WATERFORD TOWNSHIP
DEPARTMENT OF PUBLIC WORKS
2010 ANNUAL OPERATIONS REPORT

Respectfully Submitted February 28, 2011 to the
Honorable Charter Township of Waterford Board of Trustees

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Executive Summary:

The purpose of this annual report is to provide an overview of operational information related to the Waterford Township Department of Public Works (DPW). While the annual financial report prepared by the Township's auditors in conjunction with DPW management outlines the financial position of the DPW, the intent of this report is to provide an overview of 2010 operations in the various DPW Divisions and Branches. The economic challenges facing our nation, State and local communities continue to require more innovative solutions than ever to effectively and efficiently execute the DPW's mission. Through deployment of advanced technology, training and planning, the day-to-day DPW operational requirements continue to be met effectively and efficiently.

Water sales continued to decline in 2010 and were 122,763,357 gallons less than 2009, which was 92,492,517 gallons less than 2008. Lost sales revenue continued to be offset by substantial cost saving measures including capital improvement and operational spending cuts, reduced power consumption initiatives and staff reductions. The results have been dramatic in that the Water/Sewer operational deficit has been reduced from over $2 million in 2009 to approximately $150,000 in 2010 while improving operational efficiency.

Other 2010 highlights include the start-up of the new fully automated Nelsey Road Water Booster Station, which has dramatically increased water pressure for customers in and around the Northwestern area of the Township. This station was designed as a prefabricated station and was installed by DPW staff , which saved over $50,000 in project costs.

Background:

The DPW has two (2) Divisions and multiple Branches involved in providing quality water, sanitary sewer and facilities services for Waterford Township residents. The Water/Sewer Division operates and maintains 355 miles of water and 353 miles of sewer lines respectfully, 13 water treatment facilities, 18 production wells, 3,600 fire hydrants, 3,400 water valves, 8.25 million gallons of water storage utilizing 3 storage tanks, 62 sewer pumping stations and 8.800 sewer manholes. The water system was largely implemented in the second half of the 20th century and closely followed housing growth in the Township. In 1992 and 1994, the first generation iron filtration plants were constructed, which dramatically improved the quality of water provided to customers. The sanitary sewer system was largely implemented in the late 1960's and 1970's, and continues to grow as residential and business development continues. There are currently over 24,000 water accounts and 25,000 sewer accounts, which are billed quarterly. The system is estimated to serve a population of approximately 62,000 customers within the 36 square-mile Township service area. Operation and maintenance challenges continue to require more investment as infrastructure continues to age. The DPW continues to reinvest in the system and leverage new technology to aid in effective and efficient administration.

The DPW is almost unique in Southeast Michigan in that it solely provides drinking water to the Township independent of the Detroit Water and Sewerage Department (DWSD). On an average annual day, the DPW distributes 8,000,000 gallons of safe potable drinking water to customers. Peak summer day demands can exceed 18,000,000 gallons per day. The raw source of water is from eighteen (18) active wells, located within the Township, which feed the iron treatment plants for processing and distribution to customers.

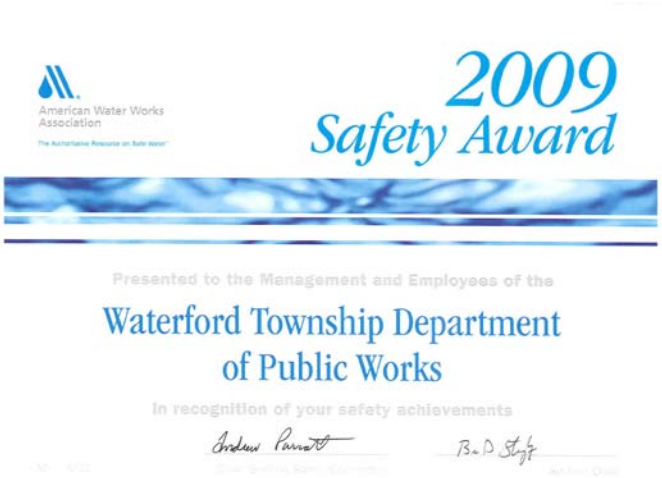
The Township is a member of the Clinton-Oakland Sanitary Sewer System, which transports sewage to DWSD for processing. This system is a regional waste water collection system that involves the partnership of Oakland County and DWSD.

The Facilities and Operations Division (F&O) is responsible for the efficient and effective maintenance and operation of the Township buildings, building systems, equipment, cemeteries, bike paths and vehicle fleet. These responsibilities specifically include the operation and maintenance of 281,600 square feet, or 6.5 acres, of Township building floor space, 54 acres of Township owned grounds, 41 miles of bike path, 5 Township Cemeteries, and a vehicle fleet of over 250 vehicles.

Honors and Awards

In 2010 the DPW was recognized by several professional organizations for achievements in the Safety program and for some of the projects recently completed:

The DPW received the National American Water Works Association (AWWA) 2009 Safety Recognition Award. This is an achievement that is bestowed upon few public works operations across the country annually and recognizes the DPW's continued effort to provide a safe and highly trained work force.



The DPW was awarded the Michigan Section AWWA (MIAWWA) 2010 Safety Recognition Award for continued improvement in safety and training.

The DPW was awarded the "Health & Safety – Medium Municipal Plant Award" from Michigan Water Environment Association (MWEA). MWEA recognized the DPW's commitment in achieving the goal of a safe work environment and health of its employees. The MWEA award will presented on June 28th as part of the 2011 MWEA Annual Conference.

The DPW received the 2009 Project of the Year Award in the Environmental ($5 -10 Million) category. This was in recognition of the Water Supply and Treatment System Upgrade and Expansion Project at Hess-Hathaway Park. The award was presented by the American Public Works Association (APWA) Michigan Chapter at its annual conference in May.

ENVIRONMENT - $5-10 MILLION

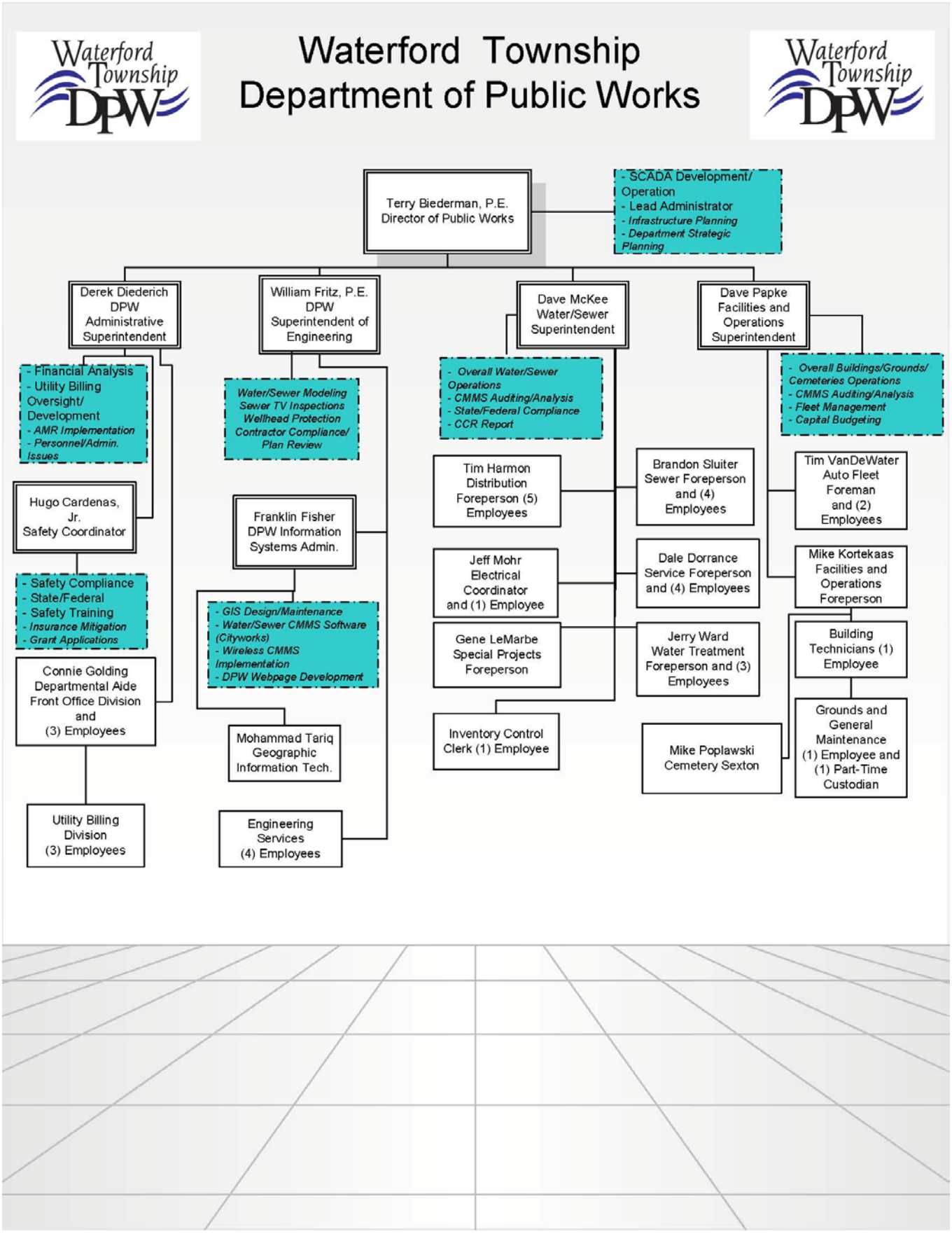
Water Supply and Treatment System Upgrade and Expansion

Managing Agency: Charter Township of Waterford Department of Public Works

Contractor: Reliance Bulding Company

Consultant: Johnson & Anderson, Inc.

The following chart outlines the DPW organization:



WATER AND SEWER DIVISION

Administrative Branch

The mission of the Administrative Services Branch is to provide professional billing and customer service to both internal and external customers. Employees are called upon to leverage the latest in computing technologies, utilizing a variety of software packages and hardware to achieve quality information flow. Employees in this branch support every Division and Branch within the DPW as well as interact and provide services to other Township Departments, customers and contractors.

The Administrative Services Branch is headed by the DPW Administrative Superintendent and is comprised of 7 full-time employees. The positions and a brief description of their typical duties are listed below:

- DPW Administrative Superintendent
  Conducts planning, research and evaluation necessary to keep the DPW's Utility Billing and Receivable Systems operational and up to date. Performs specific project management as related to the DPW's meter reading systems, Computerized Maintenance Management Systems (CMMS), creates and analyzes data to look for efficiencies. Prepares financial and operational schedules needed for the Township's Financial Audit. Creates and analyzes specialized reports. Performs the personnel and accounting functions of the DPW as required.

- Departmental Aide
  Serves as the office manager for the DPW's Administrative personnel and is responsible for the day to day functioning of the office. Oversees the DPW's daily payroll and accounts payable systems. Utilizes the DPW's CMMS package to ensure work orders and service requests are properly recorded. Prepares reports and oversees the DPW EFT-Auto-Debit payment program.

- Account Clerk II
  Responsible for DPW Accounts Payable and Payroll System. Also called upon to render customer service to both internal and external customers. Utilizes a variety of software programs to provide quality data to customers and employees.

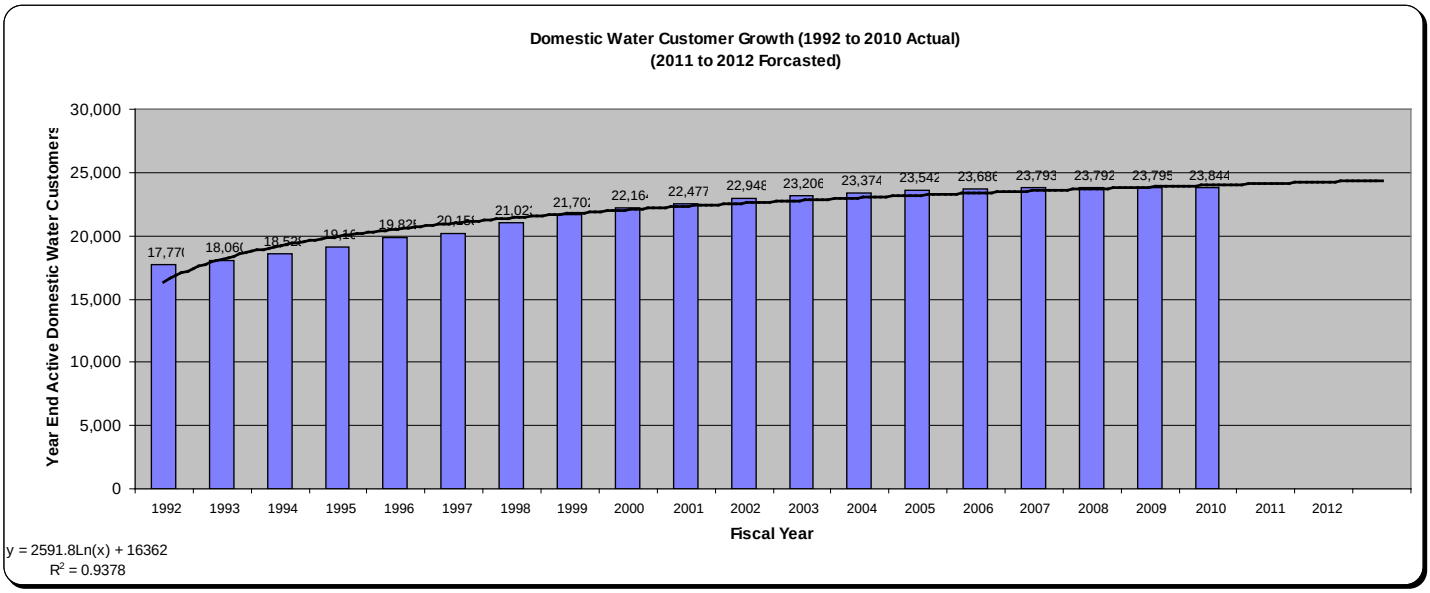
- Utility Billing Account Clerk (3)
  Responsible for rendering 108,000 water-sewer bills annually to the Township's 25,000 customers on a prescribed schedule. Process the DPW's automated lock box system and utilizes the DPW's meter reading systems to interface with the Utility Billing System. Employees are called upon to utilize a variety of software applications.

- Account Clerk I (2)
  Responsible for Point of Sale (POS) Register and customer service. Processes a variety of customer payments and requests for service. Employees utilize the Computerized Maintenance Management System (CMMS) to record work orders.

Billing Branch employees (from back left) Lori McKee, Mary Ginter, Helen Warren, Connie Golding, Nancy Kaufman, Mary Jane Duschinske, and Mary

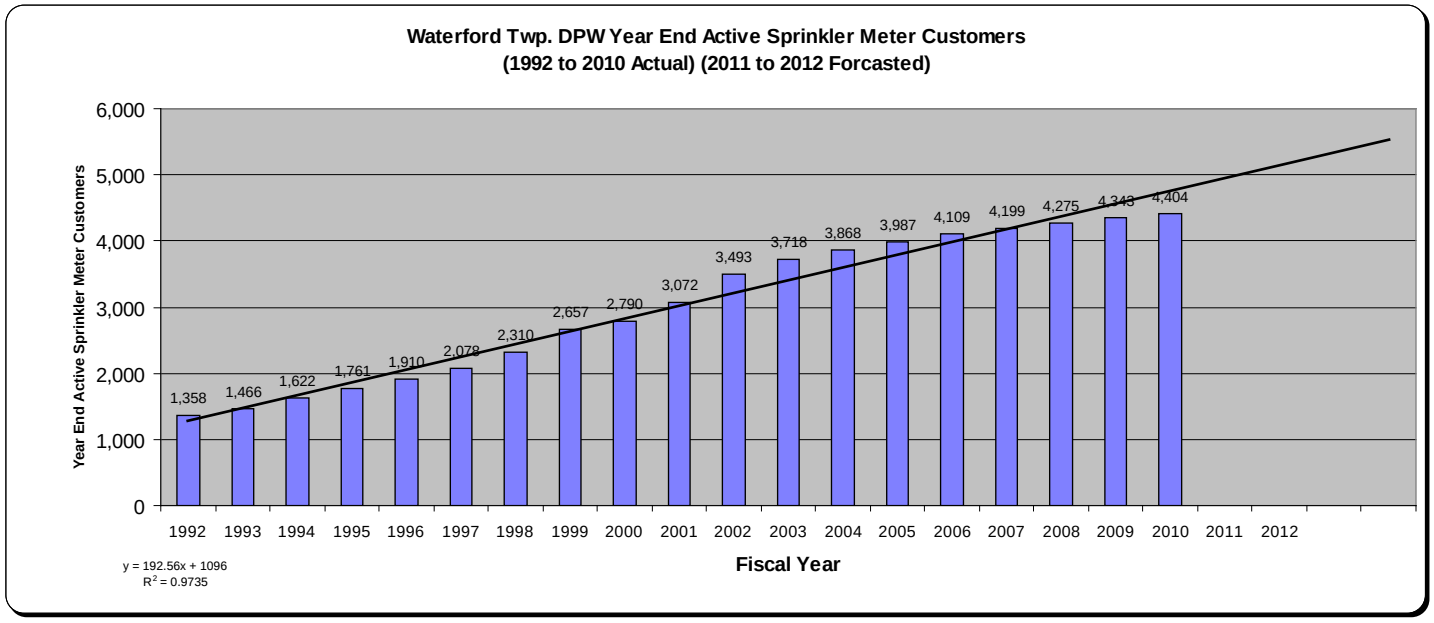
Water Customer Growth

Since 1992, the DPW has added an average of 373 water customers annually. In recent years that growth has steadily slowed. Since 2003, the DPW has added less than 200 new water customers annually. With the exception of 2010 which saw many inactive services turned back on. The projection model below indicates similar trends in the short term future. The graph below does not include sprinkler meters.



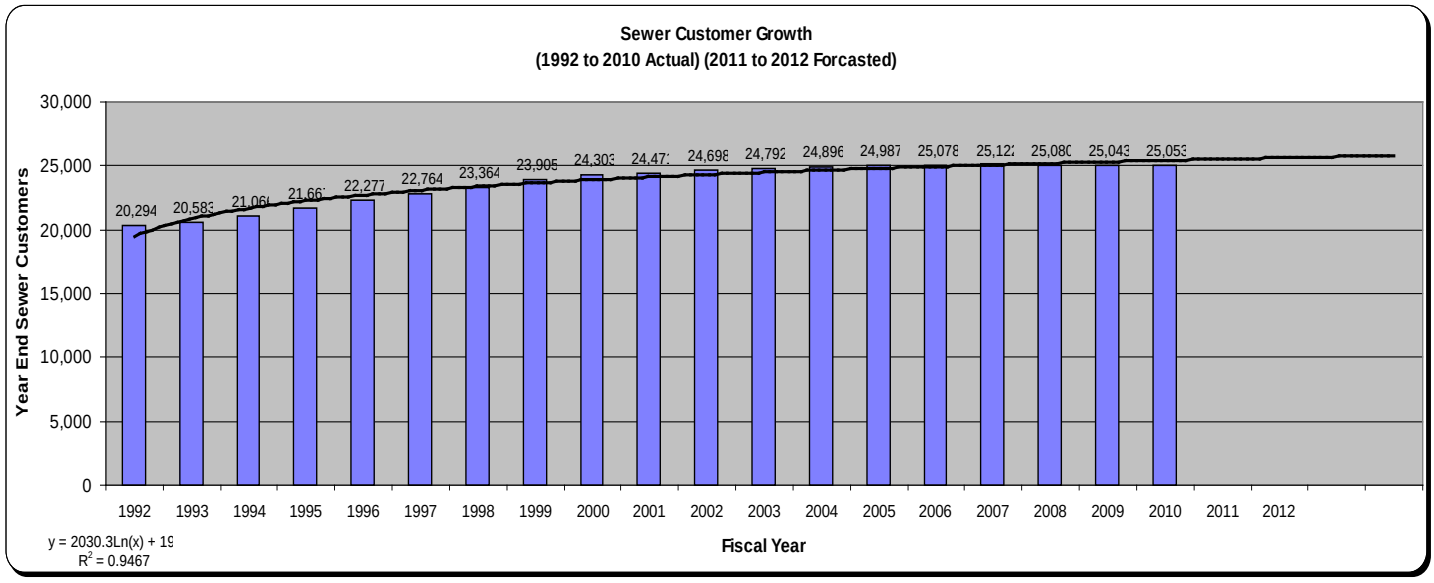
Sprinkler/Irrigation Meters

The DPW offers water customers the option of a separate water meter for outside watering and irrigation. This is a popular service with customers. The benefit to the customer is that sewer fees are not imposed on the secondary sprinkler meter. From 1992 thru 2010 the DPW has installed an average of 153 sprinkler meters annually.

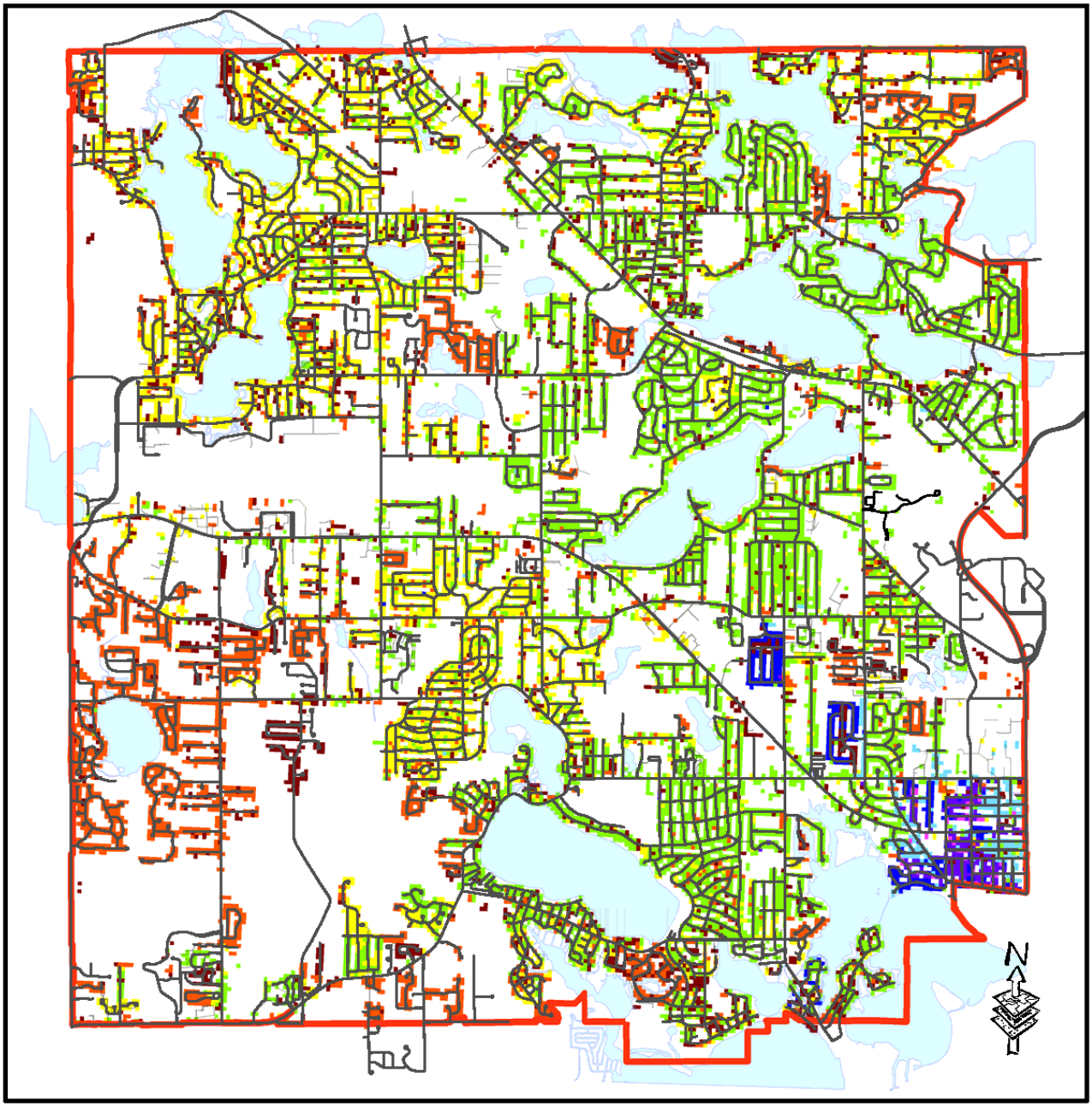


Sewer Customer Growth

Since 1992, the DPW has added an average of 296 sewer customers annually. In recent years that growth has steadily slowed. Since 2003 the DPW has added less than 100 new sewer customers annually. The projection model below indicates similar trends in the short term future.



The Charter Township of Waterford
Sewer Customers by Decade



Legend

- Waterford Road Layer
- Township Boundary Line
- Lakes

Sewer Start Year

- 1926 - 1930
- 1931 - 1940
- 1941 - 1950
- 1951 - 1960
- 1961 - 1970
- 1971 - 1980
- 1981 - 1990
- 1991 - 2000
- 2001 - 2010

0 0.25 0.5 1 1.5 2 Miles

DECADE	CUSTOMERS
1926-1930	2
1931-1940	46
1941-1950	207
1951-1960	328
1961-1970	300
1971-1980	7816
1981-1990	5242
1991-2000	3627
2001-2009	2565

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The following table illustrates the method in which a customer sewer bill is generated in the DPW:

Waterford Township Sewer Bill Breakdown Diagram:
The Sanitary Sewer Network in Waterford involves (3) Agencies, each with their own respective charges. Example is based on average residential connection and 2010 empirical customer demand data.
In 2007, Waterford started getting charged for metered wastewater as opposed to the previous Residential Equivalency Units (R.E.U.) System that was used from the 1960's to 2007.

Waterford Township DPW

Sanitary Sewer System 2010 Financial Breakdown

As of July 1, 2010 the Sewer Rates for Waterford Sewer Customers with water were $42.45 'Ready to Serve Charge'. Then, $1.90 per 100 Cubic Feet thereafter.

Sanitary Sewer System Characteristics and facts

Waterford Twp. Currently has approximately 360 miles of Sanitary Sewer lines. These lines are maintained by Waterford DPW.

The average residential customer in 2010 used 1,983 C.F. of sewer per quarter. This resulted in a $80.13 average quarterly sewer bill. Of the average sewer bill Waterford Twp. retained $47.02 or 58.69%. The balance of $33.11 was distributed to Oakland County and Detroit Water and Sewer Dept. Waterford was charged at $16.70 per MCF or 1,000 C.F. based on the County's and City's Rate Systems.

Waterford Twp. has 26,084 Total Sewer Customers as of 1-20-2011. Waterford was charged $16.70 per MCF, or 1,000 Cubic Feet by Oakland County Drain Office and the Detroit Water and Sewerage Dept. during 2010.

58.69% of the Average 2010 Residential Sewer Bill Payment Retained by Waterford

Agency 1
Waterford Twp. DPW

Waterford Twp. Currently has 63 Sewer Lift Stations. These lift stations contain pumps and other Electro-Mechanical Devices that are maintained by Waterford DPW.

Waterford Twp. Sewer Lift Stations like the one pictured to the left (5025 Highland Rd. the Clinton River Sewer Station) convey wastewater to the Oakland County Sewer Interceptor.

Waterford Township Michigan

Sanitary Sewer System Financial Breakdown

Of the average $80.13 Quarterly Average Sewer Bill Waterford Customers paid, Oakland County received $4.52 or 5.64% of the total customer payment based on the average customer consumption of 1,983 C.F. and current OCDC and DWSD charge of $16.70 per 1,000 Cubic Feet or (MCF).

Waterford belongs to the Clinton-Oakland Sewer System. This is a contract between the Township and Oakland County. Waterford pays quarterly invoices to the County, who in turn sends an allotment to the City of Detroit (D.W.S.D.).

Agency 2
Oakland County Drain Office (O.C.D.C.)

5.64% of Average Quarterly Waterford Residential Sewer Bill Payment Retained by Oakland County

Agency 3
Detroit Water and Sewer Dept. (D.W.S.D.)

35.67% of Average 2010 Sewer Bill Payment Retained by Detroit (D.W.S.D.)

Sanitary Sewer System Financial Breakdown

Of the $80.13 average quarterly sewer bill Waterford Customers paid in 2010, Detroit (D.W.S.D.) received the balance of $28.59 or 35.67% of the average residential individual sewer customer payment based on 1,983 C.F. of consumption.

The Detroit River is the final discharge point for all of Waterford's Sanitary Sewer System after much conveyance, treatment and the diligence of the (3) agencies involved.

Sanitary Sewer System Characteristics and facts

Oakland County Michigan

All of Waterford's wastewater is received by the Oakland County Interceptor. The lift station (at the corner of Elizabeth Lake Rd. and M-59 in Waterford Twp.) contains large sewer pumps and other Electro-Mechanical Devices that are maintained by the Oakland County Drain Office (O.C.D.C.).

After receiving the wastewater from one of Waterford's Lift Stations, Oakland County pumps all of Waterford's Wastewater onto the City of Detroit.

Detroit Water and Sewerage Department

Sanitary Sewer System Characteristics and facts

All of Waterford's Wastewater is ultimately received by the City of Detroit for treatment and is ultimately returned to the environment in the Detroit River. Detroit's Wastewater Treatment Plant at 9300 W. Jefferson Avenue is the single largest Wastewater Treatment Plant in the United States. This plant is estimated to serve 35% of Michigan's population. (According to the D.W.S.D. Website).

Utility Billing Revenue

The DPW's Water-Sewer Fund has three (3) main sources of revenue. These sources of revenue are generated from water-sewer usage billing (largest category), water assessment revenue and sewer assessment revenue. The assessment revenue is generated from customers whom have elected to defer their connection charges over a set number of years. Assessment revenue has been on the decline as the Township continues to age and nears build-out. This has had the affect of putting more fiscal importance on the water-sewer usage revenue component of the operation.

Water Rates:

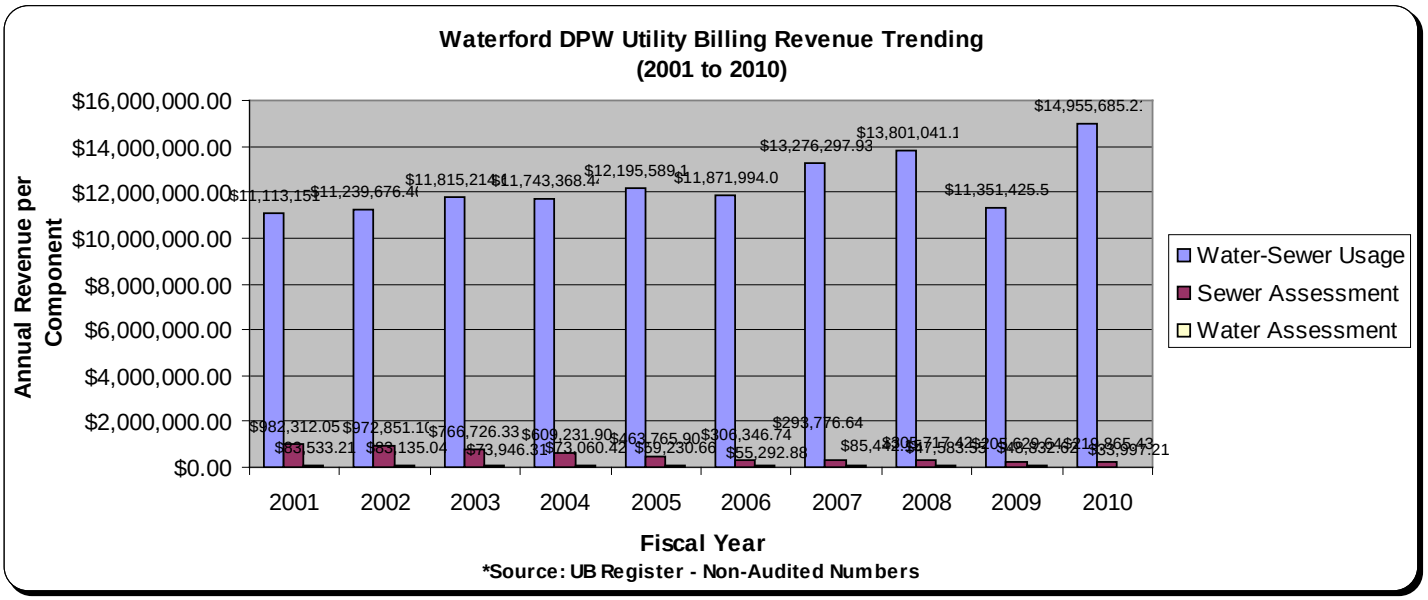
In 2010, water rates were $12.00 for the first 1,000 Cubic Feet (CF) and $1.50 per 100 CF for all water used over the base 1,000 CF.

Sewer Rates:

In July of 2010, the Ready to Serve sewer charge was adjusted from $41.50 to $42.45 per quarter and the Volume Charge was adjusted from $1.85 per 100 cubic feet (CF) to $1.90 per 100 CF as part of the annual pass through cost of the DWSD sewer rate increase. The DPW only retains approximately 58% of all sewer charges collected for internal operations while the balance of charges collected are paid to the Oakland County Drain Commissioner (OCDC) and the Detroit Water and Sewerage Department (DWSD) for transport and treatment.

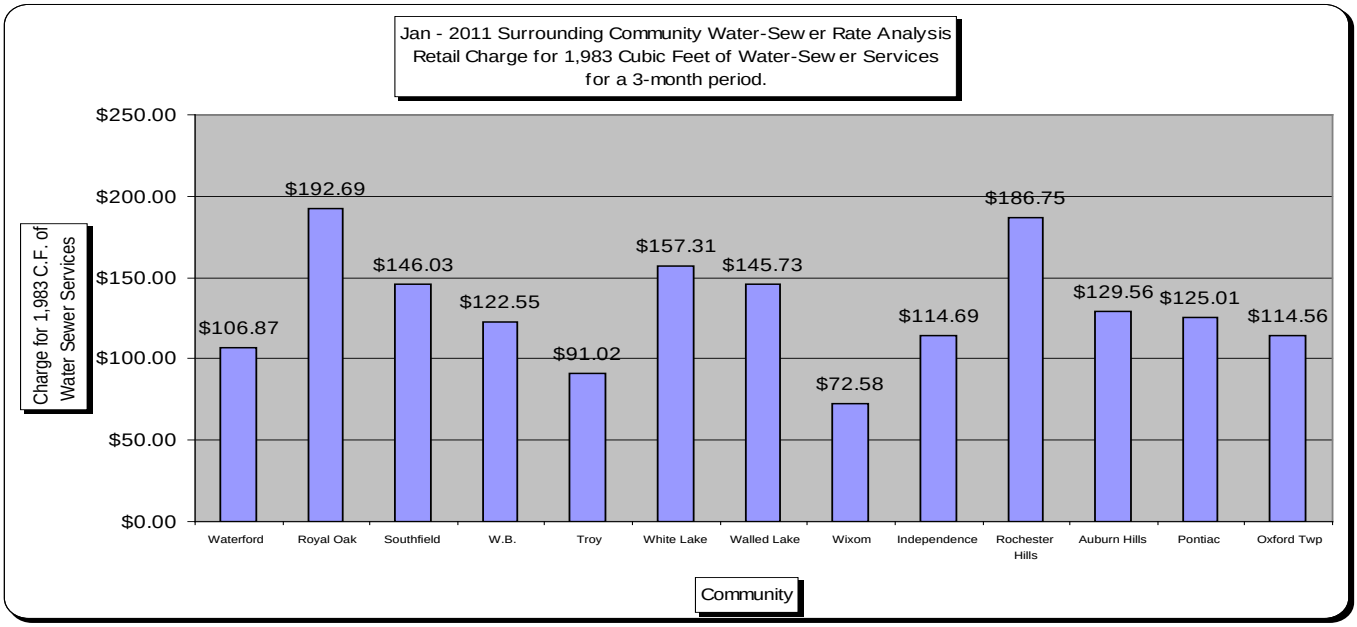
The graph below shows the Water/Sewer Division revenue stream since 2001. Assessment revenue is expected to continue to decline in the coming years. It should also be noted that the climate and weather conditions have an important impact on water-sewer revenue and charges. An extremely wet and/or cool summer would result in less water consumption and consequently less water/sewer sales revenue.

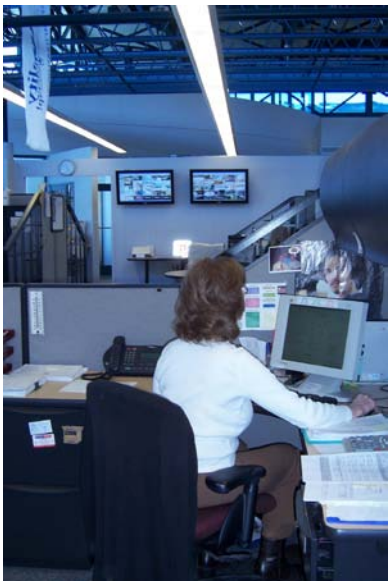
The following table illustrates the Revenue Streams and their changes from 2001 forward.



Water-Sewer Community Rate Comparisons

Many factors influence the utility rate structure within a given community. The age of the system and need for capital improvements, a rate structure that encourages conservation and rate structures of supporting agencies that help provide the service are all factors. The following graph depicts what an average residential water-sewer customer in 2010, with an average consumption of 1,983 C.F. per quarter, would pay in surrounding communities for the same services. As a whole, the Township rate structure is positioned very competitively with one of the lowest rate structures compared to surrounding communities.



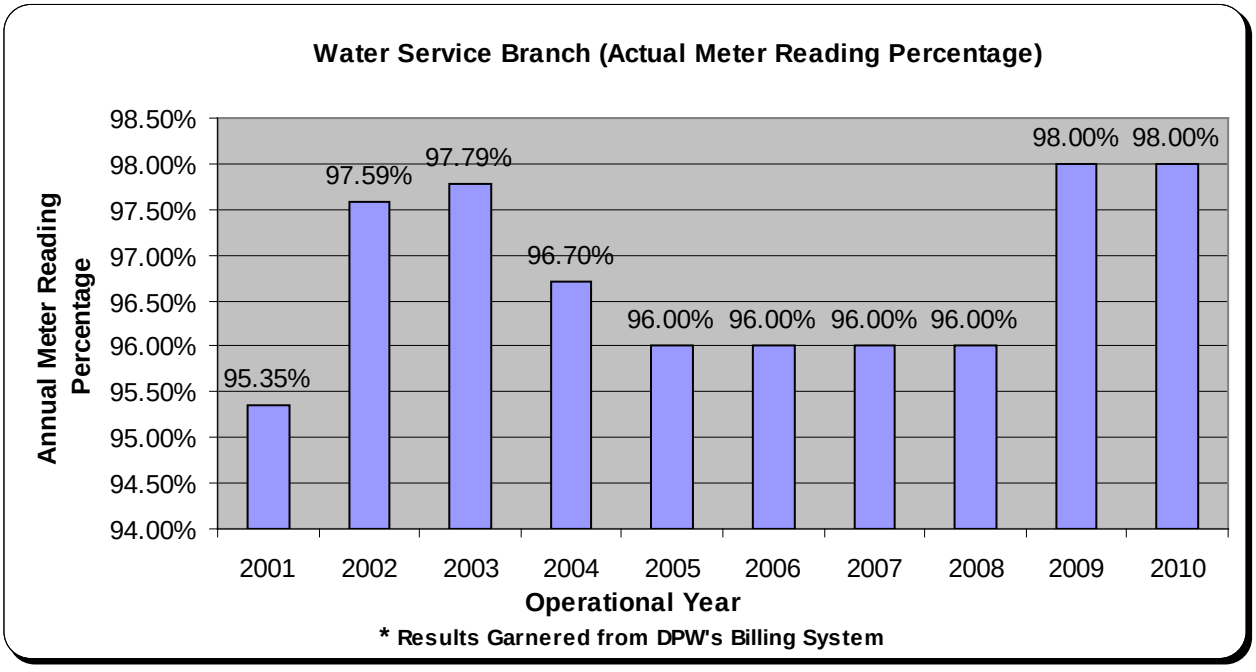


Billing Branch employee Helen Warren working on a wide variety of software and technology systems to prepare water and sewer bills.

Meter Reading

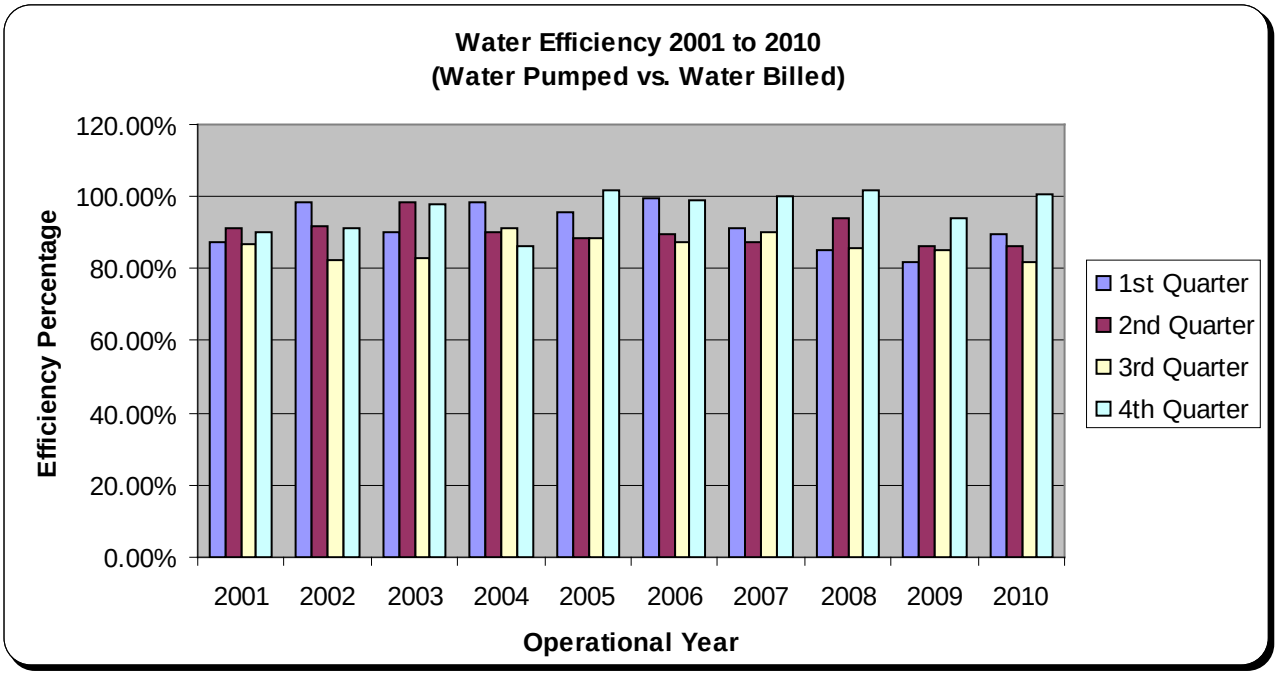
Meter reading is a vital part of the DPW operation and is referred to as the "cash box" component because meter readings are ultimately imported into the electronic billing system to create utility bills and the revenue they generate. The DPW strives to collect as many actual reads as possible because they permit maximum billable services while minimizing inconvenience and inaccurate bills to our customers. The Utility Billing and Water Service Branches work hand in hand to achieve a high actual meter reading percentage. Historically, the DPW has achieved 95% or more actual reads and 2010 continued with a high percentage of reads. The graph below indicates the actual meter reading percentage achieved annually since 2001.

Service Branch employee Heather Krupic reading a conventional Meter Reading Interface Unit. The Handheld Device is later downloaded and interfaced with the DPW's Meter Reading and Billing Software Systems.



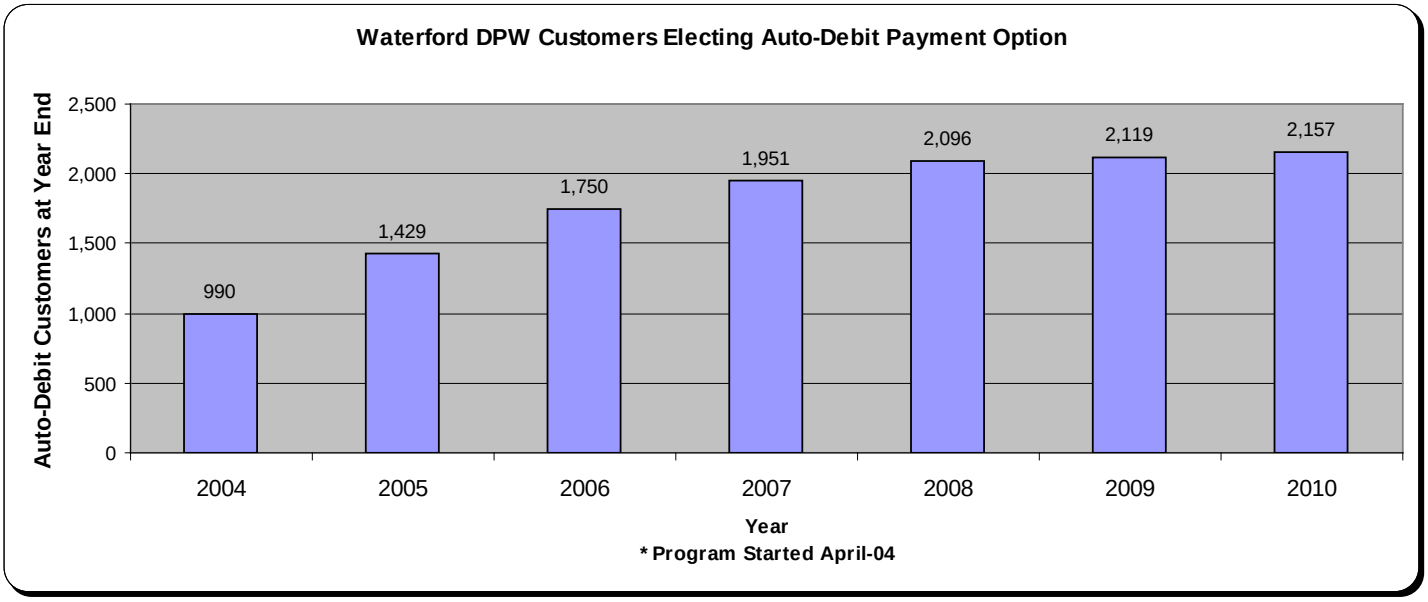
Water Efficiency

An important benchmarking statistic of any water utility is Water Efficiency, which measures the ratio of water produced to water sold. Meter readings are collected at the Water Treatment Facilities and compared against the customer account reads. In addition, other factors for water loss are taken into account including water used by the fire department, sewer jetting, hydrant flushing and tank maintenance. Other factors affecting water efficiency include the age of the distribution system, water main breaks, and composition of the pipe installed in the distribution system. With 100% water accountability as the goal, the DPW strives for the highest efficiency possible. Efforts have continued to improve efficiency through advanced SCADA monitoring, water modeling, and water main rehabilitation to identify and correct system deficiencies. The graph below depicts the water efficiency benchmarking statistics by quarter since 2001. It must be noted that anything over 90% is considered superior in the water industry. In 2010, the DPW realized very good water efficiency results.



Auto-Debit Payment Option

Starting in April 2004, the DPW began offering an Auto-Debit payment option for water-sewer customers. This service conveniently allows customers to have their water-sewer bill automatically deducted from a checking or savings account of their choice without the need to write a paper check, or send a payment via the mail. Customers still receive a paper invoice for their records. Since April of 2004, 2,157 customers or 8.16% of the customer base have elected this payment option. At this same time last year, the number of customers electing this payment option was 2,119. So, 2010 saw a nominal increase in customers electing the auto-debit payment option. This growth percentage is expected to remain constant in the coming years. Customers who travel for work, go south for the winter, or have a busy lifestyle are finding this payment option convenient. The DPW advertises this service in the utility bills mailed to customers and maintains a posting on the Township web site to inform customers of the programs availability.

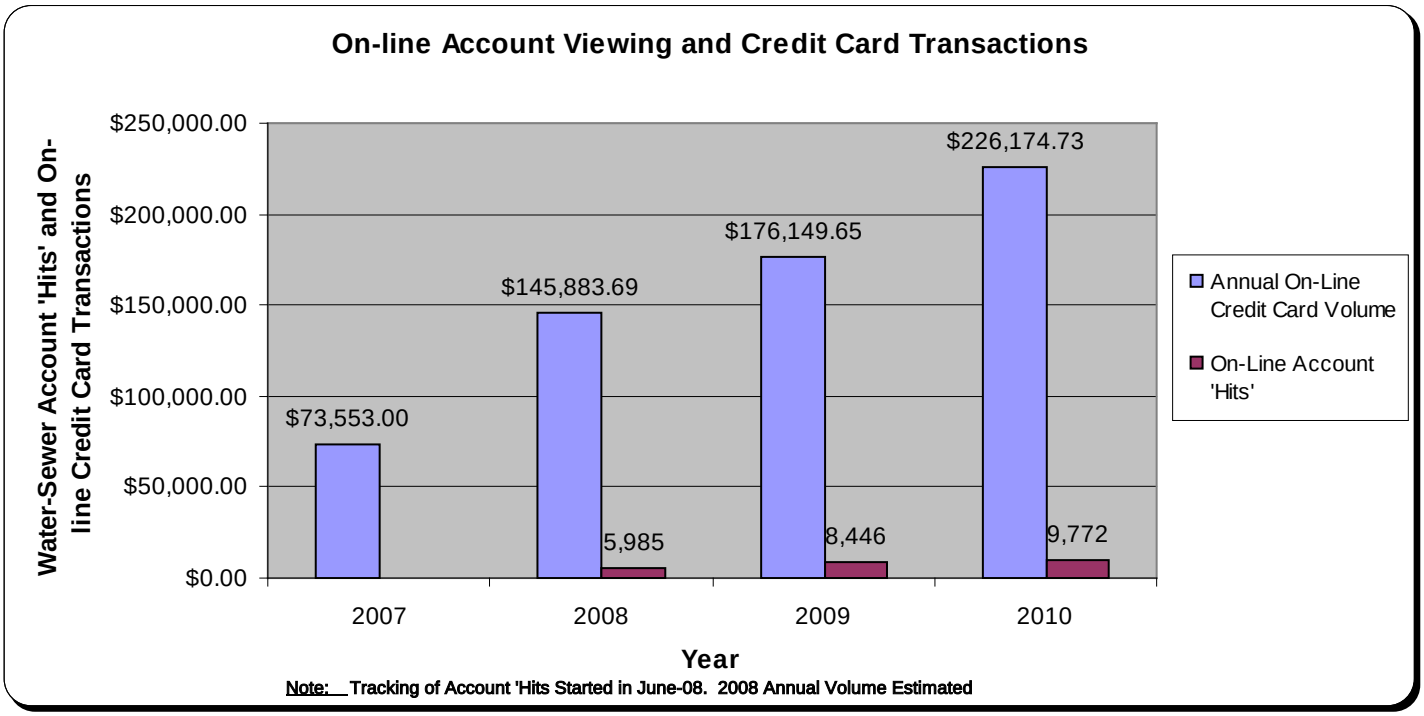


Lockbox Payment Processing

The bulk of the customer base continues to mail-in their payments, which are processed in an automated fashion by the Township's financial depository. An electronic file is then transferred daily to the DPW and updated automatically into the utility billing/accounts receivable system. This lockbox processing collection service has saved the DPW many labor hours and thousands of dollars in manual payment processing and resulted in extra interest revenue from a decreased payment float time. Lockbox processing tends to be more accurate than manual processing. Float time is the time it takes for the depository institution to receive the actual funds and commence interest earning.

On-Line Account Inquires and Payment Options

In 2007, the DPW began offering customer data inquires and payment options via the Township Web Site. Customers can access their water-sewer account 24 hours a day 7 days a week at their convenience. On-line and on site credit card transactions were implemented for payment in June 2007. The DPW saw 9,772 customer account inquires in 2010 related to their water-sewer accounts. The DPW continues to stay abreast of new technology and procedures to make customer records more accessible and enhance customer service.



Fixed Network Meter Reading System

The DPW was one of the first communities in Michigan to begin implementation of a Fixed Network Meter reading system to collect and analyze customer meter reads automatically via radio to collectors, which are connected to the Township's broadband wireless network. This process allows for automatic daily meter read updates and real-time feedback of reverse flows and other diagnostic information. It also eliminates the need for service personnel to manually collect meter reads from customer addresses, which increases employee safety, reduces liability and saves money.

This technology allows service personnel to be more proactive in operational activities such as performing preventative maintenance on assets such as meters and curb boxes. The system also provides DPW customer service staff with an enhanced ability to more effectively and accurately address customer questions when they arise because they are able to collect specific meter reads while on the phone with the customer. DPW staff can analyze trends and patterns to isolate consumption and other issues before they become problems. It also allows for daily consumption trending so that potential water leaks can be quickly identified as well as meter tampering and reverse flow.

The pictures on the subsequent pages outline 2 Fixed Network Meter Reading Products. The existing Itron 200-W Fixed Network Readers units are displayed in yellow and the Neptune R-450 Fixed Network Readers are displayed in pink on the map. The Fixed Network Collectors are depicted with a Radio Tower Symbol. The transmission range of the units to the collectors has been very good and we look forward to performance improvements as the industry improves the technology.

Waterford DPW Selected as a Beta Partner for Neptune Technology Group Fixed Network AMR System

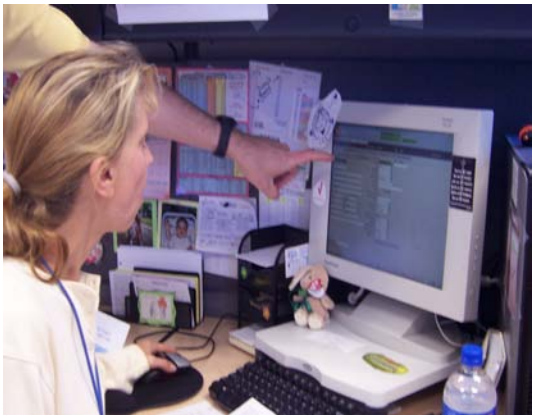
DPW Director Biederman was approached in 2006 by the Neptune Meter company to assist in their development of the next generation Fixed Network meter reading system, and the effort has resulted in deployment of a no charge beta Neptune Fixed Network that will provide the basis of the reading system for the future. As a result of the collaborative program, the DPW is deploying a state-of-the-art water metering program utilizing a fixed collector, radio reporting unit and advanced software for processing reads, alarms and reports. This system permits daily reads as well as leak detection monitoring and backflow monitoring. Over 7,500 endpoints and 3,200 high resolution meters have been installed to date.

Neptune Omni-Directional Antenna Operating at 450 MHZ located on the Cass Water Tank.

Neptune R-450 Fixed Network Collector. These collectors receive daily meter reads and then transmit the data to the DPW using the Township's Broadband Wireless System.

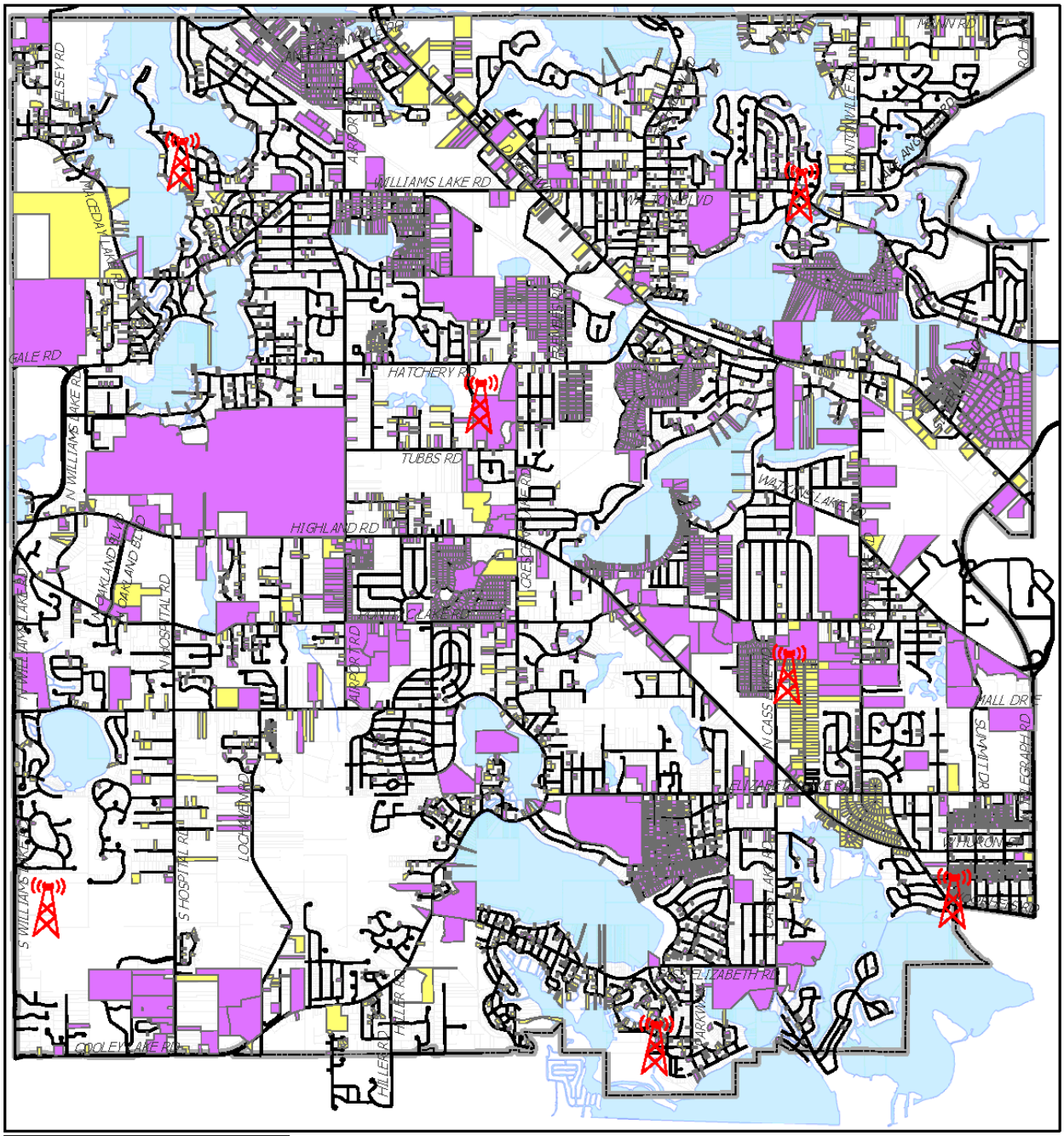
Neptune R-450 Fixed Network Collector site with a solar panel for energy conservation.

Service Branch employee Pennye Holden configuring R-450 Reading Devices in the Field.



Billing Branch Employee Mary Bunce using the Software System that permits daily meter reads. This system in conjunction with the R450 and high resolution Neptune meters has allowed the DPW to notify customers when leaks develop in their home/business saving resources.

Waterford Township Fixed AMR Network Map
(As of Jan. 2011)



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Updated: 01/24/2011

Engineering Services Branch

The mission of the Engineering Services Branch is to provide professional engineering support for the DPW and to assist other Township Departments such as Building and Engineering as necessary. By utilizing the latest computer programming, software applications and field equipment, the branch is able to provide highly accurate information in the areas of water/sewer modeling, sewer main televising, utility staking and project coordination.

The branch is headed by the Superintendent of DPW Engineering Services and is comprised of 7 full-time employees and variable number (1-3) part-time employees. The positions and a brief description of their typical duties are listed below:

- Superintendent of DPW Engineering Services
  Performs planning, project evaluation, design and specification preparation, budgeting and construction management. Gathers, assembles, and analyzes data and statistics; creates computer models, databases and prepares technical reports. Supervises Branch staff in daily operations.
- DPW Information Systems Administrator
  Responsible for updating and maintaining all hardware and software necessary to operate the DPW's Information Management and Telecommunication Systems. This position was created in 2007 in order to update the types of tasks that the former GIS Technician had began to take ownership of over time.
- DPW Information Systems Technician
  Assists the Information Systems Administrator with an emphasis on the maintenance and updating of hardware and GIS-related software applications.
- Field Engineer
  Assists in the design and preparation of engineering plans. Performs construction inspection, testing and surveying on capital projects and oversees installation, repair and maintenance of underground utilities on private development projects.
- Civil Engineering Technician
  Assists in the design and preparation of engineering plans and specifications. Performs plan reviews and maintains engineering files and records. Conducts testing, inspections and prepares pay estimates on capital projects.
- Utility Coordinator
  Locates and marks all underground utilities owned by the township in advance of construction as requested by contractors and outside agencies. Makes and updates the corrections to existing utility records as needed.
- Collection System Maintenance Tech – Grade IV
  Performs a variety of routine and manual duties related to general sewer and pump station operation.

Engineering Services Group
From Left: Karen Lee, Chris Donais, Joe Ashley, Terri Frey
Not Pictured: Frank Fisher, Mohammad Tariq

The activities of the Engineering Services Branch can be broadly broken down into six categories:

1. DPW Information Systems
2. Utility Coordination
3. Private Development
4. Infiltration – Inflow
5. Capital Improvement Projects
6. Wellhead Protection / Community Outreach

1. DPW Information Systems

The DPW has worked in coordination with the Township Information Systems Department to develop a robust Information Management System that provides critical information and applications for the efficient operations of the department and to assist other departments. The Information Technology initiatives of the department have allowed the department to streamline operations and provide valuable tools to the department and to the public that would not be available without the commitment of the department to incorporating technology into the operations of the department.

The Information Management System includes all the various components necessary to provide data and applications to the department. The DPW Information Systems staff is tasked with implementation and maintenance of the components of the Information Management System. The following is a partial list of the hardware being monitored and/or maintained by DPW Information Systems:

- ✓ 78 workstations (65 internal plus 13 at Wireless Sites)
- ✓ 18 Printers
- ✓ 1 42-Inch Plotter
- ✓ 14 Servers (Application and File Servers)
- ✓ 2 Network Attached Storage Devices (NAS)
- ✓ 3 Desktop Scanners

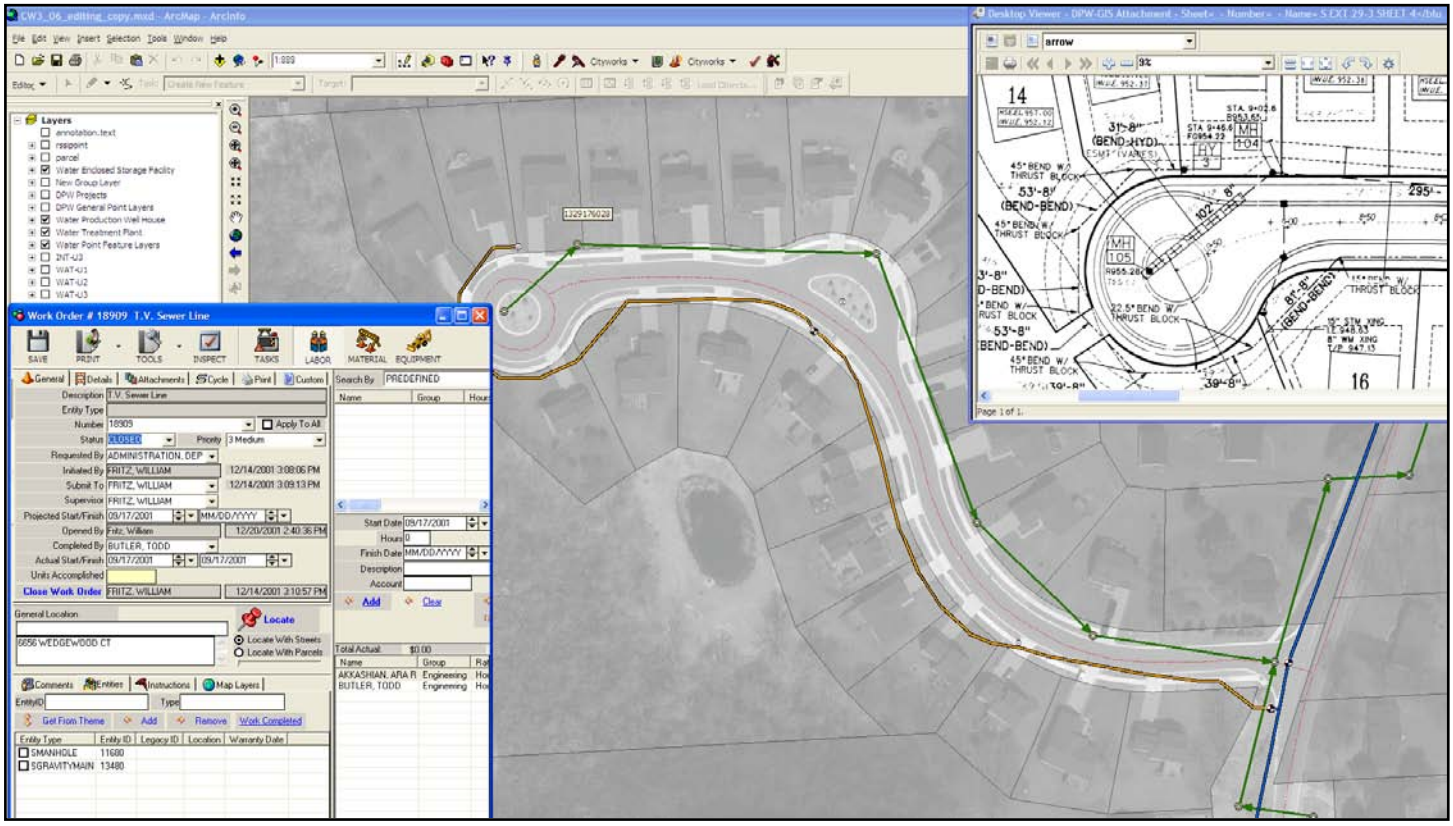
- ✓ 1 Stand-Up Large-Size Scanner
- ✓ 1 Sub-Meter GPS Unit
- ✓ 23 Network switches (8 internal and 15 at Wireless Sites)
- ✓ 28 Wireless Base Station Radios (Site to Site Communication)
- ✓ 29 Wireless Access Points (Secure 802.11x)
- ✓ 37 Standard Definition Security Cameras (2 internal and 35 at Wireless Sites)
- ✓ 46 High Definition Security Cameras (23 internal and 23 at Wireless Sites)

The following is a partial list of applications being maintained in whole or part by DPW Information Systems:

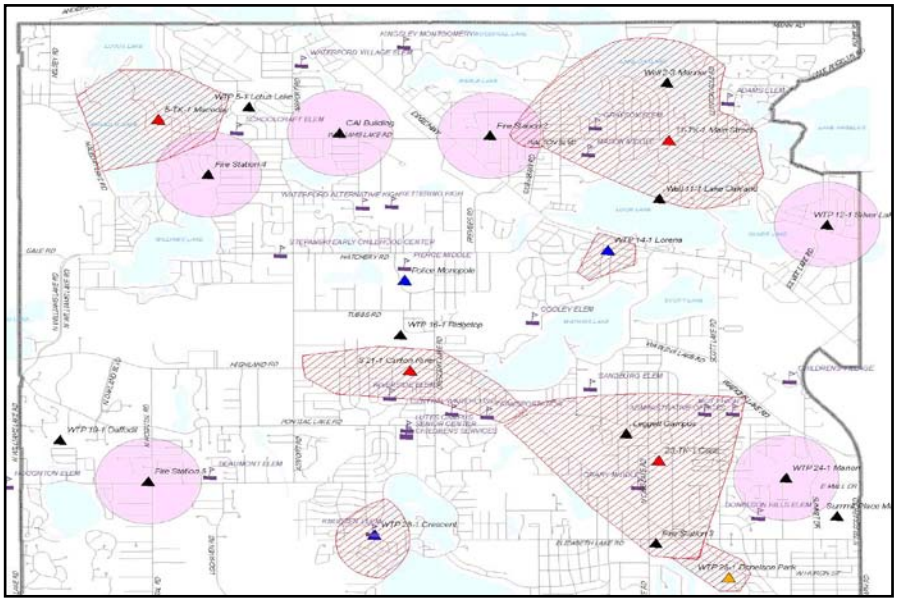
- ✓ ESRI ArcServer Enterprise Basic (SDE)
- ✓ ESRI ArcServer Enterprise Standard (ArcServer)
- ✓ ESRI ArcGIS Desktop (ArcInfo, ArcEditor, ArcView)
- ✓ Azteca Cityworks
- ✓ Hyland OnBase
- ✓ Dig-Smart
- ✓ Kronos
- ✓ ONSSI
- ✓ SCADA Alarm Manager
- ✓ NetMotion
- ✓ Blackberry Enterprise
- ✓ Neptune Fixed Base

Detailed below, are some examples of the various applications and technologies used by the DPW.

Geographic Information System (GIS) – The DPW has developed a GIS that allows spatial data to be displayed in a straightforward user interface. The GIS serves as a base for viewing infrastructure, and through integrations with work management software and document management software, functions as the central application for creating work orders and viewing supporting documentation regarding infrastructure.



Wireless Wide Area Network (WWAN) – The DPW has implemented a WWAN that allows remote facilities of the DPW to have direct access to the Township network. These remote sites are now able to pass live data and streaming video directly back to Township information systems. This allows the DPW to better monitor



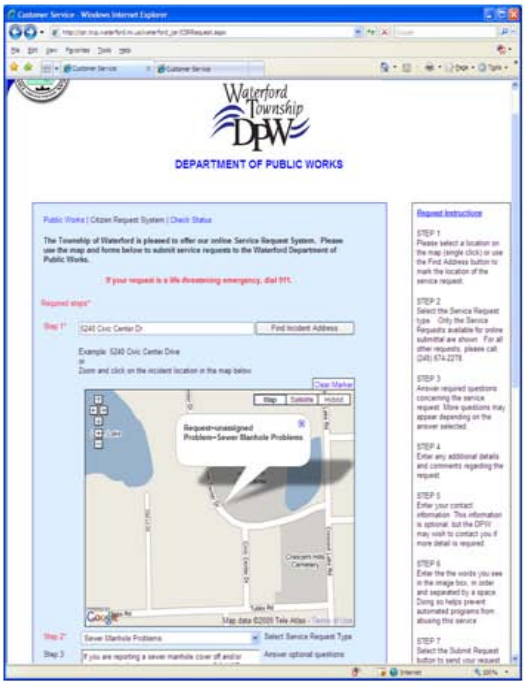
and control the control systems at the remote sites and also provides live video monitoring and alarming at these remote sites. Secure wireless hot spots are also being implemented at these locations to provide DPW staff access to all information systems while in the field.

Wireless Communication Tower at Water Plant

Above: Exterior Security Camera at Water Plant
Below: Inside View of Water Plant from Recording Software

Virtual Private Network (VPN) –In addition to providing the personnel with field access via the WWAN, the DPW has also implemented the use of NetMotion software, which provides users an encrypted connection back to the internal network, this type of connection is commonly referred to as a Virtual Private Network (VPN). This allows users secure access to data and systems available via the internal network, such as security data, system controls and all other data and systems on the network that the user has privileges to access. This provides staff the ability to quickly connect to the network in order to access data or systems whenever and wherever they may be; all that is needed is the user to be able to connect to a broadband connection. This system provides the users with a reliable and secure connection from virtually anywhere and provides a safe means for the IT department to be able to secure the connection and, if ever needed, the remote device can be locked out if required.

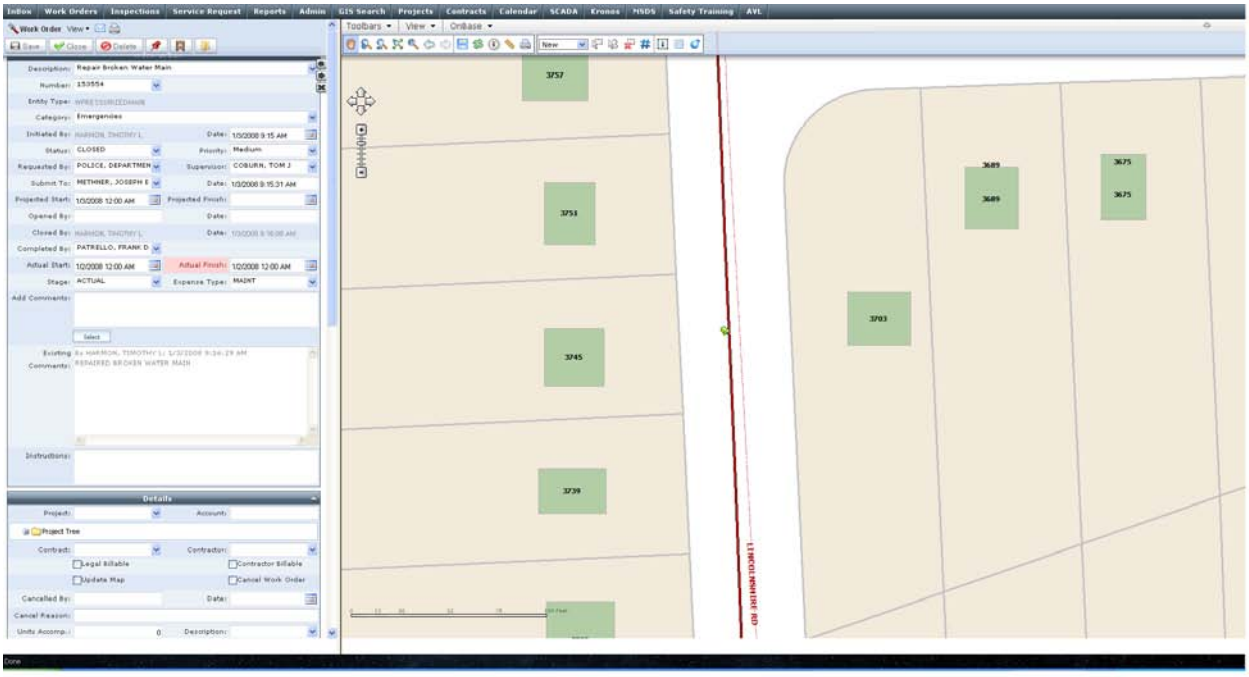
Online Citizen Service Request System (CSR) –This specially designed website allows for citizens to submit service requests online anytime. This user friendly applications was implemented to allow users to quickly enter information related to their request where it is automatically spatially referenced and entered into the department's GIS and Computer Maintenance Management System (CMMS). This application provides a quick and convenient method for citizens to inform the DPW of selected problems and a method for citizens to check the status of their request.



Residents can locate issues via the map and submit requests for repairs

Residents are provided information on how to log back in to check the status of a request

In 2010, the DPW began the process of implementing a redesigned GIS interface that leverages the latest web based technology and standards to migrate end users from a traditional client/server platform to an entirely web based interface. This new browser based application allows the software to be deployed to more computers throughout the department and other township departments without having to purchase additional software licenses or modifying systems permissions. The migration to a web based platform will allow the DPW to develop and deploy a lightweight application that can be leveraged at the DPW and other township departments to improve the DPW workflow by enabling users to quickly generate service requests and work orders from any location and also track the status of these requests.



Redesigned web based interface provides for a more efficient install and operation of the application

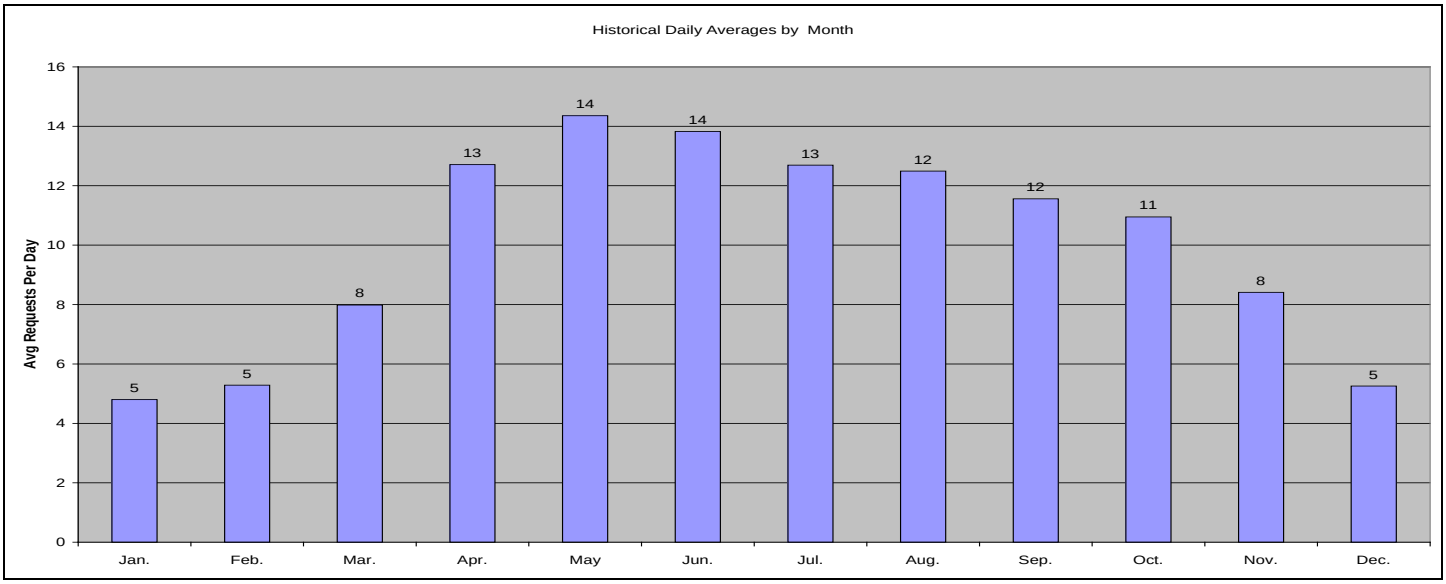
The development of the application continues in 2011 with the continued testing and integration of other core applications available in the classic version of GIS being ported over to the web based version of GIS. The most critical of these integrations being the document management interface. This integration allows the users to search documents related to the selected asset from within the GIS interface. The rollout of the application will begin early in 2011 and allow for increased savings when support for most of the existing client licenses can be discontinued as well as increased time savings due to the decreased maintenance requirements necessary to maintain the application.

2. Utility Coordination

The DPW participates in the Michigan Miss-Dig program where contractors and others anticipating underground utility work contact the Miss-Dig agency and report the location of the proposed work. Miss-Dig, in turn, broadcasts a message to the affected utilities notifying them of the imminent work and to provide staking if necessary. The affected utilities then have three working days to respond to the request.

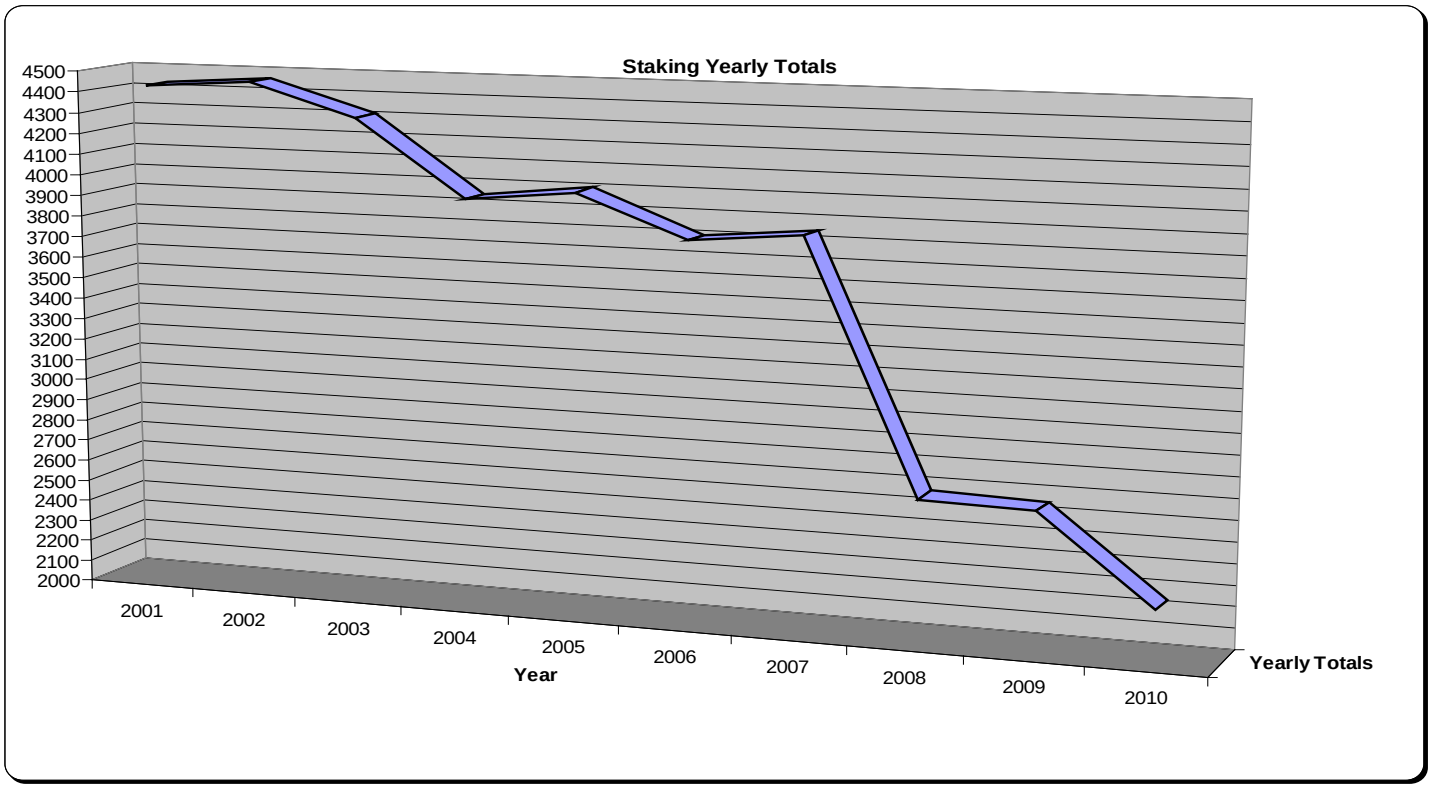
Typical Miss-Dig Markings

Terri Frey Locating a Water Shutoff

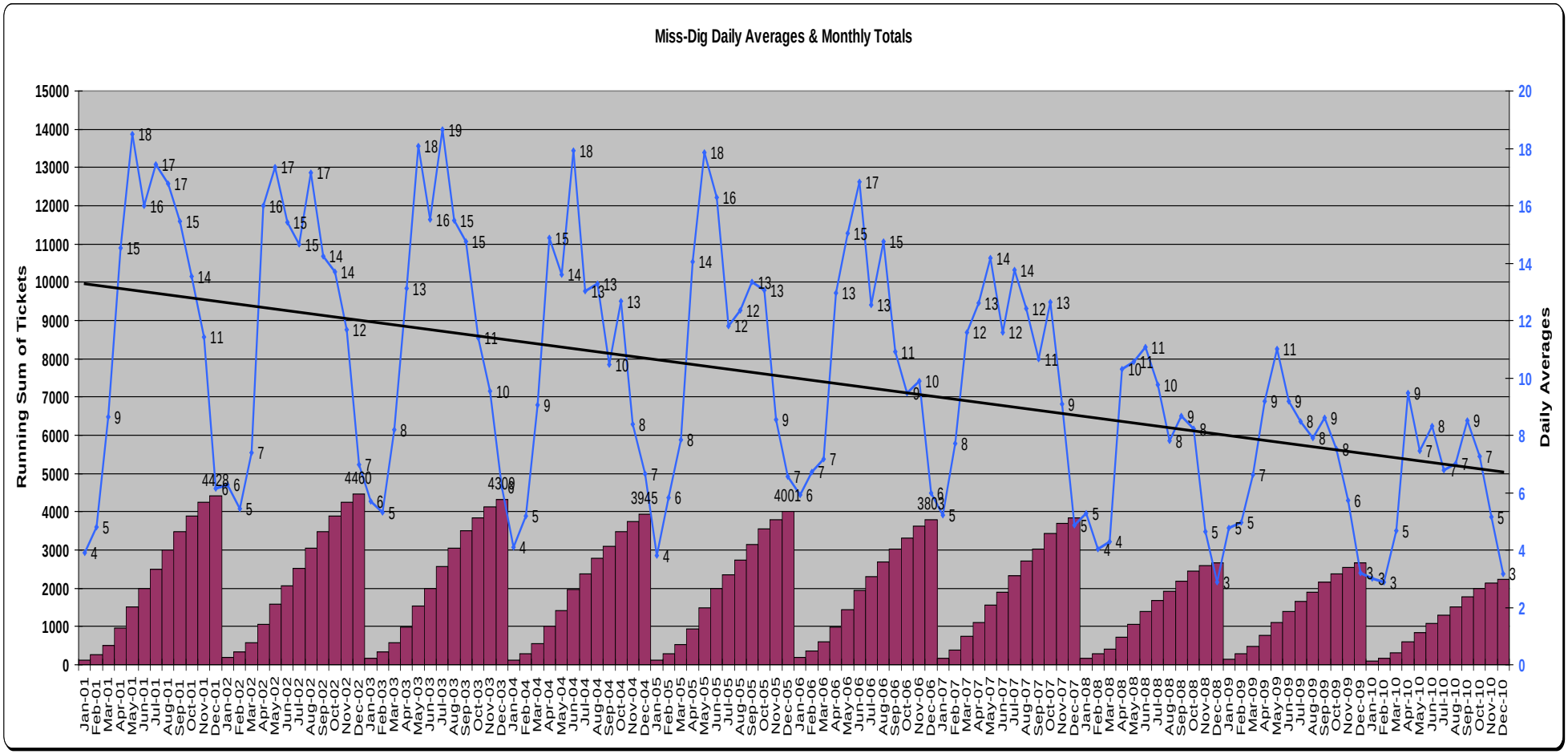


Requests are more numerous during the summer months than during the winter months. Historically, May is the busiest month with, on-average, 14 location requests received per day. The slowest month is January, averaging just 5 requests per day.

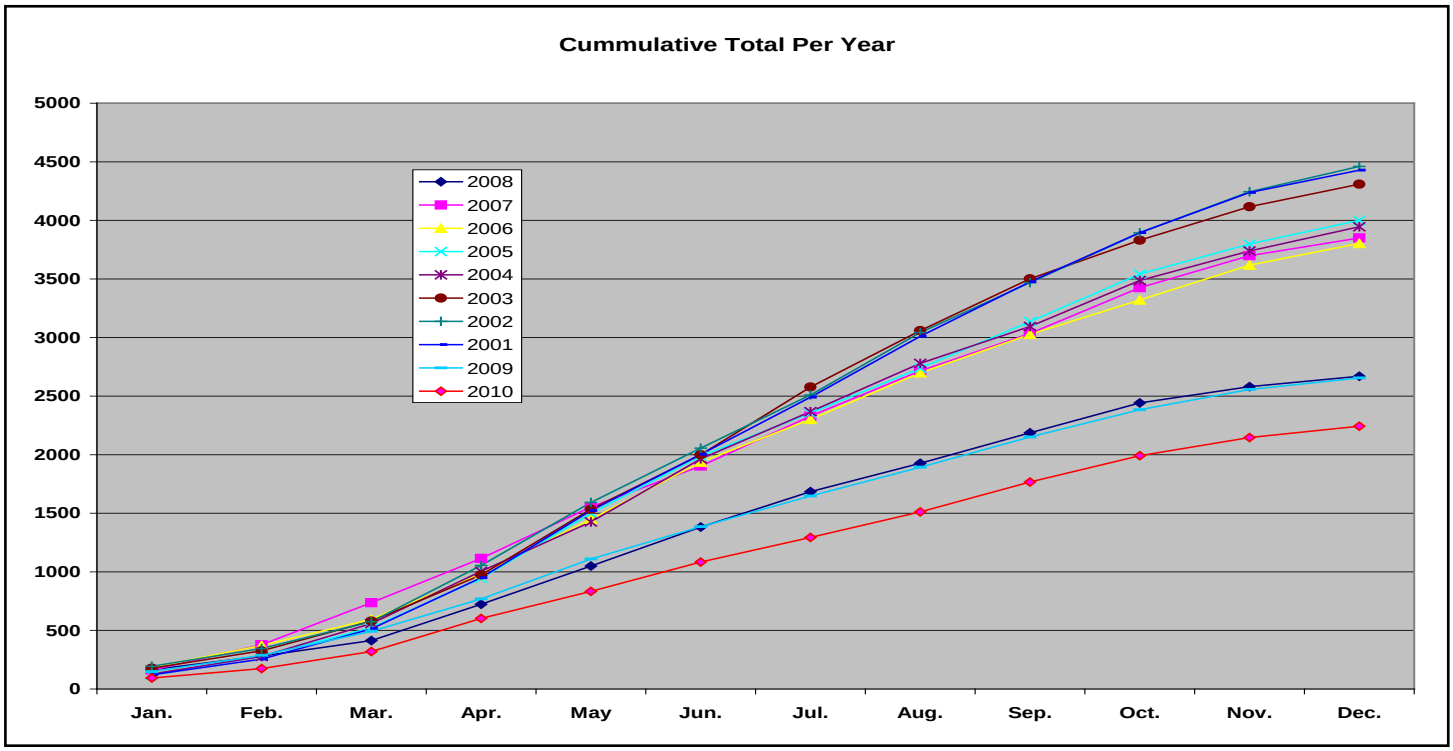
The total number of staking requests for 2010 was 2,244, which was down from 2,665 requests received in 2009. The overall historical decline is a reflection of the slowing pace of building and construction in the Township as indicated by the trend line. The sharp decline begun in 2008 continuing through 2009 and 2010, however, was an indicator of the economic slowdown experienced across the region.



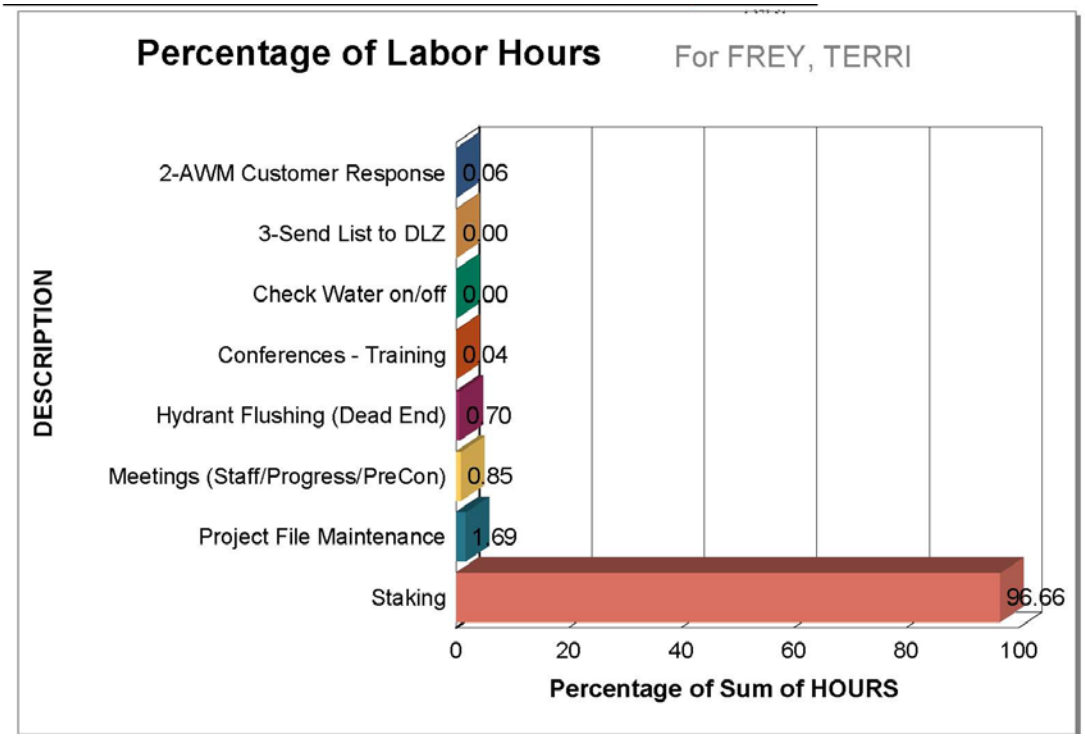
The actual daily averages for each month and the running sum of requests for each year are given below. As mentioned above, the gradual decline is an indicator of a mature, built-out community, characterized by slowing development and a reduction in new construction.



The dramatic decline begun in 2008 continuing through 2010 is illustrated in the graph below, which shows the accumulation of staking requests through the calendar year. There is a trend line for each year since 2001. There are four distinct groups of data, 2001-2003 are tightly grouped with an average yearly total of about 4,400 requests, 2004-2007 are also tightly grouped with an average yearly total of about 3,900 requests. 2008-2009 represented a significant decline. 2010 established a new, even lower total.

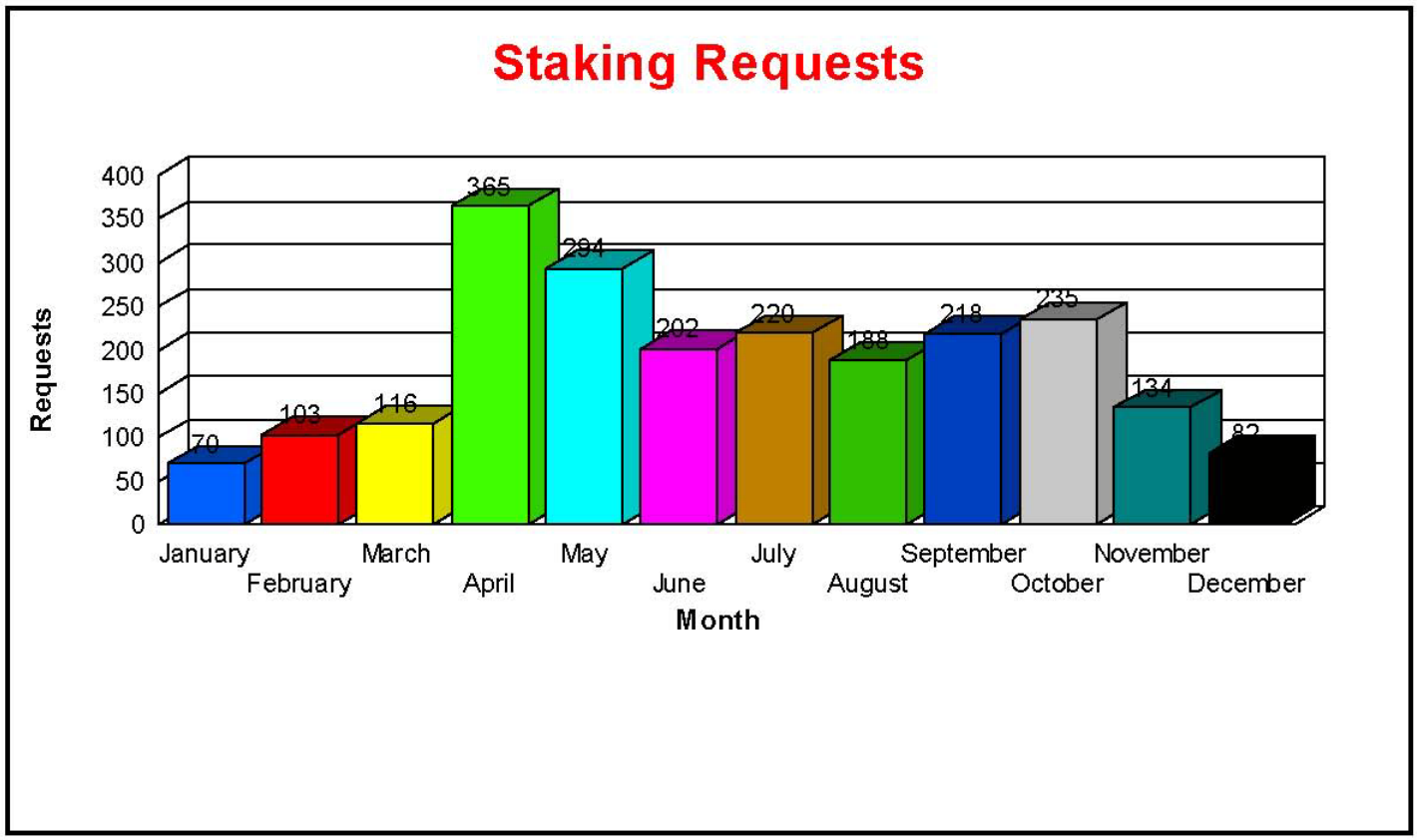


The decline in number of tickets received has allowed the Utility Coordinator to address issues such as incorrectly referenced items in the Document Management System and misrepresented objects in the GIS. The graph illustrates the diverse work performed by the Utility Coordinator.



Over 96% of the Utility Coordinator's recorded time in 2010 was spent staking. The following graph and data are a direct output of Utility Locating Service Work Orders captured by the CMMS. The amount of requests follows the expected monthly pattern mentioned above.

Year end Totals	2,227	1,481	Hrs	$ 68,117.70



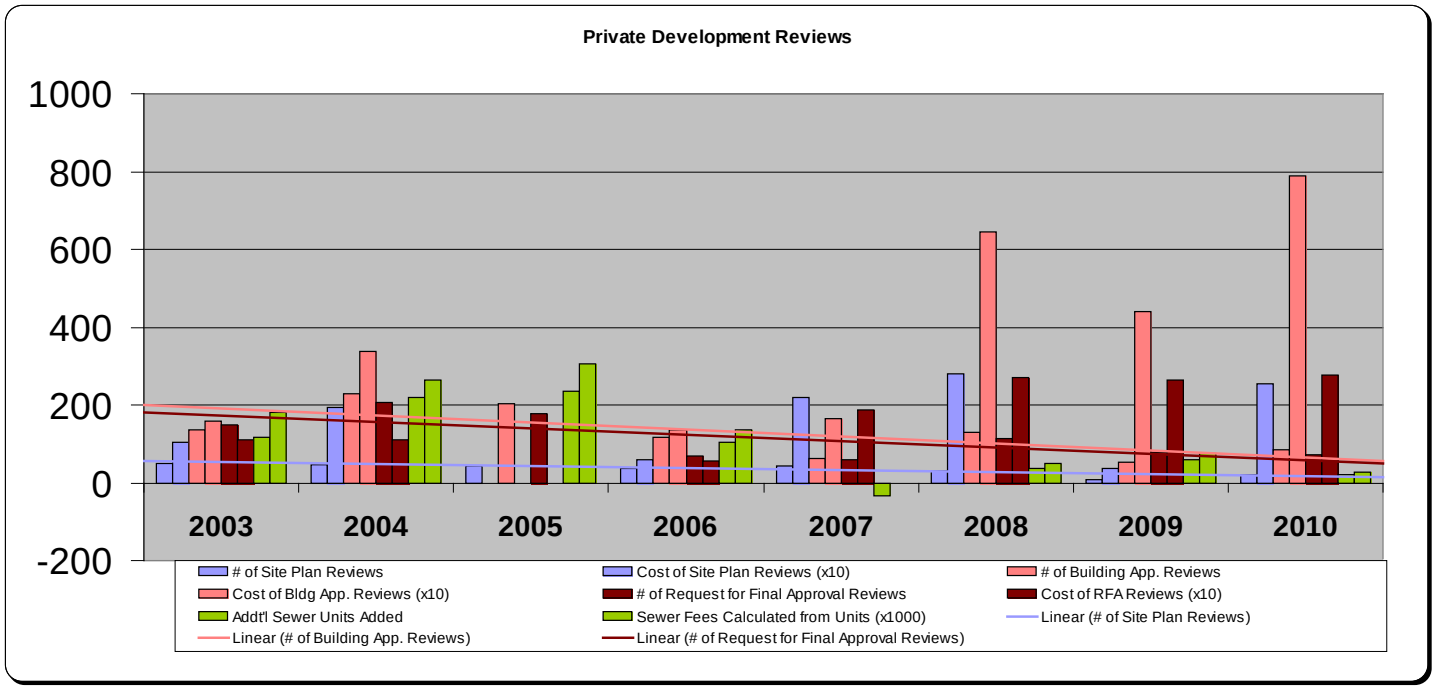
A review of the data recorded within the CMMS shows that approximately 1,480 employee-hrs were required to handle the work load. Approximately $68,000 was spent on utility locating in 2010.

3. Private Development

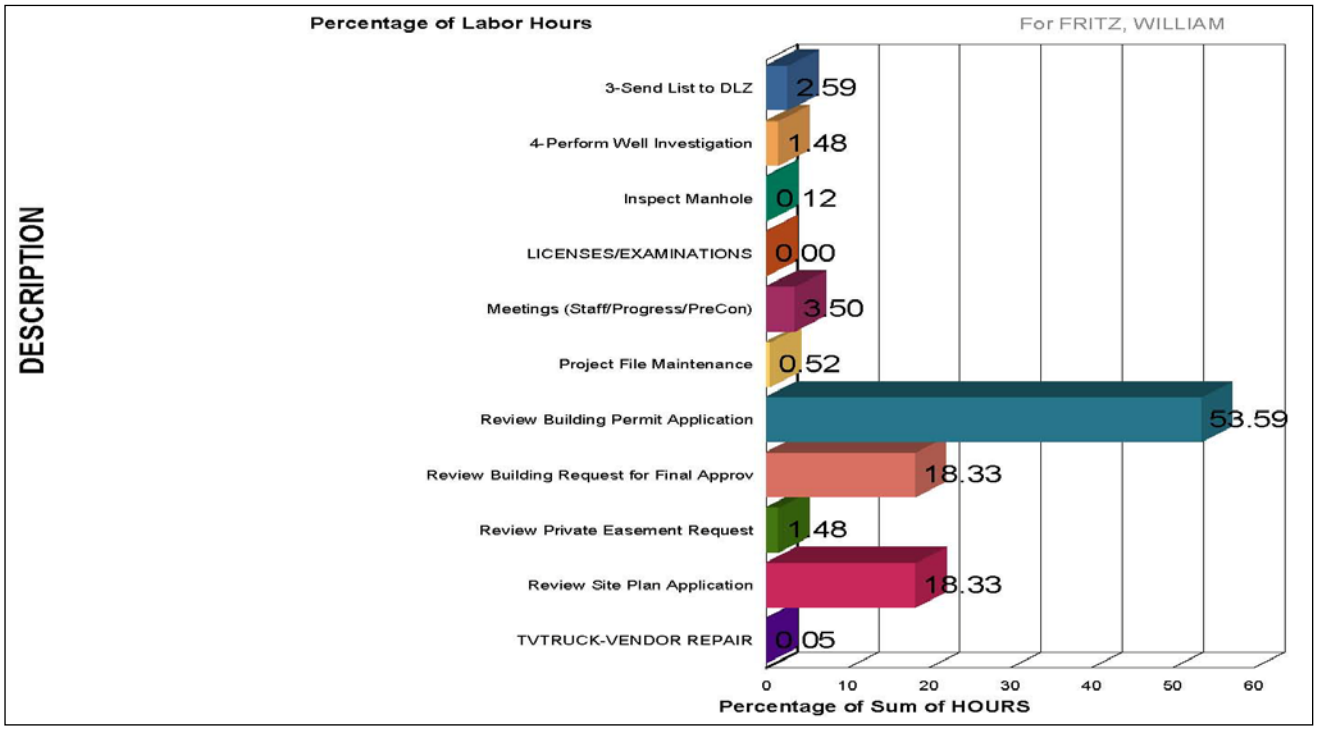
Private Development is defined as all planning and construction activities that are for the primary benefit of private business owners. Examples include new subdivisions, condominiums, apartment complexes or other residential units, offices, commercial and retail buildings.

The first step in new development is the planning and design stage. In 2010, 21 site plans were reviewed, up dramatically from the 7 reviews performed in 2009, but still lower than 2008. While an increase from 2009, 2010 continued the downward trend in proposed development in the Township (see graph below).

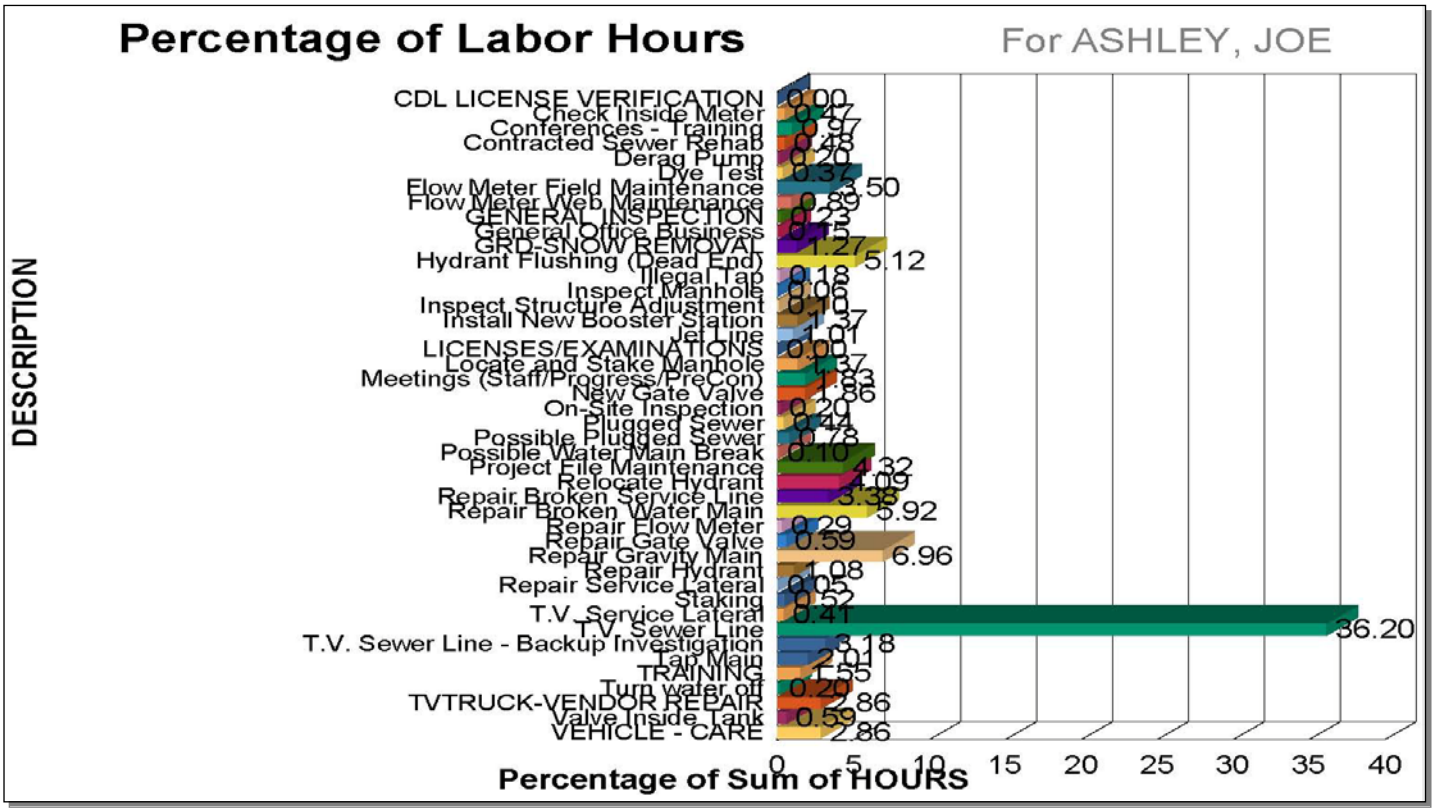
Once the site plans are approved, the next step is construction. This can be quantified in the number of building permits and the number of request-for-final-approval applications (RFA in Figure below) reviewed. Both of these indicators followed the same pattern as site plan reviews. Higher than 2009, but lower than 2008. There were 86 building application reviews and 71 requests-for-final reviewed in 2010 (see graph below).



The Engineering Superintendent completed all of the reviews mentioned above. Performing these reviews occupied about 60% of his recorded time in 2010 (see below).



Some private development projects require the installation of new water and/or sewer infrastructure. This includes water and sanitary sewer mains, sewer manholes, water valves, hydrants, and other categories. At the time of report preparation, the 2010 data was not available. The Field Engineer acts as the DPW's representative to ensure that all new water and sanitary sewer installations are done so in accordance with current standards. The following graph represents the breakdown of labor hours reported in the CMMS.



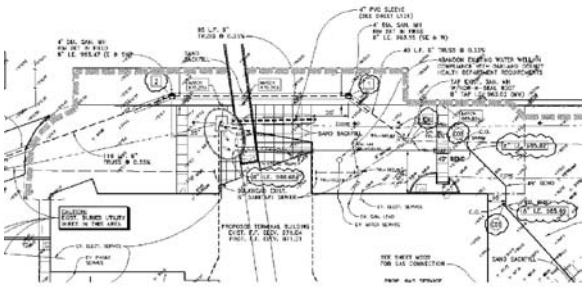
The Field Engineer also works on the Closed Circuit sewer inspection TV crew, which actually occupies nearly half of his time, as seen in the labor hours graph above.

The final steps in private development projects are:

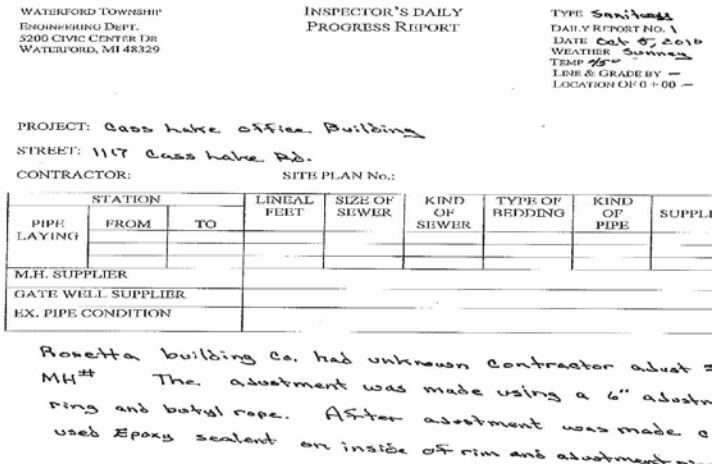
- ✓ Collecting the exact location of new infrastructure via GPS collectors
- ✓ Updating the water and/or sanitary sewer line work in the GIS/CMMS
- ✓ Importing the supporting documentation (inspection reports, testing reports, as-built construction plans, permits, etc.) into the document management system

Chris Donais GPS'ing a Fire Hydrant

New Water and Sanitary Sewer in GIS



Example of Utility Plan in Document Mgt



WATERFORD TOWNSHIP
ENGINEERING DEPT.
5200 CIVIC CENTER DR
WATERFORD, MI 48329

INSPECTOR'S DAILY
PROGRESS REPORT

TYPE Sanitary
DAILY REPORT NO. 1
DATE Oct 5, 2010
WEATHER Sunny
TEMP 75°
LINE & GRADE BY —
LOCATION OF 0 + 00 —

PROJECT: Cass Lake office Building
STREET: 1117 Cass Lake Rd.
CONTRACTOR: SITE PLAN No.:

PIPE LAYING	STATION FROM	STATION TO	LINEAL FEET	SIZE OF SEWER	KIND OF SEWER	TYPE OF BEDDING	KIND OF PIPE	SUPPLI
M.H. SUPPLIER								
GATE WELL SUPPLIER								
EX. PIPE CONDITION								

Rosetta building Co. had unknown Contractor adjust =
MH# The. adjustment was made using a 6" adjustm
ring and butyl rope. After adjustment was made e
used Epoxy sealant on inside of rim and adjustment

Inspection Report in Document Mgt

4. Infiltration-Inflow

The Township sanitary sewer system is a separated collection system that is primarily designed to convey wastewater only. Aging of the collection system has allowed, however, for increased ground water and storm water runoff to infiltrate into the system. In addition, illegal connections exist that introduce direct storm water runoff and other non-wastewater flows into the collection system. Problems such as sewer main surcharging and overflows can develop in the collection system during heavy and prolonged rain events. The DPW is committed to continuously improving the performance of the collection system through investigation, capital improvements and disconnection of illegal connections.

Infiltration-Inflow Reduction is a multi-faceted program. The components are:

- ✓ Sewer Cleaning and CCTV Inspection
- ✓ Trenchless Sewer Rehabilitation
- ✓ Flow Metering
- ✓ Smoke Testing

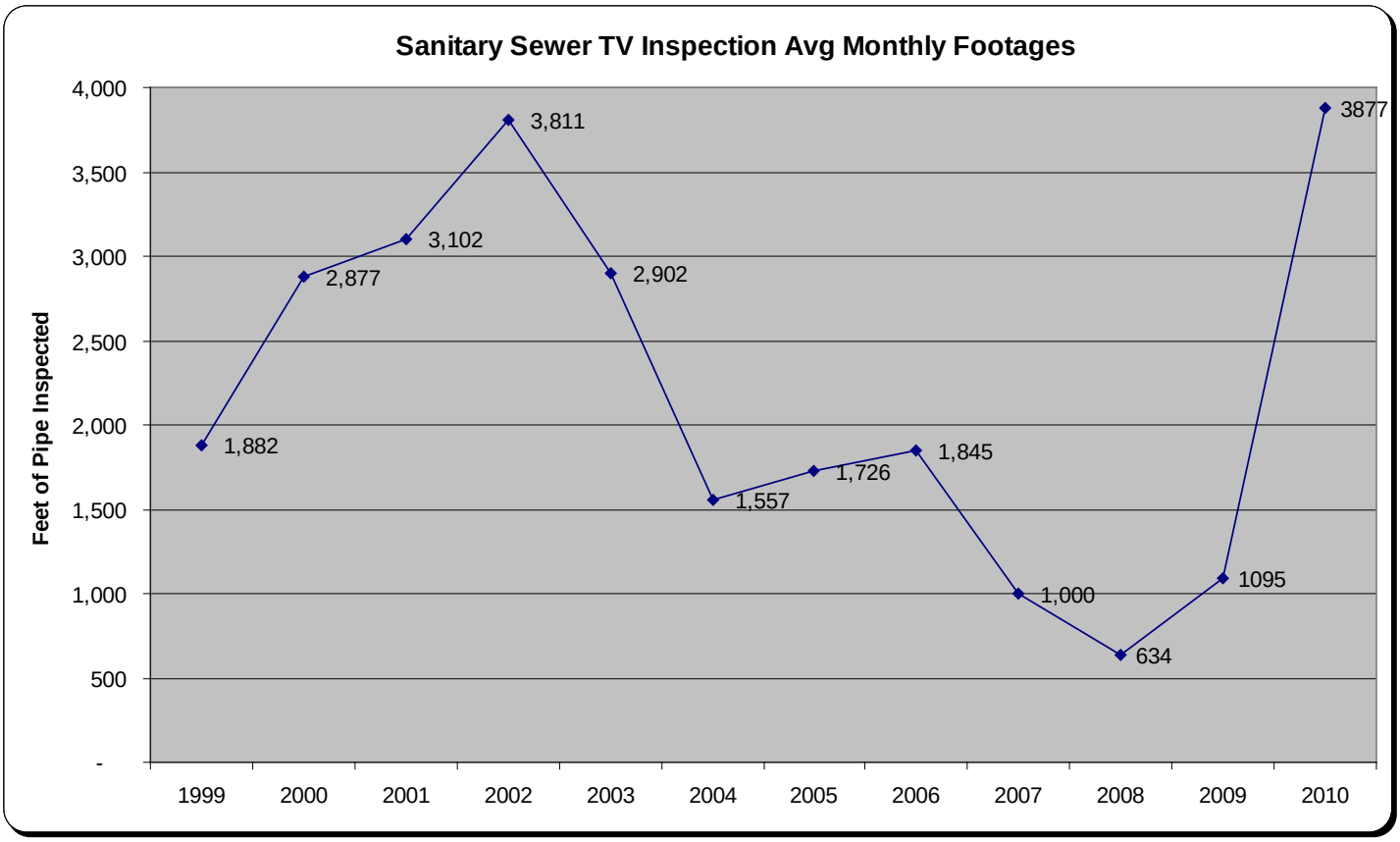
Joe Ashley Lowering CCTV Camera into Sewer Manhole

Karen Lee at the Controls of the CCTV System

Joe Ashley Performing Flow Meter Maintenance

Sewer Cleaning and CCTV Inspection

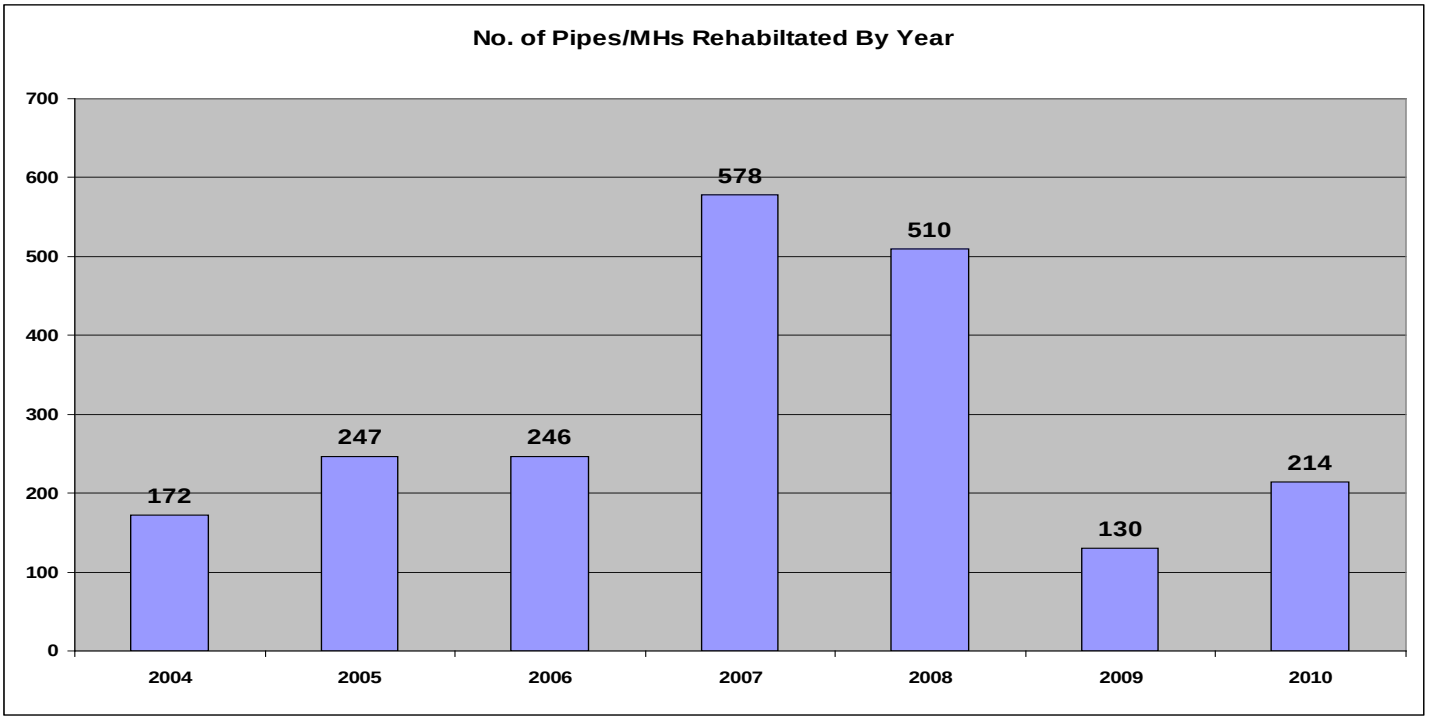
Since 1999, DPW staff has averaged about 2,200 feet of pipe inspected per month. The production rate has varied dramatically year to year due to many factors (personnel change, hardware/software problems, supplemental hardware/software upgrades). The equipment issues have been eliminated and the crew has been fully operational for several months. As a result, production has rebounded, as illustrated in the graph below.

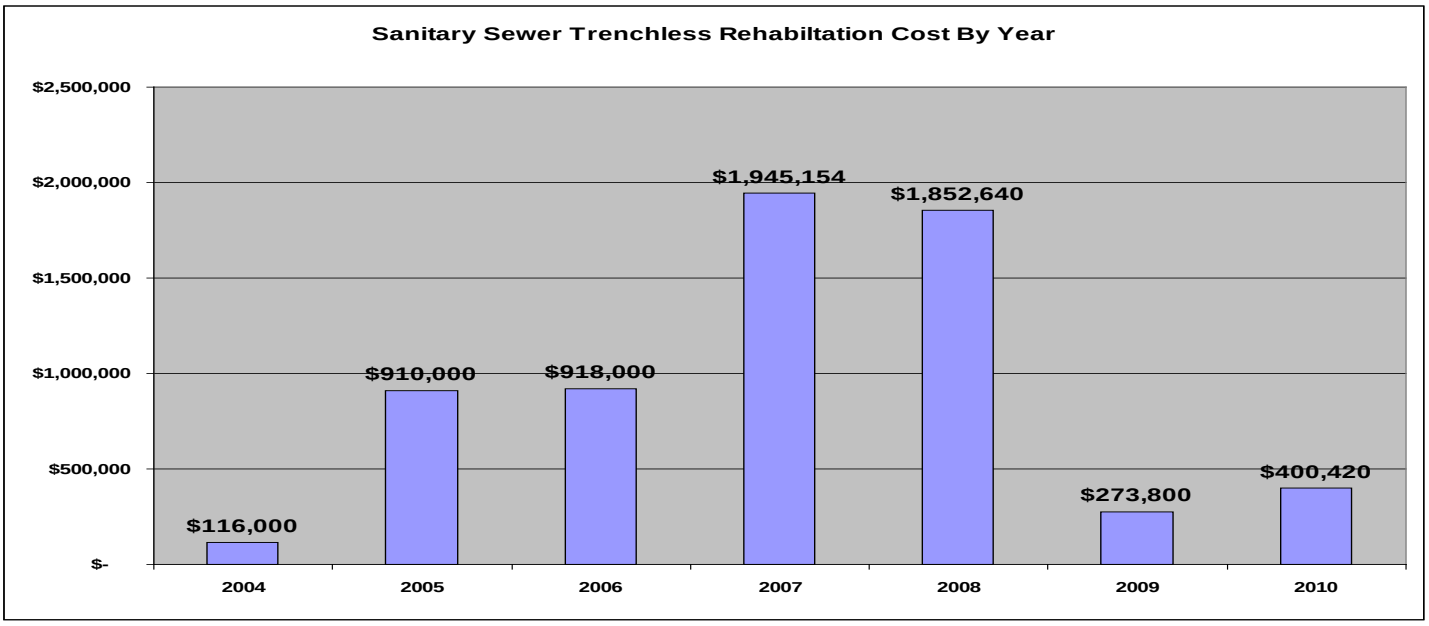


Trenchless Rehabilitation

Every year since 2004, Waterford Township DPW has rehabilitated a portion of its sanitary sewer collection system. The areas were selected using several criteria such as age, construction material and required maintenance frequency.

In addition to a multi-year rehabilitative maintenance contract, there have been three site-specific projects. The services provided are trenchless rehabilitation methods such as cured-in-place liners, pipe reaming, grouting and sealing manholes. The graphs below show the yearly costs and number of pipes/manholes rehabilitated.

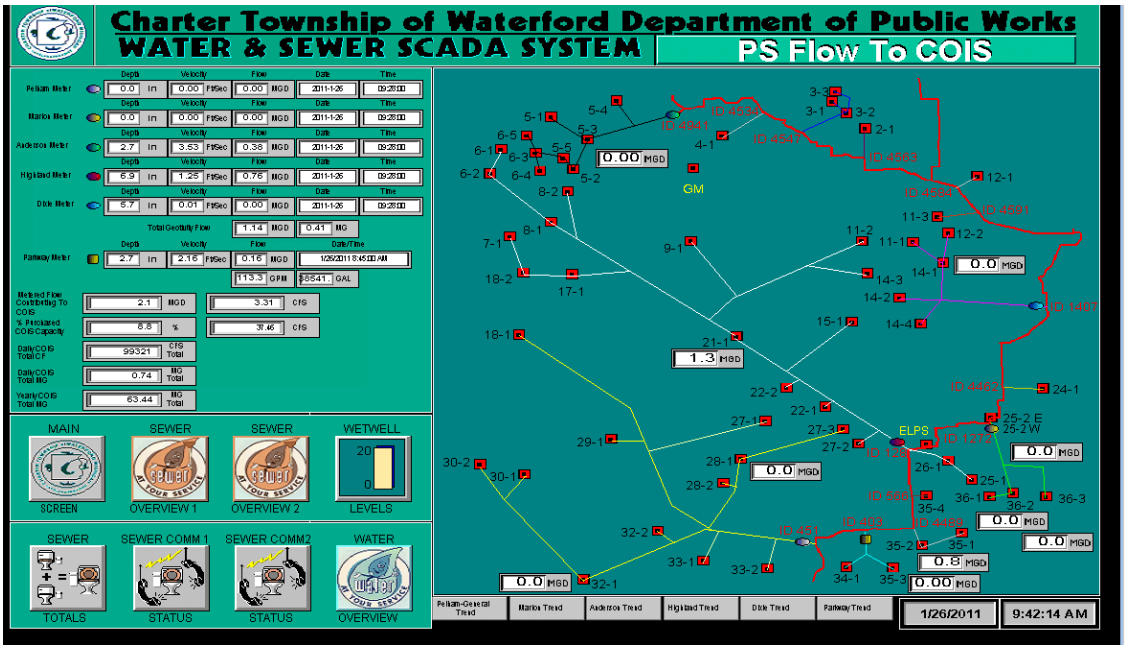




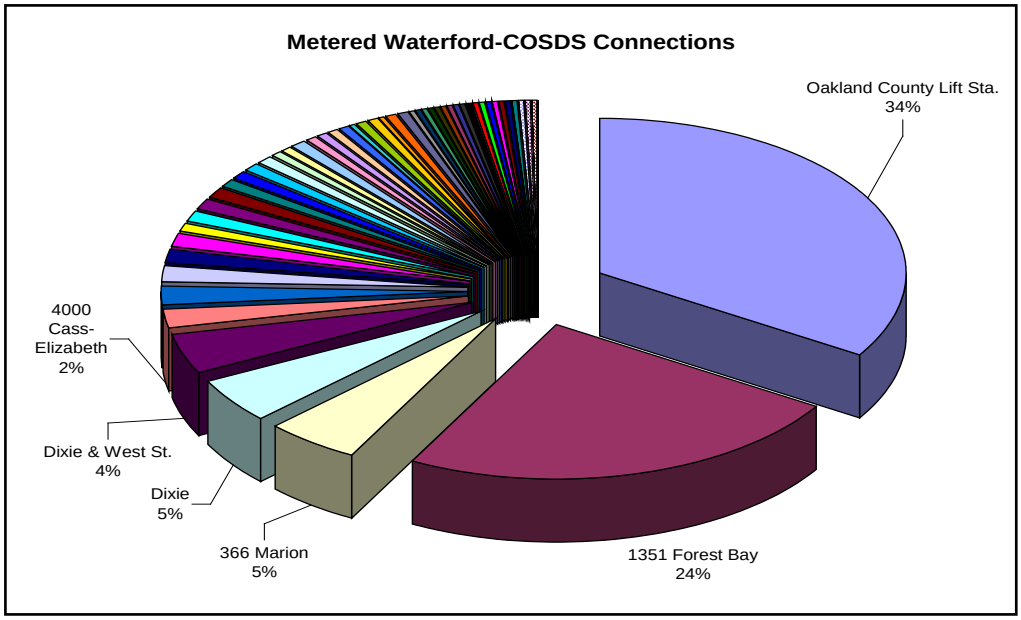
Flow Metering

Another facet of I&I reduction is flow metering of key junctions in the sanitary sewer system. The Waterford Township sanitary sewer collection system has 84 connections to the Oakland County Sewage Disposal System (COSDS). The amount of flow contributed from each connection varies tremendously. Nearly all of the connections are public sewer mains but there are a few individual homes tied directly into the OCSDS pipes. The public sewer connections themselves vary tremendously on the amount of flow contributed. There are connections with as few as 2 or 3 building leads and as many as 8,200 building leads.

In 2009 five additional meters were installed at strategic connection points to the COSDS. Another was added in 2010. The meters are continuously monitored through the Supervisory Control and Data Acquisition (SCADA) system (see map below).



All together, the six meters are measuring the flow contributed by nearly 75% of Waterford Township's total flow.

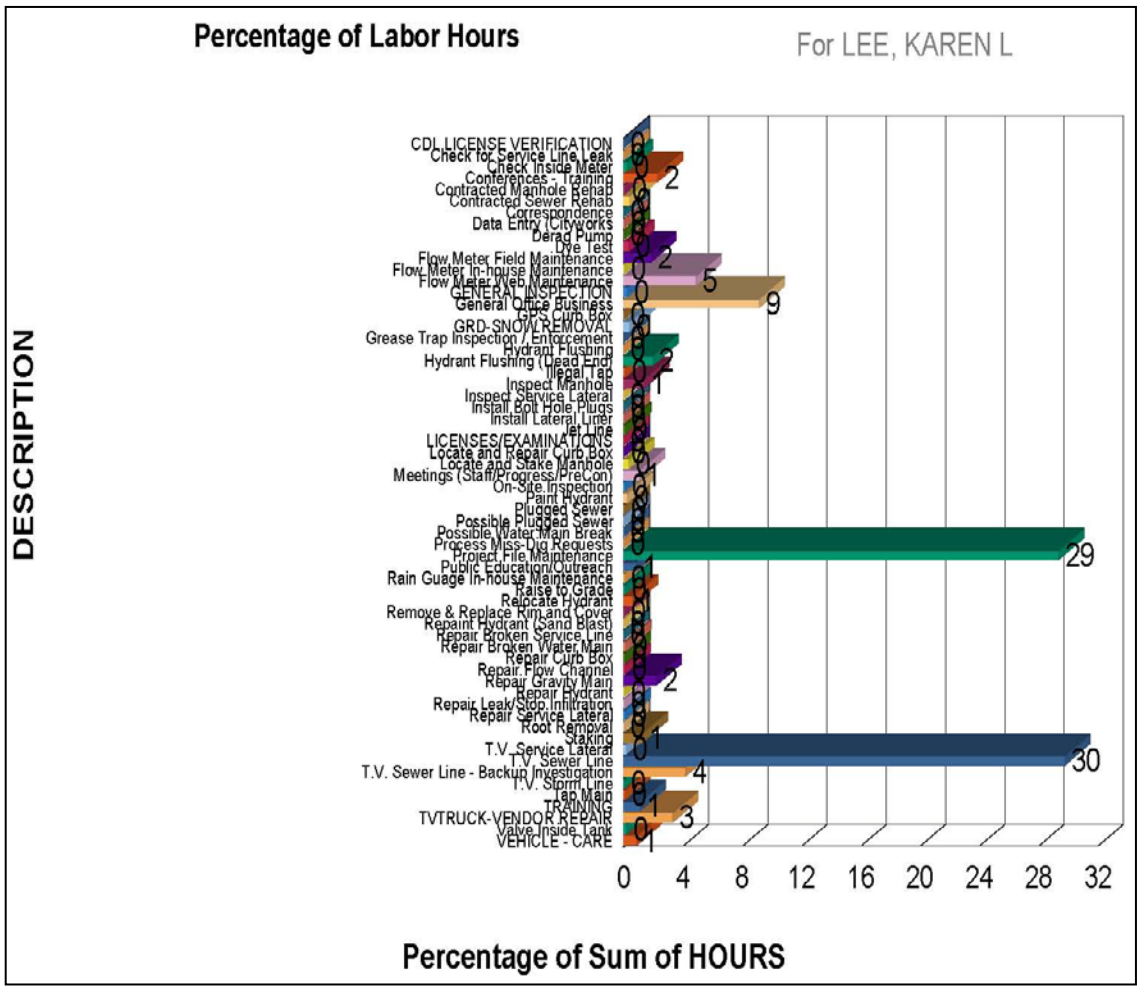


Smoke Testing

In 2010, the DPW enlisted the services of the Oakland County Water Resource Commissioner's flow metering consultant, Orchard, Hiltz & McCliment to perform smoke testing of manholes in one of the six flow metered drainage basins. Smoke testing is an effective way to lower I&I because it identifies cross-connections to storm sewers, building downspouts and sump pumps connected to the sanitary sewer. Work has started and continues to be scheduled to correct the deficiencies found in the study. The following table shows the results of the study.

Defect	Quantity	Peak estimated I/I (gpm)	Peak estimated I/I (cfs)
Missing or broken clean-out cap[1]	7	592	1.32
Smoke leaking around manholes	22	51	0.11
Manholes located in low areas that are prone to flooding	9	45	0.10
Smoke leaking through missing bolt holes	14	42	0.09
Total	**52**	**730**	**1.63**

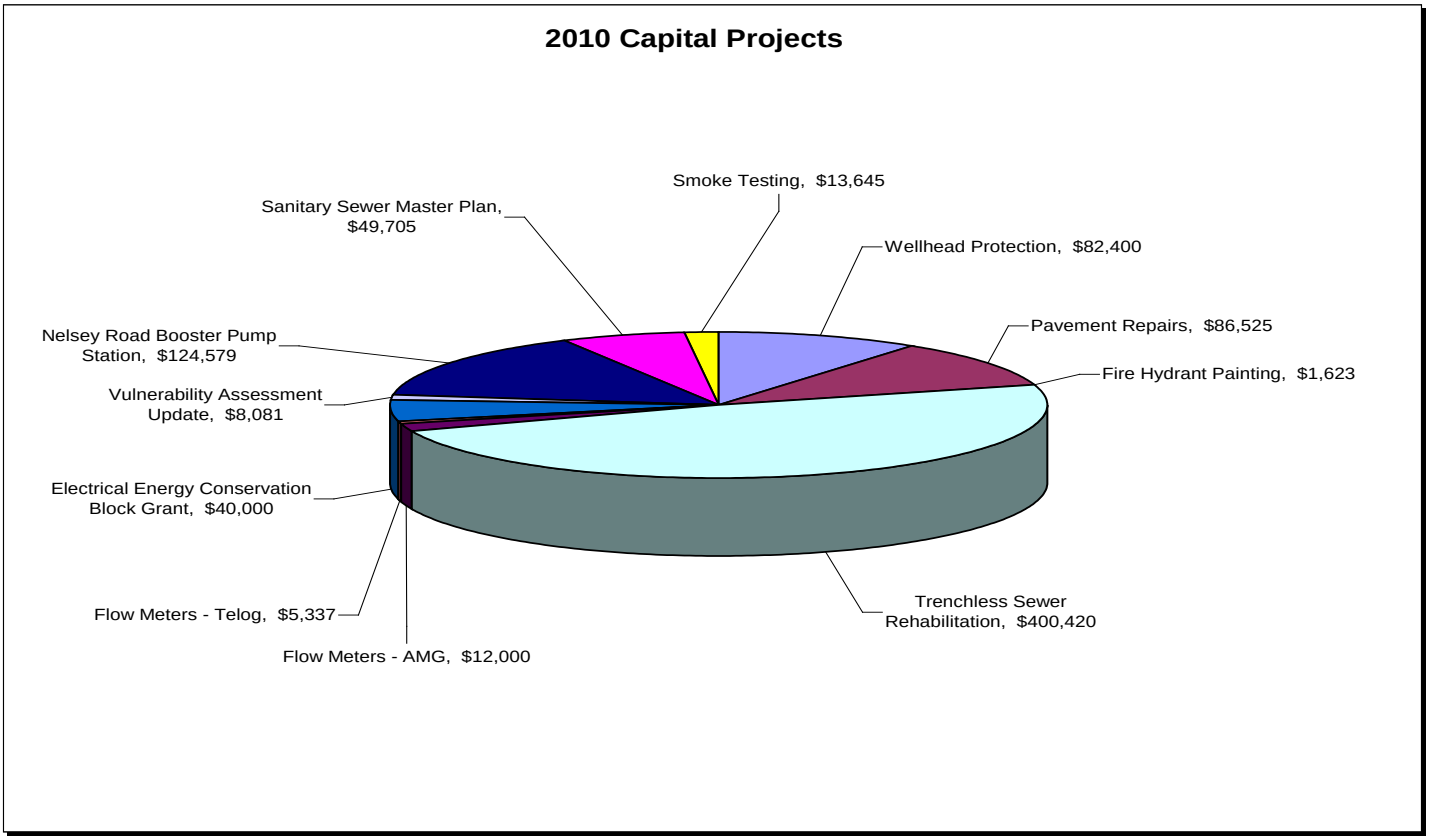
Karen Lee, Collection Systems Operator, is the primary employee tasked with monitoring Infiltration & Inflow reduction efforts and coordinating activities.



5. Capital Improvement Projects

This category includes the projects and activities that the DPW financially participated in 2010. They may be projects, for which work was performed in-house, or where the work was contracted directly by the DPW or they may be projects performed by other agencies with financial participation agreements.

The graph below illustrate the scale of each capital project's budget in relation all capital projects. The Table below lists the projects along with a brief description and the 2010 costs for each.



2010 CAPITAL IMPROVEMENT PROJECTS		
Project	**Description**	**2010 Cost**
Trenchless Sanitary Rehabilitation	Televise, Clean, ream, grout, line aging sewers	$ 400,400
Nelsey Road Booster Pump Station	Construct new water pumping station	$ 124,600
Pavement Repairs	Repair paved areas disrupted by water/sanitary repairs	$ 86,500
Wellhead Protection	Movie Trailer, Inspection of Sites of Concern, Public Outreach	$ 82,400
Sanitary Sewer Master Plan	Pump Station Analysis, Sewer System Modeling	$ 49,700
Electrical Energy Conservation Grant	Energy Audits, LED lighting fixtures	$ 40,000
Smoke Testing	Pump smoke into sanitary sewers to locate defects	$ 13,600
Flow Metering - AMG	Portable flow meters installation / continuous monitoring	$ 12,000
Vulnerability Assessment Upgrade	Evaluate changes made and assess status	$ 8,100
Flow Metering - Telog	Portable flow meters installation / continuous monitoring	$ 5,300
Fire Hydrant Painting	Paint fire hydrants	$ 1,600

2010 CAPITAL IMPROVEMENT PROJECT HIGHLIGHTS

Nelsey Road
Booster
Pump Station

Leveling the Base

Placing the Pit

Nelsey Road
Booster
Pump Station

Delivery of Station

Inside Pump Station

2010 CAPITAL IMPROVEMENT PROJECT HIGHLIGHTS

Smoke Testing

3848 Cottage Grove, smoke coming out of cleanout, cap missing

Smoke through bolt holes and around flange. Low lying area. Resident confirms flooding in spring.

Smoke Testing

Broken Cleanout in Low Area, 3981 Cass Elizabeth Rd, View #1

Broken cleanout at 1570 Oak Street

6. Wellhead Protection / Community Outreach

The success of the DPW's Wellhead Protection Program (WHPP) is due, in large part, to its emphasis on educating the public about the importance of source water protection. Each year the DPW conducts demonstrations for elementary, middle and high school classes, as well as community organizations reaching nearly 2,000 people.

Hands-on demonstrations and distribution of items such as tee shirts, squish-balls, cup holders, etc. help to embed the experience into the student's lives. The DPW also participated in educational programs at Hess-Hathaway Park for local children, at the Waterford Area Chamber of Commerce Open House at Mott High School, and hosted 6th grade science classes at a tour of our facilities.

In 2010, the WHPP resumed its 30-second public service announcement at the Waterford MJR Cinema. The PSA was played on all 15 screens prior to all movie showings.

Also in 2010, the WHPP was featured in a radio PSA broadcast over the internet on the audio stream of the three Greater Media Stations in the Detroit market (WRIF, WCSX, and WMGC). Like the movie trailer, the radio PSA was 30 seconds in length and got broadcast on-line during commercial breaks. The following images are the radio players for the three radio stations and show the DPW logo displayed during the spots.

Water Distribution Branch

The mission of the Water Distribution Branch is to provide maintenance services for the safe and efficient operation of the Township's water distribution system. The employees in this branch utilize a wide array of specialized equipment for underground excavation and other maintenance activities.

The branch is headed by the Water/Sewer Superintendent and is comprised of six full-time employees. The positions and a brief description of their typical duties are listed below:

- Water/Sewer Superintendent
  Provides overall administrative duties for the Water Distribution Branch. Provides research and analysis of the water distribution system and suggests areas of improvement. Provides budgeting support and technical assistance to employees as needed. Analyzes the DPW's CMMS.

- Distribution Foreman
  Serves as the general day to day supervisor for field employees in the distribution branch. Assures that water taps and related activities are prioritorized and scheduled properly. Ensures that the branch has materials and supplies.

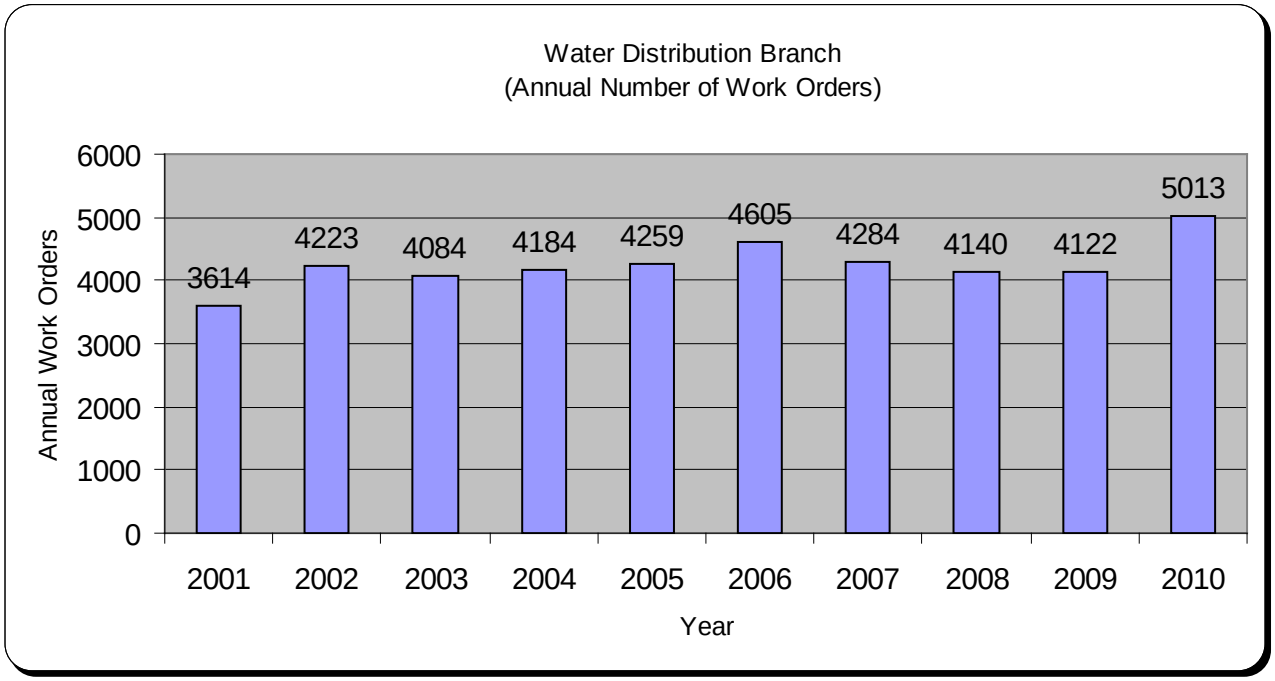
- Crew Leaders (2)
  These individuals serve as the lead employees on the job site. They ensure that proper safety procedures and work routines are followed.

- Distribution Service Workers (3)
  Employees in this classification serve primarily as general laborers and utilize heavy excavation equipment to conduct water main taps, curb box repairs, fire hydrant repairs, and sewer repairs.

Distribution Branch employees Kevin Neeb, Tim Harmon, Sam Powell, Derek VanDam, Frank Patrello. Not pictured Robert Tarchalski.

Water Distribution Branch Annual Work Orders

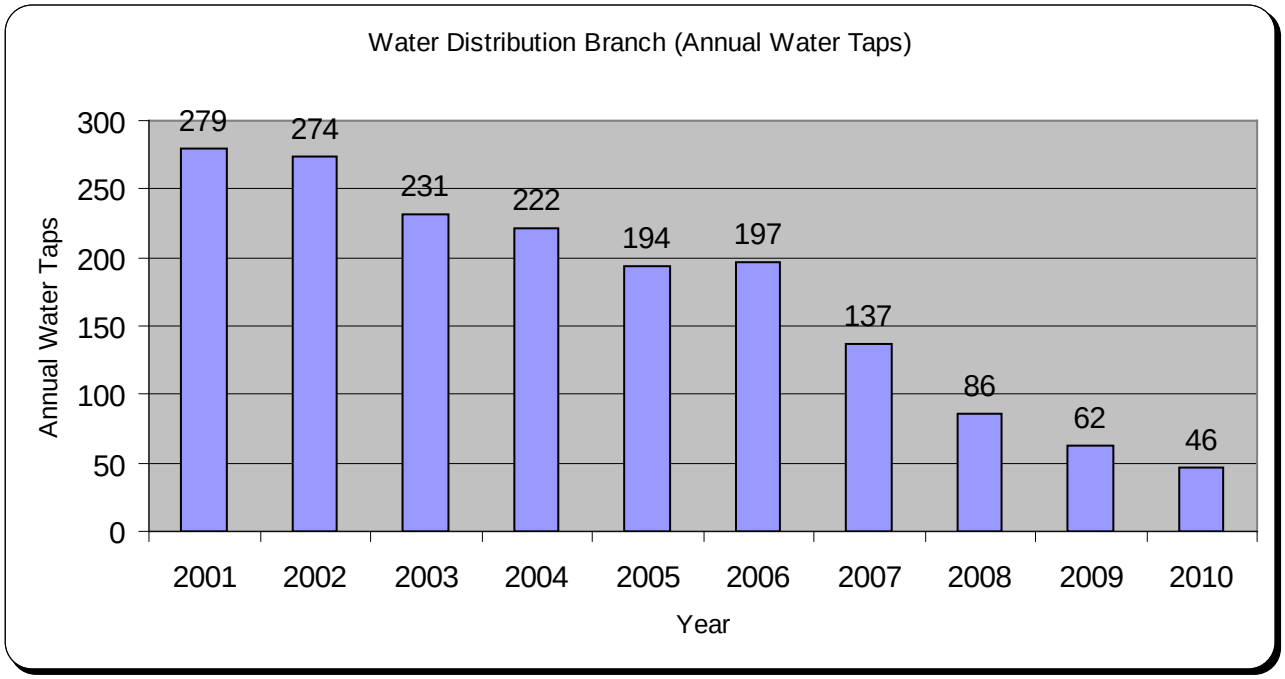
This Branch is responsible for all water main taps, water main break repairs, fire hydrant repairs and sewer main repairs. The graph below shows the aggregate annual number of the activities performed in this branch. Current work also includes raising sewer manhole rims to grade or sealing them to prevent leaking. The branch also maintains and winterizes nearly 3,600 hydrants per year to ensure reliable operation throughout the year. Similar work activity is expected to continue with additional sewer work and valve preventative maintenance work increasing.



Distribution Branch employees repairing a water main. The Township has 360 miles of water main of various age and composition.

Water Taps

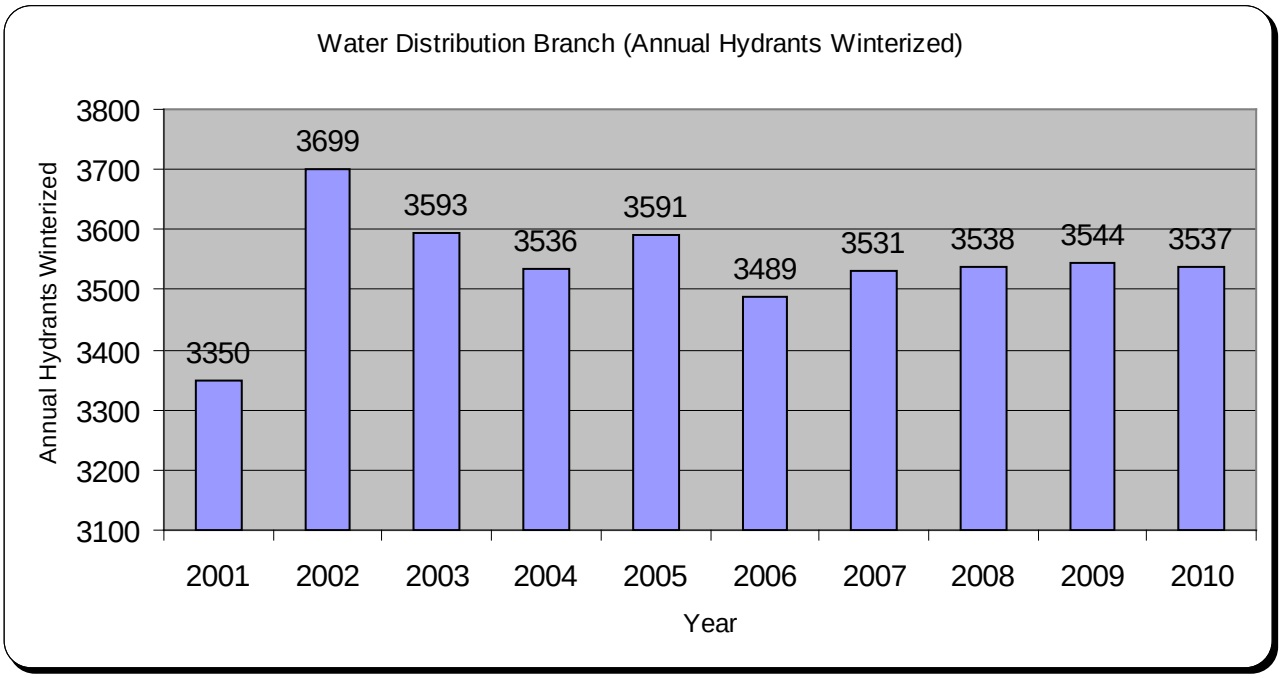
Water taps involve connecting new water customers to the water distribution system or reconnecting old worn out connections. Trends in recent years indicate a decline in new taps. This downward trend is expected to continue as the Township continues toward build-out. The graph below shows the annual water taps since 2001.



Distribution Branch crew placing a 'Trench Box' in place prior to a water main repair. Trench boxes are used as a safety measure to prevent cave-ins when working near unstable or non reliable soil conditions.

Hydrant Winterizing

The Township has nearly 3,600 fire hydrants. These hydrants are a vital part of the water distribution system and an important health and safety asset of the Township. To ensure proper functioning of these vital assets, they are maintained throughout the year. In the fall, they are inspected and pumped down as part of the winterization program to prevent damage from freezing. The graph below depicts the annual number of these activities since 2001. These trends are expected to remain constant each year.



Installation of Nelsey Road Area Water Pressure Booster Station

In 2010 the DPW's Distribution Branch installed a new In-Line Water Booster Station located in the Nelsey Road area of the Township. Performing the installation in-house saved the DPW over $50,000 in outside contractor costs. The project has increased the water pressure by an average of 20 pounds per square inch (psi) and has been well received by the water customers in this area.

Inside the vault of the Booster Station at Nelsey Road.

DPW Distribution Crew fabricating Booster Station Vault at the DPW Yard

Water Treatment and Supply Branch

The mission of the Water Treatment and Supply Branch is to ensure safe potable water is delivered to the customers of the Township. Responsibilities include maintenance of the Township's 13 water treatment plants, 2 elevated and one 1 ground storage tank totaling 8.25 million gallons of storage and 18 raw production wells. The branch is also responsible for the daily testing of water in the distribution system as well as ensuring compliance with the Safe Drinking Water Act.

The annual Consumer Confidence Report (CCR) is also compiled from operational data collected and maintained by the branch. This report serves as an annual audit detailing regulatory requirements of the water supply system and the results of the various tests conducted by the branch. It is mailed out to all customers annually and is available on line for viewing at anytime.

The branch is headed by the Water/Sewer Superintendent and is comprised of 4 full-time and 1 part-time employees. The positions and a brief description of their typical duties are listed below:

- Water/Sewer Superintendent
  Provides overall administrative duties for the Water Treatment Branch. Provides research and analysis of the water treatment system and suggests areas of improvement. Provides budgeting support and technical assistance to employees as needed. Analyzes DPW's Computerized Maintenance Management System to look for system and branch improvements.

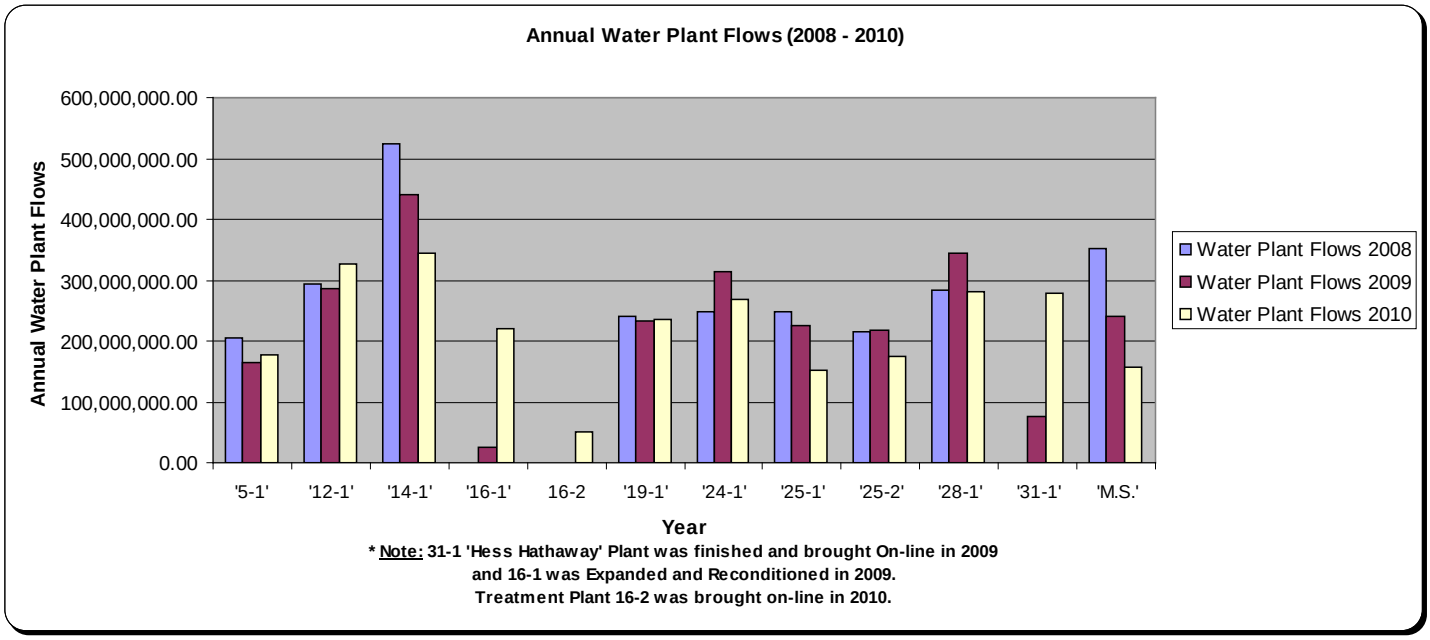
- Water Supply Foreman
  Schedules all work performed at the 11 Water Treatment Plants and oversee Monitoring Schedules required by the DEQ. Oversees Work Order completion and assists as needed in the field to provide support with tasks on everyday maintenance.

- Water Supply Operator IV (3)
  Performs daily maintenance and records field data information at all Treatment Plants, Tanks and related facilities. Performs and maintains records for monthly reporting to the DEQ. Completes work orders as assigned by the Foreman.

Treatment Branch employees Alan Gill, Jerry Ward, Aaron Potter, and Shane Solheim.

Water Pumped Analysis

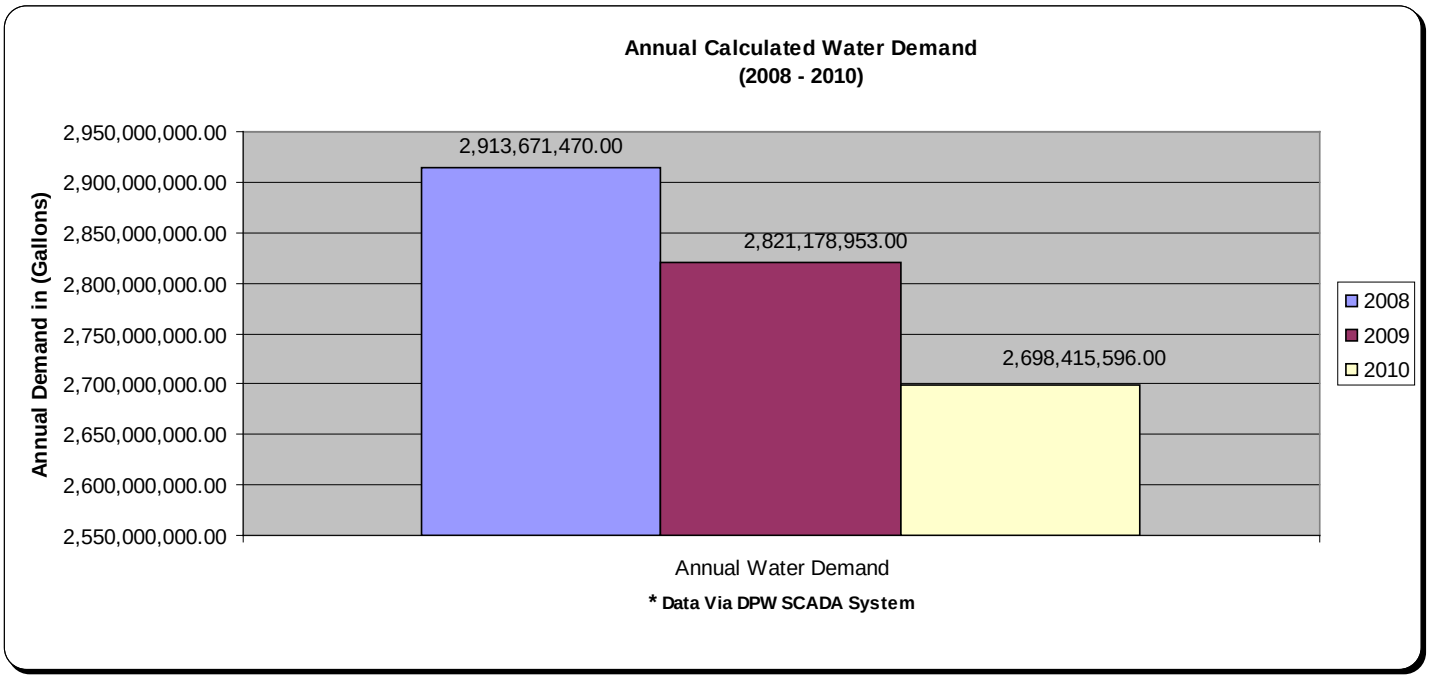
The volume of water treated and distributed to Township customers is an important component of operations. Many factors contribute to this number such as growth and development, weather, and fluctuating demand. Continuous monitoring of operational conditions and performance is performed by staff and made possible through the use of the DPW's advanced Supervisory Control and Data Acquisition (SCADA) system and hydraulic modeling. The graph below shows the annual totals per water treatment plant for 2008, 2009 and 2010.

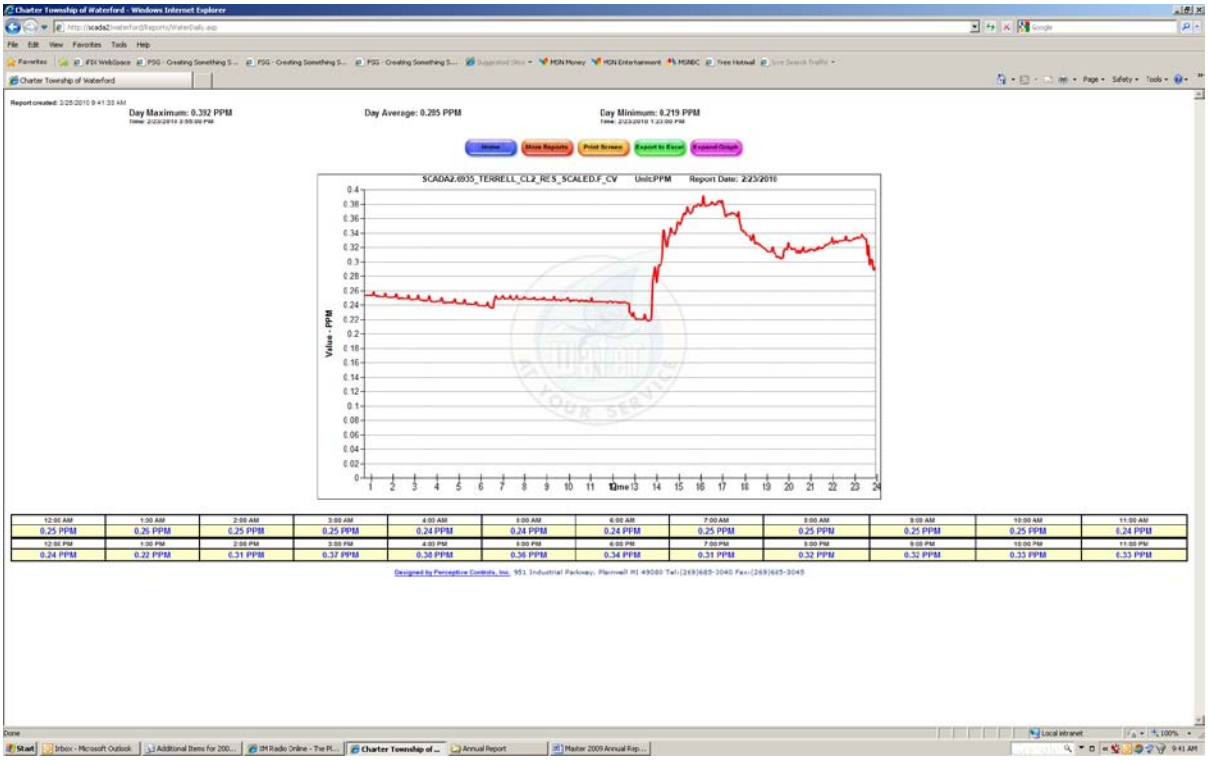


Treatment Branch employee Aaron Potter, performing maintenance on instrumentation at WTP 28-1. The Branch takes over 800 water samples per year in order to comply with MDEQ standards.

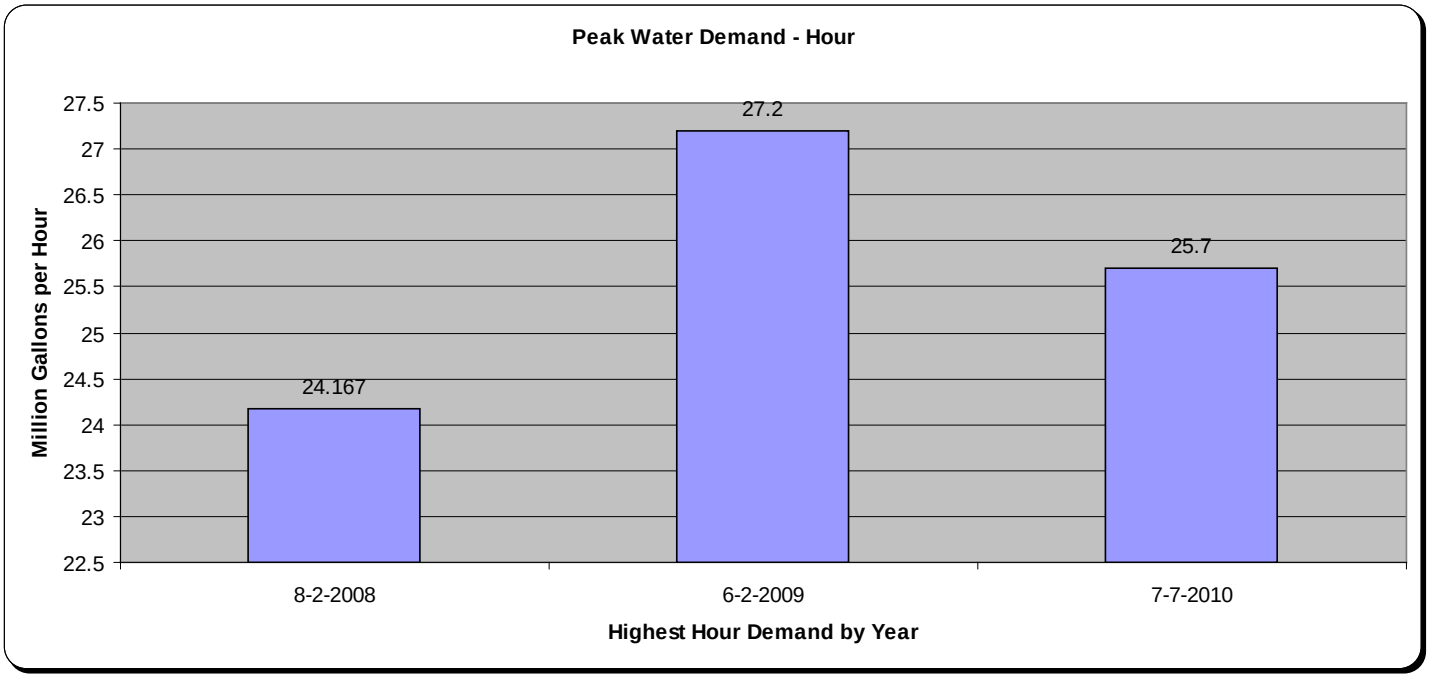
Supervisory Control and Data Acquisition (SCADA)

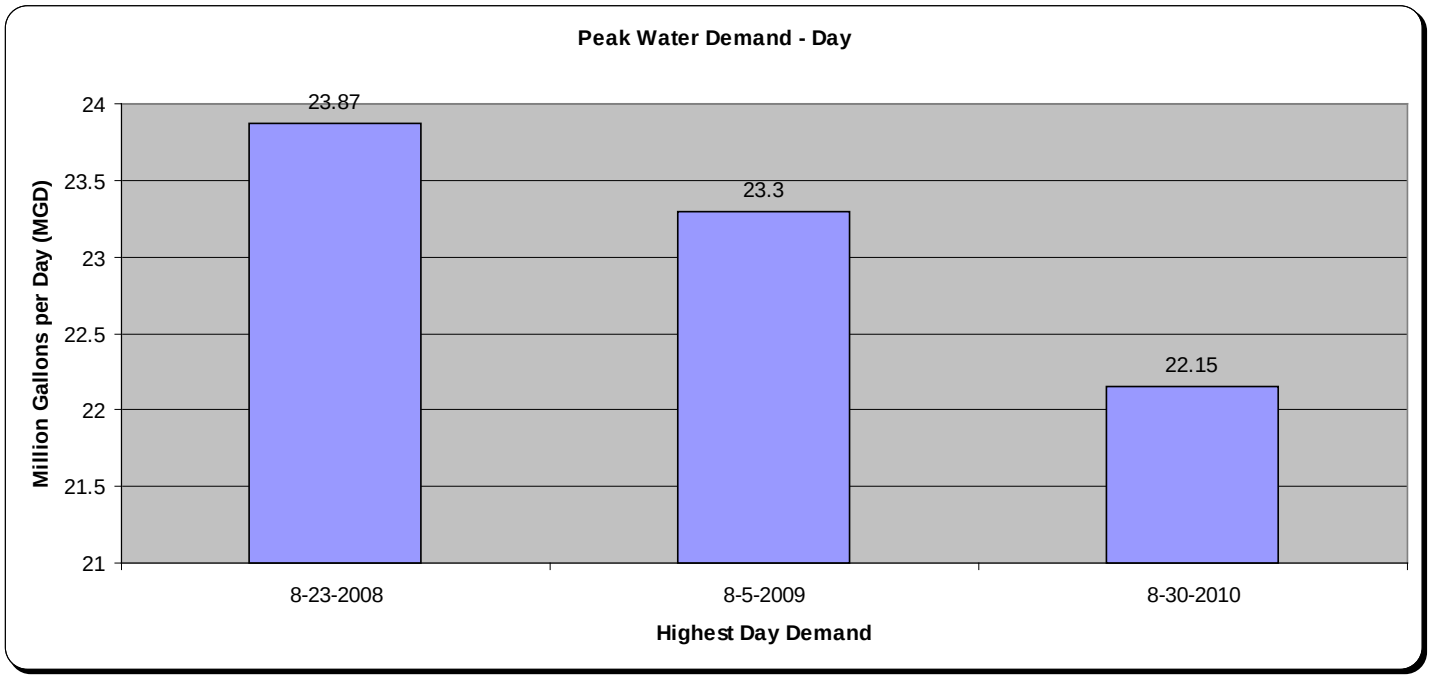
The day-to-day monitoring and operation of the water production, storage and delivery systems of the distribution system is performed via a computer controlled SCADA. This system also provides a wealth of information that is vital to the efficient administration of the water supply system. The following charts demonstrate just a few of the statistics that are utilized to ensure the customer base will receive the amount of water that is demanded in the safest and most efficient means possible.

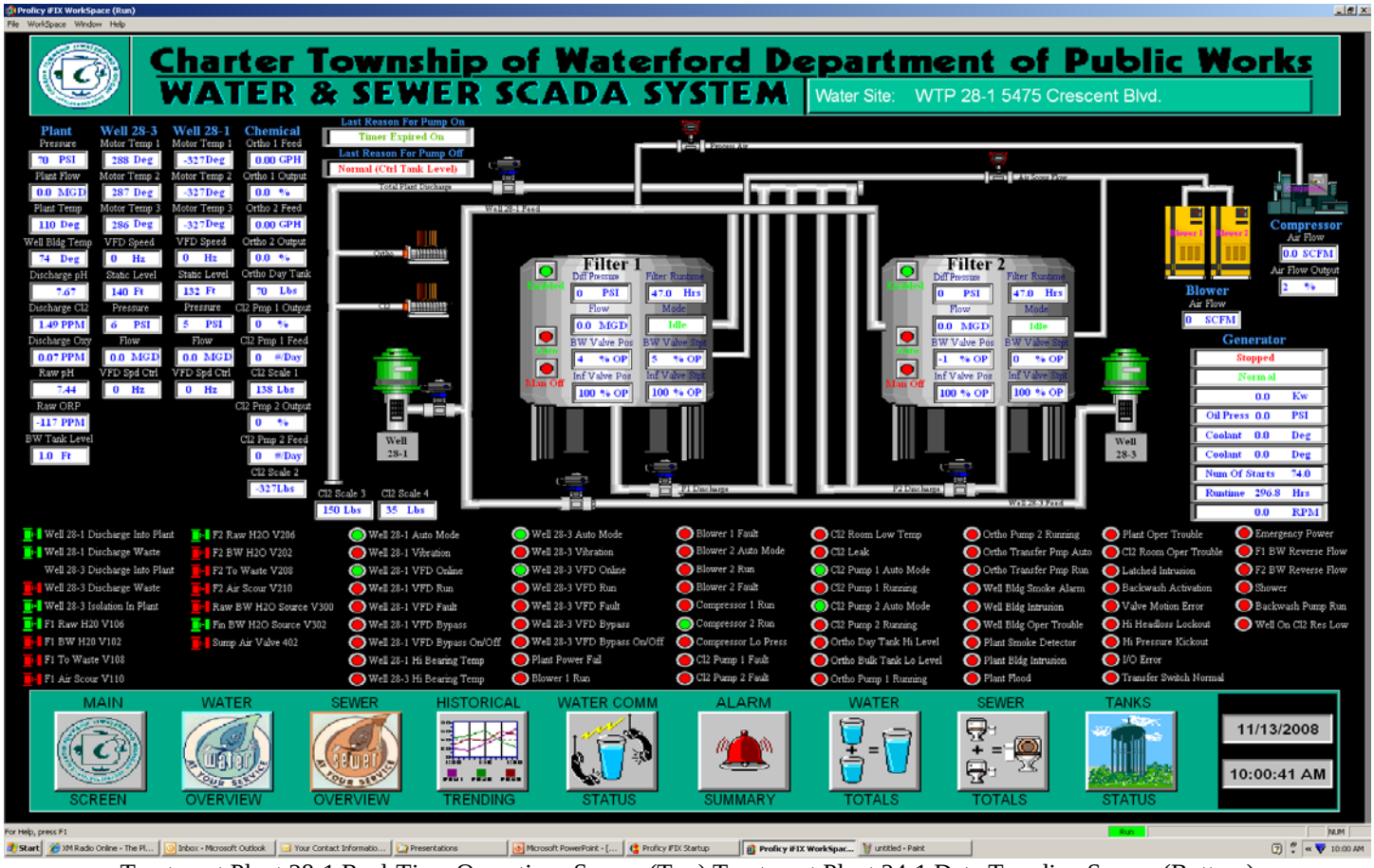




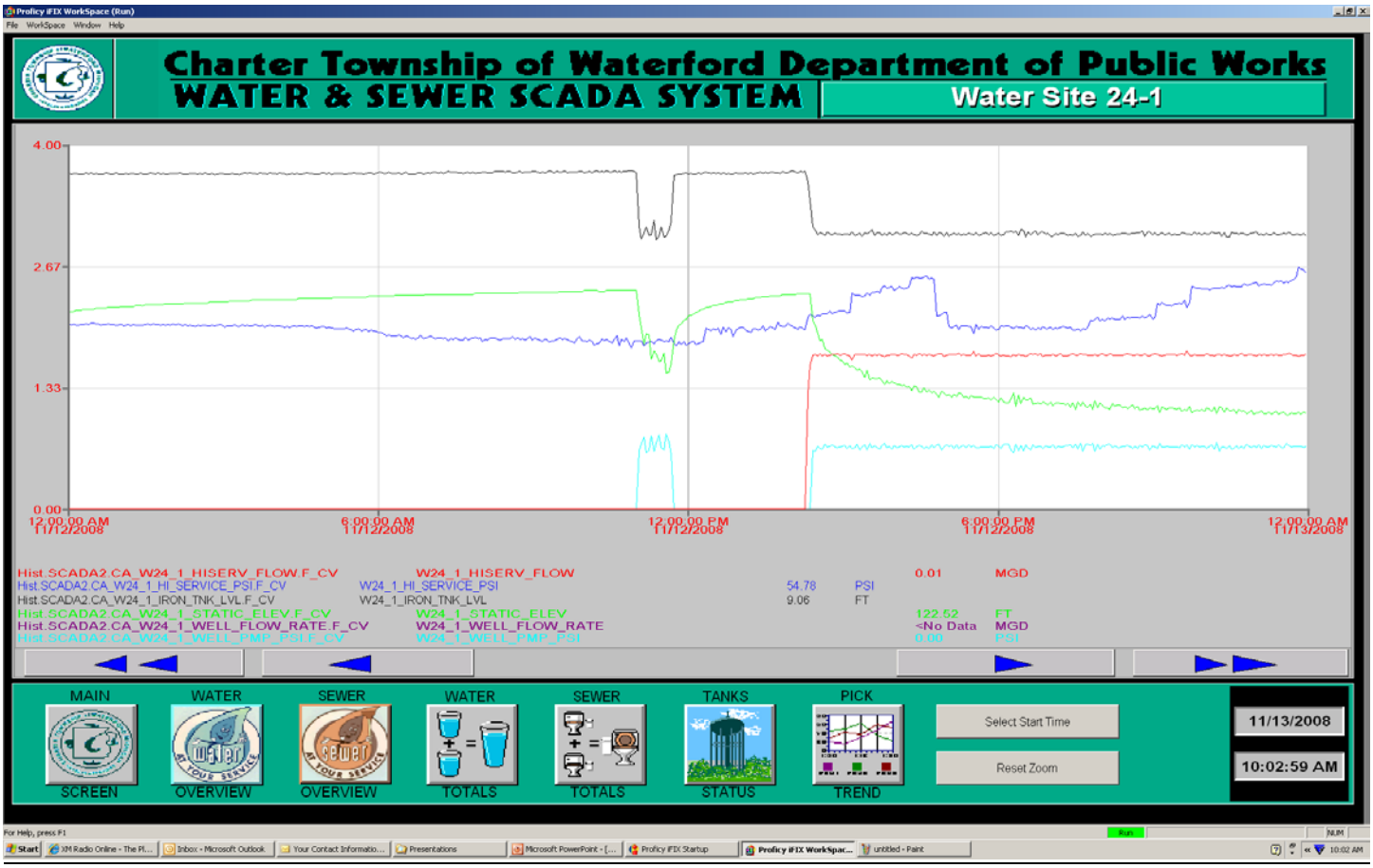
Daily Chlorine Residual Level for Maceday Tank.





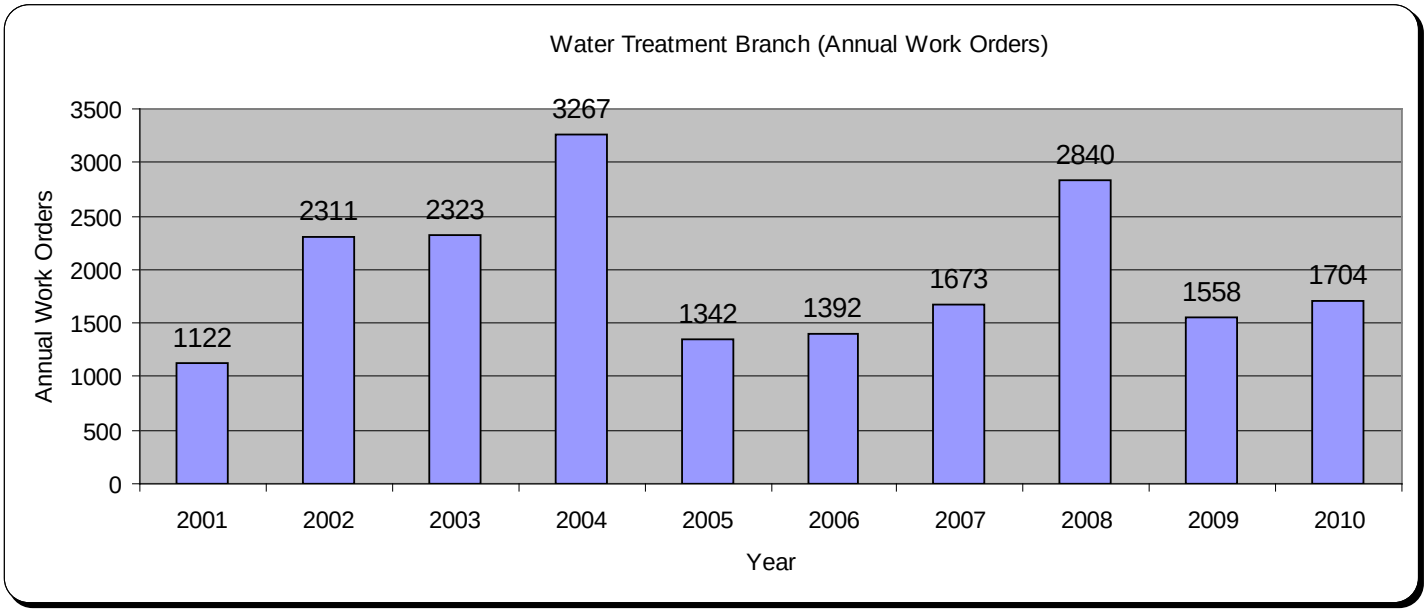


Treatment Plant 28-1 Real-Time Operations Screen (Top) Treatment Plant 24-1 Data Trending Screen (Bottom)



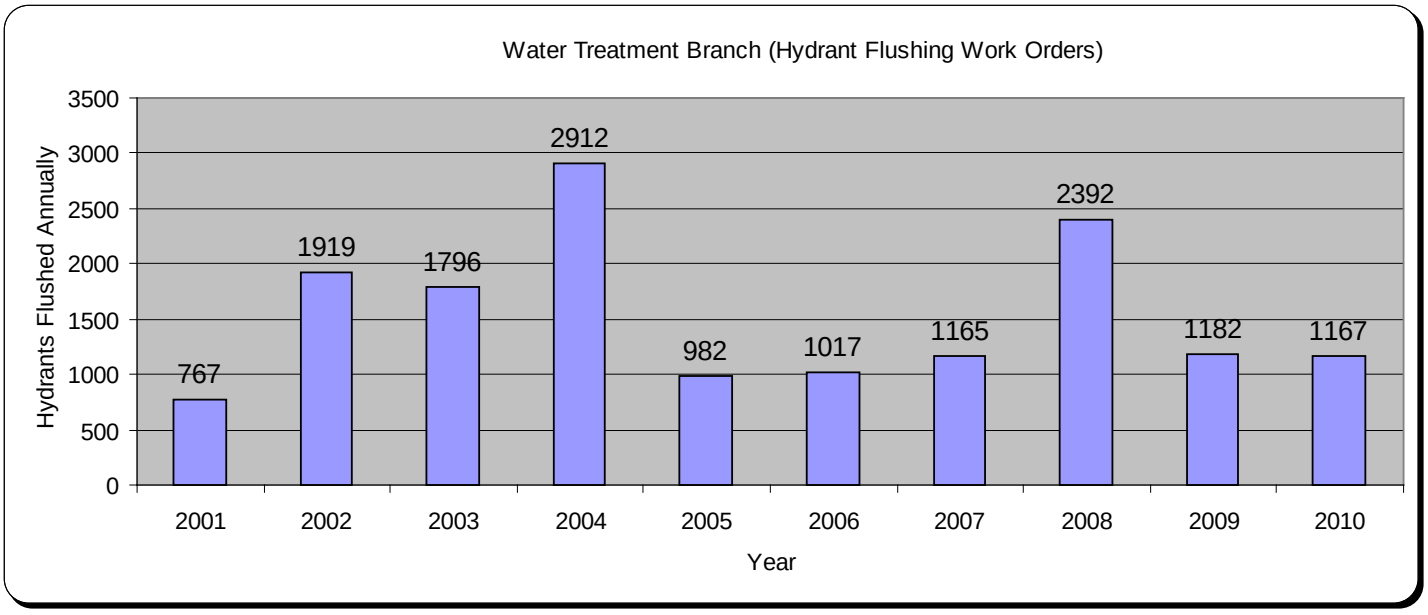
Water Treatment Branch Annual Work Orders

The graph below shows the aggregate annual number of the activities for this branch. Activities will continue to fluctuate as system components age, operational and capital modifications are made, drinking water regulations become more stringent and system demands dictate. The decrease in 2005 total work orders was primarily due to no full fall hydrant flushing program. A partial fall flushing program was completed in 2010. Each spring all dead end fire hydrants are flushed as well.



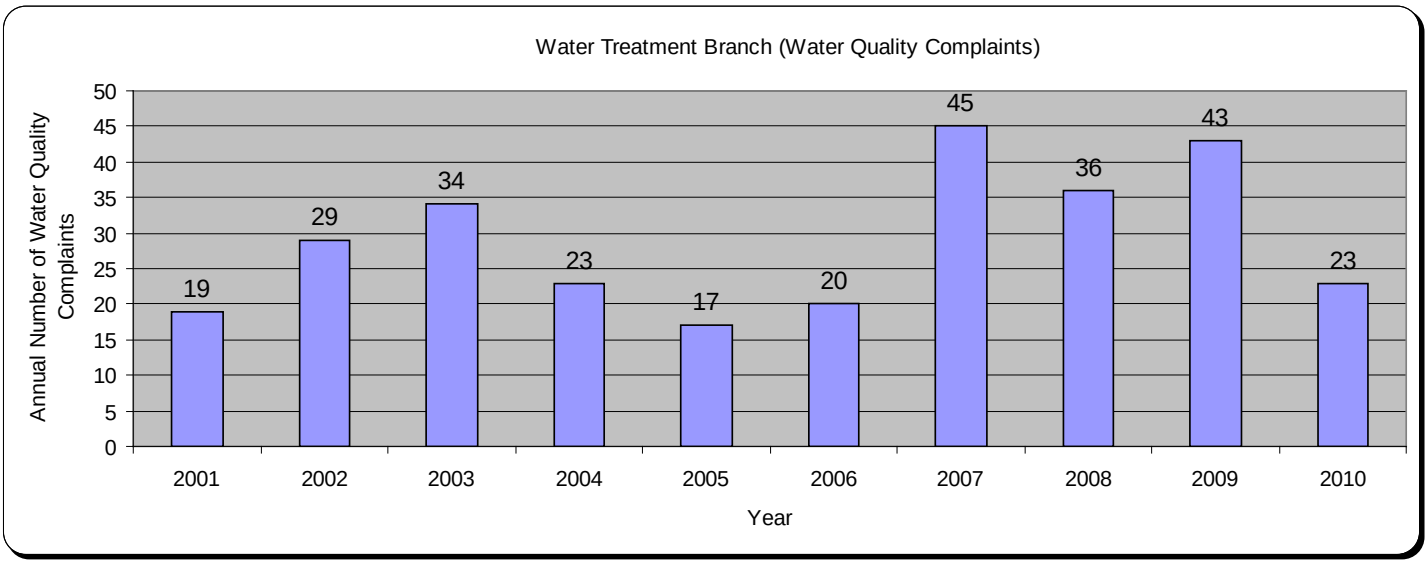
Hydrant Flushing

The Township has approximately 3,600 fire hydrants, which are a vital part of the water distribution system and an important safety asset. To improve and maintain the quality of the water in the system, hydrants are flushed periodically. The graph below depicts the annual number of these activities since 2001. The amount of hydrant flushing is dependent on observed and tested water quality parameters, but generally performed in the spring and fall of each year. As mentioned above, a full flushing of the hydrants was not warranted in 2007, 2009 or 2010. This resulted in only "dead-end" hydrants being flushed.



Treatment Branch employee Dave Johnston performing water hydrant flushing. Hydrant flushing is conducted to help ensure the Township's Water Supply is of the highest quality.

In general, water quality complaints are handled by the Treatment Branch, and can range from taste to odor issues. Examples of complaints range from water softeners, reverse osmosis filters or other items malfunctioning or needing replacement in homes or businesses to red water at the tap. However, these types of calls are relatively infrequent given the customer service population of the Township. The graph below depicts the annual frequency of water quality complaint calls since 2001. The Iron Removal Plants that were brought on-line back in the mid 1990's, along with continually monitoring the effectiveness of the process through SCADA, hydrant flushing, continuous water turnover and analysis has had a very positive affect on the quality of the Township water.



Water Quality Report – Public Outreach

The branch also compiles water analytical data, as well as general information about the water that is treated and distributed to customers in the form of an Annual Water Quality Report, which is referred to as the Consumer Confidence Report (CCR). This report provides a wealth of information about the public water system water quality parameters in the reporting operational year. The reports are mailed to every water customer with their utility bill in the first half of the year as an effort to educate and inform the public about their public water supply system. The DPW also maintains current and past yearly reports on the Township's web site in an effort to educate and inform customers about the Township's water supply.

Water Treatment Plant 28-1 is one of 13 such facilities located in the Township. These plants pump groundwater through a treatment process that removes iron and manganese, disinfects, and provides corrosion control into the distribution system.

2010 Annual Water Quality Report

Waterford Township Department of Public Works (DPW) Presents
The 13th Annual Drinking Water Quality Report

Water Service Branch

The mission of the Water Service Branch is to provide efficient and effective domestic and commercial water services including maintenance of water meters. Utilizing a variety of traditional tools, as well as handheld computers, fixed collector readers, radio read units, hi-resolution electronic meters, and various software systems, staff works closely with the Utility Billing Branch to ensure timely and accurate utility bills are distributed to customers. This branch also has general cross connection responsibilities to help ensure the safety of the public water supply.

The branch is headed by the Water/Sewer Superintendent and is comprised of five full-time employees. The positions and a brief description of their typical duties are listed below:

- Water/Sewer Superintendent
  Provides overall administrative support duties for the Water Service Branch. Provides research and analysis of the water metering system and suggests areas of improvement. Provides budgeting support and technical assistance to employees as needed. Analyzes the DPW's CMMS to look for service improvements.

- Water Service Foreman
  Schedules all work performed at various service locations throughout the Township. Oversees Work Order completion and assists as needed in the field to provide support with tasks on everyday maintenance.

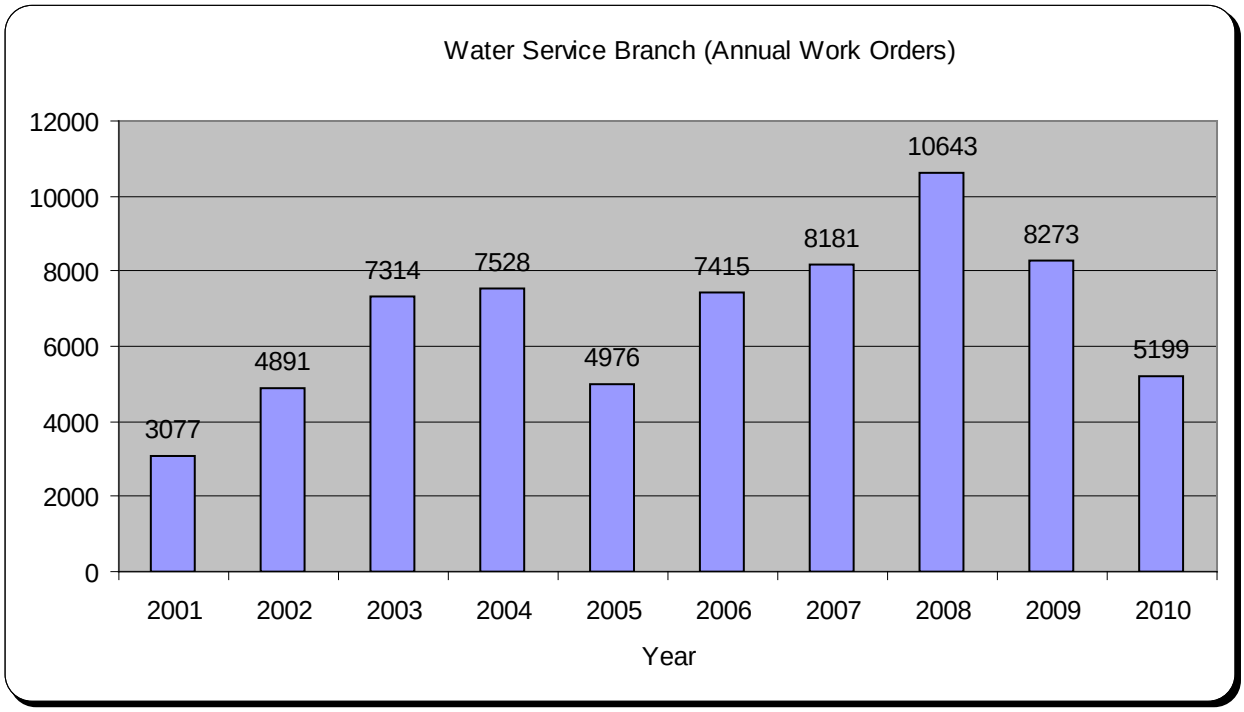
- Utility Service Tech (4)
  Performs the meter reading activities on a scheduled basis. Also conducts meter sets and meter repairs as necessary. Ensures work activities are properly recorded in the DPW's CMMS System.

Water Service Branch Employees Dale Dorrance, Carol Poplawski, Dawn Williams, Julie Griffin, and Danny Watson.

Water Service Branch Annual Work Orders

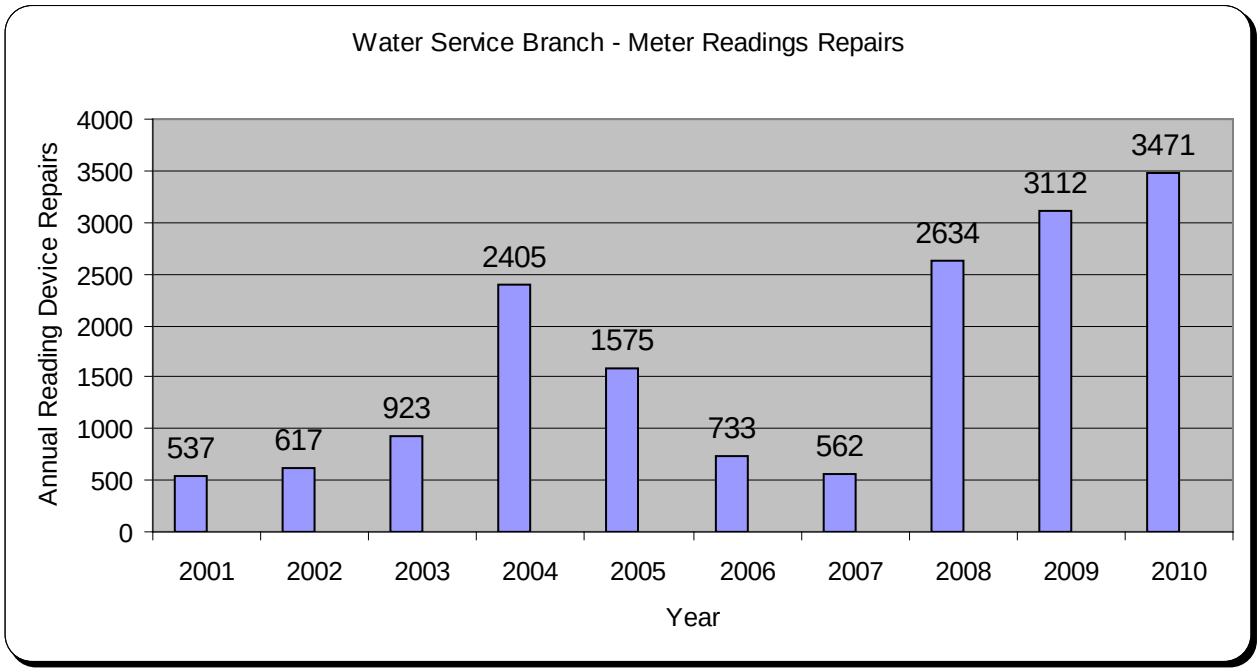
This branch is responsible for all new meter sets for new homes after taps have been made as well as repairs to existing meters and their components at existing homes and businesses to ensure accurate meter reads for billing. The branch is also responsible for retrieving all meter reads for the scheduled billing cycles.

The graph below depicts the annual number of work orders conducted by the branch. The higher numbers in recent years represent increased activity primarily due to installing new Automated Meter Reading (AMR) devices to read water meters via radio transmission, which eliminates staff from having to enter property to get readings. With the AMR devices, service personnel can drive by the property and upload the meter reading automatically, which has eliminated hundreds of meter reading hours and reduced Township liability. In 2006, work began to install the AMR units at customer locations allowing for the meter readings to be directly transmitted to a Fixed Collector. The collector then downloads the meter readings directly into the Township broadband wireless network, which sends the readings directly to the office for processing. Installation will continue over the next several years to install these devices.



Meter Reading Repairs Annual Work Orders

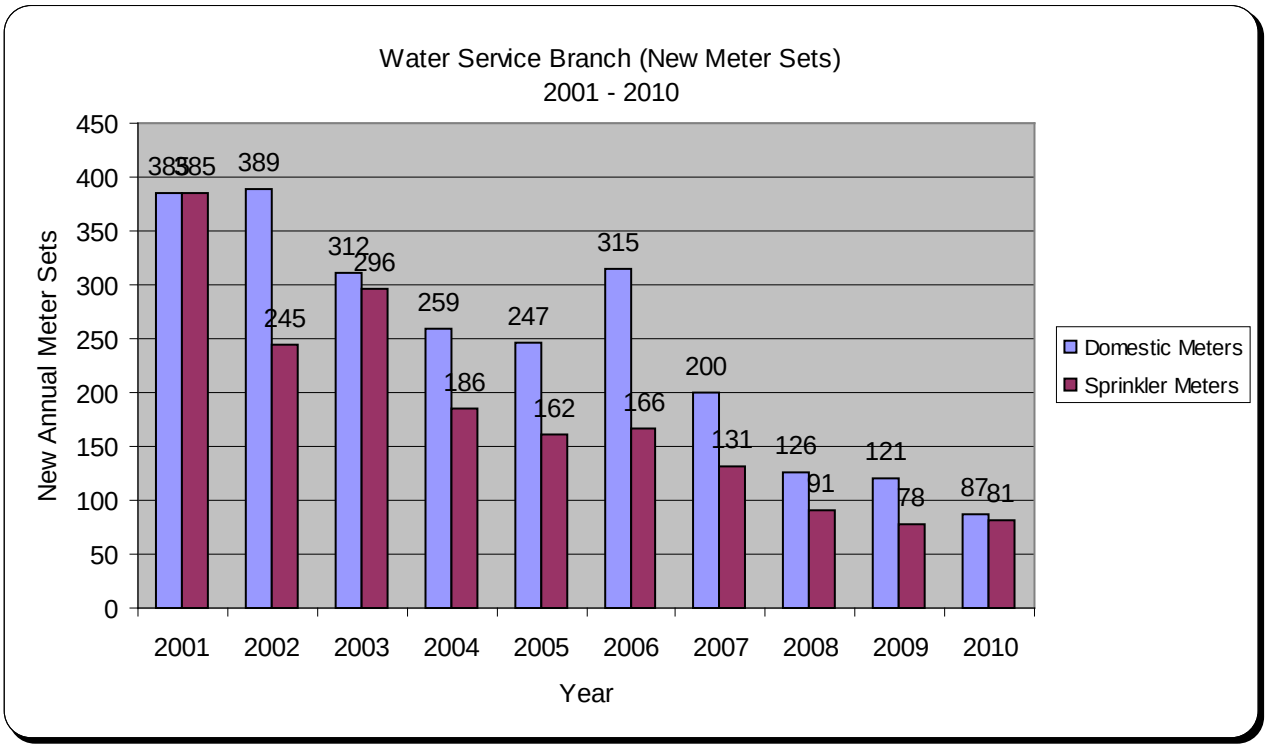
One of the largest segments of work performed by the branch is the repair and maintenance of the meter reading component of the water system. The graph below depicts the annual number of repair activities conducted on AMR and ARB reading devices since 2001. The spike in AMR devices in 2004 was due to quality control issues related to the manufacturer, which have since been corrected. The elevated number of repairs in 2008 and 2010 was primarily due to an older generation of AMR devices reaching the end of their operational life.



Service Branch employee Dale Dorrance utilizing the DPW's Electronic Meter Reading Equipment to Debug and Troubleshoot a water account. The DPW strives for a high percentage of actual meter reads which reduces the need for estimated utility bills.

New Domestic Meters and Sprinkler Meter Sets

Domestic meters measure the water consumed inside a home or business. The DPW also permits a separate sprinkler meter that only measures outside water that does not drain into the public sewer system. The sprinkler meter benefit is that additional sewerage charges will be eliminated, saving the customer money. New domestic meter installations are expected to steadily decline as the Township approaches build-out. However, the rate of sprinkler meter installations is likely to remain constant, if not grow, in the coming years as more customers take advantage of the cost savings opportunity presented.



Service Branch employee Bill Collier installing a water meter. The water meter has a set of wires connected to an outside meter reading device. New meters monitor and alarm on leak detection, back flow and no flow. In addition, meter reads are transmitted to fixed collectors that are connected to the Township's Broadband Wireless Network which sends the reads directly to the DPW Office for processing.

SEWER BRANCH

The mission of the Sewer Branch is to operate and maintain 62 sewer pumping stations, 8,800 manholes and approximately 355 miles of sanitary sewer main in the Township. Operations are enhanced with the utilization of a state-of-the-art SCADA system to control and monitor all sewer pumping stations and a Computer Maintenance Management System (CMMS) to initiate and track all work orders.

The branch is headed by the Water/Sewer Superintendent and is comprised of five full-time and 1 part time employees. The positions and a brief description of their typical duties are listed below:

- Water/Sewer Superintendent
  Provides overall administrative support duties for the Sewer Branch. Provides research and analysis of the sanitary sewer system and suggests areas of improvement. Provides budgeting support and technical assistance to employees as needed. Analyzes the CMMS to look for system and branch improvements.

- Sewer Foreman
  Reviews SCADA data and assigns crews as needed to perform routine maintenance of the Sanitary Sewer Stations and oversees all work orders generated by the DPW's CMMS program. Also responsible for scheduling of sewer main and sanitary sewer pumping station cleaning crews.

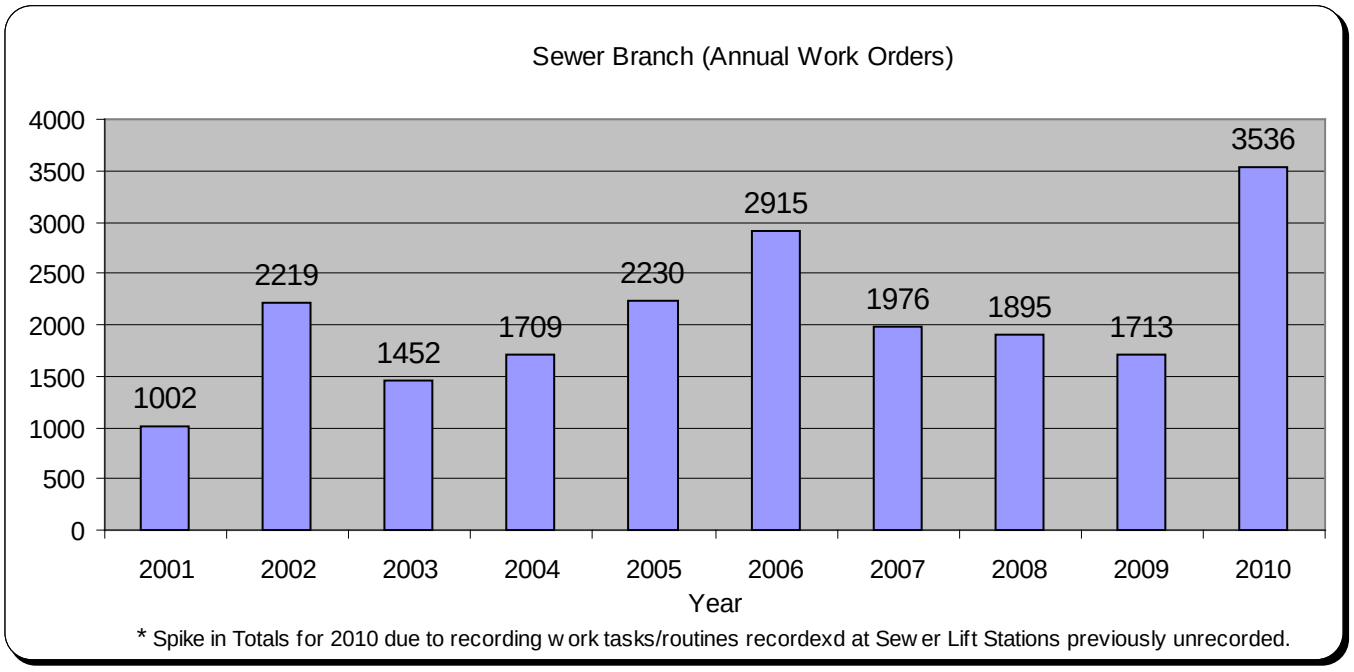
- Collection System Maintenance Tech's (4)
  Performs maintenance on all sanitary sewer pumping stations and sanitary sewer mains in the Township as scheduled by the Foreman and Assistant Foreman. Completes work orders per Foreman's directions. Collects data and keeps records of daily activities for the Foreman's review.

- Part-time (1)
  Performs painting and cleaning of sanitary sewer pumping stations as weather and operations permit.

DPW Sewer Branch employees Todd Butler, Scott McGrady, Brandon Sluiter, and Randy Bunce. Absent from Photo Terry Glisson.

Sewer Branch Annual Work Orders

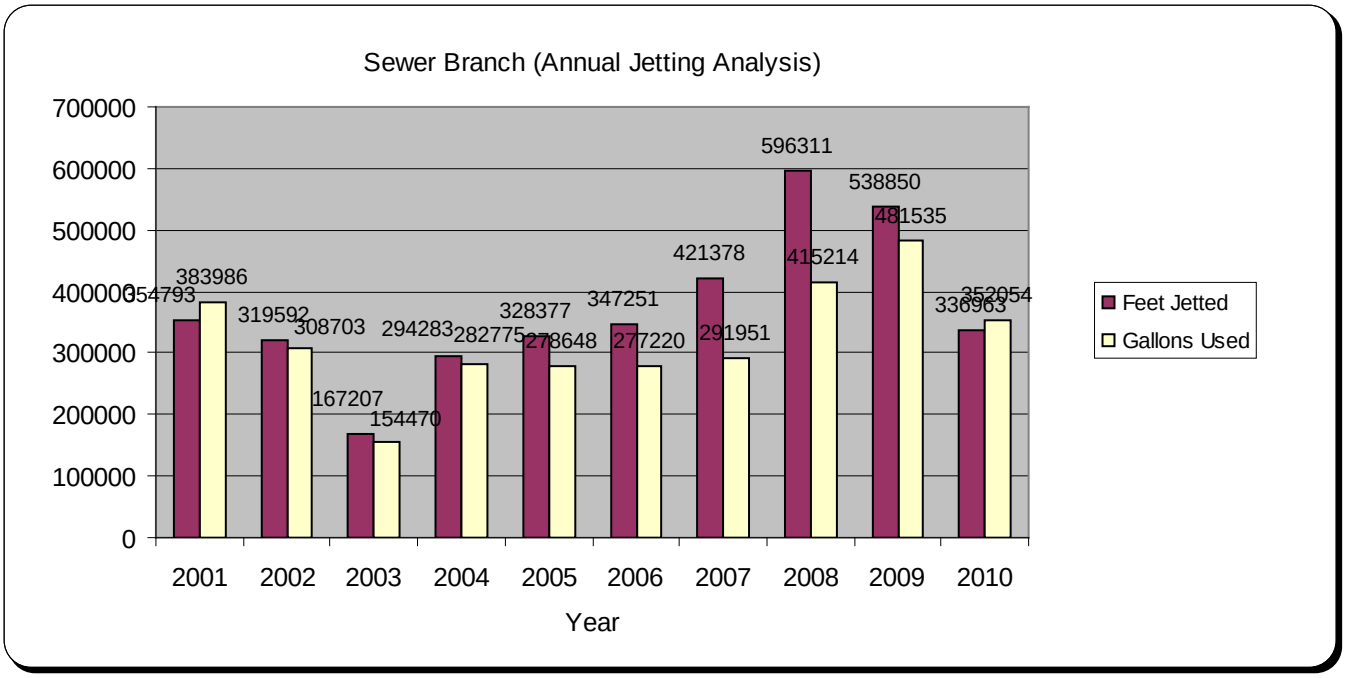
The branch is responsible for 62 sewer pumping stations and 360 miles of sanitary sewer main throughout the Township. Various maintenance activities are conducted on the sanitary sewer pumping stations and sewer mains to ensure proper operation. The graph below indicates the annual number of work orders conducted since 2001.



Sewer Main Jetting

Jetting and vacuuming of the sanitary sewer main is one of the most effective preventative maintenance activities conducted by the sewer branch to help ensure the sewer mains are clear of debris and other blockages. The DPW has 2 sewer vactor-jet trucks that perform this function. Cleaning schedules are organized through the CMMS and include data on the specific type of work conducted, the equipment used and all labor involved to provide a complete cost of the activity. The graph below indicates the annual feet of sanitary sewer main cleaned since 2001 as well as the number of gallons of water used to complete the work.

DPW Sewer Branch employees, Jim Cassidy (left) and Scott McGrady (right), working with one of the DPW's two sewer vactor trucks.

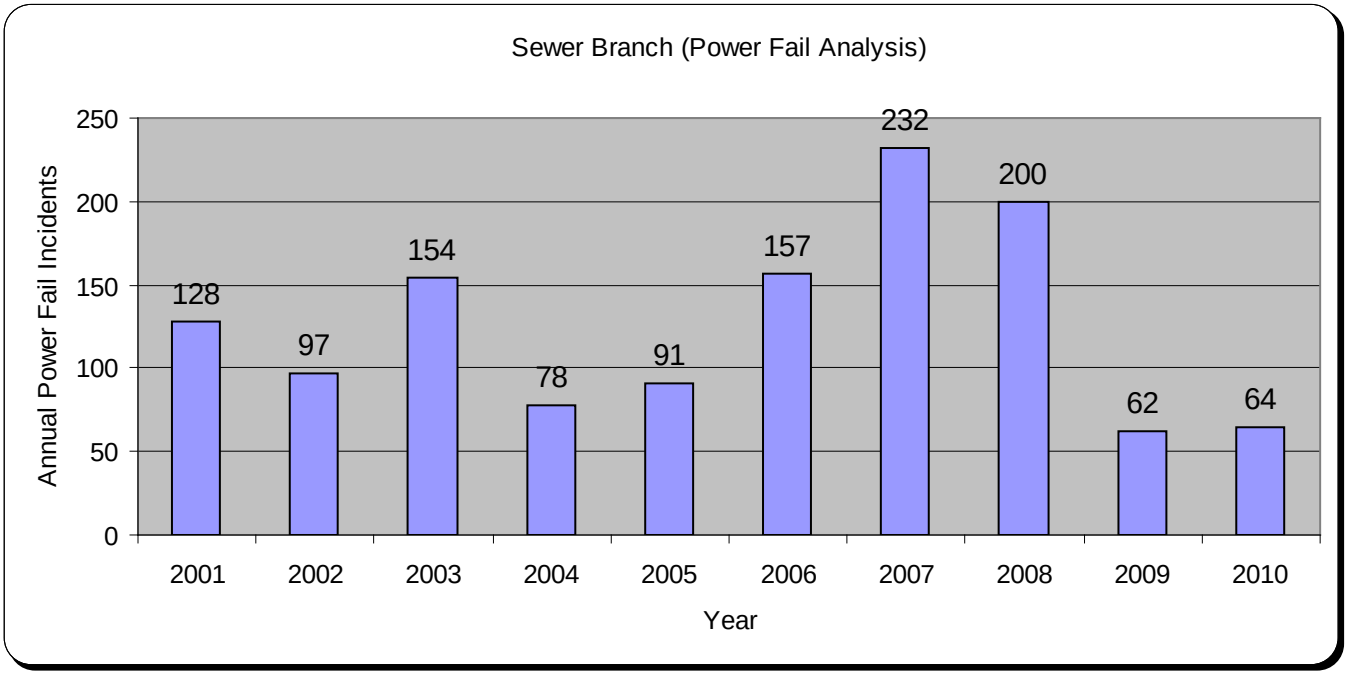


Sewer Power Fail Events

One of the most critical parameters monitored by the branch is sanitary sewer pumping station power failures through the SCADA system. Loss of power to a station is considered an emergency situation needing immediate response either through the initiation of temporary or permanent generator power. Depending on the length of power failure and the incoming flow to the station, the branch can have as little as 20 minutes to respond before backups and or Sanitary Sewer Overflows (SSO's) may occur. The graph below indicates the annual number of power fail events experienced since 2001.

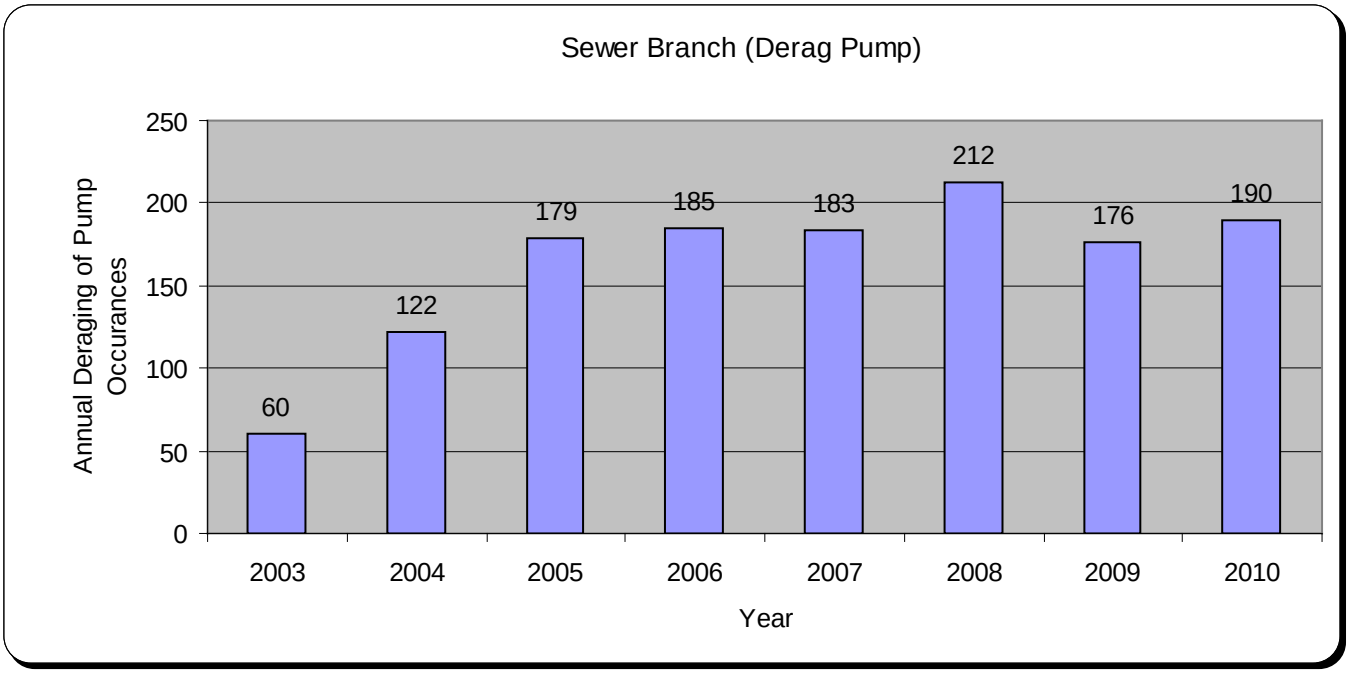
A portable generator used by the DPW during power failures. These are used at sites without permanent stationary generators.

Stationary power generator at one of the Township's 62 sewer pumping stations. At these sites, the generators automatically start and transfer load for continued operation during power failures.



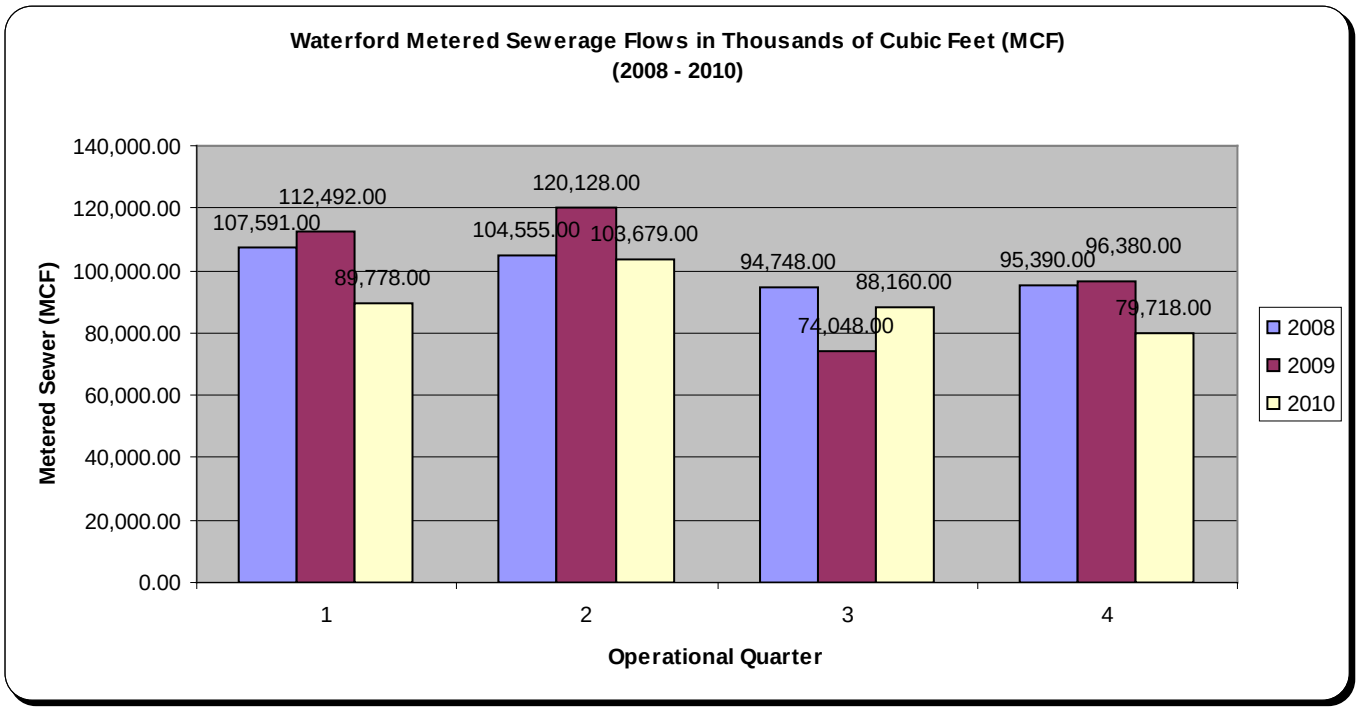
Pump Cleaning

The SCADA system is analyzed daily with respect to sewer pump starts and run times to identify potential problems with sewer pumps at various sewer pumping stations. If station pump runtime data indicates long run times on a given pump in relation to normal, the pumps are inspected for ragging and/or other problems to return them to normal pumping ability before a problem occurs. Ragging means the pump volute housing and impeller are plugged with debris, which impedes the pump's ability to pump water. This situation can cause premature failure due to wear and tear on the pump and can snap shafts resulting in a total loss of the pump. When this condition is suspected, work orders are created and tracked in the CMMS. A general response would consist of two employees and a hoist truck being dispatched to pull the pump, clear it of debris, inspect it and return it back to service. The following graph indicates the number of times this activity has occurred since 2003.



Metered Sewerage Flows

Beginning in Operational Year 2008, the Township along with the other member communities of the Clinton-Oakland Sewer Interceptor began to be billed from Oakland County based on actual sewer flows. Previously, the Township and member communities were billed based on a system of Residential Equivalency Units or (REU's). Financial planning has to factor in such items as wet or dry summers (seasonality) and the need for Capital Infrastructure Maintenance and Replacement into rate models to ensure adequate funds are available to continue to fund the Township's Sanitary Sewer operational, infrastructure and treatment costs.



Electrical Branch

The mission of the Electrical Branch is to provide electrical service for the DPW. Staff in this branch includes 1 Master and 1 Journeyman Electrician. They are skilled in all facets of electrical work including motor controls and the SCADA system.

The positions and a brief description of branch staff duties are as follows:

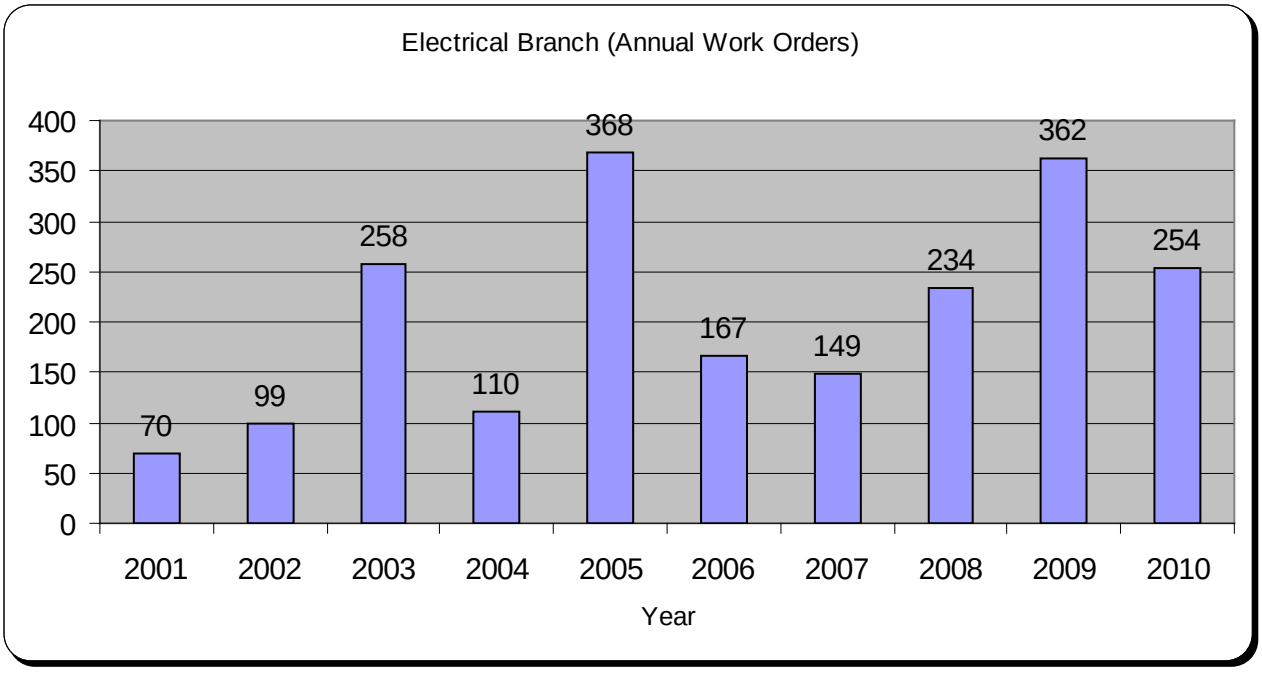
- Water/Sewer Superintendent
  Provides overall administrative support duties for the Electrical Branch. Provides research and analysis of the water/sewer plant electrical systems and suggest areas of improvement. Provides budgeting support and technical assistance to employees as needed. Analyzes the DPW's CMMS to look for system and branch improvements.

- Electrical Foreman
  Performs scheduling and planning of all work submitted to the Electrical Branch. Oversees all work completed in the CMMS program performed by the other two employees under his charge. Performs work in the field as needed to keep up with requests for electrical work.

- Electrical Service Tech II
  Performs work as assigned by the Foreman which includes all SCADA related instrumentation and related components. This employee performs electrical repairs at both water and sewer facilities as assigned.

Electrical Branch Annual Work Orders

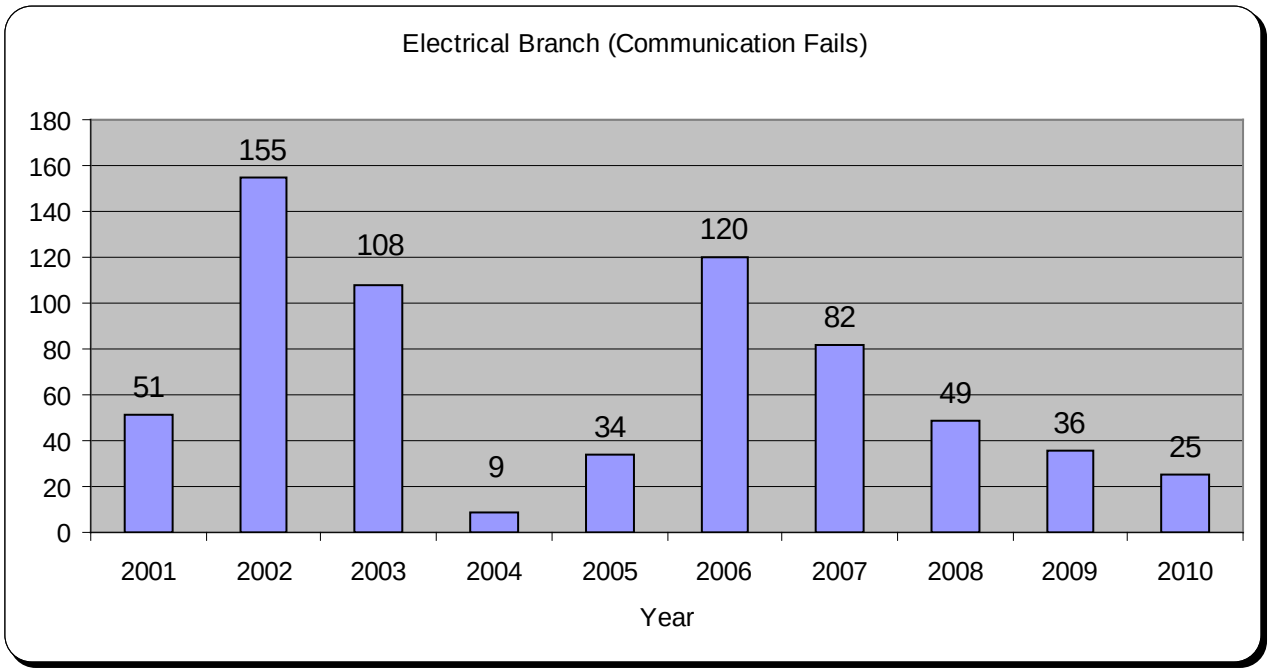
One of the main functions of the branch is the installation and maintenance of electrical, instrumentation and radio components related to the SCADA system. Additionally, this branch installs generator transfer switches, electrical upgrades and new services at the Township's water and sewer pump station facilities. The graph below indicates the annual number of work orders performed by the branch since 2001. It must be noted that, depending on the scope and complexity of the work, some activities can take several weeks to complete.



Electrical Branch employee, Jeff Mohr, utilizing a computer at the Clinton River Sewer Pumping Station to interface with the SCADA control program.

Communication Fails

This work activity is initiated when the SCADA system initiates an alarm indicating it has lost communication with a water or sewer facility. This is an important alarm condition because it means there could be a problem ranging from electrical failure to physical damage at the site. The graph below depicts the annual number of communication failures since 2001. It must be noted that there are over 85 physical sites in the Township that are continuously monitored for communication and other operational condition by the SCADA system.



Generators and Auto Transfer Switches (ATS)

The DPW currently utilizes permanent generators with automatic transfer switches at 25 sewer pumping station sites. When an Edison power failure occurs, the generator will automatically start and transfer the electrical load at the affected sewer site eliminating the need for an employee to respond while still keeping the site fully operational. With these devices in place thirty five (35%) of the Township's Sewer Stations are automatically backed up in terms of power, which leaves the balance of 37 sites to be operated by DPW personnel utilizing portable generators. Of the 13 water treatment plants, 7 are equipped with stationary generators and transfer switches. These generators and transfer switches provide the DPW with the means to continue supplying the residents with a safe and adequate drinking water supply and adequate sewage pumping means during power outages.

Safety Branch

The mission of the Safety Branch is to provide safety management and training to ensure occupational safety and health compliance with local, state, and federal laws. By using the latest technologies and the most recent training materials available, this branch continues to ensure the DPW meets all MIOSHA and governmental guidelines. The Safety Coordinator reports to the Administrative Superintendent. The abbreviated job duties are listed below.

Safety Coordinator

Responsible for planning, training, monitoring, implantation of environmental safety and health related programs. Additionally, gathers, analyzes, and inputs data for technical reports in the DPW's CMMS.

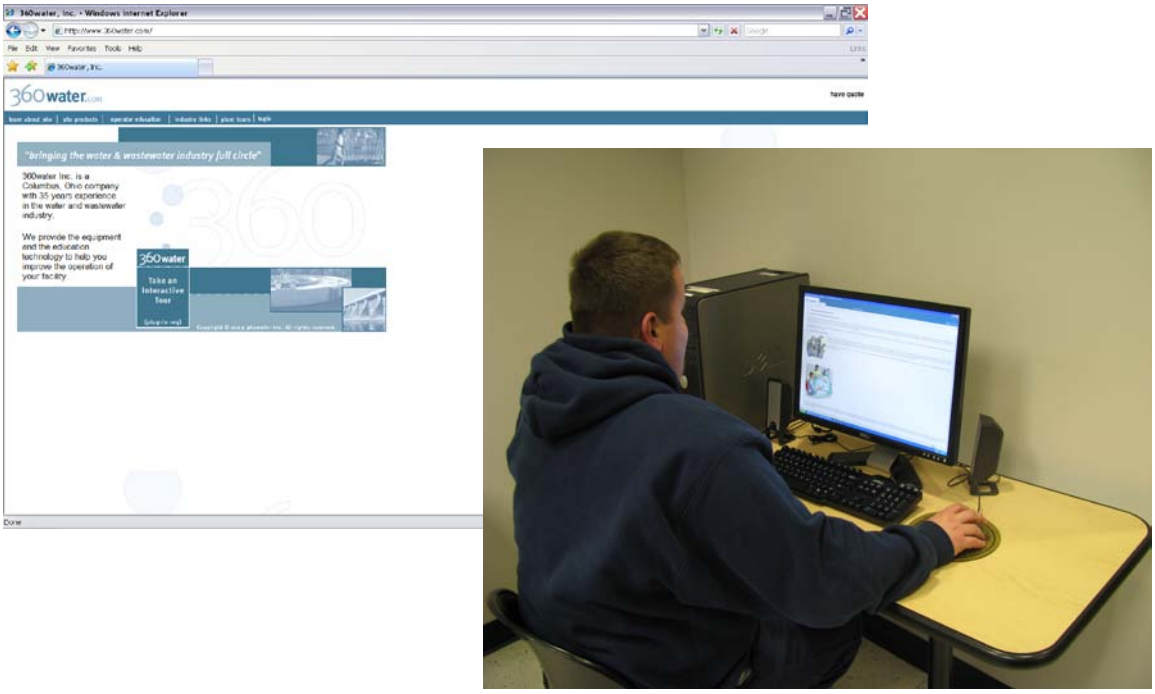
DPW Career Ladder

In 2010 the DPW has on staff 1 Storm Water Management designation, 14 Water Distribution and Limited Treatment Operator licenses, 5 Michigan Water Environmental Association and California Water Environment Association Sewer Collection licenses , 1 State certified Master and 1 State certified Journeyman electricians, 2 State certified Master Motor Mechanics and one State licensed motor Mechanic in several automotive areas.

The licenses and certification listed above have been encouraged and promoted through the DPW's career ladder program to ensure highly trained professional staff to carry out the required duties of their respective responsibilities.

Online Training for Continuing Education Credits

Operational year 2010 marked the 3rd year of money and time saving on-line computer training for DPW staff including the ability to attain Continuing Education Credits (C.E.C's) through an on-line State of Michigan approved training program by 360water.com. These credits are needed to maintain State licenses and certificates over a period of time for Water Distribution, Limited Treatment, and Sewer Collection System operators. The Safety Branch also utilizes a multitude of on-line clerical training tutorials for programs such as Word and Excel to assist and train DPW staff to better leverage their daily software tools.

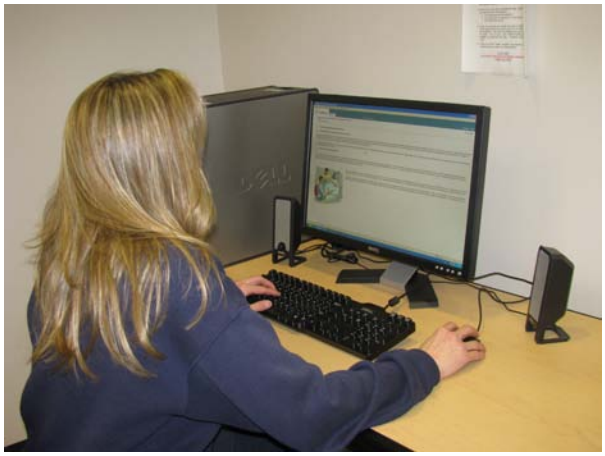


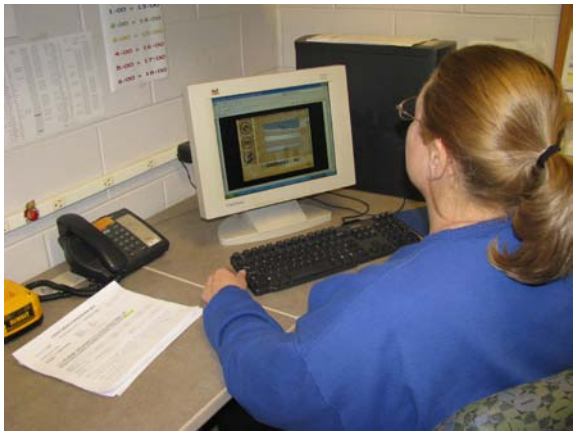
DPW employee Justin Westlake utilizing our online services to obtain Continuing Education Credits (C.E.C's)

Online Safety Training

The Safety Branch has extended computer training to include on-line safety training through the use of an Employee Training Portal by J. J. Keller & Associates. Operational year 2010 saw the introduction of on-line safety training, which saves DPW staff time and saves training dollars.

On-line training has received positive feedback from DPW staff because it provides staff with the flexibility to work this training in around their regular work schedules. They can start and stop the training until they have completed it resulting in no missed safety training.





DPW employee Karen Lee (above) and Dawn Williams (above, right) are conducting on-line safety training in two different locations within the Department of Pubic Works.

Classroom Safety Training

In partnership with our insurance provider, Michigan Municipal Risk Management Authority (MMRMA), DPW staff are trained on-site by professional training services such as Collins & Associates at no cost to the DPW.

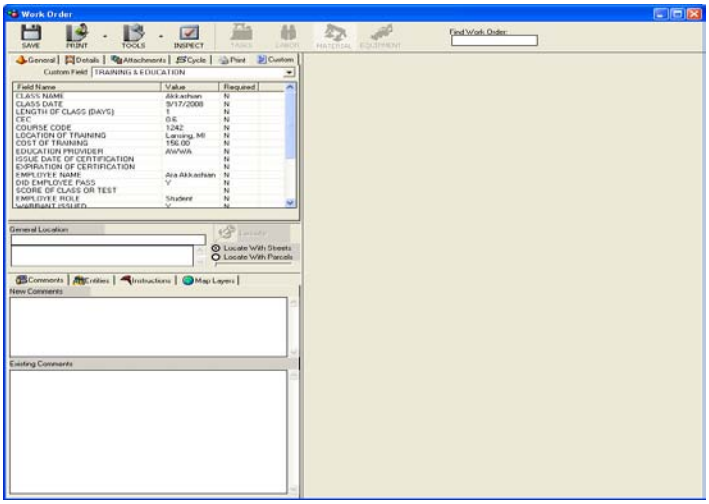
Presenter from Collins & Associates training DPW employees the hazards and safety guidelines of multiple safety topics

J.J. Keller Online

J.J. Keller Online is another on-line resource the Safety Branch continues to utilize to ensure proper staff training. The on-line service has a wealth of information and training related to environmental, safety and health topics. It is also a great tool for disseminating regulatory updates, posters and any other safety training resources.

DPW Employee Database

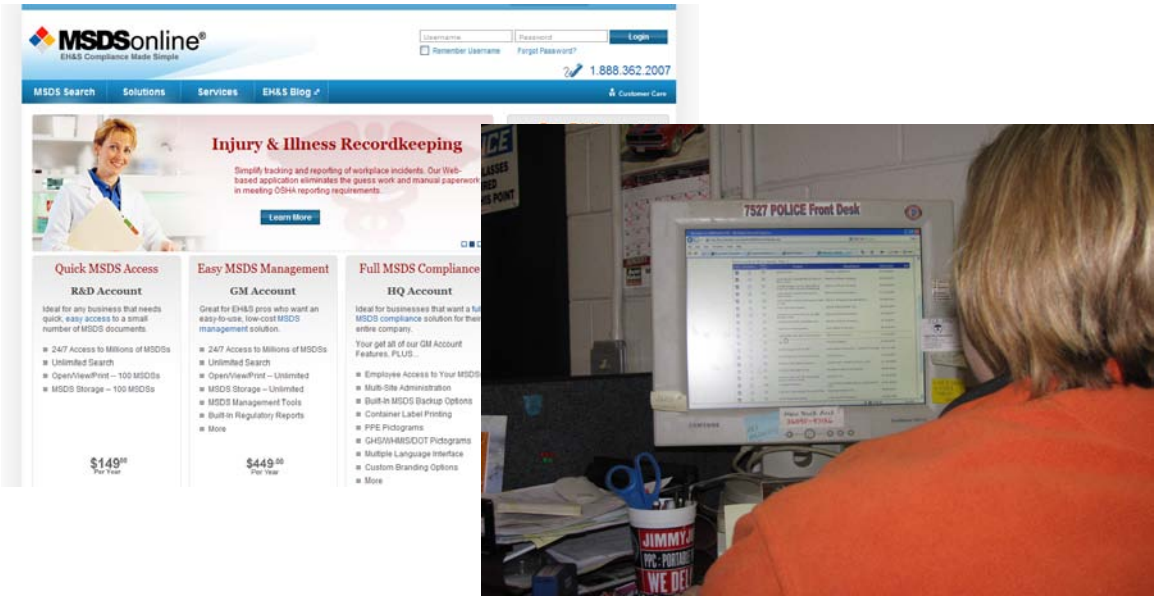
The Safety Branch also continues to utilize and enhance the in-house developed DPW Employee Database. This database documents all training, licenses, equipment and associated costs related to DPW staff.



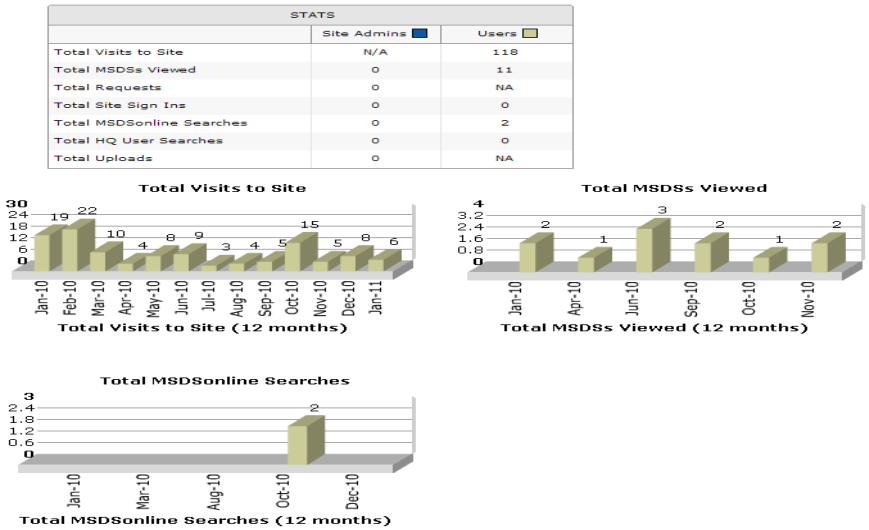
Work Order sample of how the DPW tracks all training utilizing the Employee Database.

M.S.D.S Online

The Safety Branch also continues to utilize an on-line Material Safety Data Sheet (MSDS) program to ensure accurate and up to date information related to materials utilized by the DPW to comply with Federal and State law. This web based program provides all relevant MSDA information for various chemicals used in the DPW and provides automatic updates and alerts when MSDS information changes for specific chemicals. Since implementation of the on-line MSDS program, the list of tracked chemicals has grown from 192 to 421.



Inventory Control Clerk Heather Krupic using the web based MSDS on-line program to lookup a chemical.



Statistical data on how much the MSDS on-line web service was utilized in 2010 by DPW staff.

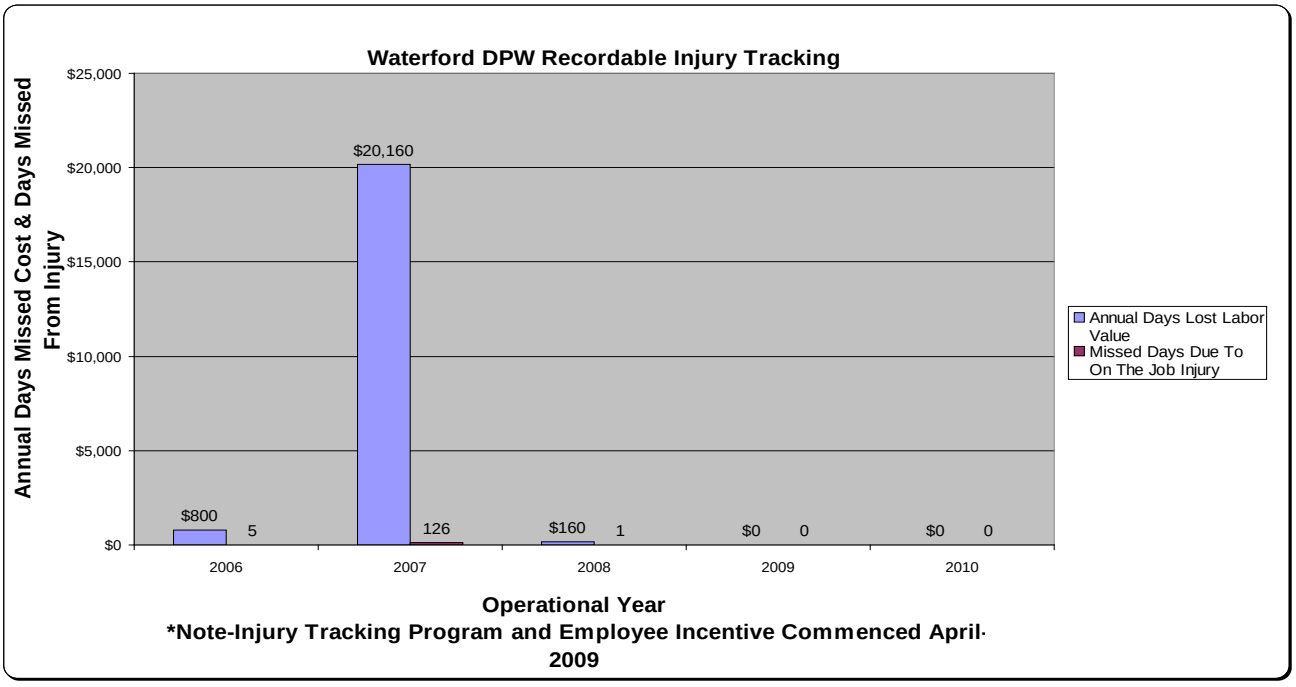
DPW Safety Performance

The number of production hours without a recordable injury or lost work day accident has increased over the past five (5) years through the efforts of the Safety Branch and DPW staff. Work continues to reduce the number of recordable injuries and lost work day accidents through enhanced training and mock exercises.

Safety Record

OSHA 300 Log	300	300	300	300	300
Year:	2006	2007	2008	2009	2010
A. Number of Recordable Injuries	7	18	5	0	0
B. Number of Lost Work Days	5	126	1	0	0
C. Number of Productive Hours Worked	82820.99	87460.25	87657.75	86743.56	88749.35

Year	Cost	Days away from work	Accidents	
2006	$800	5	7	
2007	$20,160	126	18	Rate of $20 dollars an hour utilized for analysis
2008	$160	1	8	
2009	$0	0	0	
2010	$0	0	0	



DPW Employee Incentive Program

In April 2009, the Safety Branch introduced an employee incentive program for DPW staff to help in lowering lost work day accidents. A threshold number of lost work day accidents is established and if staff meets the established goal, an in-house lunch is provided. This simple program has been met with enthusiasm and is paid for by a self sustaining returnable pop can program.

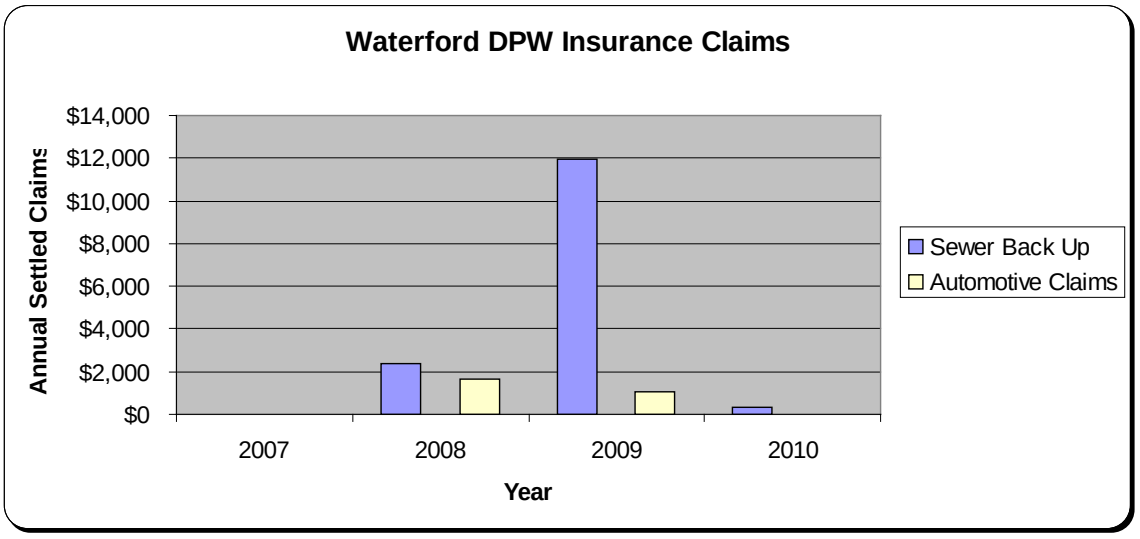
Safety board keeps track of how many days the DPW has gone with out a lost time accident

MMRMA, Claims, and Public Act 222

The Safety Branch investigates and processes all general and sewer back up claims as well as all automotive accidents and works in conjunction with the Township insurance provider, MMRMA, to reach claim resolutions.

Public Act 222 governs how and when the DPW is liable to pay for any sewer backup claim. When a sewer backup claim is received by the DPW, a thorough investigation is completed to determine if the DPW is liable for the claim under Act 222. Under Act 222, a sewer backup claim would have to meet the four (4) major conditions outlined in the Act below:

- The Township at the time of the event owned, operated, or directly or indirectly discharged into the portion of the sewage disposal system that allegedly caused damage or injury.
- The sewage disposal system of the Township had a construction, design maintenance, operation or repair defect.
- The Township knew, or in the exercise of reasonable diligence should have know, about the defect and failed to take necessary precautions to correct it; and
- The defect was substantial proximate cause of the event, damage or injury.



Statistical data showing how much was paid in insurance claims through MMRMA since 2007

The Safety Coordinator in the DPW is also a member of the MMRMA Public Utility Advisory Committee, which works to develop approaches and programs to reduce risk liability and/or expenditures.

Fat, Oil, and Grease (F.O.G.) Program

The Safety Branch is also responsible for implementing and monitoring the Township's Fat, Oil, and Grease (FOG) program to reduce and/or eliminate grease and other oils from entering the public sewer system through faulty grease and other types of traps at businesses such as restaurants and car wash's. The introduction of fats, oils and grease into the public sewer system can cause sewer backups and sanitary sewer overflows (SSO's). The program monitors over 230 facilities in the Township and has inspected over 120 of them over the last year. The FOG program has also been a useful tool to help educate businesses on the importance of proper maintenance of these traps.

DPW employee Brandon Sluiter conducting an inspection on a grease interceptor at a local facility within the Township

FOG Management Software

The FOG program is administered through the use of a FOG management software program, which tracks all 230 facilities in the Township, and the DPW CMMS to initiate work orders for remediation work. The FOG software is also able to extract information for locating possible contributors of FOG material into the public sewer system.

WATERFORD
A Charter Township
5240 Civic Center Drive
Waterford, Michigan 48329
Telephone: (248) 674-2270
Fax: (248) 674-0650

Date: December 29, 2010

Re: Inspection of Grease Trap or Grease Interceptor

Dear Food Service Manager,

In our continuing efforts in keeping Waterford Township's wastewater sewer mains free of fats, oil, and grease (FOG), businesses like yours and other local businesses in the township need to help us keep the sewer mains free of FOG and debris. By doing your part you can help us accomplish this by maintaining and serving your grease trap or grease interceptor.

In the up coming weeks, the grease trap/interceptor in or around your facility will be inspected and examined as per Charter Township of Waterford Code of Ordinances Sections: 17-67. Inspection Powers; Corrective Orders and Section 17-68. Enforcement (please see attached).

You will be receiving a phone call during your normal business hours to set up an appointment for the inspection. The inspection will consist of photographing the type of grease trap or grease interceptor in which your facility operates and maintains; location of your trap/interceptor; opening of the manhole near your property to examine the condition in which your facility is connected to the Township's sewer system; and finally, questions that you might have with the inspection.

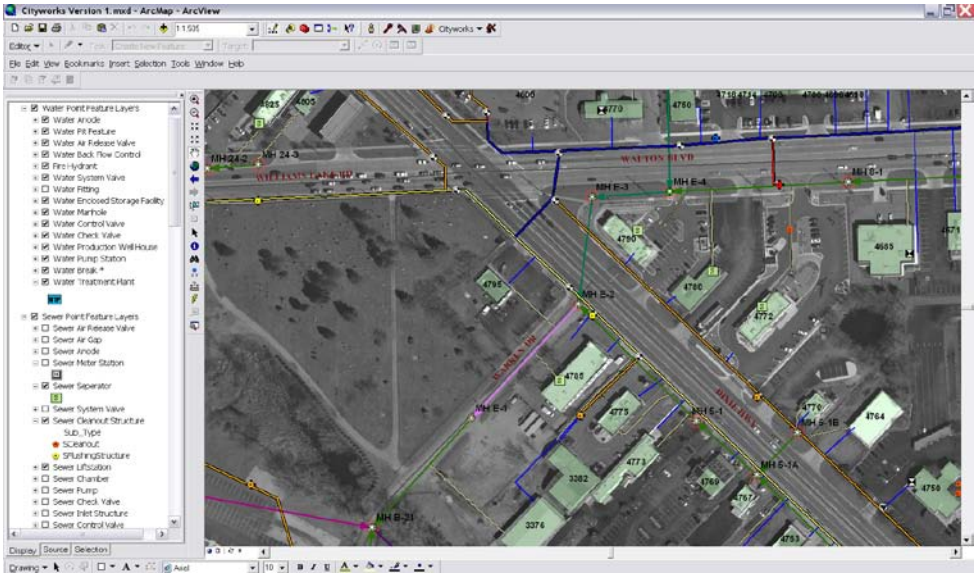
At this time, if you feel that you are not in compliance with the Township's ordinances, we advise you to contact a licensed professional to assess your current situation and have it corrected before we arrive at your facility. If you have any questions please feel free to contact Hugo Cardenas Jr. at (248) 674-2278.

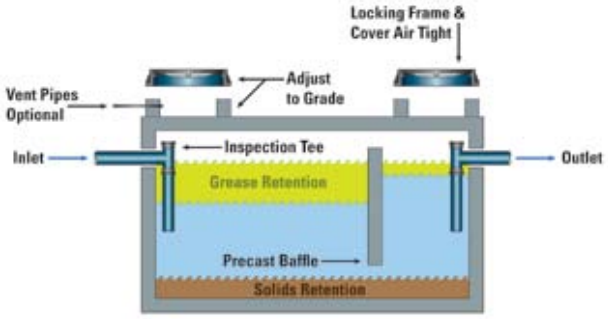
Thank you for your effort in helping us protect the environment.

Hugo Cardenas Jr.
Safety Coordinator
Waterford Township
Department of Public Works

Cc: Work Order # 221524

"Moving Forward Together"





Screen shots of the FOG software program, pre-inspection notification letter to a business for a FOG inspection, the DPW CMMS and diagram of how a grease interceptor works

MSHARP

The DPW Safety Branch has been proactive since 2009 by inviting and working together with the Michigan Occupational Safety and Health Administration (MIOSHA) in applying for certification in the Michigan Safety & Health Achievement Recognition Program (MSHARP). The MSHARP is a program created by MIOSHA in recognizing Michigan employers and employees committed to making their workplace culture one that makes safety a major priority. Currently, there are nineteen organizations within the State of Michigan that have received this recognition. When the DPW attains this award, it will be the first public utility in the State to achieve such recognition.

FACILITIES AND OPERATIONS DIVISION

The mission of the Facilities and Operations Division (F&O) is to provide professional services to Township Departments and the Citizens of Waterford Township. Efficient and effective administration of these responsibilities are accomplished through the use of trained and dedicated personnel using an advanced CMMS program to assign and track work activities on all facets of the operation and utilization of computer controlled Heating, Ventilation and Air Conditioning (HVAC) systems.

F&O is headed by the Superintendent of Facilities and Operations and is composed of 7 full-time and variable seasonal/part time employees.

- Superintendent of Facilities and Operations
  Responsible for planning, project evaluation, building system evaluation, design and bid specification preparation, budgeting, construction management, fleet management and quality review inspections of work performed by various contractors. Additionally gathers, analyzes, and inputs data for technical reports as well as the CMMS.

- Account Clerk II
  Provides administrative and clerical support, including scheduling appointments and meetings, answering phones, opening and distribution of mail, composing and typing correspondence to routine inquiries, providing counter assistance and receiving payments. Additional duties include purchase order, contract, bidder, budget and financial records keeping, cemetery sales and records. Assists in updating the CMMS and the Geographic Information System (GIS).

- Facilities Maintenance Technician (1)
  Performs a wide variety of tasks related to maintaining, repairing and constructing buildings, fixtures and equipment. Responsible for the completion of data entry and documentation of work order requests in the CMMS system.

- Maintenance Worker (2)
  Performs tasks related to plumbing, carpentry, welding, painting, masonry and other general ground and maintenance work.

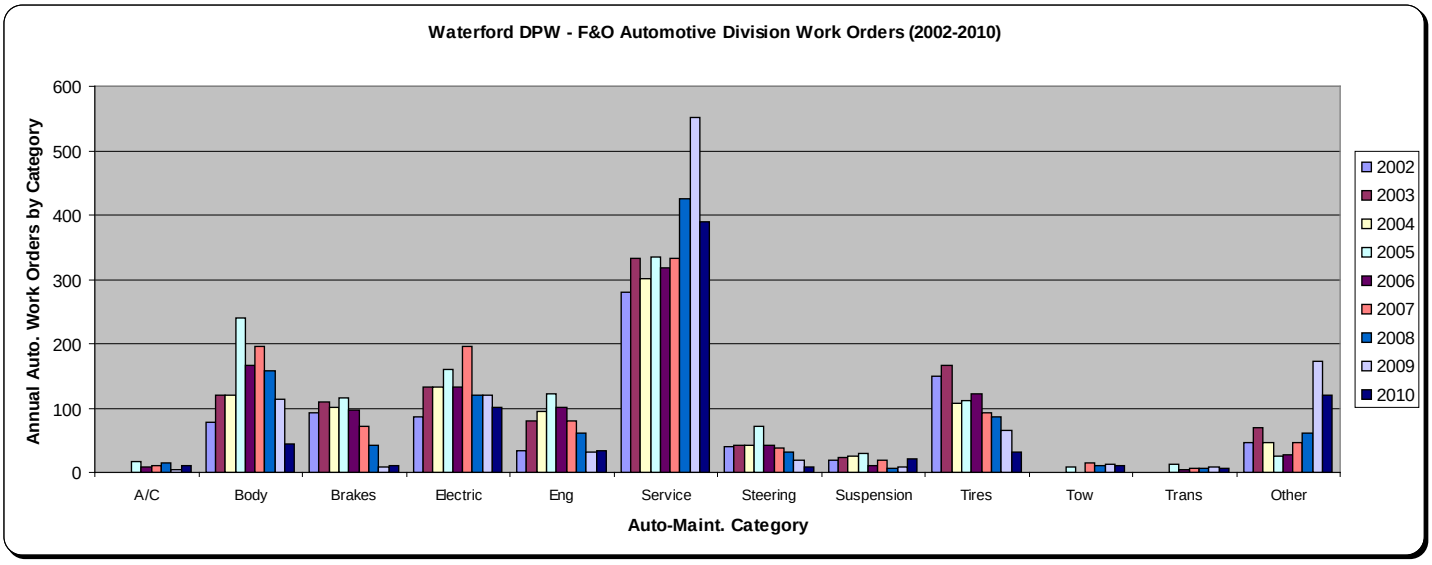
- Mechanics (3)
  Performs repairs and maintains a variety of makes and models of passenger automobiles, light and heavy duty trucks and light and heavy duty construction equipment requiring gas or diesel engine operation. Responsible for the completion of data entry and documentation of work order requests and inventory control utilizing the CMMS.

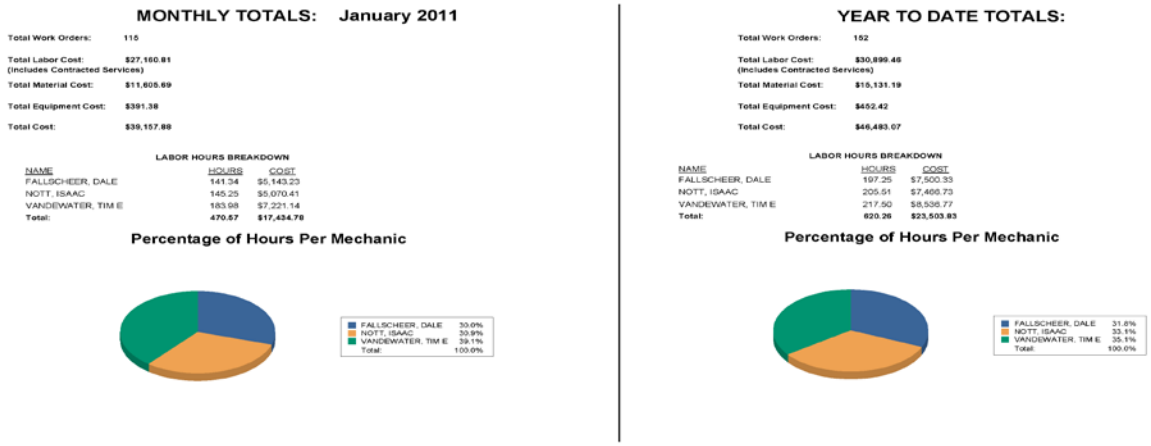
- Cemetery Sextons (1)
  Responsible for showing and selling cemetery lots to the general public, maintaining precise cemetery plot maps and records, lays out graves, sets up and prepares the grave site for funerals, receives funeral procession and collects proper papers and monies due. Responsible for the completion of data entry and documentation of work order requests in the CMMS and GIS systems.

- Inventory Clerk (1)
  Responsible for maintaining accurate records for DPW's supplies. Responsible for physical counts and reconcilement against the DPW's CMMS System. Purchases inventory supplies based off on the CMMS work order history.

Automotive Branch

The Automotive Branch conducts routine and complex service on the Township's Vehicle Fleet. Currently, there are over 250 vehicles, tractors, mowers, large trucks, generators and other specialized pieces of equipment cataloged and tracked through the CMMS. Maintenance, labor and other costs are recorded and tracked in the CMMS. Township Departments are invoiced monthly for services rendered on their respective vehicles and/or equipment. The graph below depicts the major categories of maintenance per year since 2002. Similar trends are likely to continue as the Township fleet and equipment age. To better understand these trends, we are now able to produce a weekly/monthly Fleet/Equipment Maintenance Report that includes information for vehicle identification, technicians name, labor and material cost breakdowns, providing the capability to track monthly and annual progress of individual technician labor hours and material costs.





MONTHLY TOTALS: January 2011

Total Work Orders: 115
Total Labor Cost: $27,160.91 (Includes Contracted Services)
Total Material Cost: $11,605.69
Total Equipment Cost: $391.38
Total Cost: $39,157.88

LABOR HOURS BREAKDOWN

NAME	HOURS	COST
FALLSCHEER, DALE	141.34	$5,143.23
NOTT, ISAAC	145.25	$5,070.41
VANDEWATER, TIM E	183.98	$7,221.14
Total:	470.57	$17,434.78

Percentage of Hours Per Mechanic

FALLSCHEER, DALE 30.0%
NOTT, ISAAC 30.9%
VANDEWATER, TIM E 39.1%
Total: 100.0%

YEAR TO DATE TOTALS:

Total Work Orders: 152
Total Labor Cost: $30,899.46 (Includes Contracted Services)
Total Material Cost: $15,131.19
Total Equipment Cost: $452.42
Total Cost: $46,483.07

LABOR HOURS BREAKDOWN

NAME	HOURS	COST
FALLSCHEER, DALE	197.25	$7,500.33
NOTT, ISAAC	205.51	$7,468.73
VANDEWATER, TIM E	217.50	$8,536.77
Total:	620.26	$23,503.83

Percentage of Hours Per Mechanic

FALLSCHEER, DALE 31.8%
NOTT, ISAAC 33.1%
VANDEWATER, TIM E 35.1%
Total: 100.0%

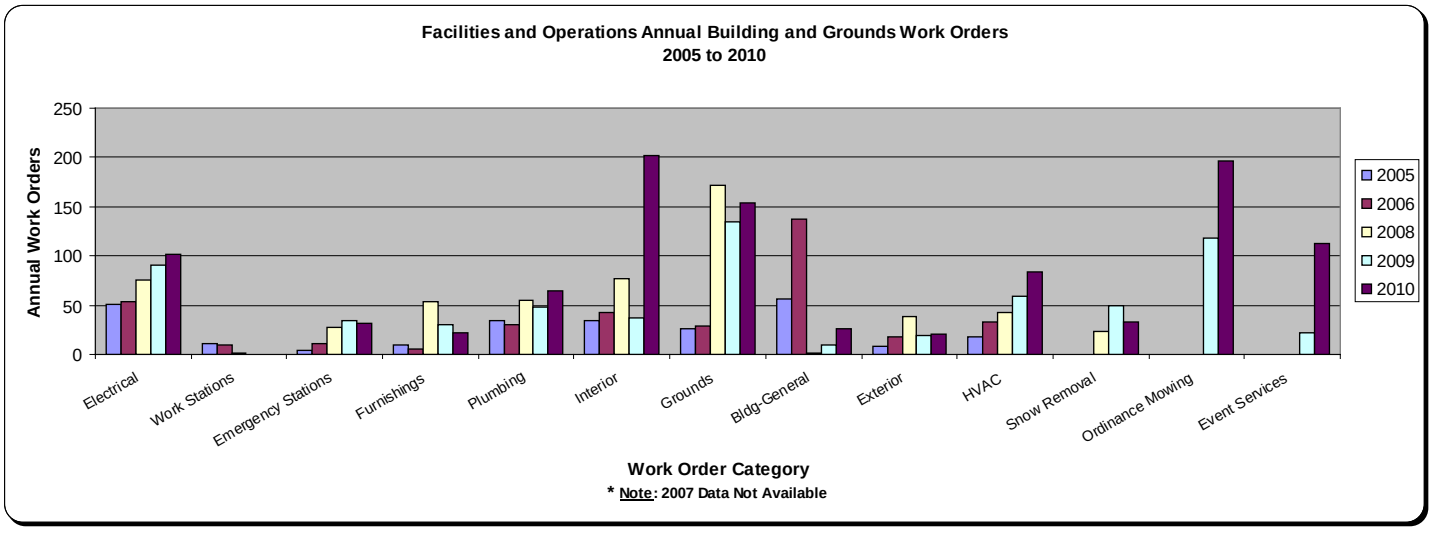
Example of Monthly and Year to Date Mechanic Work Distribution

DPW Mechanics Isaac Nott, Dale Fallscheer and Tim Vandewater along with Inventory Clerk Heather Krupic.

The GIS based CMMS was developed and implemented in-house approximately six (6) years ago as the core program for operational activity related to equipment, grounds, buildings and bike paths work and cost tracking. The system is continually improved and updated to provide for quicker data entry, material costing, scheduling and tracking of diverse work activities. Integration of F&O operations into the CMMS resulted in the entire DPW using the same platform and interface for work order scheduling and cost tracking saving thousands of dollars in development and annual software maintenance fees.

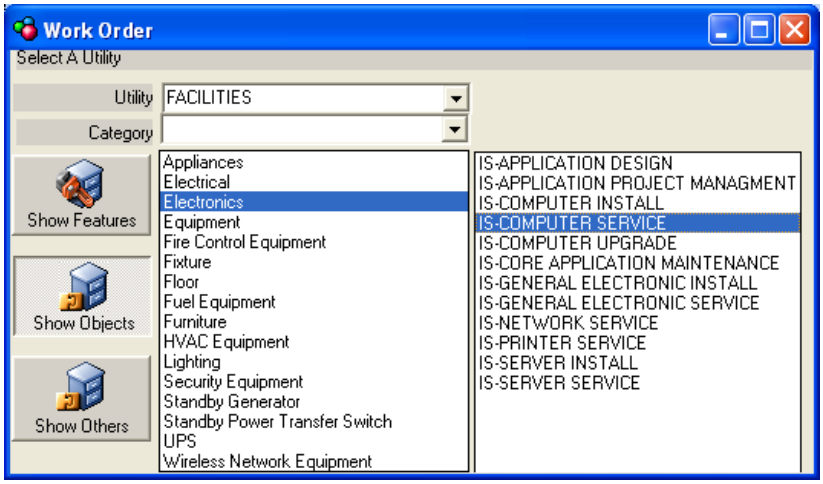
The Building Branch module of the CMMS continues to evolve with respect to work, labor and costs being captured along with capital improvements and equipment. The graph below depicts a summary of work history in the branch for 2005, 2006, 2008, 2009 and 2010. Please note that 2007 work order history is not available due to development of the new GIS CMMS program.

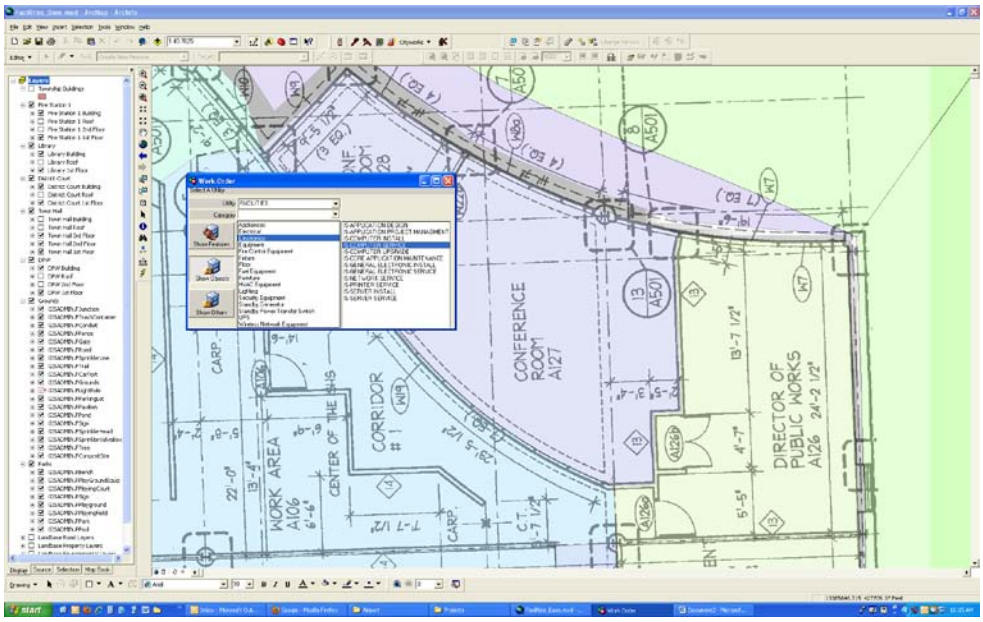
In 2009, the F&O Division also began to provide services for Ordinance Mowing through coordination with the Community Planning and Development Department (CPD). Handling these activities internally through the CMMS dramatically reduced response time for mowing complaints and resulted in the lowest number of mowing complaints by residents in years.



F&O Computerized Maintenance Management System (CMMS)

The F&O CMMS provides the means for routine maintenance and capital projects management. Both preventive and corrective maintenance items are recorded and histories maintained and analyzed to ensure Township's assets and facilities are maintained at efficient and high levels to ensure programs and services are never interrupted. As mentioned earlier, the system was developed in-house saving over $50,000 in software and license fees. The screen shots below depict a typical work order that has been spatially coded to a specific room in the DPW Building for a repair.

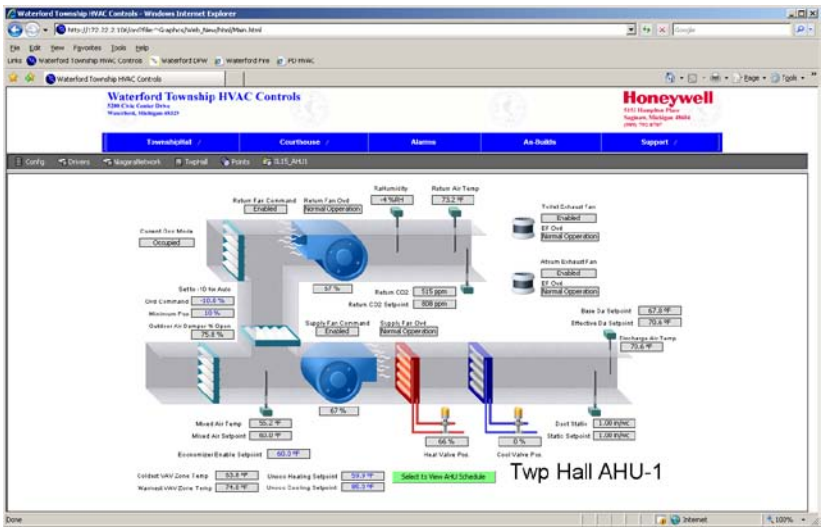




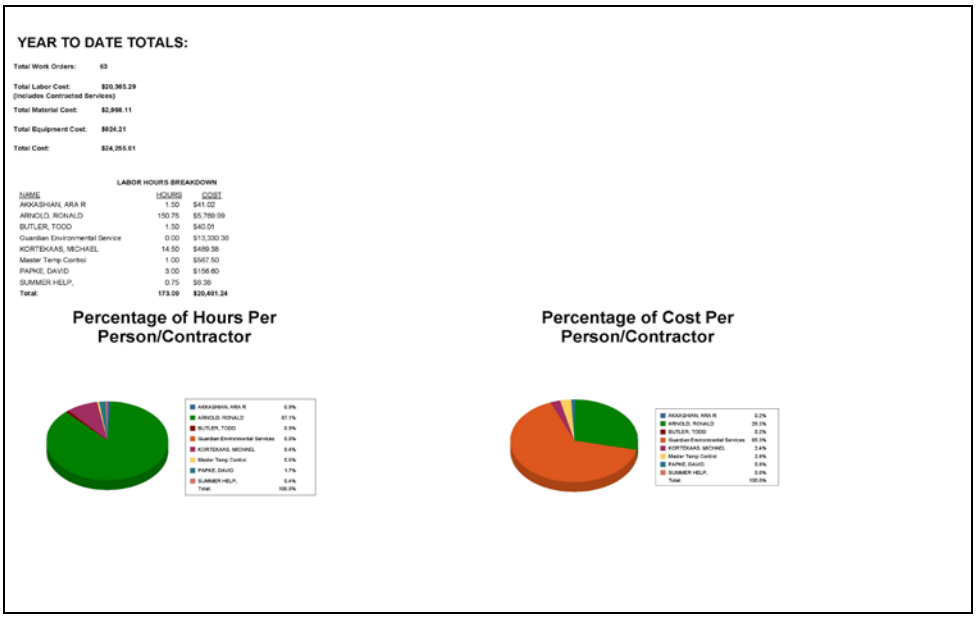
Building Work Order Generation within the CMMS System.

Building HVAC Control

F&O continues to monitor and improve building operations through the use of advanced computerized HVAC systems at Town Hall, Police Department, Fire Department and the DPW to monitor and control building temperatures and air flow. The systems also include email alarm notification and web based interfaces for remote access to analyze and correct problems. In 2010, monthly and annual HVAC operational reports that include repair, labor and other costs associated with HVAC operations was developed and generated from information contained within the CMMS. This information not only provides a cost summary to operate and maintain the HVAC systems, but also assists in identifying potential malfunctions and/or breakdowns before they happen.



Screen shot of one screen for the Townhall's HVAC Control System. This computerized system is utilized to ensure HVAC systems are working properly and energy consumption optimized.



Screen shot from a report from CMMS tracking total costs for HVAC Maintenance.

Cemetery Branch

The Cemetery Branch is responsible for the operation and maintenance of five (5) Township cemeteries with varying degrees of burial availability. F&O conducts all of the burials, internments and grounds maintenance for the cemeteries. Two (2) of the cemeteries are basically full resulting in diminished revenue, while annual maintenance liability and related expenses continue to increase. Through the CMMS program, the branch is able to accurately record and analyze burial, maintenance and cost data, which is used to determine actual cost of service so that rate structures can be incorporated to provide sufficient funds for operation.

Cemetery Name	Location
Crescent Hills	Civic Center Drive
Waterford Center	Corner of Airport Road and Pontiac Lake Road
Four Towns	Cooley Lake Road near Lochaven
Drayton Plains	Dixie Highway and Williams Lake Road
Waterford Village	Rockcroft off of Dixie Highway

Cemetery	Total Spaces	= Burials	+ Obstacle	+ Sold-Empty	+ Available	+ Unknown
Crescent Hills	6067	2777	115	1594	1345	24
Waterford Center	2089	1116	24	949	0	0
Drayton Plains	3464	1485	23	1236	708	12
Four Towns	658	336	12	310	0	0
Totals	12278	55714	174	4089	2053	36

* There are currently 212 gravesites that are not plotted in Crescent Hills Cemetery.

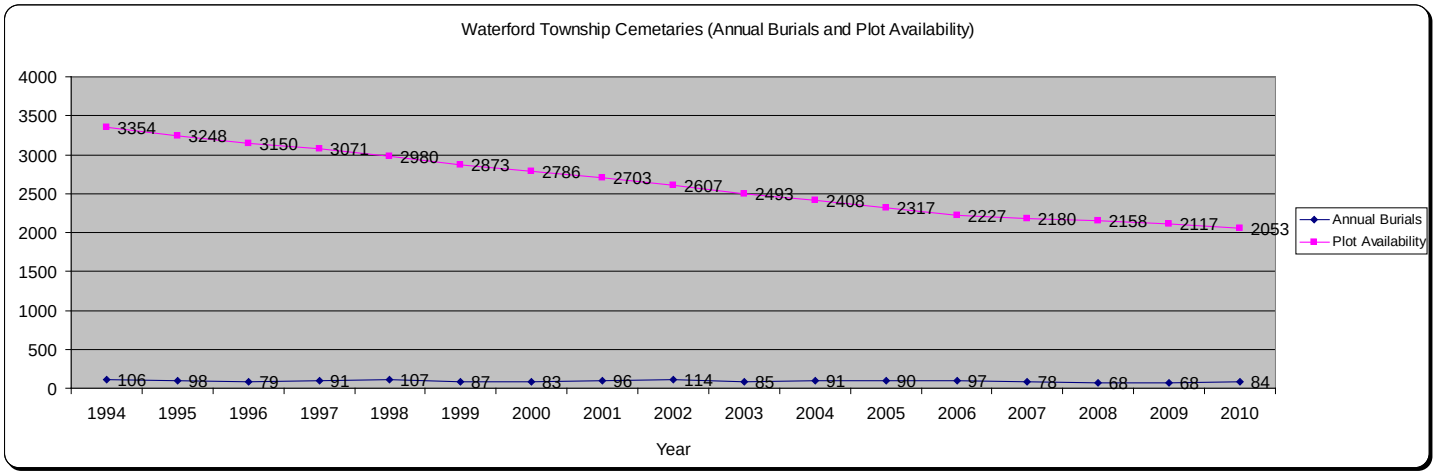
- Grave site status based on data from the DPW CMMS and GIS.
- Equipment costs based on M-Dot Schedule C.

Cemetery- Burial Trends

From 1994 to 2010, Waterford Cemeteries have averaged 89 burials per year. Holding all other contributing factors constant, current trend projections indicate that all 2,053 available plots will be completely utilized in the year 2034, or in 24 years. This trend could escalate as the population continues to age.

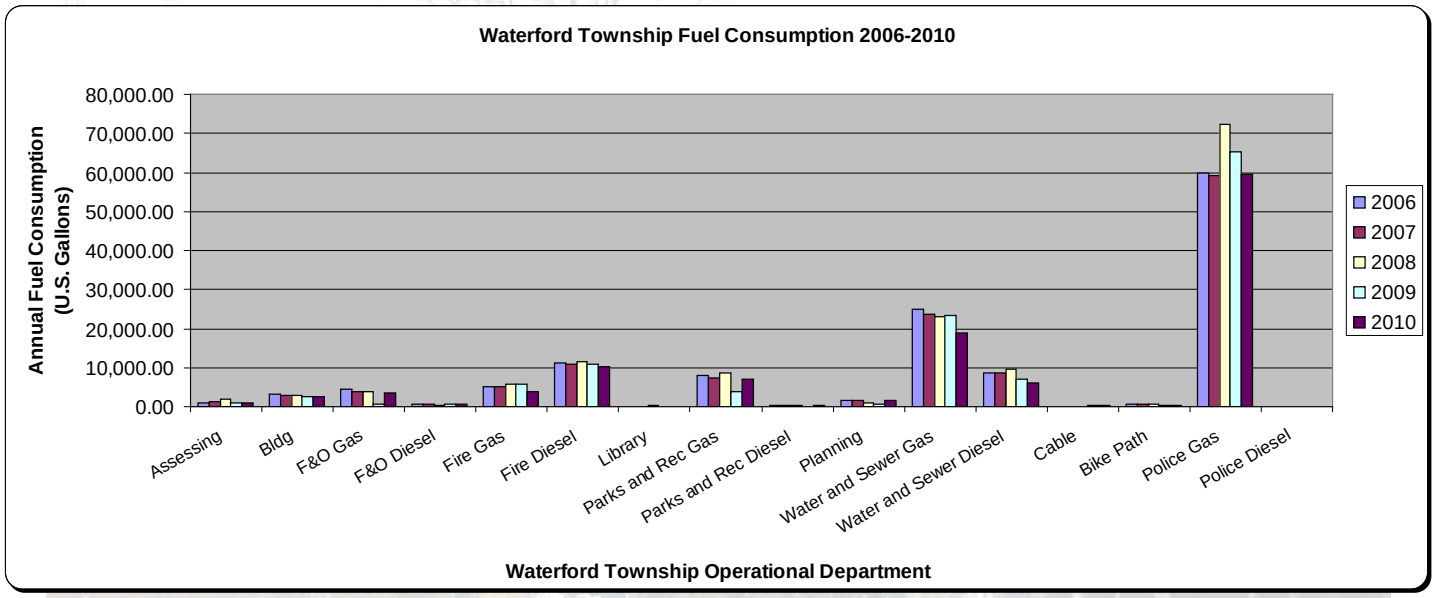
In order to help address long term perpetual care of the cemeteries and to minimize General Fund obligations to cover these expenses, a Perpetual Care Fund was established in 2007. This fund will be used as a primary source of revenue for future cemetery operation and maintenance when all plots are sold in the future. A Perpetual Care Fund fee of $200 is collected at the time of each new lot sale.

The graph below depicts the average annual burials since 1994. The graph also demonstrates the declining availability in plots into the future.



Fuel Island

F&O is also responsible for the operation and maintenance of the Township's Fuel Island. The Township's Fleet of over 250 vehicles obtain gasoline and highway grade diesel product 24 hours a day seven days a week from the fuel island located on the DPW Compound. Every vehicle is issued a vehicle number and every driver is issued a number so that these products can be tracked to the vehicle and driver for appropriate Departmental billing and accounting purposes. In early 2009, automatic integration of fuel island data, such as miles and fuel used, into the CMMS is used to facilitate automatic work order generation of vehicle and equipment service work orders. The graph below indicates the fuel consumption by year and department.

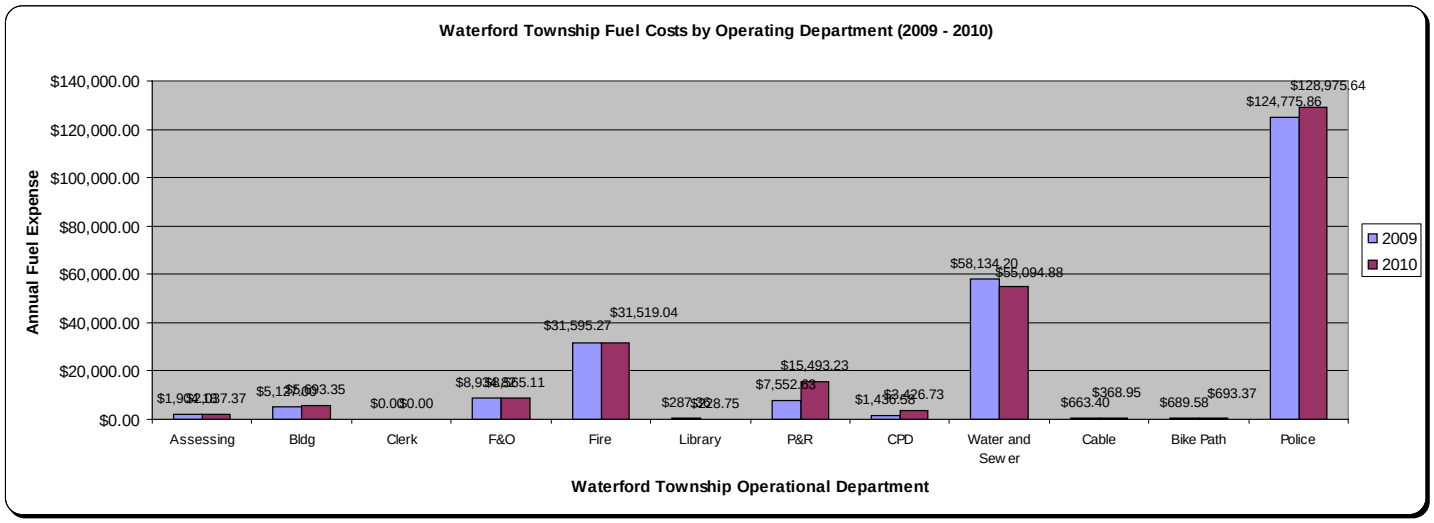


Annualized Fuel Statistics

In 2010, the Township spent $252,096.42 for gas and diesel fuel. On a blended (gas/diesel) annual basis, the Township averaged $2.18 per gallon in operational year 2010. The graph below depicts the petroleum product expenses per operational department for 2010.

Daily Fuel Analysis Report

A detailed daily fuel consumption report that includes information on the operator, vehicle, fuel obtained and an estimated Miles Per Gallon (MPG) statistic is emailed daily to Department Heads. This information provides departmental information on fuel consumed and the resulting cost.



Waterford Twp. DPW
5240 Civic Center Drive
Waterford, MI 48329

Fuel System Daily Analysis Report: 02/16/2010

Building Department

Vehicle	Date	Vehicle Name	Driver	Pump	Product	Gasoline Quantity (Gallons)	Diesel Quantity (Gallons)	Price Per Gallon	Cost	Fuel Cost per Mile	Odometer	Distance (Miles)
020203	2/16/2010 1:50:00PM	2002 GMC SONOMA PICK UP EXT CAI	Hills, David	3	Unleaded	15.50		$2.11	$32.71	$0.17	99803	197
020202	2/16/2010 9:50:00AM	2002 GMC SONOMA PICK UP	Williams, William	4	Unleaded	15.90		$2.11	$33.55	$0.17	94939	200
					Total Gasoline:	31.40	Total Diesel : 0.00		Total Cost:	$66.26	Avg : $0.17	Average MPG:

Fire Department

Vehicle	Date	Vehicle Name	Driver	Pump	Product	Gasoline Quantity (Gallons)	Diesel Quantity (Gallons)	Price Per Gallon	Cost	Fuel Cost per Mile	Odometer	Distance (Miles)
097109	2/16/2010 10:35:00PM	2009 FORD E-450	Butcher, Robert	2	Diesel		14.00	$2.35	$32.90	$0.30	4690	111
					Total Gasoline:	0.00	Total Diesel : 14.00		Total Cost:	$32.90	Avg : $0.30	Average MPG:

Parks and Recreation

Vehicle	Date	Vehicle Name	Driver	Pump	Product	Gasoline Quantity (Gallons)	Diesel Quantity (Gallons)	Price Per Gallon	Cost	Fuel Cost per Mile	Odometer	Distance (Miles)
060006	2/16/2010 3:41:00PM	1995 GMC SENIORS VAN	Siver, Stephen	4	Unleaded	15.50		$2.11	$32.71	$0.37	27343	88
					Total Gasoline:	15.50	Total Diesel : 0.00		Total Cost:	$32.71	Avg : $0.37	Average MPG:

Water and Sewer

Vehicle	Date	Vehicle Name	Driver	Pump	Product	Gasoline Quantity (Gallons)	Diesel Quantity (Gallons)	Price Per Gallon	Cost	Fuel Cost per Mile	Odometer	Distance (Miles)
091211	2/16/2010 11:35:00AM	2009 GMC SAVANA VAN	Dorrance, Dale	4	Unleaded	27.30		$2.11	$57.60	$0.18	3404	326
001209	2/16/2010 2:34:00PM	2000 GMC 1/2 TON PICK UP	Westlake, Justin	4	Unleaded	21.10		$2.11	$44.52	$0.10	61988	433
071232	2/16/2010 4:23:00PM	2007 Savana GMC Van	Collier, Lloyd	4	Unleaded	19.80		$2.11	$41.78	$0.23	19340	180
071242	2/16/2010 3:38:00PM	2007 GMC SIERRA 3/4 TON PICK UP (	Potter, Aaron	4	Unleaded	19.60		$2.11	$41.15	$0.24	36771	168
051280	2/16/2010 4:41:00PM	2005 GMC SIERRA PICK UP 4X4 (WHI	Chittick, Richard	4	Unleaded	22.00		$2.11	$46.42	$0.32	45342	146
981230	2/16/2010 9:11:00AM	1998 GMC 3500HD 1 TON DUMP	Gill, Allen	3	Unleaded	11.30		$2.11	$23.84	$0.50	30406	48
071227	2/16/2010 9:17:00AM	2007 GMC SIERRA 3/4 TON PICK UP	VanDam, Derek	3	Unleaded	14.90		$2.11	$31.44	$0.51	11341	62
					Total Gasoline:	133.90	Total Diesel : 0.00		Total Cost:	$286.73	Avg : $0.30	Average MPG:

The Report Above is an example of the Fuel Consumption Report, which is emailed to Department Heads on a daily basis.

Page 1 of 4

Grounds crew Ara Akkashian, Ron Arnold and Mike Kortekaas.

Grounds Branch

F&O is also responsible for the grounds maintenance of Township properties including winter snow removal. The grounds crew works very hard to ensure campus roads and parking lots are clear for operation at all times. F&O Crews are also responsible for the maintenance of Township bike paths and other remote properties under Township control.

Snow Removal Equipment.

F&O Grounds Crew is responsible for Township Campus
and other off-site snow removal.

Veteran's Memorial

The Veterans Memorial moved forward to completion in 2010 with cooperation between the Memorial committee and F&O staff. Working side by side, the Veterans committee completed the monument while F&O staff completed the surrounding landscape.

Mike Kortekaas working on a storm water improvement at the Veteran's Memorial Site.

F&O Employee's grading topsoil for a nice finished look at the Veteran's Memorial Site.