

Water-Wastewater



Pictured above (left to right): WWTP Operator Neil Traye, WWTP Operator Lyle Michaels, Supervisor Tom Asmus, WWTP Lab Technician/Operator Mark O'Neill, Supt. Curt Goodman, WWTP Operator Dan Johnston, WWTP Chuck Paul, WWTP Operator Bernie Stanaway, and Maintenance Mechanic & Special Equipment Operator Neil Hayward.

Not pictured from the plant: Supervisor Jim MacDonald, Operator Mary Maki, Operator Mark Spanton, Operator Roger Ohman, and Operator Randy Ritari



Marquette Water Filtration Plant



Marquette Area Wastewater Treatment Plant

Mission Statement

The Marquette Water and Wastewater Treatment Department will be a leader in effective water pollution control, continuously evolving to reflect the ever-changing demands of our many customers at the local, regional, state, national and international levels. Protecting Public Health and preserving our Resources through Technology” is our focus in achieving our goals.



Water/Wastewater Treatment Department 2011-12 Annual Report

In accordance with Section 2-80 of the City Code, listed below is a summary of activities for the Water/Wastewater Treatment Department for the 2011-2012 fiscal year.

The Year in Review

The previous 12 months span a period of time in which staff has worked through and “unraveled” several complex technical issues. Despite moments of distress and incurring unbudgeted expenses, necessary changes have been made to improve operational reliability and have resulted in a significant knowledge base gain of the staff.

On the process side, following a long streak of smooth sailing, the operation encountered some rough seas as a result of a distressed biological treatment population. The root cause was long term pH suppression, a consequence of low alkalinity lake water, low pH chemical used for phosphorus removal, and insufficient biosolids storage space. Despite the complexities of the issue, the root cause is well understood. Measures are now in place to prevent a re-occurrence.

Variable frequency drive failures has been an ongoing issue that the department feels has been addressed. Variable Frequency Drives (VFD) are complex electrical devices that allow AC motors to operate at different speeds in response to changing process variables, i.e., changing lift station wet well levels, or variations in incoming plant flow. Re-occurring VFD failures on the plant’s three RAS pumps during the past four years prompted an in depth study by plant staff, the VFD manufacturer, the Marquette Board of Light & Power and the plant’s electrical contractor. In the end, it was determined that the VFDs had been improperly wired during the construction contract of 2008. Since this repair was made, there have been no failures or faults to report.

A second source of VFD failures has been at the Lake Street lift station. These three VFDs were installed as part of the 2004 lift station improvements project. Since startup, one VFD was replaced, a second had components replaced, before two of the three VFDs failed simultaneously. The root cause of these failures is less clear than the previously described failures. Based on research done by staff on these drives, it appears that the drives in question are prone to the type of failure observed. In the end, two of the three drives have been replaced by units identical to those successfully installed and operated at the WWTP.

Looking ahead, staff plans to continue a repair and maintenance plan that allows no loss of capacity or capability. Improvements are continually being made to the SCADA network to improve the reliability of the operation by alarming and monitoring capability of the WWTP and the lift stations. The scope of work for the wastewater treatment staff has increased. Staff has taken on two new lift stations and the grease trap/interceptor inspection program. In the area of grease trap inspections, we continue to work with the local restaurateurs to minimize grease discharges into the sanitary sewer system.

Department Notable Events

- The renewal process for the plant's NPDES permit was completed and submitted to the MDEQ.
- Two digester foam suppression pumps, one dedicated to each digester, are installed and successfully operated. There have been no foaming interferences during the past year.
- The Water Environment Associations research arm, the Water Environment Research Foundation, or WERF, selected the Marquette WWTP as a site to study digester foaming. An in-depth analysis of data and additional sampling is underway.
- Lift station bypass pumping preparedness. Staff acquired essential hardware and procedures to hydraulically bypass several of the Cities owned and operated lift stations.
- Several lift stations that did not transmit data onto the City's SCADA network, or did so unreliably, are now on the network thanks to WiMAX technology and a cooperative effort between the City and Northern Michigan University.
- WWTP staff, in conjunction with Northern Michigan Public Service Academy organized and ran the annual Water/Wastewater Administrators workshop. This course fulfills the needs for Water/Wastewater Operator Certification licenses.

- Major repairs at the WWTP include: RAS Pump No. 1 VFD Replacement. RAS pump re-wiring.
- Major repairs at the lift stations include: Pine Street lift station check valve re-build. Lake Street #2 & #3 Pump VFD replacement and Granite Street lift station impeller repaired.
- A significant non-compliance issue associated with phosphorus and pH occurs. The construction of the new biosolids storage facility and the use of a different phosphorus removal chemical should relieve the problem.
- Land application: no major changes, other than additional agricultural fields are being sought in Alger County.
- The department took ownership of two additional new lift stations, Island Beach Road and Mattson Park.
- The Marquette Area Wastewater Treatment Advisory Board (MAWTAB) welcomed back Dave Kingston as a member. Dave peevishly served on the MAWTB for six years.
- During the past year the Water Plant operation remained stable meeting all State and Federal drinking water standards.
- FY 11/12 water plant projects included the painting of the outside of the building and addressing much needed corrosion control maintenance within the plant.
- The SCADA control system was upgraded which included all new hardware and upgraded process control software. Also as part of the project the water plant was separated from the City network to meet security assurances.

2011 Beach Monitoring Program

Through a grant from the State of Michigan and the Great Lakes Restoration Initiative Program along with the Superior Watershed Partnership, we monitored five beaches in the City of Marquette. In 2011, the water quality met all standards and did not have any beach closures. Note: In July of 2012, however, two closures occurred. South Beach and North Beach each had an expedience of e-coli resulting in the beaches closed for one day. A separate report will be issued on the Beach Monitoring Program later in 2012.

Operation

Staffing at the wastewater treatment plant and lift station has remained unchanged despite picking up additional responsibilities in the area of grease trap inspections and two new lift stations.

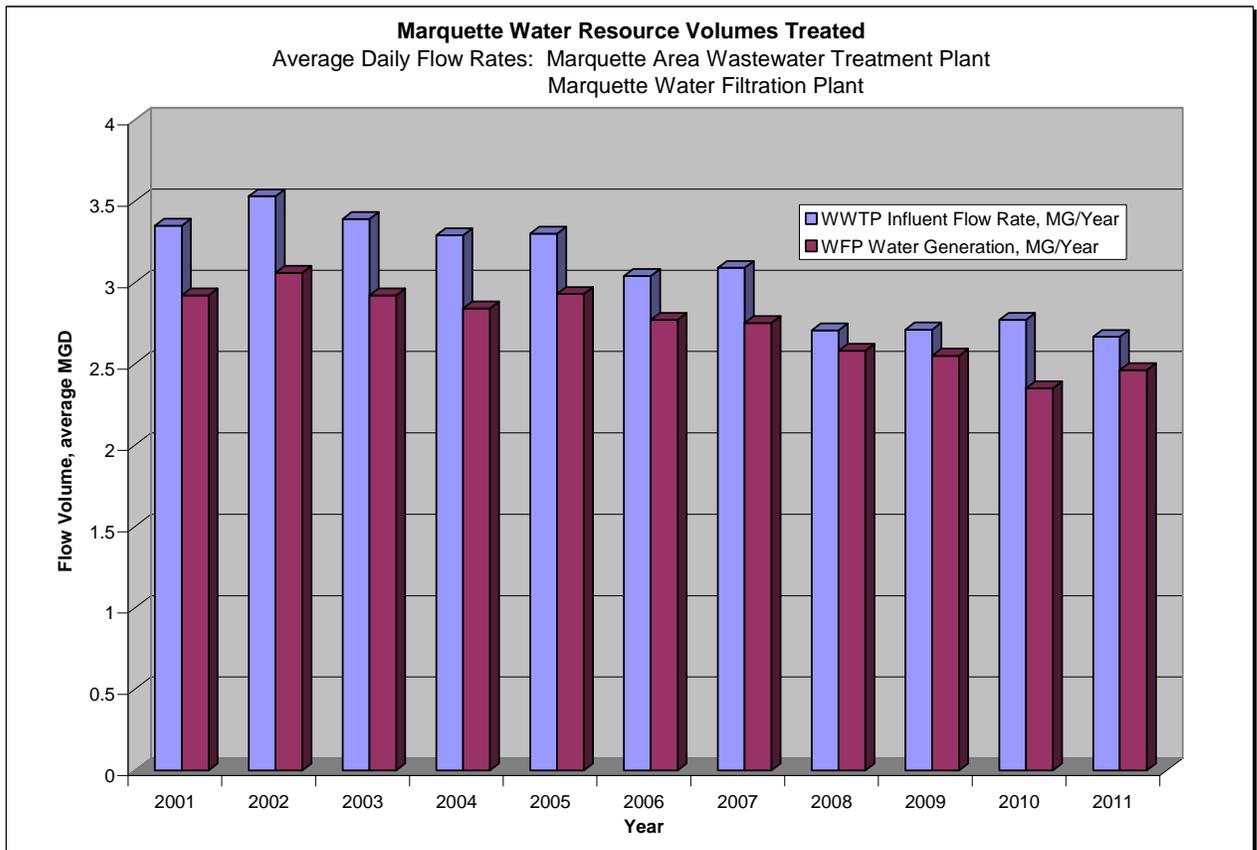
The wastewater treatment plant and lift stations employ eight full-time employees. The water plant employs five full-time employees and is

staffed at all times. All departmental employees hold the required regulatory certifications to operate water and wastewater operations. Four wastewater employees routinely support water plant operation and maintenance through dual certifications. All departmental employees are cross trained in all aspects of plant operation.

Current Operational Staffing Positions	
Wastewater Treatment Plant	Water Treatment Plant
5 Operators	4 Operators
1 Lab Technician/Coordinator	1 Working Supervisor
1 Maintenance Mechanic	
1 Supervisor	

Department Statistics

The following bar chart illustrates treated water and wastewater volumes at the two City treatment facilities.



Biosolids Disposal

During the 2011-12 fiscal year, the MAWTF applied biosolids as a fertilizer/soil amendment at the following properties:

- Cliffs Natural Resources
- Eagle Mills
- Van Damme Farm Properties

Due to limited storage capacity, biosolids were also landfilled at the Marquette County Landfill. The construction of a new biosolids cake storage facility will be underway by late August 2012.



Eagle Mills Land Reclamation Site