

2011-2012 ANNUAL REPORT



MADISON WATER UTILITY

Quality & reliability since 1882.

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INTRODUCTION

Purpose

Section 13.01(3) of the Madison General Ordinances establishes the duty of the Madison Water Utility Board to “issue an annual report that shall be made available to the Common Council.”

Mission Statement

We are entrusted by the people of Madison to supply high quality water for consumption and fire protection at a reasonable cost, while conserving and protecting our ground water resources for present and future generations.

History of the Madison Water Utility

Madison’s community water service began in 1880 with a petition to the City of Madison Common Council asking that a waterworks system be constructed. Madison’s population was 10,324. The Common Council directed its waterworks committee to establish the Madison Waterworks on September 5, 1881. Financing was obtained and contracts let in spring of 1882, and pumping commenced on December 7, 1882.

Early management was vested in the Common Council through its committee, and on March 2, 1884, general management was transferred to the Board of Water Commissioners. This Board of Water Commissioners arrangement continues today. The Madison Waterworks achieved department status in the early 1960s and became the Madison Water Utility under a General Manager leadership. In common with other Wisconsin water utilities, the Public Service Commission of Wisconsin (PSCW) regulates the utility in matters of rates, rules and levels of service.

MWU has always been a groundwater system in spite of being surrounded by lakes. A deep, high-quality aquifer beneath the city is the source of our water supply. MWU currently has 22 deep wells with a capacity of over 70 million gallons per day, and now provides water service to over 65,000 accounts in the City of Madison, Town of Madison, Shorewood Hills, Maple Bluff, Blooming Grove, and Town of Burke. As the city grows and expands, MWU must continue to plan for and add wells, storage, pumping equipment, and new and replacement pipe to meet demand and ensure a sufficient supply is available to fight fires.



Water Utility Board Governance

The Water Utility Board is described by state statute and city ordinance. It is made up of seven voting members and the Director of Public Health (or his/her designee) as an ex-officio member. The board is charged with authority for managing and operating MWU under the general direction of the Common Council. The Mayor appoints and the Common Council confirms board members for terms of five years for citizen members (with staggered appointment dates) and two years for alder members. The Director of Public Health's appointment is ongoing.

The purpose of the board, on behalf of the residents of Madison, is to see to it that MWU:

- provides consumers with an adequate quantity of high quality water for consumption and fire protection at a reasonable financial and environmental cost;
- avoids unacceptable actions and situations; and
- is prepared to continue to provide owner-centered, valued results into the future.

On August 24, 2010, the Water Utility Board adopted a [Policy Book](#), which includes policies in four major categories:

- [Outcomes](#) Policies which define the benefits MWU provides to the residents of Madison.
- [Executive Limitations](#) Policies which establish prudence and ethics boundaries.
- [Board–Executive Delegation](#) Policies which define relationships and boundaries between the board, the General Manager, and MWU staff.
- [Board Process](#) Policies which describe how the board carries out its own tasks.

PROJECTS

Major Projects

Project H₂O



MWU is upgrading to an Advanced Metering Infrastructure (AMI), a two-way communication system between the utility and the meter. The installation of the new city-wide system is called "[Project H₂O](#)." A small transmitter is attached to each water meter to wirelessly transmit water use data to the utility via a secure connection. Currently, meters are manually read every six months using an outside read system that is no longer supported by the manufacturer.

This project will provide both immediate and long-term benefits, including:

- Reduced operating costs and vehicle emissions by eliminating the need for a water meter reader to visit each property.
- Improved leak detection on both the customer side and the distribution system.
- Monthly billing and eventual online access to consumption information to assist customers with budgeting and enable better control over their own water use.
- Better consumption data to improve customer service and help with water supply planning and overall system operation.

During 2012 and the first part of 2013, every home and business in Madison will be visited for either a new meter installation or a retrofit of the existing meter.

East Side Water Supply Project



EAST SIDE WATER SUPPLY PROJECT

In July 2010, MWU began the [East Side Water Supply \(ESWS\) Project](#), a major water supply planning project that paired professional and scientific expertise with community engagement to recommend future infrastructure on Madison's East Side. The 18-month study developed projects to improve water quality and supply in an area ranging from the Yahara River in the west to I-90 in the east, and from Northport Drive and East Towne in the north to Buckeye Road in the south.

A Citizen Advisory Panel (CAP) met and advised MWU on public expectations for drinking water quality, water supply and demand, water conservation, and public participation. On July 26, 2011 the Water Utility Board approved the establishment of four projects to improve water quality and supply on Madison's east side:

[Mitigation of volatile organic compounds on site at Unit Well 15.](#)

[Removal of iron and manganese at Unit Well 8.](#)

[Removal of iron and manganese at Unit Well 7.](#)

[Replace Unit Well 3, which was abandoned in 2008.](#)

Completed Projects

Prairie Road Water Tower

The elevated water reservoir on Prairie Road, which was destroyed in a fire in 2010, has been rebuilt. The new reservoir has a larger capacity and will provide improved operational flexibility and system reliability.



TOWER UNDER CONSTRUCTION, NOVEMBER 2011

Arbor Hills Booster Pump Station 118

The [Arbor Hills Supplemental Fire Flow Supply Project](#) was established in 2009 to improve water system reliability and available fire fighting capacity and provide the ability to transfer water between pressure zones. A new booster pumping station located in Aldo Leopold Park on the Cannonball Trail Water Main was completed in 2012.



NEW BOOSTER STATION AT LEOPOLD PARK

Water Main Projects

During 2011, MWU replaced 10 miles of main and built 4.1 miles of new main at a cost of \$7.5 million. Infrastructure replacement will remain a priority for MWU for decades to come. Over 400 miles of Madison's 850-mile piping system need to be replaced in the next 40 years to renew and maintain the system.

In the fall of 2011, MWU rehabilitated approximately 1,300 feet of deteriorated cast iron main on Droster Road using emerging trenchless structural lining methods. This pilot project was the first in the state to use this structural cured-in-place pipe (CIPP) lining technology. CIPP lining allows for the construction of a new pipe inside of a deteriorated main, with only minor excavations for accessing the water main at the ends of each

400-500 foot segment. The CIPP liner is approved for drinking water systems, and it is designed to meet the strength and pressure requirements of a new pipe for at least a 50 year service life. In 2012, this technology was also used to rehabilitate a 6-inch water main on Major Avenue.



WATER MAIN LINING PROJECT ON DROSTER ROAD

Current and Upcoming Projects

MWU invites citizens to become active in the development of Water Utility projects through participation on a [Citizen's Advisory Panel](#) (CAP). Through this participatory process, citizens provide valuable input and feedback and help produce high quality projects that meet and exceed public expectations.

Well 15 VOC Mitigation Project

[Unit Well 15](#) operates year-round and serves the East Washington corridor including Westchester Gardens, Mayfair Park, Bluff Acres, Carpenter-Ridgeway, Eken Park, and Emerson East neighborhoods. Well 15 also serves the High Crossing area located east of Interstate 90/94. This well has shown increasing concentrations of a single volatile organic

compound (VOC), namely tetrachloroethylene (PCE). These compounds do not violate any current regulations; however, the concentration of PCE is steadily increasing.

A low-profile air stripper will be installed at the well site to remove VOCs at Unit Well 15. Construction will occur from the fall of 2012 through spring of 2013. The project is scheduled to be complete in June 2013.



ARCHITECTURAL RENDERING OF WELL 15 FILTER ADDITION

Zone 4 Water Supply Augmentation

The purpose of the [Zone 4 Water Supply Augmentation Project](#) is to supplement supply in the southeast part of the city to improve fire fighting capacity and system reliability. Two potential well sites are being evaluated, and test wells have been drilled near Tradewinds Parkway and Dairy Drive. A permanent production well is expected to be completed by 2014.

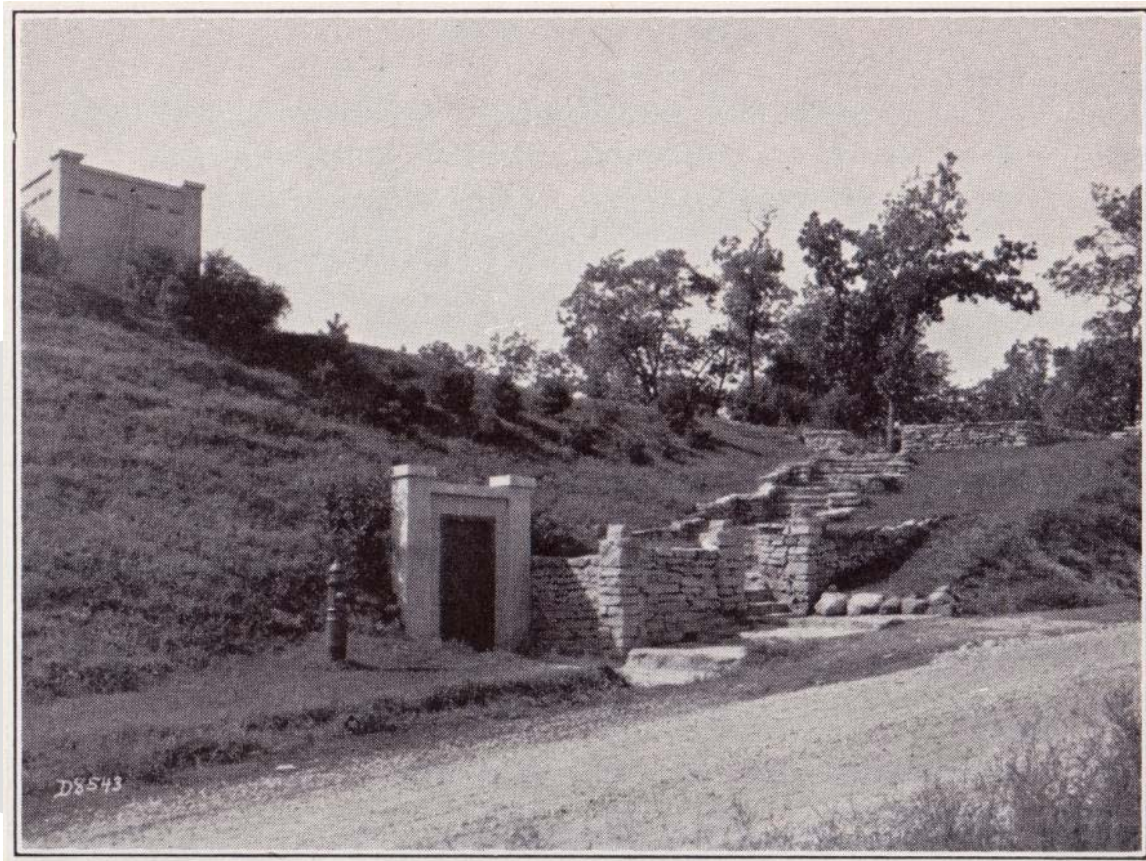
Well 7 Iron and Manganese Mitigation

Drilled in 1939, [Well 7](#) operates year-round and primarily serves the Village of Maple Bluff, Sherman Avenue neighborhoods south of Almo Avenue/Sheridan Street and west of Packers Avenue, and areas of the isthmus between Livingston Street and the Yahara River. Following the East Side Water Supply Project review of water supply and water quality needs, it was recommended that iron and manganese filters be constructed at Well 7. Design of the facility reconstruction and filter addition will begin in the fall of 2012 and construction is expected to begin in 2013.

Booster Pump Station 106 Reconstruction Project

[Booster Pumping Station 106](#) (BPS-106) is an interzone transfer pumping station located on Madison's near west side in the sloped embankment of Reservoir Park. The primary function of BPS-106 is to transfer water from Madison's main pressure zone (PZ 6, central Madison) into the City's southwest pressure zone (PZ 7, west side, southwest side). This pumping facility has been operating since 1926 - making it Madison Water Utility's oldest operating facility.

The design of the reconstruction project will begin in fall 2012 and should be completed, reviewed, and ready to bid in March or April of 2013. The bidding/preconstruction phase will likely extend to June or July of 2013. Construction of the replacement facility is anticipated to occur from the summer of 2013 to the spring of 2014.



HISTORIC PHOTO OF BOOSTER PUMP STATION 106

WATER QUALITY

Madison drinking water meets all primary (health-based) drinking water standards. The [Annual Drinking Water Quality Report](#) for 2011 was issued May 14, 2012. The water utility website also allows customers to find out [which wells serve their address](#) and to receive detailed water quality information for each well.

Chromium-6

[Chromium](#) is naturally found in rock, soil, plants, and animals. Industrial processes may also introduce chromium into the environment. In water, chromium occurs in two primary forms: chromium-3 (an essential nutrient found in many vegetables, fruits, grain, and meat) and chromium-6 (or hexavalent chromium, a suspected carcinogen). Current drinking water



regulations limit the amount of total chromium allowed in tap water to 100 ppb (parts per billion). Total chromium is the sum of all forms of chromium in a sample.

MWU annually tests all wells for total chromium. Results are typically below 3 ppb and have remained unchanged in over 30 years of testing. In 2011, the utility began voluntarily monitoring for chromium-6. The testing showed that chromium in Madison tap water primarily exists as chromium-6. Results ranged from non-detect (<0.02 ppb) to 2 ppb; nine of the twenty-two wells had trace amounts (<0.1 ppb) of chromium-6. Additional information and complete test results are available on the MWU website.

MWU is one of five utilities participating in a Water Research Foundation tailored collaboration project “Sources, Fate, and Treatment of Hexavalent Chromium.” This collaborative project will help refine the utility’s monitoring plan, improve understanding of chromium-6, and provide a first cut analysis of potential treatment alternatives or changes in operations and maintenance that could reduce the concentration of chromium-6 in drinking water.

Lead Replacement Program

Madison’s drinking water source does not contain significant amounts of [lead](#). The corrosive nature of water, however, can dissolve or corrode lead through its contact with water service lines, interior pipes, and plumbing fixtures. Lead in drinking water can cause a variety of adverse health effects, especially for infants and children.

MWU has completed a successful 11-year program to ensure all lead water service lines in the city are replaced. Except for a small number of owner-side lead services, all known lead service lines in the City of Madison have been abandoned or removed from service. Following the conclusion of the lead service line replacement program, required monitoring conducted in 2011 demonstrated lower lead levels at the customer tap.

Water Main Flushing

To improve water quality and minimize discoloration, water mains are [comprehensively flushed](#) by a technique known as unidirectional flushing. The procedure is performed in warm-weather months and involves the systematic opening and closing of hydrants, one section of main at a time, to force the water through the pipes at high velocity, removing accumulated mineral sediment until the water is clear.

In 2011, 476 miles of water main were flushed unidirectionally and 281 miles of main were flushed conventionally. The 2012 Water Main Flushing Program began in April. Due to dry weather conditions, all routine flushing was suspended from June 26 to August 13, 2012.



WATER MAIN FLUSHING IN PROGRESS

Flushing operations may lead to temporary low pressure and discolored water, which can be drawn into nearby homes and businesses if the water is being used during or immediately following the flushing. Such events should affect customers for a few hours at most. The discoloration is caused by iron (red color) or manganese (black color) particles being dislodged from the water main. If discoloration occurs, customers should open the cold tap nearest the water meter—usually a basement sink—to full flow until the water runs clear. In some situations this may take 5 to 10 minutes. If discoloration continues, customers should contact Water Quality at (608) 266-4654.

Fluoride

Fluoride is added to Madison tap water to improve dental health and reduce tooth decay. In early 2011, the US Department of Health and Human Services recommended that the optimal fluoride level should be 0.7 mg/L to reduce the potential for severe dental fluorosis in children. MWU adjusted the chemical feed pumps to meet the new recommendation shortly after it was announced. Previously, Madison's target was 1.1 mg/L fluoride. Water is tested daily to maintain the optimal level.

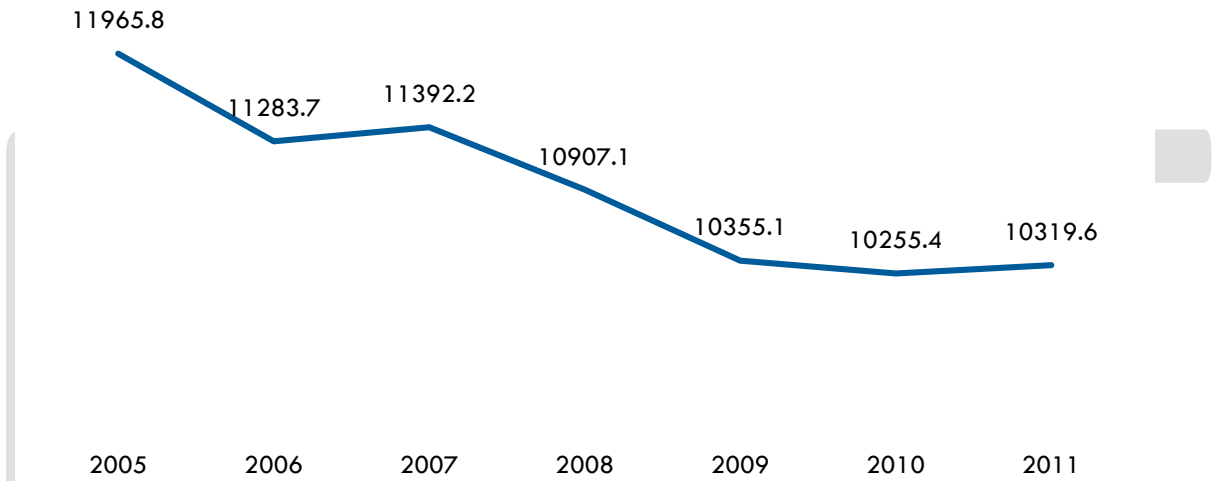


WATER SUPPLY & OPERATIONS

Pumpage

MWU pumped 10,319,600,000 gallons in 2011, a 1.4% increase over 2010 and a 4.8% decrease from the average pumpage for the previous five years. Average day pumpage was 28.3 million gallons, and the maximum day was 43 million gallons.

Annual Pumpage in Million Gallons



Through the third quarter of 2012, pumpage was 8,305,905,000 gallons, a 4% increase over the same period in 2011. Dry conditions during the summer of 2012 caused a significant increase in water demand. Pumpage increased by 19% in June and 15% in July over the same months in 2011.

Service Interruptions

There were 247 service interruptions due to main leaks in 2011. Main breaks are due to an aging piping system and are difficult to control and impossible to predict. Over the past seven years, MWU has experienced an average of over 240 main breaks per year. This calculates to an average of 29 breaks per year per 100 miles of distribution system pipe.



MWU CREW MEMBERS REPAIRING A WATER MAIN BREAK

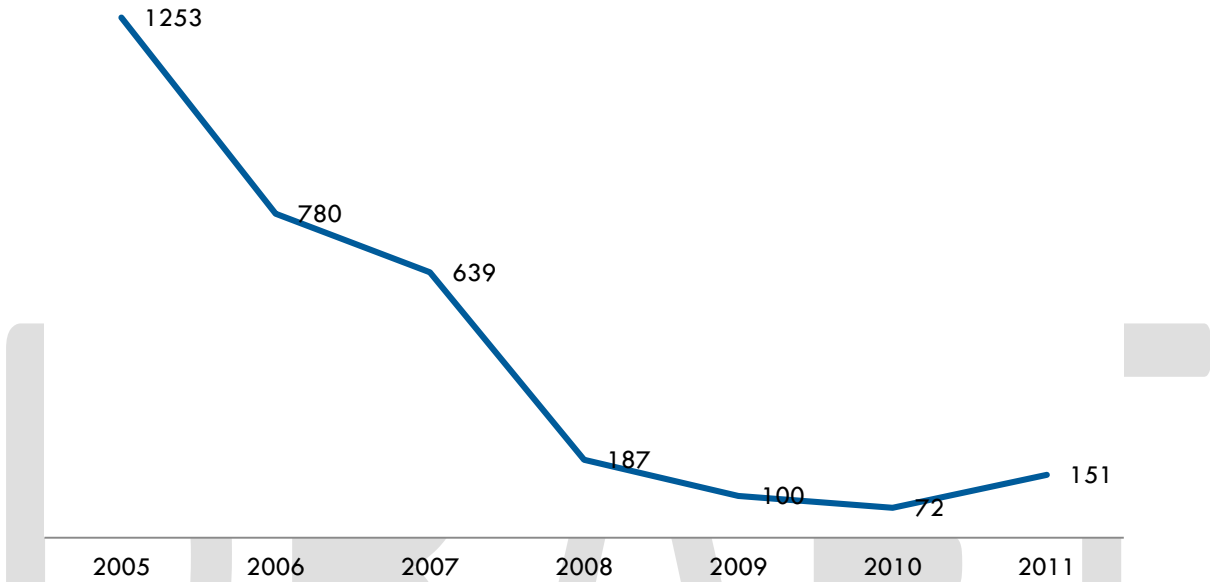
Each year, over \$7 million is invested in pipe replacement. The budget is increased 4-6 percent per year as the replacement program continually grows. Pipe segments are selected for replacement based on their break history, hydraulic capacity, age, and material. As pipe is replaced, the risk of main breaks is reduced.



Service Extensions

151 new services were installed in 2011.

Number of New Services by Year



FINANCES

2011 Financial Highlights

During 2011, MWU increased its total net assets, or equity, by \$2,750,000 compared to an increase of \$2,976,000 in 2010. Cash and investments increased by \$11,986,000 due to an increase in construction funds from the 2011 bond issue combined with a deferred tax equivalent payment to the City of Madison. Sales of water increased \$1,403,000 in 2011, due to a nine percent increase in water rates in May 2011.

The bond refunding in 2009 combined with ongoing proactive rate adjustments allowed MWU to exceed its minimum debt coverage requirement for the last two years. The accounts required by the revenue bond resolutions are all fully funded and MWU continues to pay down its loan from the City of Madison which, once paid off, will allow the utility to begin to build an unrestricted reserve account.

In order for these positive trends to continue, MWU must continue to proactively seek rate adjustments given the infrastructure replacement and improvement plans for the next several years.



Other highlights:

- **Operating revenues increased** \$1,417,000 or 5.31% from 2010. The higher revenues were due to a 9% rate increase effective May 3, 2011, that was prorated in beginning with the August 1, 2011 customer billing. As the number of customers increased 0.28%, water pumped increased 0.63%.
- **Operating income increased** \$427,770 or 5.17% from the prior year. The increase was due to the increase in operating revenue and a lower percentage increase (4.7%) in operation, maintenance and taxes expense, offset by a higher percentage increase (7.65%) in depreciation charges.
- **Gain from property disposal decreased** \$581,304 in 2011 - as MWU recognized \$48,080 gain on the disposal of vacant land - compared to 2010, when the utility recognized gains totaling \$629,384.
- **Payment in lieu of taxes (PILOT)** by MWU to the City of Madison **increased** \$405,884 or 9.86% to \$4,519,771 in 2011, from \$4,113,887 in 2010.
- **Cash and investments increased** to \$4,421,853 in 2011, from \$174,248 in 2010. MWU made its 2011 PILOT payment to the City of Madison in 2012. The 2010 PILOT payment was made in 2010.

Rates

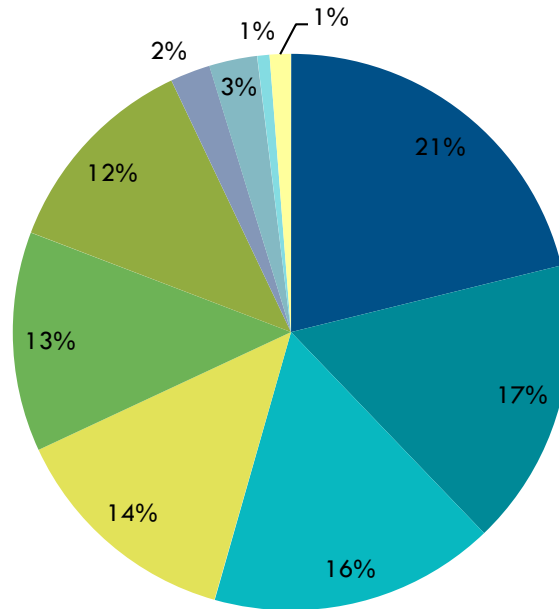
MWU was granted a 9% rate increase effective May 3, 2011. The rate increase was prorated in beginning with the August 1, 2011 customer billing, and the full rate increase was included on the January 1, 2012 bills. MWU is now ranked twenty-ninth for nonresidential rates and forty-seventh for residential rates out of 80 utilities classified as AB (over 4,000 customers) in Wisconsin, and has the thirteenth lowest nonresidential rates in Dane County. The average 6 month residential bill (water used, 44 ccf) is \$128.40, which is \$21.40 per month.



Cost of Service and Debt

Cost of Service

Where Your Water Dollar Goes



- Transmission and Distribution (Water Mains)
- Depreciation of Physical Plant
- Payment in Lieu of Taxes to City of Madison
- Administrative and General
- Pumping
- Interest and Amortization Expense, Net
- Customer Service and Metering
- Water Treatment
- Source of Supply (Wells)
- Other

Operations and maintenance expenses totaled \$14,525,000 in 2011, or \$220.27 per customer account. This is a 3.06% increase over 2010 due to increased expenses for water pumping (higher electricity costs), research on drinking water quality, employee pension and health insurance benefits, and workers compensation insurance claims.

Interest and amortization expense was \$3,853,000 in 2011, compared to \$3,540,000 in 2010, an increase of 8.84% due to increased borrowing.

A [cost of service study \(COSS\)](#) was conducted by Public Service Commission of Wisconsin staff in early 2011. The purpose of a COSS is to reasonably determine the cost of providing services to classes of customers that have similar characteristics (residential, commercial, industrial, etc.) so that rate designs are fair and nondiscriminatory.



Long-Term Debt

Date	Purpose	Final Maturity	Interest Rates	Original Amount	12/31/11 Amount Outstanding
REVENUE BONDS					
12/01/07	Refunding debt and system improvements	1/01/28	4.00-4.75%	\$27,185,000	\$23,965,000
12/09/09	Refunding debt and system improvements	1/01/30	2.00-5.00%	\$48,540,000	\$47,025,000
11/10/10	System improvements	1/01/31	0.90-5.25%	\$13,250,000	\$13,250,000
12/22/11	System improvements	1/01/32	2.00-4.00%	\$19,370,000	\$19,370,000
Totals				\$108,345,000	\$103,610,000
ADVANCE FROM MUNICIPALITY					
10/19/10	Payoff unfunded pension liability	10/01/24	3.41%	\$1,404,052	\$1,348,946
1/01/08	Advance from City, Burke Utility District #1	n/a	1.20%	\$393,762	\$423,802
LOAN FROM MUNICIPALITY					
2005	Advance from City of Madison	n/a	1.20%	\$4,573,000	\$6,120,000

On August 4, 2005, the Common Council approved a loan from the City of Madison to MWU to be used as financing with interest charged monthly at 0.25% higher than the monthly rate earned through the utility's investment pool. No formal schedule for repayment has been established, but MWU is making payments of \$765,000 a year plus interest.



ADDITIONAL RESOURCES

- [Project News](#)
- [2011 Drinking Water Quality Annual Report](#) (also known as the Consumer Confidence Report or CCR)
- [2011 Report on Water Quality Monitoring](#)
- [2011 Pumpage by Unit Well](#)
- [2011 Annual Report to the Public Service Commission of Wisconsin](#)
- [2011 Financial Statements](#)
- [Cost of Service Study \(Exhibit 3.02, Docket 3280-WR-112, PSC REF#:145871\)](#)

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