Conservation

As residents of the Commonwealth, we all have a responsibility to conserve water. As the infrastructure of our State continually changes, conservation becomes a more pertinent issue. Water is a precious resource and there is a limited supply, so please, *remember to only use what you need.*

"Do you take it for granted that every time you turn the faucet on, you have water? As a water steward, it is my duty to share some important tips on how you can conserve water. Please read these valuable tips and see how you can help conserve water."

Outdoor Water Conservation Tips

- Water the lawn only when needed
- Install an automatic irrigation system
- Plant drought resistant trees and plants
- Keep lawn free of weeds
- Mow grass higher than normal
- Don't let the hose run while washing the car
- Use a broom to clean the sidewalk and driveway instead of a hose
- Use automatic shut-off nozzles on hoses

Indoor Water Conservation Tips

Typically, inside your house, bathroom facilities constitute nearly 75% of the water used.

Bathroom Tips:

- Check all faucets, pipes and toilets periodically for leaks
- Install water saving shower heads and fixtures
- Install a low-flow toilet
- Turn off water while shaving and brushing teeth
- Don't use the toilet as a wastebasket

Kitchen and Laundry Tips:

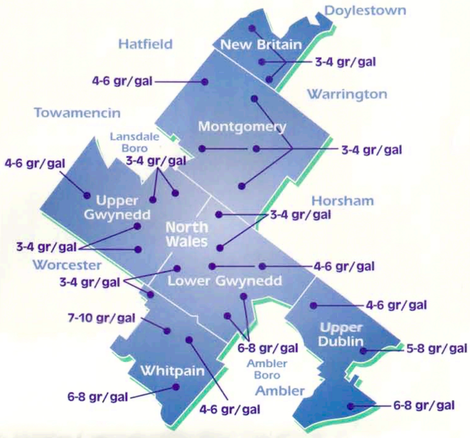
- Fill your dishwasher before you run it
- Don't let the water run while rinsing vegetables and dishes
- Select proper water level for laundry

What Makes Water Hard?

Water hardness is referred to as a measure of the soap or detergent consuming power of water. Technically, the salts of calcium and magnesium that are commonly present in natural water cause hardness.

In the water industry hardness is expressed in terms of milligrams per liter (mg/l). In the water treatment business hardness is most often expressed in terms of grains per gallon (gr/gal). The conversion factor is 17.1 mg/l equals 1 gr/gal of hardness. The table that follows describes the various textbook levels of hardness:

Description	Hardness (mg/l)	Hardness (gr/gal)
Extremely Soft	0-45	0-2.6
Soft	46-90	2.6-5.2
Moderately Hard	91-130	5.2-7.6
Hard	131-170	7.6-9.9
Very Hard	171-250	10.0-14.6



To Soften, or Not to Soften?

The typical equipment used for water softening is the ion exchange water softener. Softening is accomplished by means of synthetic resin media exchanging ions of calcium and magnesium with ions of sodium. Although this method of softening can produce water with zero hardness, it is important to understand the limitations of the process.

- Ion exchange softeners increase the sodium content of the treated water.
- Households that use these devices show elevated levels of lead and copper in the treated water.
- The softening process strips the chlorine residual from the water and may accelerate heterotrophic bacterial growth within the plumbing system.

As the Authority continues to modify and upgrade our distribution capabilities we will be able to transfer additional amounts of naturally soft Forest Park water throughout the system. This will continue to increase the quality of the water we provide and lower the levels of those factors that attribute to water hardness and the aesthetic problems they may present.

Ground Water vs. Surface Water

As water seeps through the ground to reach the aquifers it is filtered and purified through the layers of the earth. At the same time water dissolves and retains the naturally occurring minerals it comes in contact with. Ground water usually does not need to be treated because Mother Nature does such a good job with the purification process. Higher levels of dissolved solids, constant cool temperature, and low levels of dissolved oxygen characterize ground water. However, ground water may contain an abundance of the minerals that can contribute to hardness problems. Supplemental ground water supplies used by the Authority produce water with a hardness range of 12 to 15 grains per gallon.

Water that comes from streams, rivers and lakes is referred to as surface water. Surface water accumulates mainly as a result of direct runoff from rain or snow. It does not percolate through the ground and does not pick-up the elevated levels of dissolved minerals that attribute to water hardness. Surface water is referred to as 'naturally soft', although it is not mineral free. In general, turbidity, suspended solids, rapid temperature fluctuations, and high levels of dissolved oxygen characterize surface water. The Forest Park Water Treatment Plant consistently produces water for distribution with an average hardness range of 2 1/2 to 4 grains per gallon, or 45 to 65 milligrams per liter.

It is important to realize that there isn't any one area of the Authority's distribution system that is served exclusively by ground water. In those areas where the wells do run to supplement the supply, blended water is delivered. The current system ratio is 85% surface water to 15% ground water, which may vary slightly on a seasonal basis.

NWWA
NORTH WALES WATER AUTHORITY
Pure water, quality service...naturally
200 West Walnut Street, P.O. Box 1339
North Wales, PA 19454-0339

Serving 25,000+ customers in 7 municipalities in 2 counties.

1999 Water Quality Report

NWWA
NORTH WALES WATER AUTHORITY

Hi! I'm the Water Wizard

...the official mascot of the North Wales Water Authority. I am pleased to present our 1999 Water Quality report to you. First, I would like to thank the customers who provided us with feedback to our 1998 Water Quality report. We have made some changes from last year, and we hope you prefer the new format.

At the North Wales Water Authority, we take great pride in delivering high quality drinking water to our 25,000 plus customers. Our staff of dedicated employees work to bring you the finest drinking water available by producing water that meets or significantly exceeds all current standards. Please read on to see how we are able to deliver you water of outstanding quality.

Where Does Your Water Come From?

Forest Park Water, which is jointly owned by North Wales and North Penn Water Authorities, consists of a 96 million gallon per day raw water pumping station on the Delaware River at Point Pleasant and transmission mains which discharge the Delaware River water into the North Branch of the Neshaminy Creek. Once discharged, the water flows down the Neshaminy Creek through Lake Galena. The water released from Lake Galena flows two miles downstream to the Forest Park Water Treatment Plant located in Chalfont, Pennsylvania. From the treatment plant, the North Wales and North Penn Water Authorities individually take their share of the supply for distribution within their respective service areas. Currently, 85% of our water comes from the Delaware River and 15% comes from ground water sources.

Water Quality

Since the Authority operates its own distribution system, as well as being a part owner of the Forest Park Water facilities, sampling under the SDWA (Safe Drinking Water Act) is conducted independently by both utilities in accordance with appropriate requirements. This ensures that the Authority takes all distribution samples for which it is responsible and Forest Park Water takes all samples related to a surface water treatment facility. To some extent, this arrangement results in duplication of testing but ensures an added measure of quality control.

Excellent, informative report on an extremely important issue.
John McNeil, North Wales, 1998 Water Quality Report

Excellent presentation. Clean and concise.
~ Jerome Flomen, Maple Glen, 1998 Water Quality Report

The Forest Park Water Treatment Plant utilizes ozone as both a pre-treatment and post-treatment oxidant to replace chlorine in the process. Forest Park Water is one of only a handful of ozone plants currently in operation in the United States. In addition to the use of ozone and the normal treatment train of flocculation, sedimentation and filtration, Forest Park Water was constructed with granular activated carbon (GAC) contactors after the filtration train. These contactors, in combination with the use of ozone, are designed to be biologically active. This extra "polishing step" in the process ensures that any remaining organics or taste and odor compounds are removed before the water leaves the treatment plant. As a result of this process, organic contaminants that may find their way into the raw water source are effectively dealt with automatically in the process.

This treatment process ensures that customers of the NWWA are receiving the finest quality drinking water available today from any surface water treatment plant in the United States.

Monitoring Your Water

The North Wales Water Authority routinely monitors for constituents in your drinking water according to Federal and State laws. The North Wales Water Authority tables show the results of our monitoring for the period of January 1st to December 31st, 1999. All drinking water, including bottled drinking water, may be reasonably expected to contain at least small amounts of some constituents. It's important to remember that the presence of these constituents does not necessarily pose a health risk.

Every year the Authority receives a new set of monitoring requirements from the Pennsylvania Department of Environmental Protection (DEP) based on our previous results. Individual and groups of contaminants may be required to be monitored weekly, monthly, quarterly, annually, etc. Currently, the Authority monitors for ninety-three (93) contaminants at thirteen entry points and throughout the distribution system. We constantly monitor the water supply for various constituents. Our 1999 monitoring did not detect any cryptosporidium in our source water.

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons such as persons with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly, and infants can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. More information about contaminants and potential health effects can be obtained by calling the Environmental Protection Agency's Safe Drinking Water Hotline at 1-800-426-4791 or visit the EPA website at www.epa.gov/safewater/dwhealth.

Volatile Organic Contaminants

Contaminant (Unit of Measurement)	Violation Yes/No	NWWA Level Detected	Range	MCLG Goal	MCL
TTHM [Total trihalomethanes] (ppb)	No	14	1-30	0	100

Benzene (ppb), Carbon tetrachloride (ppb), Chlorobenzene (ppb), o-Dichlorobenzene (ppb), p-Dichlorobenzene (ppb), 1,2 - Dichloroethane (ppb), 1,1 - Dichloroethylene (ppb), cis-1,2-Dichloroethylene (ppb), trans-1,2-Dichloroethylene (ppb), Dichloromethane (ppb), 1,2-Dichloropropane (ppb), Ethylbenzene (ppb), Styrene (ppb), Tetrachloroethylene (ppb), 1,2,4-Trichlorobenzene (ppb), 1,1,1 - Trichloroethane (ppb), 1,1,2 -Trichloroethane (ppb), Trichloroethylene (ppb), Toluene (ppm), Vinyl Chloride (ppb) and Xylenes (ppm) were monitored but not detected.

Likely Source of Contamination TTHM (Total trihalomethanes): By-products of drinking water chlorination

Inorganic Contaminants

Contaminant (Unit of Measurement)	Violation Yes/No	NWWA Level Detected	Range	MCLG Goal	MCL
Arsenic (ppb)	No	0	0-3	N/A	50
Copper* (ppm) 9/98	No	0.6	0-0.9	1.3	AL=1.3
Cyanide (ppb) 5/97	No	0	0-5	200	200
Lead* (ppb) 9/98	No	8	0-10	0	AL=15
Nitrate (as Nitrogen) (ppm) 4/99	No	1.68	0-3.8	10	10

Antimony (ppb), Asbestos (MFL), Barium (ppm), Beryllium (ppb), Cadmium (ppb), Chromium (ppb), Fluoride (ppm), Mercury (inorganic) (ppb), Nitrite (as Nitrogen) (ppm), Selenium (ppb) and Thallium (ppb) were monitored but not detected.

* Naturally occurring levels of lead and copper in the source water are non-detectable. This table represents the level detected in the 90th percentile of homes monitored in accordance with the US-EPA Lead and Copper Rule. None of the homes monitored for these contaminants exceeded the Action Level.

Likely Source of Contamination: Arsenic: Erosion of natural deposits; runoff from orchards; runoff from glass and electronics production wastes Copper: Corrosion of household plumbing systems; erosion of natural deposits; leaching from wood preservatives Cyanide: Discharge from steel/metal factories; discharge from plastic and fertilizer factories Lead: Corrosion of household plumbing; erosion of natural deposits Nitrate (as Nitrogen): Runoff from fertilizer use; leaching from septic tanks; erosion of natural deposits

Radioactive Contaminants

Contaminant (Unit of Measurement)	Violation Yes/No	NWWA Level Detected	Range	MCLG Goal	MCL
Alpha emitters (pCi/l)	No	< 3	N/A	0	15
Combined radium (pCi/l)	No	< 1	N/A	0	5

Likely Source of Contamination: Alpha emitters and Combined radium: Erosion of natural deposits

Microbiological Contaminants

Contaminant (Unit of Measurement)	Violation Yes/No	NWWA Level Detected	Range	MCLG Goal	MCL
Total Coliform Bacteria	No	0	N/A	0	presence of coliform bacteria in 5% of monthly samples
Fecal Coliform and E. coli Bacteria	No	0	N/A	0	a routine sample and repeat sample E.coli Bacteria are total coliform positive, and one is also fecal coliform or E. coli positive
Turbidity (NTU)	No	0.04	0.03-0.07	N/A	TT

Likely Sources of Contamination: Turbidity: Soil runoff

Synthetic Organic Contaminants Including Pesticides & Herbicides

2,4-D (ppb), 2,4,5-TP (Silvex) (ppb), Alachlor (ppb), Atrazine (ppb), Benzo(a)pyrene (PAH) (nanograms/l), Chlordane (ppb), Dalapon (ppb), Di(2-ethylhexyl) adipate (ppb), Di(2-ethylhexyl) phthalate (ppb), Dinoseb (ppb), Endrin (ppb), Heptachlor (nanograms/l), Heptachlor epoxide (nanograms/l), Hexachlorobenzene (ppb), Hexachlorocyclo-pentadiene (ppb), Lindane (nanograms/l), Methoxychlor (ppb), Pentachlorophenol (ppb), Picloram (ppb), Simazine (ppb) and Toxaphene (ppb) were monitored but not detected.

Data presented in the above tables is from the most recent testing and monitoring done in accordance with the regulations of the Pennsylvania Department of Environmental Protection.
VOC testing was last performed 3/99 • TTHM monitoring was performed quarterly throughout 1999
Unless otherwise noted, IOC testing was last performed 2/97 • Radiological testing was last performed 7/96
SOC testing was last performed 8/97 • Bacteria and turbidity are monitored on a continuous basis

Customer Service

The North Wales Water Authority continues to make great strides in delivering superior customer service. Over the past year we have implemented a number of components to serve you more effectively. For instance, we created a Welcome Packet for all of our new customers. The Welcome Packet includes a company brochure, shut-off valve tag, dye tablets, a leak card with conservation information and applications for our value-added services. To service our existing customers with the same important information, we have been sending out these materials through quarterly mailings.

Customer feedback is a crucial part of delivering superior customer service. We developed a short customer survey that is sent to customers who have contacted our office. If you should happen to receive one of these surveys, we would appreciate you taking a few minutes out of your day to let us know how we are doing. You may also obtain the questionnaire from our website.

Educational programs are a critical element to our strategic plan. Over the past year we have developed a more extensive public outreach program. During the year, we give tours of the Forest Park Water Treatment Facility to civic organizations, schools, scout troops and local groups. We also participate in various municipal community days and the Water Wizard makes special appearances throughout the areas we serve.

In conjunction with North Penn Water Authority, we offer the Clean Stream Program to area schools. This program allows the children to get their feet wet in local streams as a way to learn more about water, our most vital resource.

Through our various outreach programs, it is our hope that we can produce lifelong water stewards.

Our regularly scheduled public meetings are held at 7:00 pm on the 1st and 3rd Wednesday of the month at the North Wales Water Authority.

If you have a community event you would like us to participate in or you are interested in a tour of Forest Park Water, please contact our public relations department.

NWWA
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In these tables you will find many terms and abbreviations you might not be familiar with.

Non-Detects (ND) - laboratory analysis indicates that the constituent is not present.
Parts per million (ppm) or Milligrams per liter (mg/l) - one part per million corresponds to one minute in two years or a single penny in $10,000.
Parts per billion (ppb) or Micrograms per liter - one part per billion corresponds to one minute in 2,000 years or a single penny in $10,000,000.
Parts per trillion (ppt) or Nanograms per liter (nanograms/l) - one part per trillion corresponds to one minute in 2,000,000 years or a single penny in $10,000,000,000.
Parts per quadrillion (ppq) or Picograms per liter (picograms/l) - one part per quadrillion corresponds to one minute in 2,000,000,000 years or one penny in $10,000,000,000,000.
Picocuries per liter (pCi/L) - picocuries per liter is a measure of the radioactivity in water.
Million Fibers per Liter (MFL) - million fibers per liter is a measure of the presence of asbestos fibers that are longer than 10 micrometers.
Nephelometric Turbidity Unit (NTU) - nephelometric turbidity unit is a measure of the clarity of water. Turbidity in excess of 5 NTU is just noticeable to the average person.

This was an excellently produced report. Thanks for the information.
~ Francis & Rita Ferris, Jr., North Wales, 1998 Water Quality Report

WWW.NWWATER.COM

Another important customer service feature that we have added during the past year is our newly designed website. The website provides you with a wide variety of information about conducting business with the Authority, the services we offer, plus a wealth of information about the water that is delivered to you.

Log on to find the following information at your fingertips:

- Business hours
- Emergency information
- Value-added services and applications
- How to read your meter
- How to read your water bill
- Explanation of billing charges
- Payment options
- Conservation tips
- Where does your water come from
- Water hardness information
- Forest Park Water Treatment Facility
- Links to industry websites
- Authority literature including newsletters, annual reports and conservation information

...Plus much more.

Be sure to visit us frequently since we are always adding important information to our site.

To help you better understand these terms, we've provided the following definitions:

AL – Action Level - the concentration of a contaminant which, if exceeded, triggers treatment or other requirements which a water system must follow.
TT – Treatment Technique - A treatment technique is a required process intended to reduce the level of a contaminant in drinking water.
MCL – Maximum Contaminant Level - The "Maximum Allowed" (MCL) is the highest level of a contaminant that is allowed in drinking water. MCLs are set as close to the MCLGs as feasible using the best available treatment technology.
MCLG – Maximum Contaminant Level Goal - The "Goal" (MCLG) is the level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs allow for a margin of safety.

Glad it's pure! ~ Jean Cox, Ambler, 1998 Water Quality Report