- SCADA communication is now totally on the fiber loop following incorporation of the Radio Tower and Nyloncraft remote terminal units (RTUs) into the fiber loop. The radio system serves as backup.
- Email capability was added to SCADA alarms resulting in improved staff response times and overall awareness of system perturbations. Successful accomplishment of this project was an excellent example of a team effort between the Electric Division, City IT, and our maintenance partner (H&G Services).

Preventive Maintenance (PM)

We are continuing with our substation PM program to help prevent and mitigate failures, and prolong equipment life. The following are key PMs completed in 2013:

Insulator Cleaning

Insulators were power cleaned by Preventive Power and Maintenance in January at University, Union, Virgil, and Logan Substations. These cleanings are part of our strategy to do UP plus one other substation annually with the goal of cleaning every substation at least once every ten years. Cleaning of insulators at University, Twelfth Street, Clover, and Borley Substations will be completed the first week of 2014.

Vacuum and Oil Circuit Reclosers

The oil tanks were lowered on eleven vacuum reclosers allowing inspection, adjustment, and testing of vacuum bottle integrity. This year we also tested the four VHK breakers at the Fourth Street Substation. Testing on the VHK and ESV reclosers both include contact resistance and hipot testing of the vacuum interrupters. Five oil reclosers were also inspected and tested. We tested the fault interrupting devices on two 34 kV circuit breakers this past year.

Relay Testing

Electromechanical relays were tested and calibrated at three substations. These relays protect our substation transformers from faults and over currents. Twelve electronic relays (DPU's and TPU's) were tested. These protect our transformers and feeder circuits.

Routine Inspections (failure finding tasks)

Our infrared (IR) scan was completed in June. IR surveys provide the opportunity to preemptively address equipment temperature anomalies thereby preventing failure. We are also maintaining our aggressive transformer oil testing schedule.

GIS (Geographic Information System)

The Electric Division has effectively used its GIS base map to assist power outage response teams. GIS information provides both a precise location of the affected residence or business and the necessary information (through its relational database features) to determine the extent of the outage.

The MUE GIS implementation expanded further throughout 2013 with daily application of the data collected and maintained in the GIS system. For example:

- GIS continues to play a vital role in the periodic inspection of high voltage equipment. The effort required the creation of equipment location maps throughout MUE territory.
- Maintained construction and streetlight work flow.
- Helped implement the transition from Utility Center to the new Futura Software.
- Maintained Circuit Maps updates, Futura updates, transformer database, of over 300

work orders.

- Maintained all laptop computers for crews. Trained crews on new Futura software to help Construction Workflow be more efficient.
- Attended extensive Training with Projects department in editing in new Futura Software.
- Supported Construction with detailed maps for underground facility inspections.
- Implemented ArcGIS Online to GIS department. This gives Locators and Contractors online capability to view the entire MUE Electric field inventory.

Project Engineering Activities

The new Hospice site project was one of our most significant projects this past year that involved abandoning and relocating a number of primary circuits. We also completed the Main Street widening project north of Day Road. Two other projects requiring significant effort were the Union Street and 4th Street improvement expansion projects.

The most demanding projects, requiring in excess of 160 hours per crew, included the following:

- Electric distribution improvements (line maintenance projects):
 - Pole Inspection / Replacement Program
 - Borley Sub 52-2 Primary Rebuild
 - Borley Sub 52-3 Primary Rebuild
 - Bercado Sub 5-2 Primary Rebuild
- Substation Support:
 - Scheduled projects to support:
 - Switching
 - Circuit Load Balance
 - Recloser upgrades and change outs
- Major City Jobs:
 - Catalpa and Main St. Improvements
 - Toscana Apartments
 - Hospice Site
 - Trinity Road Memory Care
 - River Walk Improvements
 - Union Street Widening
 - Bremen Highway Widening

- 4th Street Improvements
- West Street Improvements
- 12th Street Widening
- System PM:
 - Vault Hazard Testing
 - SF6 gas inspection and servicing of all puffers in service
 - Transformer and Closure verification and inspection (also in support of new GIS program)

Metering

The number of electric customers increased from 27,027 to 27,322 (1.09 percent). The north and south side service trucks completed 19,048 install/removal work orders this year along with taking over the water removal install work orders. The Meter Technician van completed 1,720 work orders, along with several power quality test and recording procedures. We trained a new meterman this year as well as a new service rep on the metering van.

The Meter Readers and Jeff Persyn have kept the reading schedule at or near 31 days all year and have completed 3,712 re-read work orders.

The following table depicts performance in the area of work orders:

Work Orders for Electric	2012	2013	Percent Change
Removals	9,763	9,546	-2.22
Installs	9,646	9,498	-1.53
Sets	162	227	40.1
Re-reads	3,569	3,712	4.01
Change Meters	386	628	62.7
Miscellaneous	635	865	36.2
Totals	24,161	24,467	1.27

The disconnect truck ran shut-off lists 192 days this year which included 2,530 customers. They completed 2,205 reconnects during working hours. They make it a priority to do follow-up visits to disconnected accounts to check for tampering and theft. The shut-off truck helps the meter-readers read if we don't have a shut-off list. The truck has also completed 684 removal and 287 install work orders as well as generating \$87,170 in reconnect and tampering fees. As a department we also completed 100 after-hours reconnects.

We are continuing a program of changing meters from three phase mechanical thermal demand-type metering to electronic solid state-type metering along with single phase A-type base adaptor upgrades. We have also implemented a program to replace single-phase meters that have been in our system over 20 years, many of which result in a loss revenue due to excessive mechanical losses.

We continue to move toward an Automatic Meter Reading (A.M.R.) program. We have changed all meters in Village Green this year as a test case as well as receiving training from Itron on the hardware and software for the A.M.R. system. Once all things are on-line we can move to implement change in getting the meter readings.

The following table depicts performance in the area of shut-offs:

Shut-offs	2012	2013	Percent Change
Past-Due Amount	\$307,621	\$284,465	-7.52
Total Amount Due	\$625,834	\$531,838	-15.0
# Shut-Offs	3,286	2,751	-16.3
# Bad Checks	201	84	-58.2
# Payment Plans & Extensions	158	123	-99.1
# Payment Plan Deposits	293	233	-20.5
Shut-Off Totals	3,938	3,286	-16.6

This year we also sent four of our service reps to advanced meter training. Vicki Harvey and Justin Overholser attended Great Lake electric metering school in Grand Rapids, and Steve Doctor and Jeff Skeeter attended school in Mattoon IL. As a department we also attended monthly IMEA safety training. We will continue to move forward with these programs and research new programs to improve on our service delivery to our customers.

OPERATIONS

Within the Mishawaka Utilities Electric Division, the Engineering, Construction, and Metering Departments all rely on the Operations Department for support. The Operations Department purchases, coordinates and maintains all goods, services, and rolling stock for the Electric Division. In conjunction with the Business Office, the Operations Department generates bills for contracted services set up by Engineering and damage claims to our facilities due to traffic accidents and contractor dig-ins. The Operations Department also assists the Accounting Department in keeping accurate material and accounts payable records, and by generating all purchase orders and job costing reports.

Other key functions of the Operations Department include:

- Dispatching crews and providing assistance to both customers and other divisions

over the telephone and two-way radio.

- Maintaining all records for use by Accounting, Engineering, and Construction pertaining to transformers, meters and inventory material.
- Maintaining the storeroom and issuing materials to construction crews.
- Issuing polyphase meter sockets to electrical contractors.
- Tracking the SCADA system that monitors the entire substation network.

Working safely is one of the most important aspects of our job. One facet of maintaining a safe workplace is using equipment and tools that are in good working order and up to industry and government safety standards.

Each year, we are required to test our bucket trucks and line trucks for both structural and dielectric safety compliance. Structural safety is basically defined by condition of the equipment that we own. Equipment must be in good mechanical and physical condition to be considered safe. Dielectric safety is defined by the insulation properties that certain equipment possesses. Proper insulation levels must be met for equipment to be operated safely around energized electric lines. Each year, we contract Altec Industries to perform on-site structural and dielectric tests on all of our bucket trucks and line trucks. The past year was no exception. Each piece of equipment was inspected to verify its structural and mechanical soundness. Then high voltage tests were conducted to verify that the insulation levels met or exceeded industry standards for safety. Every five years, units are actually x-ray tested to check for structural cracks and stresses that are not detectable with the human eye. Any structural or dielectric deficiencies that are discovered are reported immediately. Upon this type of notification, the non-compliant equipment is removed from service until the necessary repairs or adjustments are made. During the month of January, Altec Industries performed the necessary inspections and tests to maintain and document our compliance with all safety regulations and requirements related to our aerial devices.

Another ongoing safety program in place at the Electric Division involves our required personal protection equipment, or PPE. PPE consists of high-voltage rubber gloves and sleeves which all linemen are required to wear when working on or around energized electric equipment, flame-retardant clothing, hard hats, safety glasses and fall arrest harnesses and lanyards for all linemen that work in bucket trucks. Rubber gloves and sleeves are tested and certified twice a year per industry standards. Fall arrest equipment is inspected annually. All other equipment is inspected by the individual employee on a daily basis for wear and damage.

Prevention is always the first step towards working safely. Any employee whose job would place him/her in a situation where an electrical arc flash could occur is issued flame retardant (FR) outerwear. We continue to partner with BrownDuck, located in Rockville, Indiana, to provide us with the necessary FR outerwear for our employees. Each employee is fitted individually for his garments. These sizes are kept on file with BrownDuck for future orders. FR clothing is BrownDuck's specialty, which is why we chose them as a partner in this endeavor. The average cost to outfit an employee in FR outerwear is \$400.00. But this is a small investment when compared to employee safety and peace of mind. By providing this FR

outerwear, we are OSHA compliant for this type of PPE.

In 2013, the Electric Division received a new vehicle to add to the working fleet. It is a 42-foot single-man insulated aerial platform, or bucket truck, that was delivered in early January. The unit was built on a Ford F550 4 x 4 chassis by Altec Industries in their Elizabethtown, Kentucky plant. This new truck now serves as our front-line trouble rig. Two older units, a large bucket truck and a digger derrick truck, were traded to Altec as part of the sales agreement.

H & G Services continues to control unwanted vegetation growth in our substations. By contracting the vegetation control to an outside firm, we actually save money and MU man-hours versus purchasing the herbicide and applying it ourselves. 2013 was the eighth year of the contract with H & G. The Electric Division plans to renew the contract for 2014 based on H & G's past performance during weed growth seasons. They are a valuable partner in our effort to keep our facilities well-maintained and well-groomed. The condition of our substations is a direct reflection of our overall commitment to be good neighbors to the citizens and businesses that make Mishawaka their home.

We continue to partner with HD Supply Utilities of Mattoon, Illinois by utilizing their Vendor Managed Inventory system, or VMI. Mishawaka Utilities entered into this partnership in January of 2009 to institute an inventory management system with HD Supply acting as our primary vendor for line construction and maintenance material. But the VMI is far more than a single vendor supply partnership. By relying on HD Supply to keep inventory in stock at their warehouse, we can reduce the material that we need to keep on our shelves. This reduces the amount of capital we have invested in store-room inventory that isn't out on the City's electrical system helping to generate revenue.

Another facet of the VMI is the web-based material management software package. The inventory is monitored via desk top and laptop computers or wireless barcode scanners. Any activity on the VMI web system registers instantly and records all material transactions. These transactions include material receipts from HD Supply, material issues to job orders and material issues to truck inventory. Pricing of the material is also managed in real time utilizing an average-cost format. At any time, the system can be queried to give information regarding on-hand material quantities and current material values,



Rodeo Participants

either for individual items or for the entire on-hand stock. All materials have been assigned minimum and maximum stocking quantities. When any material item's on-hand level drops below its minimum, the system is prompted to generate a reorder ticket for that item. These orders are filled and deliveries are sent from HD Supply every Wednesday. With scheduled

weekly deliveries, we are confident that we should very seldom, if ever, run out of any material under normal circumstances.

If faced with extraordinary events such as an ice storm or severe weather event, HD Supply will treat us as a preferred customer and fill orders for all of our needs ahead of their other non-VMI customers. They guarantee response to emergency order requests within 24 hours. With distribution centers nationwide, we are confident with placing our trust in HD Supply for our material needs. After the second full year of the VMI, we are still pleased with the results. We are reducing our on-hand inventory levels, which was the main objective. We are also pleased with the weekly deliveries and the computer-based material management software. In 2013, HD completed development of a second generation of software to drive the VMI system. We continue to “profit” from the ongoing alliance with HD Supply and are excited to see the results in cost savings, lower on-hand material carrying costs and rapid response to material needs as they arise. Mainly, we are looking forward to the sixth year of our partnership with HD Supply and the benefits that accompany that partnership.

Another alliance that we have developed is a transformer salvage program with our partners at HD Supply and transformer vendors Solomon Electric in Solomon, Kansas. In today’s market, many transformer salvage companies charge to destroy used transformers. However, the agreement we reached with Solomon to have them process non-functioning or a technologically out-of-date transformer allows us to receive credit based on the salvage values of the recovered materials. Normally, we would only be allowed to use this credit with Solomon towards the purchase of transformers from their company. But forming this 3-way alliance, the credit is issued to HD Supply and saved on account for to us for use on any equipment, material or services that HD Supply would sell to us outside of the VMI agreement. Here is how this breaks down in dollars and cents. Take as an example a standard aerial service transformer in a typical residential area. The size or KVA rating is usually 50. Salvage value for that transformer would be roughly \$4.00 to \$5.00 per KVA, or approximately \$200.00 to \$250.00. Last year, we declared 98 transformers as salvage and received over \$49,600.00 in usable credit with HD Supply. We were able to use this credit towards invoices for tools, inspection services, and other miscellaneous items.



Lineman at work

A major concern in the Electric Division is saving money whenever possible, but demanding and receiving the highest quality products and services from our vendors is extremely important as well.

The Operations Department wrote purchase orders for approximately \$957,123.00 for goods and services in 2013. This figure includes, but is not limited to, lighting for Bremen Highway South Gateway, the Church Street Underpass and Riverwalk projects. This is a slight increase from the \$867,761.00 for goods and services purchased in 2012. Purchases of \$145,921.00 for inventory

materials from non-VMI vendors and \$248,904.00 for distribution transformers helped us to reach these. Again, these figures do not include goods and services from blanket purchase orders or inventory material and distribution transformers purchased from HD Supply through the VMI system. HD Supply VMI material and transformers amounted to a cost of \$1,260,869.00 for 2013.

Overall spending through the Operations Department continued to decrease in 2013. But there were major endeavors which increased spending in some categories. These expenditures can be tied to projects such as the Main Street corridor development and the State Road 331 project. A program to change out wooden utility poles that were tested and condemned added to the overall increase in material expenditures in 2013 as well. However, another area in which increases in spending can be attributed would be the continued fluctuation in fuel costs during 2013, which is ultimately passed on to us as end users. Rising costs of raw materials and higher overall demand for the goods that our industry uses nationwide were responsible for higher costs as well. Increased purchase costs related to wire and street lighting are due to continued special projects and an aggressive street light maintenance and installation program.

The Operations Department continues to use blanket purchase orders, whenever practical, to assist the Accounting Department in streamlining their paperwork process. We also electronically process and forward as many reports as possible to reduce the amount of paperwork being transferred between offices.

The Operations Department strives for efficiency in the administration of procurement and accounting, the management of materials and services, and the maintenance of the fleet and facilities. We serve as an integral support department for the Electric Division. We are also here to aid other divisions within Mishawaka Utilities and departments in the City of Mishawaka with any tasks that we can. As the Operations Department looks ahead to meeting the new challenges of 2014, we welcome the opportunity to build upon our accomplishments and to develop future successes.

Water Division

Bruno Trimboli, Manager

In 2013, the Mishawaka Utilities Water Division continued its daily mission of supplying potable water to over 17,100 water accounts representing an estimated population of over 46,000 people. Our goal, as always, has been to provide drinking water that meets or exceeds the rigorous drinking water standards established by the US Environmental Protection Agency and the Indiana Department of Environmental Management, while maintaining reliable service. All of the ground water pumped for our system is derived from twenty-two production wells that pump water from the St. Joseph Aquifer. These wells are distributed between our three well fields and the water subsequently produced is treated in one of our three water treatment plants. The maximum available production from our treatment plants is in excess of thirty million gallons of water per day. Currently our daily average pumping totals 8.9 million gallons, with our total volume of 3.26 billion gallons of water pumped in 2013. About 98% of the water we produced last year was filtered to remove most of the iron and manganese naturally present in our ground

Currently our daily average pumping totals 8.9 million gallons, with our total volume of 3.26 billion gallons of water pumped in 2013

water, and all of our water was treated with chlorine, fluoride and phosphate compounds to enhance the potability of the water we pump. Water is pumped throughout our 295 miles of water distribution main to our customers via six

water booster stations, and four elevated water storage tanks totaling some 6.75 million gallons of elevated storage.

Working to maintain and protect the quality of our water are: the Water Quality, Operations, and Wellhead Protection group; the Water Treatment and Pumping Facility Maintenance group; the Distribution System Maintenance and Construction group; and the Water Metering and Backflow Inspection group.

The Water Quality/Operations group is responsible for the operation of our water treatment plants and well fields, and for the comprehensive testing of the drinking water that these facilities produce in accordance with Federal and State regulations. Water quality throughout our distribution system from the wells to the customer's service line was monitored and maintained through the over 19,500 discrete tests performed either in our water quality laboratories or by independent certified labs contracted by us. Water quality testing and treatment plant operations are conducted and monitored on a daily basis by this group. The Annual Drinking Water Quality Report that is provided to our customers by July 1st of each year is published by the Water Quality/Operations group. This report summarizes the results of our comprehensive testing for our citizens in accordance with directions promulgated by the USEPA.



Mishawaka Utilities Water Division													
Water Quality Laboratory Testing Totals 2013													
TEST / MONTH	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Conductivity	132	120	154	126	160	126	132	138	142	160	132	126	1,648
Manganese	132	120	154	126	160	126	132	138	142	160	132	126	1,648
Iron	132	120	154	126	160	126	132	138	142	160	132	126	1,648
Hardness-Calcium	132	120	154	126	160	126	132	138	142	160	132	126	1,648
Alkalinity	132	120	154	126	160	126	132	138	142	160	132	126	1,648
Total Hardness	132	120	154	126	160	126	132	138	142	160	132	126	1,648
Fluoride	124	116	146	120	146	120	124	124	142	146	120	124	1,552
Phosphate	88	80	88	84	92	84	88	92	80	92	88	84	1,040
Free Chlorine	124	116	124	120	124	120	124	124	120	124	120	124	1,464
Total Chlorine	124	116	124	120	124	120	124	124	120	124	120	124	1,464
pH	132	126	154	126	160	126	132	138	142	160	132	126	1,654
Temperature	132	126	154	126	160	126	132	138	142	160	132	126	1,654
Routine Bacti	50	50	50	50	50	50	50	50	50	50	50	50	600
Other Bacti	0	0	17	0	6	16	6	6	4	5	2	4	66
Raw Bacti	0	0	22	0	22	0	0	0	22	22	0	0	88
TSS	2	2	2	2	2	2	2	2	2	2	2	2	24
Lead & Copper	0	0	0	0	0	0	0	0	0	0	0	0	0
VOC	0	0	0	0	0	0	0	0	0	0	0	0	0
SOC	0	0	0	0	0	0	0	0	0	0	0	0	0
IOC	0	0	0	0	0	0	0	0	0	0	0	0	0
Sodium	0	0	0	0	0	0	0	0	0	0	0	0	0
Radionuclides	0	0	0	0	0	0	0	0	0	0	0	0	0
Nitrate	0	0	0	3	0	0	0	0	0	0	0	0	3
TTHM's & HAA5	0	6	0	0	6	0	0	6	0	0	6	0	24
MONTHLY TOTALS	1,568	1,458	1,805	1,507	1,852	1,520	1,574	1,632	1,676	1,845	1,564	1,520	19,521
Total Tests completed for 2013 - 19,521													

Protection of our aquifer falls on the shoulders of the Well Head Protection Coordinator. In 2013, the Well Head Protection effort continued to identify and confirm thousands of potential sources of ground water contamination and to integrate this information with our GIS resources. This included locating abandoned wells, identifying commercial and industrial activities that have the potential to contaminate the ground water, and our participation on the St. Joseph County Water Resource Area Board.

The Water Metering /Backflow/Cross Connection group is responsible for testing of the many backflow devices located throughout our distribution system. The purpose of these devices is to prevent the back-siphoning of potentially harmful contaminants from commercial, industrial or irrigation activities into the potable water distribution system. Backflow devices are required in all commercial and industrial buildings and on all irrigation systems that receive water service from Mishawaka Utilities.

The Water Division Meter Department coordinates closely with the Customer Service arm of the MU Business Office to schedule the installation, removal and testing of our water meters. Most of this work is done on a pre-scheduled basis, but often these personnel are required to respond to radio dispatch. Water meters not only are necessary to allow us to bill our customers for water and wastewater services, but they also help us to determine the type and trends of service required. Customer emergencies account for much of the Meter Department's efforts.



Crane Removes Well Pump

The Water Treatment and Pumping Facility Maintenance group keeps our water treatment plants and associated well fields, booster stations, pressure control vaults and elevated water storage tanks in proper working order. Each of our twenty-two production wells were inspected, serviced, and maintained as required. In addition, two high service motors and two high service pumps at our Virgil Street facility were completely overhauled, and our Virgil Street Well #28 was cleaned and the pumping equipment was replaced. Division Street Well #21 was cleaned as well.

The Water Distribution System Maintenance & Construction group continued their intense pace in 2013. Water main breaks, leaking service lines, broken distribution valves, fire hydrant flushing, and assistance to contractors working for the City were examples of services provided. Projects supported included the Wilson Blvd. project, the Church Street project, and the Union Street

project. The Tuscana Park project was the largest non-public water project the Water Division completed in the past year. Also, as in past years, on numerous occasions, we brought our crews in to work during evening or night time hours in order to minimize the impact of our work on our

potentially affected customers as we relocated water main and/or fire hydrants for the contractors.



There are over 2,700 fire hydrants in our system. The most important function of the fire hydrant is to fight fires, but they are also used to flush the distribution system as required to further enhance water quality. During our yearly flushing, each hydrant is checked for proper operation and repaired as required. Fire flow data is acquired and provided to engineering and insurance entities as requested. A dependable and ample water source for fire-fighting purposes (ISO rating) has a direct bearing on a community's ability to attract or retain commercial and industrial activities.

The year 2013 found the Water Division, with the assistance of Umbaugh & Associates, revising the water rates and revising the manner in which those rates are administered. The desired goal was to create a more fair and equitable water rate structure for our customers.

The final challenge of 2013 for the Water Division was to address an event that occurred on Christmas Eve where a potential disaster was averted at the Blair Hills Booster Station. Piping inside the station disintegrated allowing the interior of the station to be ravaged by high pressure water. A heroic all-night effort by Water Division, City, and vendor employees prevented the loss of water service on Christmas Day as well as the potential for a protracted water service outage for thousands of our customers. It goes without saying that the Water Division will continue to exemplify this spirit in 2014 as we strive to continue to deliver world class service to our customers.

*A heroic all-night effort by
Water Division, City, and vendor
employees prevented the loss of
water service*

PUMPING SUMMARY OF 2013							
All Flows in Millions of Gallons (MG)							
MONTH	VIRGIL WELL FIELD		DWF		Gmwd Well Field	Total Raw Pumped	Total Finished
	Finished Water	Raw Water	Finished Flow	Raw Water			
January	88.31	84.76	108.03	127.99	5.31	218.06	201.59
February	91.79	85.89	95.47	112.81	4.62	206.47	191.88
March	104.48	104.12	107.92	92.77	5.57	202.45	217.97
April	89.43	79.64	117.11	138.62	5.10	223.37	211.65
May	161.33	163.35	122.16	147.81	7.00	318.16	290.49
June	146.17	147.06	144.70	173.25	5.28	325.59	296.15
July	170.89	173.53	150.18	180.18	5.88	359.58	326.95
August	184.78	187.48	146.47	177.19	6.07	370.74	337.32
September	170.97	173.72	143.55	174.74	8.19	356.66	322.71
October	87.10	89.12	129.70	158.14	4.65	251.91	221.45
November	80.76	82.04	101.29	123.21	5.16	210.42	187.21
December	87.47	85.43	103.48	123.53	4.59	213.54	195.54
Yearly Total	1463.49	1456.15	1470.05	1730.24	67.42	3256.96	3000.91
Yearly Average	121.96	121.35	122.50	144.19	5.62	271.41	250.08
Highest Month	184.78	187.48	150.18	180.18	8.19	370.74	337.32
Lowest Month	80.76	79.64	95.47	92.77	4.59	202.45	187.21

Wastewater Division

Karl R. Kopec, Manager

Overview

Mishawaka's wastewater treatment facility serves over 17,000 residential, commercial, and industrial accounts. The population served exceeds 50 thousand. In 2013 over 3.6 billion gallons of wastewater were treated and over 5.5 million pounds of pollutants were removed prior to discharge into the St. Joseph River. In 2013, there were no exceedances of effluent limits. The treatment facility operates 24 hours per day, 365 days a year. The twenty six employees of the Wastewater Division have over 498 years of combined wastewater experience. Seven members of the staff hold Indiana's highest level of professional operator certification.



Mishawaka Wastewater Treatment Plant

The mission of the Wastewater Division is to protect public health and the water environment of the community and to provide efficient service at a reasonable cost. Mishawaka's wastewater treatment plant is a Class IV facility with an average design capacity of 20 million gallons per day (MGD). Class IV facilities comprise the largest and most complex treatment facilities in the state.

The service area that contributes flow to the wastewater facility extends beyond the city limits. Areas served include new developments in Osceola, and parts of the county north, east, and south of the city limits. Expanding the service area protects groundwater, our drinking water source, and increases the customer base, lowering the overall wastewater cost per household.

Mishawaka's wastewater facility is unique because of its location near downtown and within the Lincoln Park neighborhood. The facility is surrounded by houses, condominiums, apartments, parks and the Riverwalk. Much effort is expended to be a positive member of our community. The buffer once provided by the river disappeared as the section of Riverwalk between Kamm Island and Kate's Garden was completed. Hundreds of "Riverwalkers" pass by the facility each week and many positive comments have been received about the well-kept grounds and landscaping. As the public is drawn closer to the facility, housekeeping and maintenance have become more important than ever. Treatment facility employees take pride in efforts to keep the facility an attractive asset of the community.



North Side of Treatment Plant

In addition to the treatment plant, the Division also operates the Biosolids Facility on South Logan Street, which is manned by Sam Garrison. This site is the location for the solids dewatering operation and the storage of biosolids prior to land application. Another responsibility is monitoring of industrial dischargers through the Division's Industrial Pretreatment Program with Ted Hope as our Pretreatment Technician. Eight significant industrial dischargers are monitored and regulated to assure that their discharges comply with Federal and local standards,

and do not harm the wastewater treatment facility processes.

The Division is responsible for certain aspects of the City's sewer system. These responsibilities include the maintenance of 29 remote sewage pump lift stations, operation of five remote odor control facilities, monitoring and reporting on the activity of the 22 combined sewer overflow (CSO) structures, and the operation of the combined sewer overflow control program. Lift stations are required to pump sewage from areas where it cannot flow by gravity.

Mishawaka's lift stations range in size from 150 gallons per minute (gpm) to 4,000 gpm. Critical stations are equipped with stand-by generators in case of power outages and the remainders have transfer switches and receptacles to allow for portable generator operation. Since newer lift stations tend to be far from the treatment facility, in the outer reaches of the collection system, all new stations are required to have permanent stand-by generators. Additionally, generators for three older existing lift stations were purchased using ARRA stimulus funding. Designs for renovating two of these lift stations were completed in 2012 with construction starting in 2013. The Wastewater maintenance department which includes Dave Hoskins, Mike Kubisiak, Mike Mezykowski, Lonnie Moore and Jim Settles also maintain these units.

The Wastewater Division operates a laboratory that provides process control testing and regulatory compliance analysis. The laboratory conducts analyses that are required in our NPDES permit. This includes analysis of samples from each process to ensure optimum efficiency, monitoring of the effluent to comply with discharge limitations, and analysis of industrial samples to ensure compliance with Federal and local pretreatment standards. Currently, the laboratory employs Chief Chemist Ken Botka and two Facility Chemists, Jill Norton and Larry Pozgay.

The laboratory analyzes approximately 18,000 routine samples every year. Along with these samples, duplicates, spikes and standards must be tested to ensure that quality data is obtained bringing the total number of analyses to nearly 39,000. Routine samples include carbonaceous biochemical oxygen demand (cBOD), suspended and volatile solids, ammonia, phosphorus, and solids analysis for sludge and biosolids. These analyses are conducted daily. The laboratory also conducts analysis for the heavy metals cadmium, chromium, copper, lead, nickel and zinc. These tests are performed quarterly on the influent and effluent of the wastewater treatment facility. The laboratory staff also continued participation in an E. coli study on river samples that began in 1997. The E. coli study involves weekly sampling of the St. Joseph River at Bittersweet Road Bridge, Main Street Bridge, the Ironwood Drive Bridge and Angela Boulevard Bridge.



Chief Chemist Ken Botka

During the summer, the laboratory performs bacteriological tests for Mishawaka's swimming pools. The laboratory conducts the bacterial analysis through its Indiana State Department of Health Certificate, which is required in order to perform bacteriological testing of drinking water and pools. As part of this certification, the laboratory is required to correctly analyze ten unknown bacterial cultures as a performance evaluation. In 2013, the laboratory correctly identified all ten.

As part of the NPDES permit requirements, the laboratory collected samples for biomonitoring and organic pollutant monitoring. Although these tests were not done in-house, significant time was spent in the organization and collection of the samples. Biomonitoring is done twice a year to test the potential for toxicity of our effluent on living organisms. Three samples were taken in May and December of 2013. The organic pollutant monitoring analyzes for more than 200 individual organic compounds. Our effluent passed this test showing no organics above detection limits for samples taken in 2013.

Every year the laboratory is required to participate in the EPA's Discharge Monitoring Report - Quality Control (DMR-QC) program. This Federal program consists of analyzing samples with unknown concentrations for all of the parameters of the NPDES permit, including biomonitoring. The results of the testing give the EPA and the Indiana Department of Environmental

Management assurance that the data we submit on a monthly basis is accurate. In 2013, all the parameters were analyzed correctly.

The laboratory assists the pretreatment program for the City of Mishawaka. The laboratory conducted analyses on 8 permitted industries in 2013. Analyses ranged from metals and cyanide to cBOD and pH. The test results allowed the pretreatment coordinator to confirm that the industries were in compliance with their discharge permit limits. Pretreatment testing was performed weekly throughout the year. The hard work by the laboratory staff paid off once again by receiving the Indiana Water Environment Association 2013 Laboratory Excellence Award. This is the 12th consecutive year that the laboratory has received this award.

The Treatment Process

Mishawaka's wastewater treatment consists of the following processes: influent screening, grit removal, primary settling, activated sludge secondary treatment, final clarification, disinfection, post aeration, and anaerobic digestion. The treatment facility is designed to operate in the conventional activated sludge mode. The activated sludge process is a biological treatment process in which a mixture of wastewater and activated sludge bacteria are aerated and mixed. Organic pollutants and ammonia, phosphorus, and heavy metals are removed in the process. Ammonia removal is required because it is toxic to aquatic life and it creates an oxygen demand, lowering the level of dissolved oxygen in the river. Phosphorus is removed both biologically and by chemical precipitation using ferrous chloride. Phosphorus removal is required because excess amounts in the river can cause oxygen depleting algae blooms that harm aquatic life.

Digester gas is a free and renewable source of energy. Utilizing digester gas offsets the amount of natural gas that must be purchased and significantly reduces carbon dioxide emissions from the plant.

Solids generated in the treatment process are biologically converted in an anaerobic environment to simple organic compounds and become known as biosolids. These biosolids are dewatered at the Biosolids Facility and are land applied on area farm fields for soil conditioning and fertilizing. Land application of biosolids is recycling in its truest sense. A byproduct of anaerobic digestion is methane gas. The gas is captured and compressed and is used as a fuel in the treatment plant boilers. Hot water generated by the boilers is used to heat the facility's buildings and to also heat the anaerobic digester tanks. Digester gas is a free and renewable source of energy. Utilizing digester gas offsets the amount of natural gas that must be purchased and significantly reduces carbon dioxide emissions from the facility.

The treated effluent from the facility is disinfected with sodium hypochlorite and then treated with sodium bisulfite to remove any remaining chlorine. At the very end of the process the effluent is aerated to add dissolved oxygen just before discharge to the river.

Statistics

In 2013 the wastewater facility treated over 3.62 billion gallons, averaging 302 million gallons monthly and 9.9 million gallons per day. The treated flow was 182 million gallons more than in 2012.

In 2013 over 5.5 million pounds of pollutants were removed in the treatment process and the quality of treated discharge to the St. Joseph River was exceptional.

Mishawaka's wastewater facility has an average design flow capacity of 20 million gallons per day (MGD) and a peak design flow capacity of 42 MGD. The highest peak flow treated in 2013 was 60 MG on September 19th. The maximum total flow treated on a single day was 19.47 million gallons on April 19th. Treating flow in excess of the design capacity requires skillful operation and a well maintained facility. Pollutants removed during 2013 included 5.1 million pounds of organic compounds, 54 thousand pounds of phosphorus, and 350 thousand pounds of ammonia nitrogen.

*...over 5.5 million pounds of
pollutants were removed in the
treatment process*

Biosolids, the stabilized solid material resulting from the treatment of wastewater, are land applied on area farm fields. In 2013, almost 1053 dry tons of biosolids were processed. Farmers desire biosolids because it contains nitrogen and phosphorus, reducing the amount of commercial fertilizer that must be used. It also improves the quality of the soil.

Digester gas is generated in the anaerobic digestion treatment process. This gas is 65% methane and is captured and burned in the treatment plant boilers supplying heat to the facility's buildings and providing heat required by the treatment process. Approximately 60 thousand cubic feet per day is generated, replacing purchased natural gas.

	2007	2008	2009	2010	2011	2012	2013
Average Flow (MGD)	11.53	14.23	12.64	10.16	11.43	9.19	9.92
Peak Flow (MGD)	36.3	36.1	27.5	58.8	59.7	58.0	60.4
BOD Removed (%)	97	97	98	98	98	98	98
Phosphorus Removed (%)	79	79	78	79	79	80	80
Ammonia Removed (%)	90	96	96	93	90	95	92
Solids Removed (%)	96	96	97	98	97	98	97
Biosolids Produced (dry tons)	967	911	826	1115	1093	1121	1053
Electricity Use (MkWh)	Pre-expansion		5.283	4.874	4.922	4.992	5.075
Natural Gas Use (Mcf)	Pre-expansion		9.914	7.691	7.055	5.378	6.633
Total Precipitation (inches)	49.1	51.6	44.9	33.7	43.33	34.52	38.17

Significant Projects in 2013

Lift station Control Modification

The Wastewater Division is responsible for the operation and maintenance of lift stations in and around the City. In addition to routine inspections, all stations are monitored remotely, through a radio-based computer network, for operating status and alarms. During the year the Division completed a project to upgrade the main computer interface which monitors and reports lift station status at the wastewater plant. The original computer interface and monitoring software was installed in 2002 and had become outdated. The new system is compatible with existing control and monitoring systems that were installed at the Wastewater Plant during the 2008 facility upgrade. The new system provides reliable and stable lift station monitoring.

Middleboro Lift Station

The City's oldest lift station was redesigned in 2012. Middleboro was originally placed in service in 1952. Extensive renovation began in 2013 with construction to be completed in 2014. In addition to replacing all piping, pumps and electrical components, the outside of the brick structure was renovated to preserve its architectural appearance. This rebuilt lift station will serve efficiently for decades to come.

Ancient Visitor

During construction of new sewer lines along River Avenue, we discovered a 31,000 pound boulder. It is believed that this several hundred million year old boulder was transported to Mishawaka by glaciers during the area's last Ice Age approximately 20,000 years ago. The composition of this boulder is predominantly granite which is not native bedrock in our area. Geologists believe that the origin of the boulder was northern Michigan or Canada. This boulder is now on display at the City's Wastewater Treatment Facility with a marker explaining its history for the public to see.



Ice Age Boulder

CSO Elimination

A Long Term Control Plan (LTCP) element was completed in 2013 in the Wilson Boulevard Area. The Wilson Boulevard upgrades include the combining of CSOs and diverting flows from River Crossing 3 to River Crossing 4. This project eliminated CSO – 005 Webster Street and CSO – 007 Benton Street and River Crossing 3 was abandoned. The disturbed area in the Wilson Boulevard area was updated with new streets and sidewalks when the sewer work was complete. Landscaping will be completed in the Spring of 2014.

Mariellen Liftstation

In 2013 a new lift station that was part of the 331 Underpass Project became an asset of the City. Located near the intersection of Lincolnway East and Capital Avenue, the station was predominately funded by the Indiana Department of Transportation but the



Mariellen Lift Station

City of Mishawaka assumed ownership and perpetual maintenance. This is a large lift station that is designed to handle a wide range of flows from 250 gallons per minute up to a future peak flow rate of 6,600 gallons per minute.

The lift station design is unique because it uses screw pumps rather than the more traditional centrifugal pumps normally used. This lift station did not need to provide much pressure to the flow, but it needed to handle high volumes.

The most cost effective pump for these conditions is a screw pump. The lift station has two screw pumps with a space for a future third pump, and includes a stand-by generator and carbon adsorption odor control unit. The innovative design by American Structurepoint, Inc. will be recognized as a Merit Award winner at the March 2014 American Council of Engineering Companies of Indiana awards banquet.

Lift Station Upgrades

Holy Cross, Juday Creek, and Mariellen are the City's three largest lift stations. During 2013 several control deficiencies were identified. The control system designs were modified and physical changes will be made to the controls in early 2014.



Holy Cross Lift Station

Award Winning

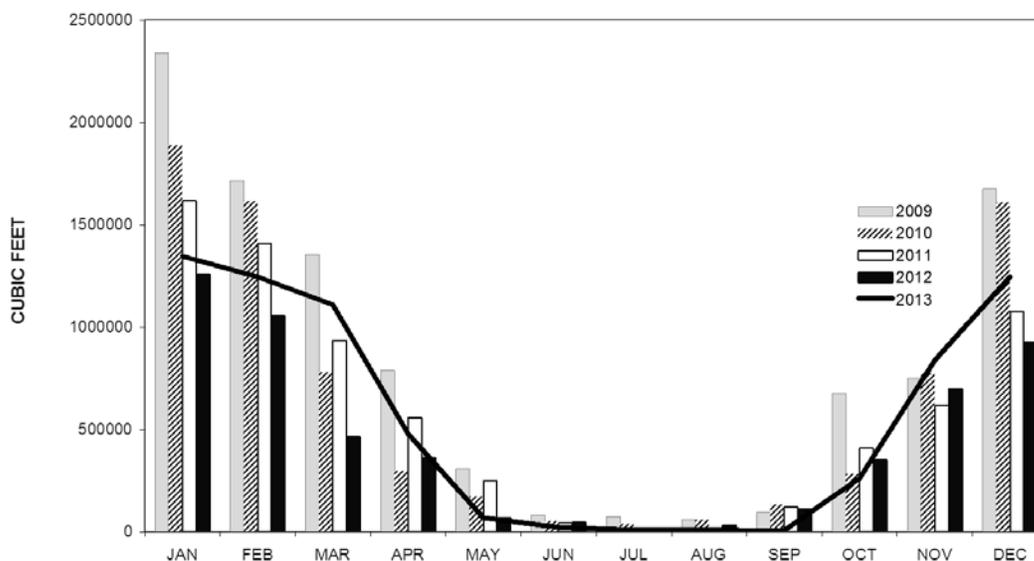
The Mishawaka Wastewater Division received a major award at the 77th Indiana Water Environment Association Annual Conference, held in Indianapolis November 20 – 22. Mishawaka's wastewater laboratory received its twelfth consecutive Laboratory Excellence Award.

In 2013 Chemist Jill Norton was elected to serve as President Elect of Indiana Water Environment Association (IWEA) in 2014. Jill will ascend to the office of President in 2015. IWEA is one of 75 affiliated member organizations of the national Water Environment Federation (WEF). Jill brings distinction to Mishawaka as she is poised to lead the State's water quality association.

Efficiencies

Wastewater treatment facilities are large consumers of energy. It is estimated that wastewater treatment facilities consume 3 percent of electricity generated nationally. In the treatment process, aeration and pumping require the highest energy usage. To reduce this demand, the wastewater facility operates a high-efficiency turbo blower. The turbo blower passed EPA green initiative requirements. The turbo blower serves as the primary source of process air and reduces aeration electrical consumption nearly 30 percent. The blower also requires less maintenance compared to the plant's other positive displacement blowers. The new turbo blower was placed in service in July of 2010 and is in its third full year of operation.

Nipsco Gas Usage 2009 thru 2013



Digester gas which is produced in the treatment process is recovered and burned in the facility’s hot water boilers to provide “free” energy that replaces natural gas. The boilers provide heat for the facility buildings and also heat the two one-million gallon digester tanks. Much time was invested in 2013 fine-tuning the digitally controlled heating and ventilation system that serves all the facility’s buildings and connecting tunnels. This effort has significantly reduced the plant’s reliance on natural gas while maximizing the use of “free” digester gas.

Mishawaka has documented a 16 percent improvement in overall wastewater energy performance. The facility has decreased natural gas consumption 32 percent between 2009 and 2013. This is a significant achievement considering the 2008 treatment plant expansion required a 35 percent increase in heating capacity due to increased building area and safety code-mandated increases in building ventilation. Improvements to the digester system have increased digester gas production an average of 15 percent. Digester gas utilization has risen from 40 percent or less to nearly 70 percent. The new central heating system more efficiently burns digester gas and distributes “free” heat wherever it is needed.

The treatment facility staff continues to look for opportunities to increase energy efficiencies and reduce energy consumption and cost. The Mishawaka Wastewater Facility volunteered to participate in an Energy Pilot Project sponsored by EPA and the Indiana Department of Environmental Management. Along with seven other Indiana wastewater and water utilities, Mishawaka developed an energy management system (EMS). EMSs track energy use and look at measures that might be available to reduce consumption and maximize available energy. The result of the pilot project is a more energy efficient wastewater facility for Mishawaka’s ratepayers.

The Division also continued to work toward becoming a paperless operation. With the installation of the new SCADA computer system in the last expansion, collection of data is now occurring electronically. All of the paper chart recorders have been taken off-line and the operations data is archived digitally.

The operation of the treatment facility is accomplished by a team of dedicated operators that provide coverage 24 hours a day, seven days a week. This includes 3 shifts with 2 operators on each shift, two swing shift operators, and two utility operators. Operators include Mike DeCocker, Mike McDonald, Robert Hall, Tim Wells, Johnny Francis, Jim Szulczyk, John Bolinger, Anthony Vogel, Adrian Peterson and Dave Pieters. Each pair of operators is responsible for making process control decisions on their shift. On off-shifts, weekends, and holidays the facility is staffed solely by these two-person crews.



Chief Operator Robert Hall

Safety Milestone

By the end of 2013 the Wastewater Division reached 1,833 days without a lost time injury. This amounts to over 254,000 person hours worked during this impressive stretch of safe work days. The wastewater industry presents numerous hazards and records higher than average occupational injury rates. The staff deserves credit for working smartly and keeping safety a high priority.

Combined Sewer Overflows / Consent Decree

Although the wastewater treatment facility has been upgraded and expanded to keep pace with growth in the community and ever more stringent environmental regulations, there are parts of the sewer system that date back to the early 1900's. These remaining older sewers carry both sanitary sewage and stormwater runoff in the same pipe and need to be addressed to minimize combined sewer overflows (CSOs). During heavy rainstorms, when the capacity of the sewer system is exceeded, combined sewer overflows can discharge a mixture of stormwater runoff and wastewater directly into the river without treatment. CSOs were constructed to prevent basement backups and street flooding. Mishawaka is one of 90 communities in Indiana with combined sewer overflows. There are around 850 CSO communities nationwide.

The reduction of CSOs is now required by federal law. Sewer design that made sense in the last century is not acceptable today. CSO reduction is one of the City's top priorities. Since 1990 Mishawaka has reduced annual CSO volume by more than 86%. This significant reduction has been achieved through a combination of treatment facility expansions, sewer separation projects, and sewer system capacity upgrades and an aggressive sewer maintenance program. Mishawaka has developed a federally mandated long-term control plan (LTCP) to address the remaining combined sewer overflows. Because Mishawaka discharges into an interstate river, the approved plan will be enforced by a federal consent decree.

Throughout 2013 the City continued negotiations that began in late 2004 with the US Environmental Protection Agency, Indiana Department of Environmental Management, and the Department of Justice over its Long Term Control Plan details and consent decree language. The protracted negotiations are a result of the complexity of CSO reduction and the significant cost to do so. The proposed plan will vastly reduce the occurrence of CSOs from the current 50 overflows per year to zero overflows in years with typical rainfall.

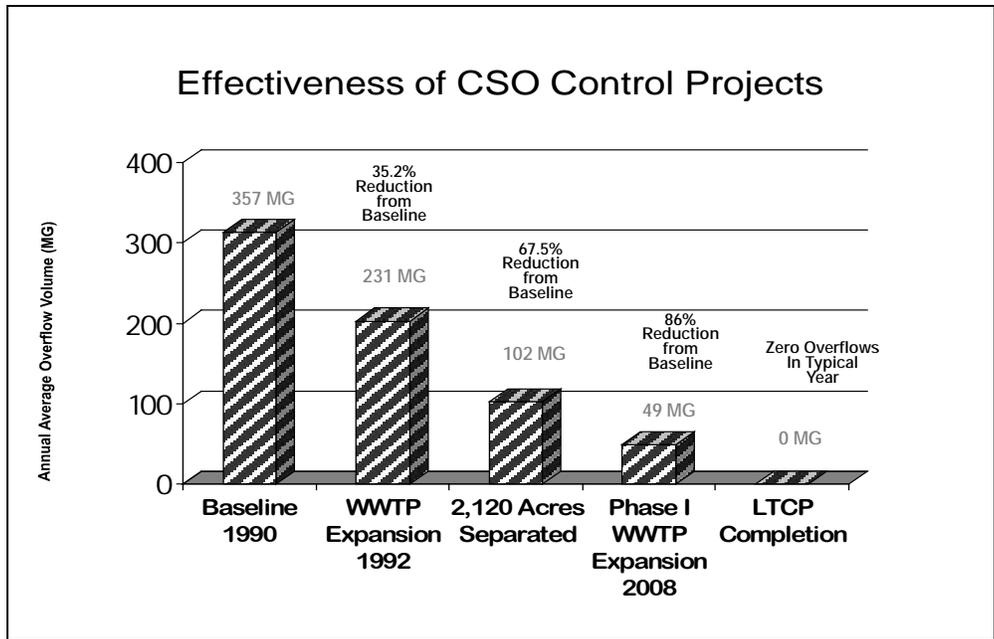
The details of the negotiations centered on developing specific CSO reduction plans, timetables for construction, and on the language that would be placed into an enforceable agreement called a Consent Decree. The City's goal in the negotiations was to arrive at an approved Long Term Control Plan that minimizes CSOs in a cost effective and affordable way. Because of the high cost of CSO reductions, essentially re-engineering the existing combined sewer system, the City was granted 20 years to complete the projects in the LTCP. The cost for meeting the requirements in our federally mandated plan may exceed \$140 million. The combined sewer overflow Long Term Control Plan will be the largest public works project in the history of Mishawaka.

On December 4, 2013 the City received notification from the Department of Justice that our LTCP received approval from the Federal and State agencies involved, and the Consent Decree may now be signed and lodged in Federal Court. The plan is comprehensive and will result in the elimination of overflows during typical storms that occur in Mishawaka. The Consent Decree is a binding agreement that Mishawaka will fund, design, and construct the projects in the LTCP within the agreed to time-frame. Failure to meet these commitments can result in significant fines and penalties.

The combined sewer overflow Long Term Control Plan will be the largest public works project in the history of Mishawaka

Looking Ahead

Mishawaka's National Pollutant Discharge Permit (NPDES) expired in November of 2011. This 5-year permit is the facility's operating license. The City received its new permit on May 1, 2012. It expires April 30, 2017. The new permit contains mercury limits for the first time. The new discharge limit is 1.3 parts per trillion as an annual average. This is an extremely low limit. One part per trillion is the equivalent of one inch in 16 million miles! Like most large communities, Mishawaka cannot meet the 1.3 part per trillion limit all of the time. Monitoring over the past five years shows that the limit is exceeded in about 30% of samples. The State allows communities to apply for a variance of the mercury limit which results in a higher limit that is attainable. A condition of receiving a variance is the development of a Mercury Minimization Plan that focuses on pollution prevention and source control to achieve mercury effluent reductions due to a lack of economically viable end-of-pipe treatment options. In 2013 Mishawaka continued the variance process and the development of the Mercury Minimization Plan. The State allows a 36 month time frame to complete the work necessary to be granted the variance and revised mercury limit. In early 2014 the variance request will be submitted to the State.



Final approval of Mishawaka’s LTCP and consent decree language occurred in December 2013. The consent decree is being signed by local, state, and federal officials and will be published in the Federal Register in early 2014. After a 30 day public notice period, the decree and attached LTCP will be lodged in Federal court, making it official.

The plan is estimated to cost between \$140 and \$160 million and take 20 years to fully complete. The decree will require that the LTCP be implemented according to schedule and that it meet the goal of zero overflows. In December of 2010 a \$37 million Sewage Works revenue bond was sold to fund the first phases of the City’s LTCP projects. Future rate increases will be necessary to cover Long Term Control Plan costs.

Conclusion

Mishawaka is fortunate to have a modern wastewater treatment plant with capacity to keep Mishawaka moving forward. Aggressive combined sewer overflow control efforts have positioned the City well ahead of many Indiana communities. Protecting and enhancing the St. Joseph River as well as promoting health in the community are benefits that all of Mishawaka’s citizens can enjoy.

Sewer Maintenance Department

Tom Dolly, Manager

The Sewer Department is responsible for the infrastructure maintenance and rehabilitation of the collection system which includes over 200 miles of sanitary sewers, and storm lines. The Department has twelve dedicated and conscientious employees that are both versatile and enthusiastic. Responsibilities for the Department include televising, cleaning lines making repairs and cleaning leaves or snow off of storm inlets.



Sewer Maintenance Department

The Department also responds to residential calls for sewer concerns, inspects new construction sewer hook ups and locates sewer lines for contractors. Working with the City GIS and Engineering Departments to televise sewer laterals from homes is also a function of the Department for determining sewer insurance repairs.

Another significant responsibility of the Sewer Department is to maximize the volume of flow transported to the Wastewater Treatment Plant. This is accomplished by preventive maintenance and inspection of the sewers on a well-planned, rigorous schedule. This includes all sanitary manholes, storm sewers, inlets and catch basins.



Video Inspection Crew

Inspections of new sewer system extensions are conducted through sewer televising to insure that the construction meets our City specifications.

The Department also performs tasks for Electric, Water, Parks, Streets, and the Wastewater Treatment Plant.

The Sewer Department is comprised of four divisions that include the Video Inspection

Crew, the Cleaning Crew, the Repair Crew, and the Utility Crew.

Video Inspection Crew

The video inspection crew is comprised of two main camera operators, and several cross-trained individuals. Several employees were selected and given extensive training on the new equipment which includes remote robotic cameras, and a new data collection system.

The crew provides precise documentation on sewers that may need maintenance such as; jetting and vacuuming, dragging for heavy debris, root cutting or herbicide treatment for root control. The video inspection also checks the integrity of the pipe, the condition of sanitary sewer laterals and validates repairs or lining.

The video inspection crew is well equipped and includes two state of the art camera systems which can travel up to 1,200 feet in length, take videos, still pictures, and record data to a computer in the camera truck, and print reports.

On the two video inspection trucks there are three cameras and three robotic drive systems that transport the cameras. This hardware is interchangeable in the event one is in need of



Video Inspection Controls



GIS Data Collection

repair. The robotic cameras can drive down any sewer system from 8" to 60" in diameter and up to 1,200 feet in length. The cameras have articulating heads that have zoom, as well as pan and tilt capabilities. The computers that drive these cameras can record all visual data and all manually documented information entered by our camera technicians. This information is uploaded to the City GIS Department and Engineering for further study and updating of the City GIS Map.

The video inspection trucks are also equipped with pole cameras to inspect manholes and tight spaces that a normal tractor driven camera can't get into. These cameras have the ability to reach 24 feet in depth and one of them has zoom capabilities. One of the trucks has a lateral launch system that gives us the ability to televise residential laterals from the main line in the street up to the house to determine blockages or damage. We are also able to take our mini push cam system into homes to televise from the house to the street to determine blockages or damage. In

In 2013, over 5,693 feet of residential laterals were televised with the push cam system

2013 the Sewer Department purchased a new pan and tilt push camera system that gave us the ability to pan or tilt the camera to get a better view of any fracture or defect in a homeowners lateral. In 2013, over 5,693 feet of residential laterals were televised with the push cam system.



Broken Sewer Pipe

The employee's assigned to push cam inspections may also be assigned to do sewer locates for contractors, and follow-ups to residential concerns. These employees performed 103 sewer excavation inspections in 2013.

Cleaning Crew

The main function of the cleaning crew is to perform scheduled preventative maintenance cleaning on a daily basis. The cleaning crew has two combination trucks, an Aquatech, and a Vactor. Two highly skilled operators and a select group of cross-trained individuals operate these trucks. Between the two combination trucks, 191,448 feet of sewer lines were cleaned during the year. One of these trucks will assist the video inspection crew by cleaning lines before they are televised, while the other crew cleans inlets, and catch basins.

As a result of the preventive maintenance schedule we have been able to minimize sewer surcharges into basements, increase the volume of flow to the wastewater treatment plant, and decrease combined sewer overflows.



Cleaning Crew

The Mishawaka Sewer Repair Crew

The repair crew is comprised of cross-trained employees who perform routine maintenance on storm inlets, catch basins, manholes, and concrete flat work on sewer repairs. The repair crew uses concrete saws, jack hammers, cement mixer, backhoe, and concrete finishing equipment on a daily basis.

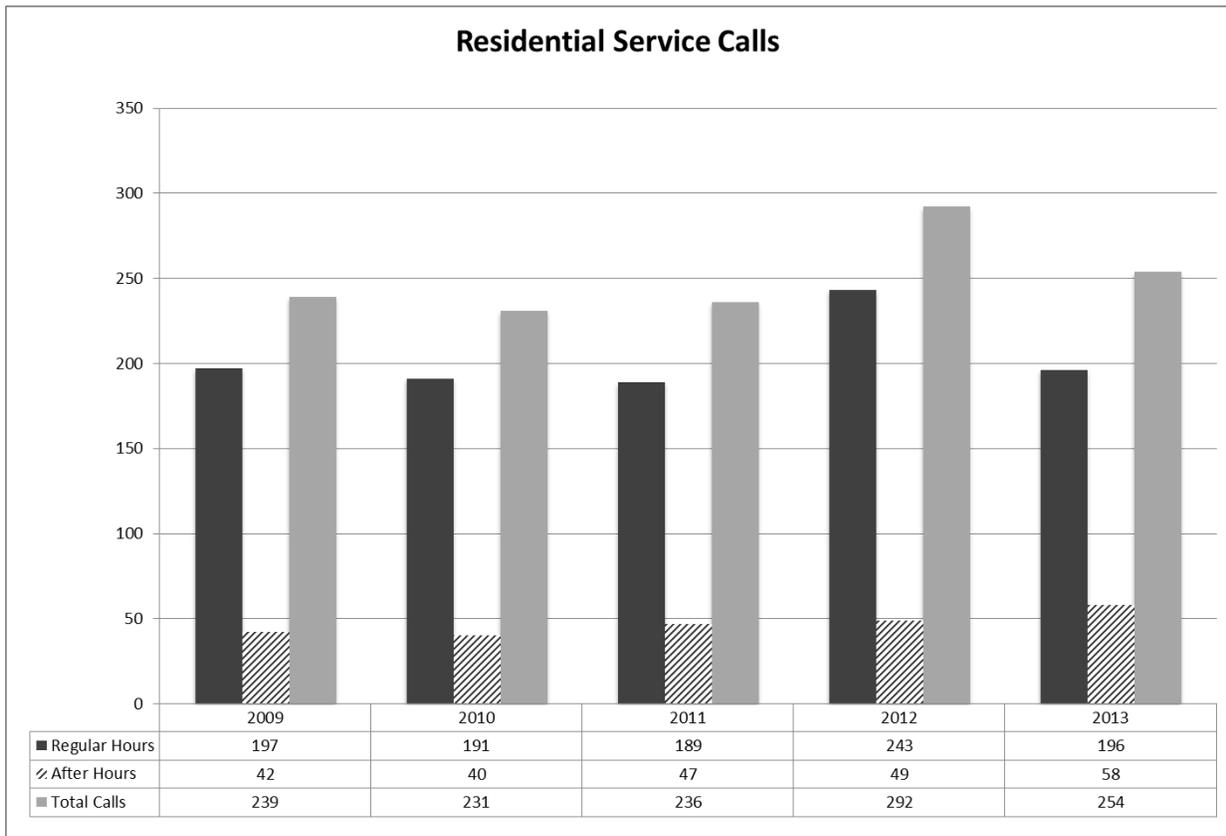
The Mishawaka Sewer Utility Crew

The sewer utility crew, comprised of all cross-trained employees, performs many jobs for the Sewer Department. Their jobs range from doing traffic control for the video inspection or cleaning crew, inlet patrol, lateral locate inspections, new construction inspections, service request mini-cam inspections, and GIS data collection for sanitary sewers.

Over the past year, 196 calls were received from residents during normal working hours and 58 after-hours requests for our personnel to check the sewer main. These calls ranged from homes with sewer problems, odors coming from the sewer line, water standing in the street or inspection of contractor cleaned laterals. Of the 254 calls, 67 residents qualified for the sewer insurance program. These 67 sewer insurance work order calls were taken, set-up and completed by our office personnel. These residents had repairs that ranged from a simple second opinion cleaning and 1 year guarantee against tree roots, to a more in-depth project such as an excavation and lateral repair. This program has proven to be very successful in assisting Mishawaka's residents with the high cost of sewer lateral repairs. More of the specifics regarding the sewer insurance program can be found on our City's website.



Cleaning Crews in Action



2013 PREVENTIVE MAINTENANCE SUMMARY

	Number	Feet	Miles
Sanitary Sewer Jetted and Vactored		177,068	33.54
Sanitary Sewer Root Cut		3,523	.67
Sanitary Sewer Dragged		0	0
Combined Sewer Jetted/Vactored		13,620	2.58
Combined Sewer Root Cut		1,615	.31
Combined Sewer Dragged		0	
Storm Sewer Jetted and Vactored		760	.14
Storm Sewer Root Cut		365	.07
Storm Sewer Dragged			
Inlets Cleaned	134		
Catch Basins Cleaned	228		
Drywells Cleaned	1		
Manholes Cleaned	0		
Vactoring Hours	2,927		
Sanitary Sewer Back-Up			
Storm Sewer Back-up			

2013 VIDEO INSPECTIONS

		Feet	Miles
Sanitary Sewer TV Inspected	Existing	210,369	39.84
	New		
Storm Sewer TV Inspected	Existing	1,285	.24
	New	11,166	2.11
Combined Sewer TV Inspected	Existing	17,441	3.30
Service Lateral TV Inspected 110	Existing	5,693	1.08
	New		
	Total	245,954	46.58

2013 MAINTENANCE REPAIR SUMMARY

Sanitary & Combined Manhole Entry	3
Sanitary Main Repairs	0
Sanitary Manhole Repairs	1
Sanitary Manholes Replaced	0
Sanitary Manhole Invert Repairs	0
Sanitary Manhole Bench Repairs	0
Storm Grate Replaced or Repaired	7
Combined Manhole Raised to Grade or Exposed	4
Storm Main Repairs	0
Storm Manhole Repairs	4
Combined Manhole Invert/Bench Repair	0
Storm Manhole Invert/Bench Repair	0
Storm Inlet Repairs/Replaced	3
Storm Catch Basin Repairs/Replaced	3
Combined Catch Basin Replaced/Repaired	2
Combined Inlets Repaired/Replaced	2
Bags of Concrete	219
Castings	11
Risers	2
Pre-Fabs	0
Sewer Permit Inspections	103
Water Tap Inspections	32
“As-Built” Inspections	8

The Sewer Department continues to strive to improve its preventive maintenance programs and, through cost-effective measures, maintain the current level of services provided. Through its various programs, the division endeavors to preserve and maintain its major infrastructure system investment. Working together as a team with all Departments has proven to be one of the most important keys to success in 2013.

Mishawaka Utilities Business Office

Virginia Fras, Manager

The Business Office continues to look for internal ways to improve efficiencies and reduce costs. This past year we partnered with Lake Michigan Mailers to pick up the U.S. mail metered at a significantly discounted First-Class rate, barcode it, sort it, and deliver it to the Postal Service the same day. The key advantages to this option are a reduction in postage for automation compatible mail and elimination of charges that we would normally incur throughout the year.

...a reduction in postage for automation compatible mail and elimination of charges that we would

This option gives us the opportunity to keep our current postage equipment, while obtaining the greatest savings with little or no change in our operating environment.

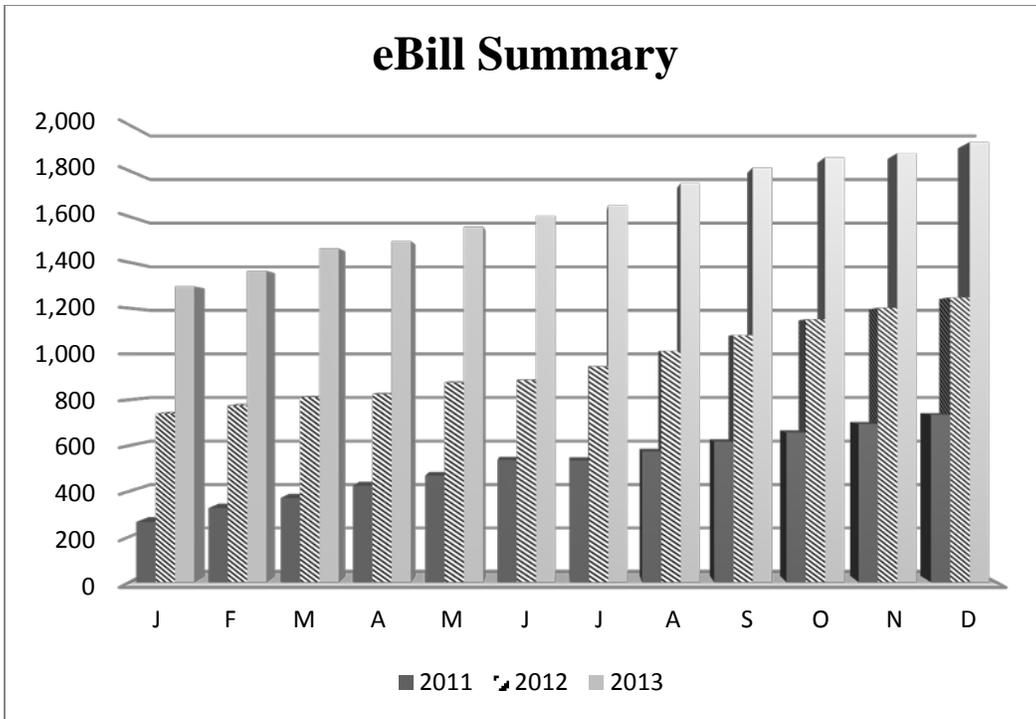
Our e-mail statements continue to increase in number. E-mail statements enable Mishawaka Utilities to reduce billing costs, while maintaining customer service and efficiency.

Electronic invoice presentment and payment provides the following numerous benefits:

- Reduction in costs associated with the production, handling, and mailing of paper invoices
- Dramatically improved customer service due to 24/7 customer self-service for invoice and payment histories
- Enhanced cash flow from quicker payments made electronically and aided by the automated collections manager, which allows the biller to send automated reminders of payment due, payment overdue, etc.
- Labor costs associated with invoice packaging, mailing, handling of paper, dispute resolution and collections are reduced
- Customer satisfaction is improved as customers save time and money by paying electronically, with no need to write checks, fill out remittance forms, address envelopes or add postage
- Electronic payment provides security because sensitive personal information is transmitted stored and maintained using best practice PCI compliant systems



Customer Service



eBill Summary Over Last Three Years

Our goal this year is to continue updating our customer service and billing software to improve on internal efficiencies. This solution improves customer service response times, enhances customer intelligence, improves application integration, and lowers maintenance and integration costs.

The Mishawaka Utilities Business Office welcomes a new year and thanks their customers for giving us the opportunity to serve you. It's been our pleasure serving the citizens of Mishawaka and we hope to continue to provide "World Class Service", now and in the future.