

MUHLENBERG TOWNSHIP AUTHORITY
WATER CONSERVATION PLAN
JANUARY 2009

General

Efficient water use can prolong supply adequacy, reduce energy consumption, compensate for system inadequacies, reduce wastewater flows, and reduce the impact of population growth or economic expansion. The Water Conservation Program provides a basis for improving water use efficiency in the Authority's water system by establishing policies and objectives to be applied during normal operating conditions, as well as during drought emergencies. It also identifies assumptions, goals and implementation impacts which form the basis of the Water Conservation Program, water system characteristics, existing and proposed conservation measures, the drought emergency plan, and implementation procedures. It is intended to satisfy the needs of the Authority and the requirements of the Delaware River Basin Commission (DRBC) and the Pennsylvania Department of Environmental Protection (DEP).

Assumptions

The following assumptions guided preparation of the Water Conservation Program and Drought Emergency Plan:

- (1) It is an active and continuing water system tool and will be reviewed, revised, and updated periodically.
- (2) It is a factor to be considered in all water service activities, including financing, staffing, public education, planning and policy formulation.
- (3) It is to treat all customers and customer classes equitably.
- (4) Voluntary customer participation will be most effective in building public cooperation and support for long-term conservation measures.
- (5) Because the Authority well supplies are part of a regional water resource, any actions should be coordinated with nearby public and private suppliers, and regulations may be imposed on water operations by higher levels of water management responsibility, such as DRBC or DEP.

Goals

The Water Conservation Program and Drought Emergency Plan is intended to satisfy the following goals:

- (1) Provide a safe and adequate supply of water to all customers under normal conditions at a reasonable cost.
- (2) Serve all customers desiring water service with the available supply.
- (3) Carry out operations during emergency conditions in a way that minimizes inconvenience and cost.

Impact

Successful implementation of the various conservation measures will impact on the water system and its customers in several ways:

- (1) Reduced water consumption will result in lower electric power costs for heating and pumping water and may result in lower water bills.
- (2) Reduced water consumption may also result in lower wastewater flows.
- (3) Water system pumping, treatment and operation and maintenance costs will likely decline in conjunction with reduced water consumption.
- (4) Reduction of unmetered uses and losses will result in direct cost savings and may delay water rate increases.
- (5) The existing well supplies will be able to supply a larger customer base, postponing the need for additional and expensive supply development projects.
- (6) Reduced consumption will decrease water revenues, and rate increases may be needed to satisfactorily cover fixed and variable costs.

Water Conservation Program

A normal water supply condition exists when groundwater production is adequate to satisfy water system demands, and when groundwater levels are within normal seasonal variations. A normal condition also requires an absence of required conservation actions imposed by regulatory agencies, such as the Delaware River Basin Commission and the Pennsylvania Department of Environmental Protection.

The goal of water conservation during normal water supply conditions is to maintain a predetermined consumption level per customer, to reduce peak water use, and to encourage long-term reductions in per customer consumption. Residential water customers account for about 50 percent of all water sales, and commercial industrial customers account for the other 50 percent of all water sales. Conservation measures must impact on these two groups in order to achieve the stated goals. The amount of unmetered water must remain at or below present percentages. The following conservation measures are part of the Authority's Water Conservation Program.

- (1) Public Education increases public awareness of the water source, the supply availability, the treatment and distribution costs required and the benefits of water use efficiency. Specific programs include:
 - (a) Provide customers with basic information on water supply facilities, projected water requirements, and the need for conservation.
 - (b) Provide free water conservation literature at the Authority office, and the office of Muhlenberg Township and Laureldale Borough.
 - (c) Periodically, distribute water conservation literature to customers listing specific actions to reduce water use in the home and business.
 - (d) Continue to notify customers with unusually high consumption and investigate to determine the reason.
 - (e) Publicize the Water Conservation Program and make copies available to schools and civic organizations.
 - (f) Provide water conservation posters for schools, businesses, and major water consumers.
 - (g) Seek the cooperation of the school officials to initiate a program of water education activities, such as the AWWA School Program.
 - (h) Post up-to-date water conservation information on the Authority's website and update as necessary to keep the information current.
- (2) Metering. Maintain accurate metering and recordkeeping for water consumption.
 - (a) Meter all water consumers, including municipal services.
 - (b) Customer billing is to be based on metered usage.
 - (c) Maintain accurate records of meter installation, testing, repair, and replacement activities.

- (d) Source Metering – Well Nos. 1, 2, 3, 4, 6, 8, 9, 10, 11, 12, 13, 14, and 15 Pump Station discharges are all equipped with individual meters of various types including venturi flow tubes, propeller, and turbine meters. The proposed Quarry Production Bore Holes No. 1 and No. 2 will be equipped with venturi meters with displays of both instantaneous and totalized pumping.

Muhlenberg Township Authority has six emergency interconnections with the City of Reading. Each interconnection is metered as follows:

- | | | |
|----|---------------------------------|----------------|
| 1. | Adams Street | 6 – inch meter |
| 2. | Pottsville Pike (Myers Canning) | 4 – inch meter |
| 3. | N. 13 th Street | 4 – inch meter |
| 4. | Rt. 61 & Grant Street | 4 – inch meter |
| 5. | Crossroads Corporate Center | 8 – inch meter |
| 6. | Tuckerton Road & Rt. 61 | 8 – inch meter |

All operating well stations are visited at least once per day and pumpage rates are manually recorded. Flow data output from all stations is incorporated into the Authority's system-wide SCADA network for monitoring, trending and alarming. Muhlenberg Township Authority has in place a meter calibration and maintenance program for routine testing of all supply and interconnection meters.

- (e) Service Metering – The Muhlenberg Township Authority system serves about 15,300 people in Muhlenberg Township (including the former Borough of Temple), 3,624 people in Laureldale Borough and 152 people in Alsace Township. Public water supply is provided to 8,010 domestic, 590 commercial, 46 industrial and 44 municipal metered customers. All customers are currently metered. Domestic meters are primarily positive displacement type meters with outside touch read capabilities. Commercial, industrial, and public meter types vary dependent upon the type of application. Water billing is based on metered usage. Muhlenberg Township Authority has in-place a meter calibration maintenance, and replacement program for the

routine testing, repair, and/or replacement of all service meters. Meters are tested according to the following guidelines:

<u>Size/Type</u>	<u>Frequency</u>	<u>Registration Variance</u>
Supply Meter	2 years	4% at 20 gpm
> 1 – Inch	4 years	4% at 20 gpm
1 – Inch	6 years	4% at 20 gpm
¾ - Inch	8 years	4% at 10 gpm
5/8 – Inch	10 years	4% at 6 gpm

- (f) Continue to monitor meter-reading results with immediate attention to stopped meters or unexplained sizeable reductions or increases in consumption.
- (3) Pricing. Establish water service prices that cover costs of service, discourage water waste, and provide for additional supply development.
 - (a) Consider a uniform commodity rate structure for water use above the minimum charge.
 - (b) Periodically reevaluate water rates to insure adequate coverage of costs.
 - (c) Consider surcharges for excess water use by heat transfer equipment, such as air conditioning, refrigeration, heat pump, and other heating or cooling equipment.
- (4) Leakage and Loss management. Continue to maintain levels of un-metered water that are less than 15 percent of the total water supplied to the system. Muhlenberg Township Authority is diligent in monitoring its distribution system for leaks. The Authority has conducted system-wide leakage surveys in 1985, 1989, 1990, 1991, 1992, 1994, 1999, 2004 and 2006. Leakage location programs include computerized leak location technique to eliminate “hit or miss” techniques requiring multiple excavations with high labor and equipment costs and the accompanying disruptions of service. Highly sensitive listening devices are used to detect the presence of a leak. Once a leak is detected a Correlator (which employs the principle of time-of-flight measurements of sound waves) is used to determine the precise location of the leak. Leak detection services are provided as part of both a routine maintenance program and on an

emergency basis. Leakage repairs are performed either by Authority Personnel or by subcontractor.

Based on historical trends the Authority has established a triggering point for the need of a leakage survey when the water system equals or exceeds 15 percent.

Unaccounted-for-water. Unaccounted-for-water amounts in recent years was 19.6% in 2007 and 15.4% in 2008. Non-revenue water use consisting of hydrant flushing, plant use, and leaks, fires, meter under registration has decreased from 220 MG in 2007 to 215 MG in 2008.

The Authority's Leakage and Loss Management objectives include:

- (a) Review water supply and consumption records and determine un-metered water.
- (b) Maintain records of leaks reported and repairs made to determine areas requiring additional evaluation or main replacement. Include on the record the following:
 - (1) Break Data (who it was reported by, date, location, type, and cause)
 - (2) Pipe Data (diameter, thickness, material, joint, any corrosion or siltation)
 - (3) Environs (soil type, depth of pipe, other structures/pipes in contact)
 - (4) Repairs made, start and finish time/date.
 - (5) Conditions at break
 - (6) Valves Shut Down (number, size, location, time)
- (c) Regularly update water system maps to accurately show pipelines, valves, and hydrants, as well as the age, material, size, and lining of pipelines.
- (d) Continue to monitor and inspect storage facilities for leakage.
- (e) Identify the employees responsible for leak detection, and periodically evaluate the need for leak surveys in any part of the system.
- (f) Review daily pumpage to determine whether the system demand deviates from normal patterns.
- (g) Continue to encourage leak reporting and to give high priority to the expeditious repair of leaks.

- (h) Record estimated un-metered uses, such as firefighting, fire department testing, hydrant flushing, standpipe overflows, etc.
 - (i) Continue to test and inspect new main construction.
 - (j) Continue to monitor water pumped to waste for turbidity control.
 - (k) All valves and hydrants should be exercised and sounded for leakage annually.
- (5) System Planning and rehabilitation. Plan capital additions, which improve the performance of the water system, and provide timely financing.
- (a) Plan, finance, and develop additional water supplies, as they are needed.
 - (b) Develop a continuing meter replacement program.
 - (c) Replace water mains and service lines, which are determined to have high leakage potential.
 - (d) Develop a 5-year plan for capital additions, renewals, and replacements.
 - (e) As a long-term improvement; plan to operate the system at two service pressure levels to eliminate high service pressures.
- (6) Retrofit Devices. Encourage customers to install devices at existing water fixtures to reduce flows or volumes.
- (a) Make literature on retrofit devices and their benefits available to customers, plumbers, and plumbing fixture suppliers.
 - (b) Install and evaluate retrofit devices at Authority-owned buildings and related public buildings
- (7) New Construction. Continue to require the use of water-saving fixtures and appliances in new construction and in rehabilitated construction.
- (a) No new service connections shall be made to newly constructed premises with plumbing fixtures and fittings that do not comply with water conservation performance standards contained in Resolution No. 88-2 Revision No. 2 of the Delaware River Basin Commission.
 - (b) Continue to require the installation of water-saving devices in all new construction.
 - (c) Promote the use of landscaping and irrigated techniques that reduce water use.
- (8) Water Reuse and Recycling. Encourage reuse and recycling of water.

- (a) Promote use of greywater for household and commercial plant watering, where applicable.
 - (b) Promote water recycling at industries, institutions, and businesses.
 - (c) Determine potential for irrigation with treated wastewater.
- (9) Water Use Policies. Adopt policies to encourage water conservation and to enforce policies and water use restriction.
- (a) Encourage lawn watering between 6.00 p.m. and 9:00 a.m. to reduce peak water use.
 - (b) Develop and adopt land use regulations that protect groundwater recharge areas and potential well locations.
 - (c) Institute fines for unauthorized use of water such as illegal connections and hydrant use.
 - (d) Determine the water supply conditions that will trigger the various stages of drought emergency provisions.
 - (e) Adopt policies to permit usage bans, rationing, excess use charges, and installation of flow restrictors, service termination, and fines as required during the stages of a drought emergency.