DRINKING WATER SOURCE PROTECTION PLAN
for the
CITY OF NEWTON FALLS

DECEMBER 2014

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Cover Photo: "USACE Berlin Dam Mahoning River" by Margaret Luzier, U.S. Army Corps of Engineers - U.S. Army Corps of Engineers Digital Visual Library

Executive Summary

The City of Newton Falls operates a community public water system that serves a population of approximately 5,043 people. The water treatment plant draws raw water from the East Branch of the Mahoning River. The drainage area of the watershed is approximately 1,144.6 square miles. As described in pages 9 to12 of this document, the water quality of the East Branch of the Mahoning River has been impacted by agricultural runoff, particularly around Berlin Reservoir and along Kale Creek. As a result, the river frequently contains high levels of turbidity and pathogens. Additionally, a series of dams along the river have highly altered the flow regime. The relatively low-energy conditions of the reservoirs encourage algae growth, increasing issues with turbidity, taste and odor, and disinfection byproducts at drinking water treatment systems, especially when releases from the reservoirs are at their peak.

In 2014 the City of Newton Falls hired Economic Development Data Services (EDDS) to help develop a drinking water source protection plan for the city's drinking water supply. Planning meetings included staff from the city, EDDS, Trumbull County Soil and Water Conservation District and Ohio EPA.

The planning team concluded that it could most effectively focus on three efforts:

(1) supporting the Soil and Water Conservation District staff of Trumbull and Mahoning Counties in their efforts to encourage the agricultural community in the source water protection area to adopt (or continue) best management practices, such as planting winter cover crops, installing filter strips, and avoiding application of pesticides, fertilizers or manure on frozen ground or just before precipitation events;

(2) tracking the permitting of new oil and gas wells, to understand how quickly a spill at a well pad might make its way to the intake, and to ensure that local emergency response teams are aware of their proximity to the intake;

(3) establish good contacts with local emergency responders, to ensure they know to report immediately to the water department about any spills into Lake Milton or the Corridor Management Zone of Newton Falls' source water protection area.

The Implementation Plan provided in the following three pages (for quick reference) summarizes activities that are ongoing in the city's source water protection area, as well as some additional activities that will be initiated in the following year or so. These activities are discussed in greater detail on pages 19 to 23.

Implementation Plan

Bolded items indicate new strategies; others are ongoing

Activity	***Responsible Party***	***When Implemented***	***Comments***
SOURCE MANAGEMENT ACTIVITIES			
Reduce runoff from agricultural fields and ditches			
Conservation programs administered by the Soil and Water Conservation District	Trumbull and Mahoning County SWCDs	Ongoing	See pages 19 and 25 for details
Manage risk associated with oil and gas exploration			
Maintain up to date inventory of well permits issued through the Ohio Department of Natural Resources (ODNR)	PWS Operator	Beginning January 2015 New permits checked quarterly	See page 19 - 20 for details
Maintain up to date maps of existing and proposed oil and gas pipelines	PWS Operator	Beginning January 2015 New permits checked quarterly	
Coordinate with Emergency Responders - Trumbull and Mahoning Counties	PWS Operator	Beginning January 2015 Ongoing	
Highways - Spills			
Investigate possibility of installing signs at I-76 bridge over Lake Milton	City Manager	January 2015	See page 19 - 20 for details

Activity	***Responsible Party***	***When Implemented***	***Comments***
Ask Newton Falls Joint Fire District and both Trumbull and Mahoning County Sheriff's Departments to notify water treatment plan of any spills into Lake Milton or Mahoning River upstream from Newton Falls.	City Manager	**Changes in contact information to be provided as they occur, or at least on annual basis.**	See page 21 for details
EDUCATION AND OUTREACH			
Consumer Confidence Report. **Include info on source water protection plan in CCR.**	**PWS operator and staff**	Annually	CCR is updated annually and made available on village web site
Plant tours Offer tours upon request.	PWS staff	Ongoing – as requested	
Web Page **Post information about source water protection strategies on the Water Plant's web page**	**PWS and/or Team outreach members**	**Starting January 2015 and ongoing as needed thereafter**	See page 25 for details
Brochure **Create brochure about Newton Falls' source water protection plan for distribution at appropriate venues**	**Team outreach members, with OEPA assistance**	**Begin drafting January 2015 for posting on web page by March 2015**	See page 25 for details
Festivals **Brochures about Newton Falls' SWAP program will be made available at the Fourth of July festival and at the Fireman's Chili Cook-off**	**Team outreach members**	**Starting summer 2015 and annually thereafter**	See page 25 for details
Newspaper **Publicize conservation and source water protection efforts in the local newspaper**	**Team outreach members**	**As available**	

Activity	***Responsible Party***	***When Implemented***	***Comments***
Earth Day **Provide information about Newton Falls' SWAP during the City-wide cleanup around Earth Day.**	**Team outreach members**	**Starting April 2015 and annually thereafter**	See page 25 for details
CONTINGENCY PLANNING			
Plans for Short and Long-term Water Shortages	PWS operator		See page 20 - 23 for details
Update Emergency Contacts PWS staff will notify Newton Falls Fire Department of changes in contact staff on at least an annual basis.	PWS operator	As part of annual contingency plan review /update	
Spill Response	PWS operator		Documented in plant's contingency plan, which is reviewed and updated annually
SOURCE WATER MONITORING			
Raw Water Sampling PWS staff will continue to sample raw water at intake before pumping to reservoirs	PWS staff	Ongoing	See page 26 for details

Source Water Protection Plan for the City of Newton Falls

Purpose

The goal of this document is to summarize strategies that are ongoing and/or will be pursued in the future to minimize the threats of contamination or water shortage to Newton Falls' source of drinking water—the East Branch of the Mahoning River. Although Newton Falls treats the water to meet federal and state drinking water standards, conventional treatment does not fully eradicate all potential contaminants, and beyond-conventional treatment is often very expensive. By completing this plan, the City of Newton Falls acknowledges that implementing measures to prevent spills and releases into the East Branch of the Mahoning River can be a relatively economical way to help ensure the safety of the City's drinking water, while also improving river quality for other uses.

Why should a community have a source water protection plan? Water is a vital part of all facets of our communities. It is essential to agriculture, to washing, to cooling for industry and power stations, to moving wastewater away from populated areas and above all, to drinking. In addition to being a basic necessity of life, clean, affordable water can be an important economic driver. Many manufacturing plants use significant amounts of water and can even decide plant locations based on the availability of quality water. Clean water, provided at a reasonable cost, can attract new business and residents which help fuel economic growth and prosperity.

Governments invest a significant amount of money and time in their water treatment and distribution; *keeping the water source clean keeps costs as low as possible*. When contamination occurs, it can have a huge financial impact on communities and entire financial reserves can be wiped out. Contamination also disrupts lives and businesses, creating a negative economic effect for the local community. Most importantly, when drinking water is contaminated, the health of our families and fellow citizens is put at risk.

Because it only takes one major event to drastically change the quality of your water source, it is critical to plan ahead. Protection planning can prevent a future event entirely, minimize a potential threat, or simply prepare the community for when something does happen to the water supply. A source water protection plan can also be used when evaluating potential development opportunities that may affect drinking water supplies in the future.

- ✓ It helps the City provide the safest and highest quality drinking water to its customers at the lowest possible cost.

- ✓ It establishes activities to minimize the threats to the source of drinking water.
- ✓ It helps to plan for expansion, development, zoning, and emergency response issues.
- ✓ It can provide more opportunities for funding to improve infrastructure, purchase land in the protection area, and other improvements to the water system.

Background

Source Water Protection

Source water assessment and protection (SWAP) is a non-regulatory state program administered by the Ohio Environmental Protection Agency. The program started as the Wellhead Protection Program, which was part of the 1986 amendments to the federal Safe Drinking Water Act. These amendments required states to administer a source water protection program for their systems using ground water. In 1992 Ohio's Wellhead Protection Program was approved by the U.S. Environmental Protection Agency. The wellhead protection program provided guidance and technical assistance to public water systems, who were encouraged to complete assessments and protection plans using their own resources. Ohio EPA staff reviewed the assessments and formally endorsed them, when complete.

In 1996, the Safe Drinking Water Act was amended again. Section 1453 was added, providing states with the necessary federal funding to complete source water assessments for their public water systems. At that time, the program was extended to include surface water systems and was renamed "Source Water Protection." It was the intent of Congress that public water systems use the information in their source water assessment to develop a drinking water source protection plan. The background information presented here includes information from the Newton Falls source water assessment report completed by Ohio EPA in February 2003, but expands on it considerably, using data from Ohio EPA's 2011 Total Maximum Daily Load (TMDL) study of the Upper Mahoning River Watershed.

This plan was drafted by Ken Harsch, working with Newton Falls staff, and with assistance from Ohio EPA. The local planning team includes:

Jeff Hawkins, Water Plant superintendent
Jack Haney, City Manager
Amy Reeher, Trumbull County Soil and Water Conservation District

Public Water System Description

The City of Newton Falls is a community of 4,795 (2010 census data). The City of Newton Falls Water Department services this community and approximately 632 customers outside the City. The East Branch of the Mahoning River serves as the raw water source for the City. Water is pumped from an intake on the East Branch of the Mahoning River at the corner of Starr Street and Riverside Drive in Newton Township to the water treatment plant. The treatment capacity is approximately 1.5 million gallons per day, but current average production is about 0.6 million gallons per day.

The Newton Falls public water system consists of a conventional filtration water treatment system with one elevated standpipe storage tower in the distribution system. The system has a storage capacity of 730,000 gallons. The intake was built in 1958. The intake is visually inspected twice a day, with intake screens cleaned as needed.

Description of Source Water Area

The Mahoning River is a 108-mile tributary to the Shenango River. The Mahoning River originates in the north western corner of Columbiana County and flows north between Sebring and Alliance, passes through the Berlin Reservoir and Lake Milton prior to flowing through Newton Falls. The Mahoning River joins the West Branch just north of Newton Falls and eventually flows into Pennsylvania and joins the Shenango River near New Castle, Pennsylvania to form the Beaver River. The Beaver River is a tributary to the Ohio River. The Mahoning River watershed covers 1,144.6 square miles in portions of Columbiana, Portage, Mahoning, Trumbull, Stark, Geauga, and Ashtabula Counties in Ohio, and Lawrence County in Pennsylvania. Its average fall from the headwaters of the Mahoning River to the intake is 7.4 feet per mile.

Kale Creek joins the Mahoning River just south of Newton Falls. The land use surrounding Kale Creek is mainly agricultural and contributes significantly to the turbidity of the Mahoning River as it flows through Newton Falls. According to the 2011 Total Maximum Daily Load (TMDL) study of the Upper Mahoning River Watershed (Ohio EPA, 2011), the majority of the aquatic life use impairment was found on Kale Creek where three sampling sites were not attaining water quality standards, and three were only partially attaining. The areas of non-attainment are due to alterations in stream side vegetative cover and siltation. Additionally, one area was found to have low dissolved oxygen that may be a result of failing septic systems. Partial attainment was attributed to low dissolved oxygen and turbidity due to agricultural practices (Ohio EPA, 2006).

The source water protection area for Newton Falls' intake comprises only that portion of the Mahoning River watershed that drains into the river upstream from the intake. This area is shown in Figure 1. It covers approximately 305 square miles, or about 7% of the total watershed area. This area lies within the Killbuck-Glaciated Pittsburgh Plateau Physiographic Region and Erie/Ontario Drift and Lake Plain Ecoregions, which are

characterized by a rolling landscape composed of low rounded hills with scattered end moraines and kettles. Urban-industrial activity, as well as dairy, livestock, corn and soy-bean farming are common.

Within the protection area, the predominant land use is agriculture, with pasture/hay farms (33%), followed by deciduous forests (30%) and row crops (22%). Soils are somewhat poorly drained to moderately well drained and are formed in glacial till and outwash or lacustrine materials.

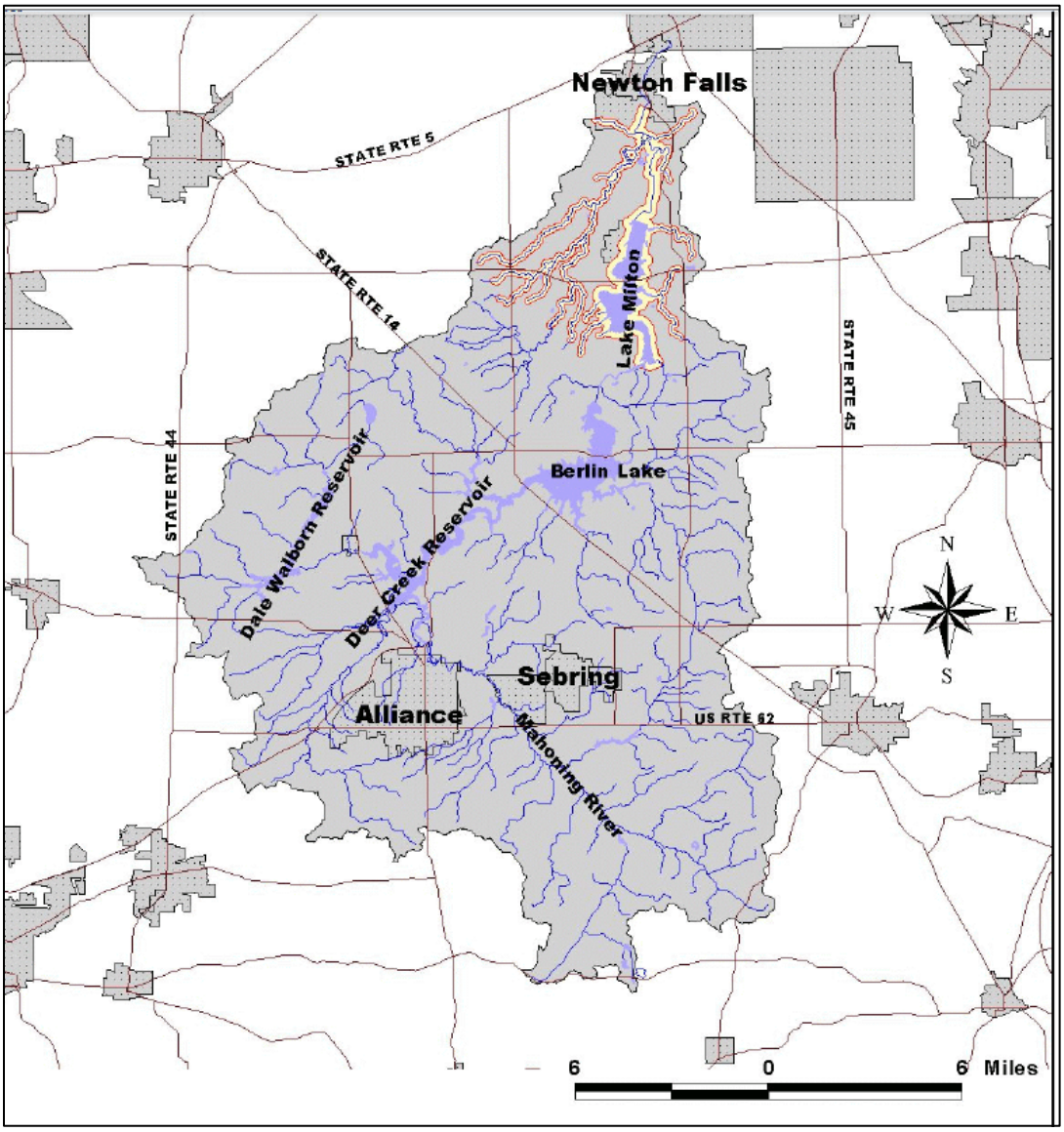

Figure 1 -- Source water protection area for the City of Newton Falls, with the Corridor Management Zone outlined in red. (From Ohio EPA's 2003 *Drinking Water Source Assessment report for the City of Newton Falls*)

Source Water Quality

The primary water quality impacts in the Mahoning River at the Newton Falls intake are soil disturbance (technically known as "hydromodification"), runoff from agricultural fields, and pathogens from upstream septic overflows.

Hydromodification. The East Branch of the Mahoning River receives flow from Kale Creek which drains numerous agricultural drainage ditches. These typically are straight, following property boundaries, and U-shaped in cross-section. Both features allow for unusually rapid flow, which intensifies erosion of the ditch banks and channel, resulting in higher turbidity levels in the river. High turbidity levels are often associated with greater levels of disease-causing microorganisms (viruses, parasites, and bacteria). Water treatment plant staff report significant raw water turbidity increases following storm events, especially noticeable in Kale Creek. These appear to be due to agricultural activities and soil erosion in the upstream areas. A public water system is required to treat the water until it registers below 0.3 NTU in 95 percent of the samples for the month; in all cases water quality must not exceed five NTU before the water can be released to the distribution system for public consumption.

Water treatment plant personnel also indicated that atrazine (a common herbicide synthetic organic compound) levels are typically higher in raw water samples during the corn growing season (May-June) and particularly after storm events.

Additionally, soil particles carry organic material that may combine with chlorine to form disinfection byproducts (primarily trihalomethanes and haloacetic acids), which may increase the risk of cancer. The Maximum Contaminant Limit (MCL) for trihalomethanes as a group is 80 ug/l as an annual average; the MCL for haloacetic acids as a group is 60 ug/l as an annual average. Removing disinfection byproducts is difficult and expensive, raising the costs of providing safe drinking water.

Nutrients and Pesticides. Seasonal applications of nutrients (primarily nitrate and phosphate) and pesticides can have a significant impact on water quality. Nitrate has health impacts and therefore has a Maximum Contaminant Limit (MCL) of 10 mg/l in drinking water. Phosphate has no direct health impacts on humans, but encourages the growth of algae. When the algae die, they decompose and release organic compounds that result in taste and odor issues for drinking water, as well as an increase in disinfection byproducts. Cyanobacteria, ("blue-green algae"), have become a major concern in Ohio due to their ability to form toxins that are dangerous for humans to bathe in or drink. Most public water suppliers use activated carbon to treat taste and odor and toxins released by cyanobacteria, but carbon treatment is very expensive.

Pathogens. Various areas along the Mahoning River and its tributaries do not have central sewer service, therefore illicitly discharging home septic systems increase the likelihood of pathogen impairment. Other sources of pathogens include upstream wastewater treatment systems. Before distributing water for public consumption, a public water supplier is required to disinfect the water until no *E. coli* can be detected.

These sources are discussed in more detail under the Potential Contaminant Source Inventory section.

Stream Designation for Aquatic Life

The Ohio EPA conducted a TMDL study for the Upper Mahoning River that was signed off by the United States Environmental Protection Agency (U.S. EPA) in 2011. The TMDL lists the watershed area around Newton Falls as 25% non-attainment, 42% partial attainment and 33% full attainment for aquatic life use. According to the report, the majority of the impairment was found on Kale Creek where three sites were non-attaining and three were partially attaining. Additionally, partial attainment was found on the mainstem of the East Branch of the Mahoning River in Newton Falls. The TMDL indicates that excess fine sediment, elevated nutrient concentrations and unnatural stream flow conditions accounted for 75% of the causes of aquatic life use impairment. As shown in Figure 2, the greatest impairment related to excessive nutrients occurs in the upper reaches of the watershed, above Berlin Reservoir. Newton Falls water treatment plant staff note that water quality at the city intake is lower when the Berlin Reservoir is releasing large amounts of water.

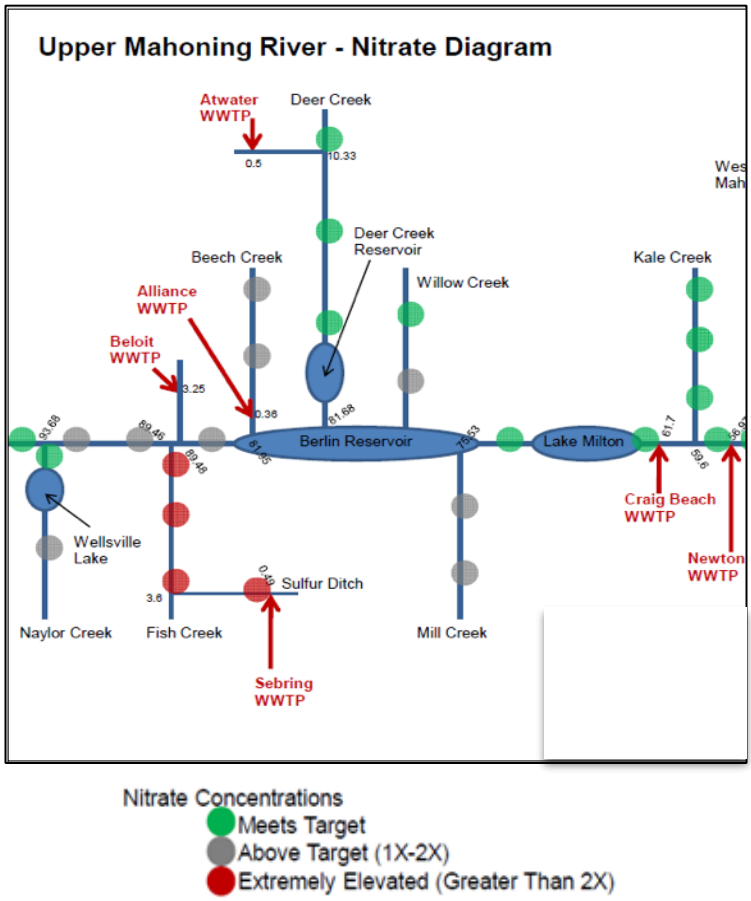

Figure 2 – Diagram of nitrate levels measured at stream sites from headwaters of Upper Mahoning (left) to Newton Falls. (adapted from Ohio EPA, 2011).

Flow in the East Branch of the Upper Mahoning is regulated by releases from the dams below Berlin Lake and Lake Milton. These releases are coordinated by the Army Corps of Engineers' Pittsburgh office on a daily basis. In general, Berlin reservoir is emptied more during the summer, starting in mid-July, while Lake Milton is emptied more during the winter. Since the City is obliged to pump on a daily basis, due to limited storage, it cannot turn off the intake for any extended period of time to avoid particularly low-quality water, but it may be able to avoid some of the most degraded water by tracking major dam releases. The status of water releases is reported daily via voice mail at 330-547-5445.

Treated Water Quality

The Newton Falls public water system has generally been successful in treating water to meet state and federal drinking water quality standards. However, as shown in Table One, levels of total trihalomethanes have exceeded the MCL in the past. According to Ohio EPA's records, the city was issued violation notices in September and December of 2010, and in March of 2011. As noted above, trihalomethanes form when chlorine combines with organic material. Reducing the levels of turbidity and plant material, especially algae, in the source water would help prevent the formation of THMs.

Table 1. Water Quality Monitoring Summary of Treated Water, City of Newton Falls PWS

Ohio EPA Public Water System Compliance Monitoring Database (January, 1999 – November, 2014)

NOTES: Primary Maximum Contaminant Limits (MCLs) are health-based standards. Some constituents only have Secondary MCLs, which refer to taste, odor or appearance (staining of fixtures or clothing), not related to health. Action Levels apply to lead, copper, and some radioactive contaminants, which typically originate in individual homes and must be tested in the homes.

Contaminant (units)	Levels Found	Primary MCL	Secondary MCL	Action Level	MCL Violation ?[a]	Typical Sources Related to Human Activities[b]
Barium (mg/l)	0.017 – 0.031	2	*	*	NO	Runoff from mining and metal refineries wastes
Copper (mg/l)	0.0614 – 0.227	*	*	1.3	*	Corrosion of household plumbing systems.
Fluoride (mg/l)	0.93 – 1.49	4	2	*	NO	Additive promoting strong teeth. Discharge from fertilizer and aluminum factories
Lead (µg/l)	5.41 – 5.6	*	*	15	*	Corrosion of household plumbing systems
Nitrate (mg/l)	0.1 – 2.4	10	*	*	NO	Runoff from fertilizer use, leaching from septic systems, sewage
Nitrite (mg/l)	0.2	1	*	*	NO	Runoff from fertilizer use; Leaching from septic tanks, sewage.
Phosphate (mg/l)	0.24 – 3.59	*	*	*	*	Runoff from fertilizer use; Leaching from septic tanks, sewage.
Phosphorus (mg/l)	0.12 – 1.77	*	*	*	*	Runoff from fertilizer use; Leaching from septic tanks, sewage; Discharge of industrial waste
Radioactive Constituents						
Beta/photo emitters (pCi/L)	5.02	*	*	50	NO	Discharge from production of luminous dials and smoke

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Ohio EPA Public Water System Compliance Monitoring Database (January, 1999 – November, 2014)

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Contaminant (units)	Levels Found	Primary MCL	Secondary MCL	Action Level	MCL Violation ?[a]	Typical Sources Related to Human Activities[b]
Radium-228 (pCi/L)	0.4	5	*	*	NO	dials and smoke detectors, hospital wastes, nuclear power plants
Synthetic Organic Contaminants including Herbicides and Pesticides						
Atrazine (µg/l)	0.31 – 1.6	3	*	*	NO	Herbicide runoff
Simazine (µg/l)	0.14	4	*	*	NO	Herbicide runoff
Volatile Organic Contaminants						
Xylenes (mg/l)	0.0008	10	*	*	NO	Discharge from petroleum factories; Discharge from chemical factories
Bacteriological						
Cryptosporidium	1	*	*	*	*	Animal waste
Disinfection By-Products (DBP's)						
TTHMs [Total Trihalomethanes] (µg/l)	19.8 – 184.6	80	*	*	YES[c]	By-product of drinking water chlorination
Bromodichloromethane (µg/l)	5.6 – 51.6	Primary MCL = 80 µg/l for the SUM of these four constituents, which are products of chlorinating the drinking water				
Chloroform (µg/l)	12.4 – 89.5					
Bromoform (µg/l)	0.5 – 56.2					
Dibromochloromethane (µg/l)	0.9 – 76.8					

Table 1. Water Quality Monitoring Summary of Treated Water, City of Newton Falls PWS

Ohio EPA Public Water System Compliance Monitoring Database (January, 1999 – November, 2014)

NOTES: Primary Maximum Contaminant Limits (MCLs) are health-based standards. Some constituents only have Secondary MCLs, which refer to taste, odor or appearance (staining of fixtures or clothing), not related to health. Action Levels apply to lead, copper, and some radioactive contaminants, which typically originate in individual homes and must be tested in the homes.

Contaminant (units)	Levels Found	Primary MCL	Secondary MCL	Action Level	MCL Violation ?[a]	Typical Sources Related to Human Activities[b]
HAA5s [Total Haloacetic Acids] (µg/l)	18.5 - 115	60	*	*	NO	By-product of drinking water chlorination
Dibromoacetic Acid (µg/l)	1 – 4.2	Primary MCL = 80 µg/l for the SUM of these five haloacetic acids, which are products of chlorinating the drinking water.				
Dichloroacetic Acid (µg/l)	6.2 - 56					
Trichloroacetic Acid (µg/l)	5.2 - 53					
Monobromoacetic Acid (µg/l)	1.3 – 4.2					
Monochloroacetic Acid (µg/l)	2.1 – 10.1					

[a] A sampling result that exceeds the MCL value does not necessarily indicate a violation by the public water system. MCL violations for many contaminants are based on a running annual average instead of a single exceedance.

[b] All inorganic and radioactive constituents listed here are also naturally-occurring in the environment at some level.

[c] MCL violations for TTHM's in 2010 and 2011.

Identification of Local Source Water Concerns

Area of Focus

While the entire source water area contributes to Newton Falls' water supply, it is impractical to focus on such a large area. Instead, Ohio EPA encourages a community to focus its efforts on the "corridor management zone" (CMZ), which is defined as a zone that extends upstream ten miles from the intake that is 1,000 feet wide on each side of the main stem and 500 feet wide on each side of the tributaries (Figure 3). This area includes the emergency management zone (EMZ), which is defined as a semi-circle that extends 500 feet upstream and 100 feet downstream of the intake. It is especially important that potential contaminant sources be minimized within the EMZ, as a spill at this location could easily result in contaminants entering the intake before the public water supplier even becomes aware of the accident.

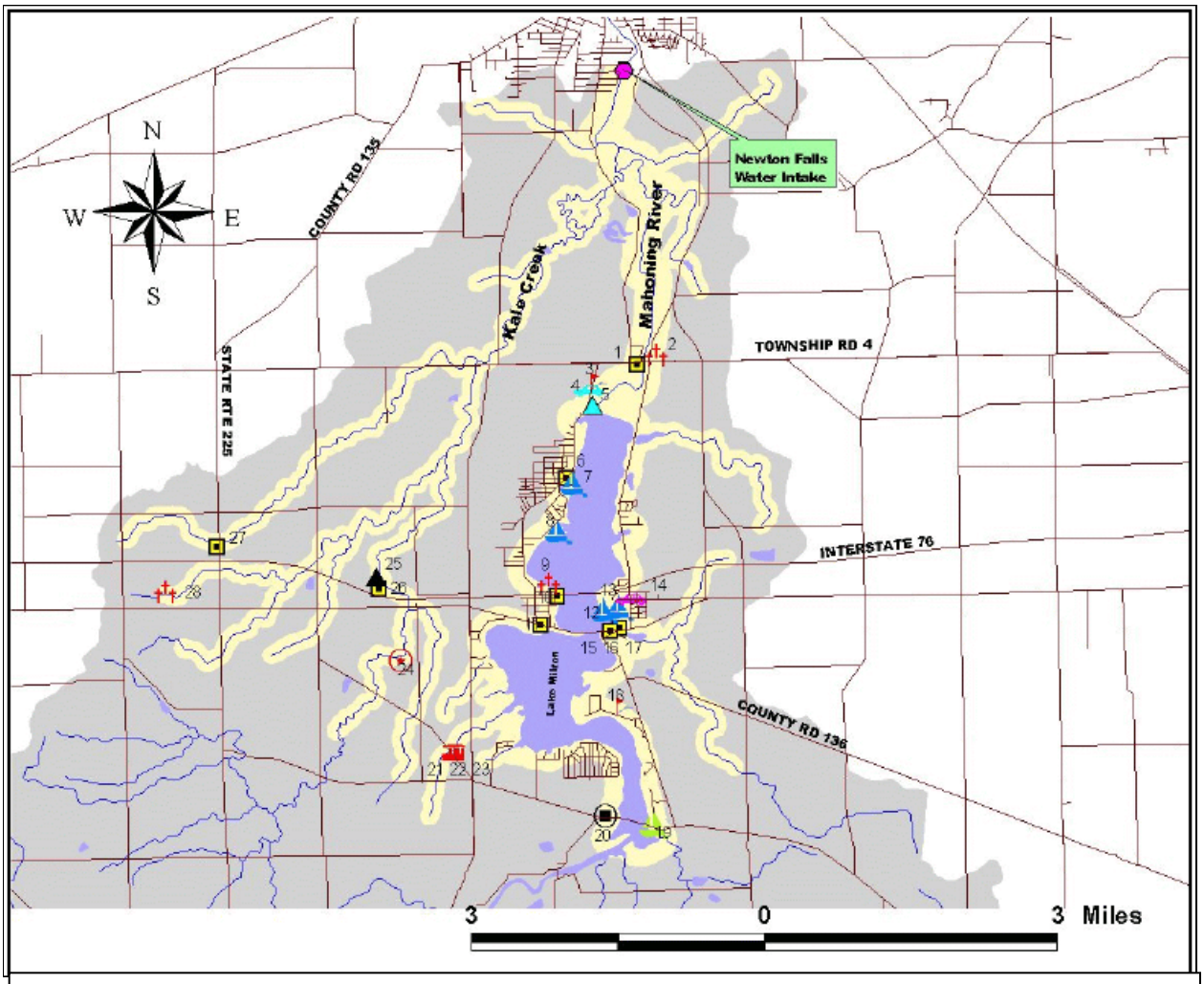


Figure 3. Corridor Management Zone (shown in yellow) for the Newton Falls Source Water Protection Area. (EPA, 2003)

Potential Contaminant Source Inventory

To develop appropriate strategies for preventing contamination of Newton Falls' source water, it is necessary to drive through the area and note the types of activities or facilities occurring within it. Ohio EPA staff conducted a comprehensive inventory of the CMZ area in 2003, and a more cursory inventory was conducted in 2014, to verify that no major changes had occurred since then.

Septic System Discharges: Discharges from septic systems within the CMZ have a high potential to negatively impact the water quality in Lake Milton, particularly in the introduction of fecal coliform bacteria. Based on the relatively low population density in the protection area, this is considered to be a medium priority threat.

Oil and Gas Production: Recent oil and gas production in the Marcellus and Utica shales has been focused primarily to the south and east of the City, with no new production wells identified within the CMZ. However, transportation of products and wastes associated with shale gas development poses risks to the city's source waters. Each hydraulically fractured well requires 2 to 5 million gallons of water to be introduced to the subsurface, half of which is then extracted with entrained hydrocarbons and metals for disposal at a distant injection well. Traffic and train accidents during the transportation of this "produced water" are a primary threat to water quality in Lake Milton and the Mahoning River. Other potential sources of contamination associated with the oil and gas industry include blow outs at the well head, leaks or overflows of sludge pits, and pipeline breaks. The risk of impact to water quality from these sources make this threat a high priority.

Agricultural Activities: Threats posed by agriculture in the protection area include agricultural and animal feedlot runoff, manure handling facilities, and agricultural chemicals. Pasture and hay (33%) and row crops (22%) make up the major portion of land use within the CMZ. In the Spring, the City has encountered elevated synthetic organic compounds (SOCs), such as alachlor, atrazine, and simazine, which are likely from agricultural runoff. The areas of primary concern regarding agricultural runoff are around the banks of Kale Creek. Mitigating risks from agriculture is of high priority.

Wastewater Treatment Plants: As shown on Figure 4, there are five wastewater treatment plants within the source water area, and two facilities permitted for industrial waste discharge within the source water area. Two of the wastewater treatment plants (Craig Beach and NEO Church of God Campground) are in significant noncompliance with their NPDES permit. The significant non-compliance for Craig Beach was for positive bacteria samples. The plant currently has plans to upgrade the plant to minimize the non-compliance issues. The NEO Church of God Campground has plans to tie into the sanitary sewer. Two of the three remaining plants have been in noncompliance for several quarters of the last couple years. While water quality issues may be present at the

wastewater treatment plans that are noncompliant, the issues are minor relative to the discharge limits of their permit:

Municipal NPDES Permits

Craig Beach (Mahoning River below Lake Milton)

Green Acres Campground (Lake Milton)
NEO Church of God Campground (tributary to Mahoning River)
Nemenz Little Village Shoppe (tributary to Kale Creek)

Industrial NPDES Permits

Rinker Materials (Kale Creek)

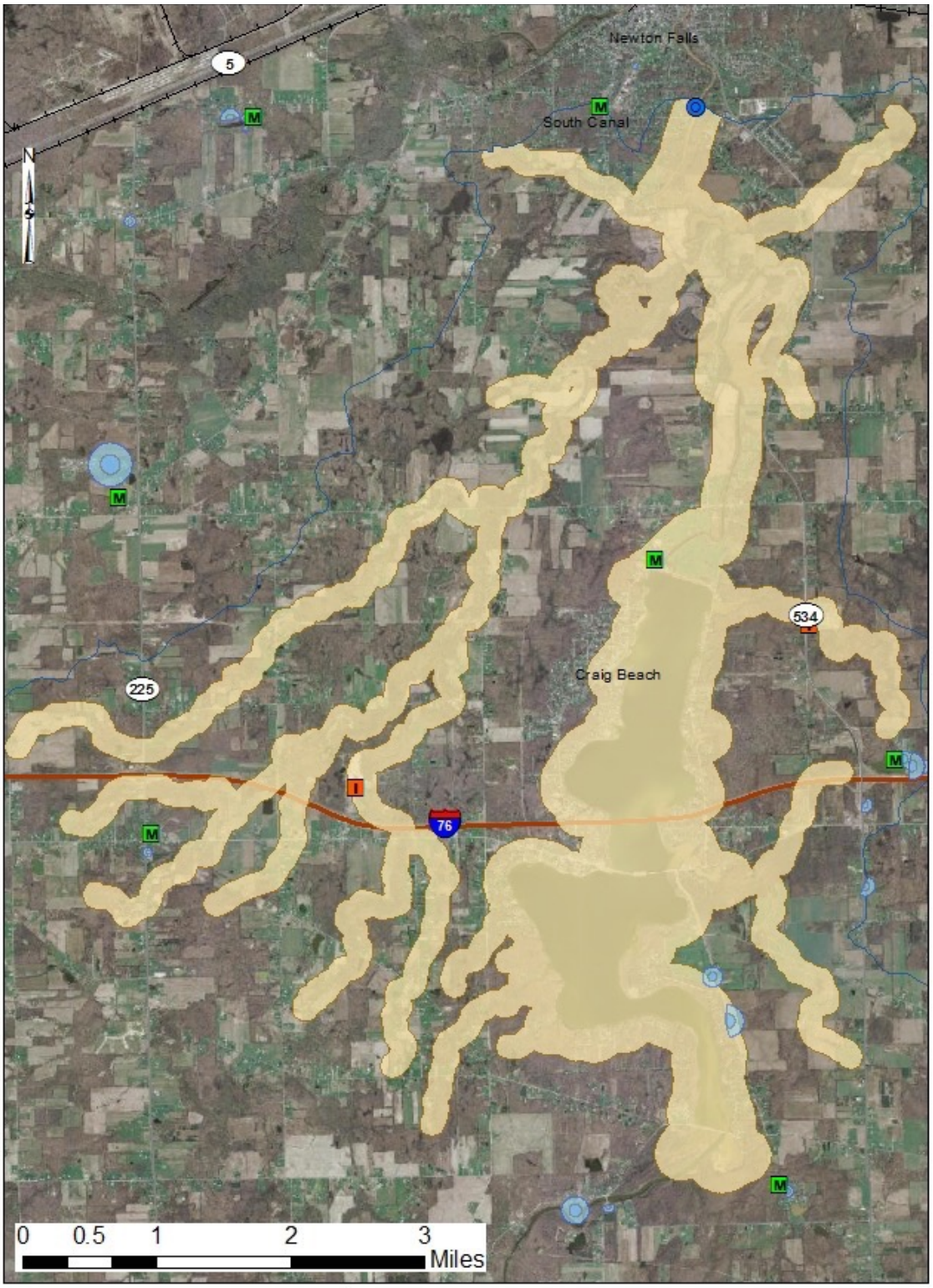


Figure 4. Corridor Management Zone (shown in yellow) for the Newton Falls Source Water Protection Area and municipal (green M) and industrial (orange I) NPDES permitted facilities. (EPA, 2003)

Protective Strategies

Protective strategies for source water protection areas are presented in four categories: strategies targeted to specific types of activities or facilities; contingency planning; public education, and source water monitoring.

Specific Contaminant Source Strategies

Source water protection efforts for the City of Newton Falls will focus on mitigating the potential for contamination associated with agricultural runoff, transportation of oil and gas development wastes, general transportation accidents, and septic system discharges.

Agricultural Activities: The City, through the local NRCS, will provide education to local farmers on the use of best management practices to reduce agricultural and animal feedlot runoff, use of proper manure handling facilities, proper handling and road safety with agricultural chemicals, and other methods to control or reduce impacts to surface waters. Specific Best Management Practices (BMPs) will be targeted to each landowner through the Trumbull County SWCD. Particular attention will be paid to areas around Kale Creek with the goal of increasing overall usage of cover crops and conservation tillage to reduce levels of turbidity and SOCs and limiting livestock access to the creek to reduce levels of turbidity and pathogens.

Septic System Discharges: A two pronged approach will be implemented to address the risks associated with septic system discharges. The first strategy will be education and outreach. The City will produce a brochure based on OEPA templates and will post the brochure on its website, send it out with the annual CCR, and make it available at local community events. Second, the City will develop a local ordinance instituting setback and design requirements for septic systems.

Oil and Gas Production: The potential threats posed by oil and gas development in and around the City are primarily those caused by industrial scale materials handling. As such, the City recognizes that knowledge about location and early warning are vital to mitigating the impact from a spill. Therefore, the City will maintain a simple database of the locations of active drill sites which will be easily accessible to City and Water administration. The City will also maintain a map of the locations of current and proposed pipelines within the CMZ to the extent that it is possible to do so. The City will also request that local and county emergency responders (Fire and Police) contact the City immediately if a release has been reported or detected. The database and map will be updated quarterly using ODNR and FracTracker (http://www.fractracker.org) as resources.

Transportation Routes: To mitigate the threats to water quality posed by traffic accidents, particularly along I-76, the City will contact ODOT to secure permission and possibly aid in posting signs along the portion of I-76 that crosses Lake Milton. The City will contact local and county first responders to ask that any spills be reported immediately to the water department so that mitigation efforts can begin immediately.

Drinking Water Shortage/Emergency Response

The City of Newton Falls maintains an Emergency Drinking Water Contingency Plan that was created in 1995 and is updated annually, with the last update being completed on March 5, 2014. Copies of this plan are kept at the water plant and the municipal building. The plan comprises 35 pages and lays out contingencies for managing a wide variety of potential threats. The plan contains contact information for municipal officials, water supply and distribution personnel, OEPA, first responders, local industries, and media outlets.

In the event of a short term loss of drinking water, the following sources and methods have been identified in the City's Emergency Drinking Water Contingency Plan:

Sources and Transport Methods

1. Ground Water using Tank Trucks

2. Surface Water using Newton Falls Fire Station Pumpers And Tank Trucks.

3. Public or Private Ponds using Newton Falls Fire Station Pumpers and Tank Trucks.

4. Reservoirs, using Fire Station Pumpers and Tank Trucks
    a. West Branch
    b. Lake Milton
    c. Berlin Lake

5. Swimming Pools
    a. Private pools using Tank Trucks.

6. Interconnections with Other Water Facilities using Emergency Connections
    a. Lordstown
    b. Niles.

7. Water stored within building water system, property owners control (boiling and sterilization procedures will be made available)
    a. Water Heaters
    b. Pools
    c. Tanks

8. Bottled water or Tank Trucks from outside sources:
    a. Local bottled water dealers
    b. Using water haulers from surrounding communities
        i. Southington Estates 330-898-6489
        ii. Viets Water Hauling 330-898-1173
        iii. Foltz and Sons 330-583-3634

9. Dairies or Bottling Plants
    a. Pepsi-Cola Bottlers 800-345-8116
    b. Austintown Dairy Co. 330-792-0246

10. Others
    a. Bottled beverages,
    b. Liquids
    c. Milk for human consumption.

Emergency Response - Contamination in Lake Milton

The City of Newton Falls maintains an Emergency Drinking Water Contingency Plan that addresses accidental chemical spills and releases in the protection area. Currently, the Water Department has procedures in place to manage the introduction of slugs of contaminants to the treatment system. In addition to current efforts, the Water Department will investigate the accessibility of large scale clean up operators who may be available to assist the City in the event of a major incident.

The following text has been incorporated into the Contingency Plan, which is kept at City Hall and at the Water Plant to be used in the event of a spill or release within the protection area.

Accidental Chemical Spill or Release within the Protection Area

1. Determine the following information:
    a. Who made the first observation? What is their phone number and location?
    b. When did it happen?
    c. What was spilled?
    d. Where is it? (How long before it would reach the intake?)
    e. Has the spill been reported to Ohio EPA?

2. Has the fire department or hazardous materials response team been notified? If no notifications have been made, immediately contact emergency personnel and Agencies (i.e., fire department, Ohio EPA, etc.).

3. Contact the following personnel and village officials:
    a. Jeff Hawkins, Water Plant Supervisor (330) 872-1808
    b. Jack Haney, City Manager (330) 872-0806

4. If it is safe to do so, visit the scene to make contact with on-scene personnel and agencies.

5. Complete the following as soon as possible.
    a. Perform a physical check on the pumping stations and their structural integrity.
    b. If it is determined that contamination did occur, immediately shut down all raw water pumping.
    c. Proper precautions must be taken during sampling to prevent exposure to the contaminant.
    d. If the system needs to be temporarily shut down as a result of the spill, the procedures can be found in the treatment plant's contingency plan.

6 Once raw water pumping has been turned off, obtain the following information:
    a. Who is responsible for the cleanup? Get phone numbers and other contact information
    b. What contractors or consultants have been sent by the responsible party?
    c. What actions have they taken?
    d. How long is clean-up expected to take?

7. Follow up with the on-scene responders and contractors to determine if additional long-term actions (such as additional raw water monitoring) are required or recommended. If so, determine
    a. What kind of monitoring is needed, at what frequency?
    b. What levels will trigger return to normal operations?
    c. What kind of additional treatment may be needed?

Drinking Water Shortage – Long-Term Loss of Source

There are primarily two kinds of contingencies that may create a long-term loss-of-source for a surface water system: a drought that leaves the Mahoning River dry for an extended period of time or a catastrophic event that would undermine the structural integrity of the reservoir (e.g., earthquake). A drought so severe that it would cause the Mahoning River to dry up seems improbable, but it is a scenario that becomes more likely over time. This is due to (1) evidence that global climate change is trending to a hotter climate; and (2) greater overall water use as population increases. Newton Falls maintains interconnections with Lordstown to the south and Trumbull County to the north. However, it should be noted that both of these systems also purchase water and do not produce their own. Lordstown gets its water from Niles (also a purchasing system), Mahoning Valley (2.4 mgd, Mahoning River) and Warren (12.2 mgd, from Mosquito Lake). According to Ohio EPA records, Trumbull County purchases only from Newton Falls and would not be able to provide water other than what was already in storage.

In the unlikely event of a long-term loss of source, the City would use the existing interconnections to purchase water from neighboring communities.

Funding for Water Emergencies

The Newton Falls Water Department maintains reserve funds that would be available in the event of an emergency. If these funds were insufficient, the City Council would appropriate funds as needed for emergency expenditures.

Planning for the Future

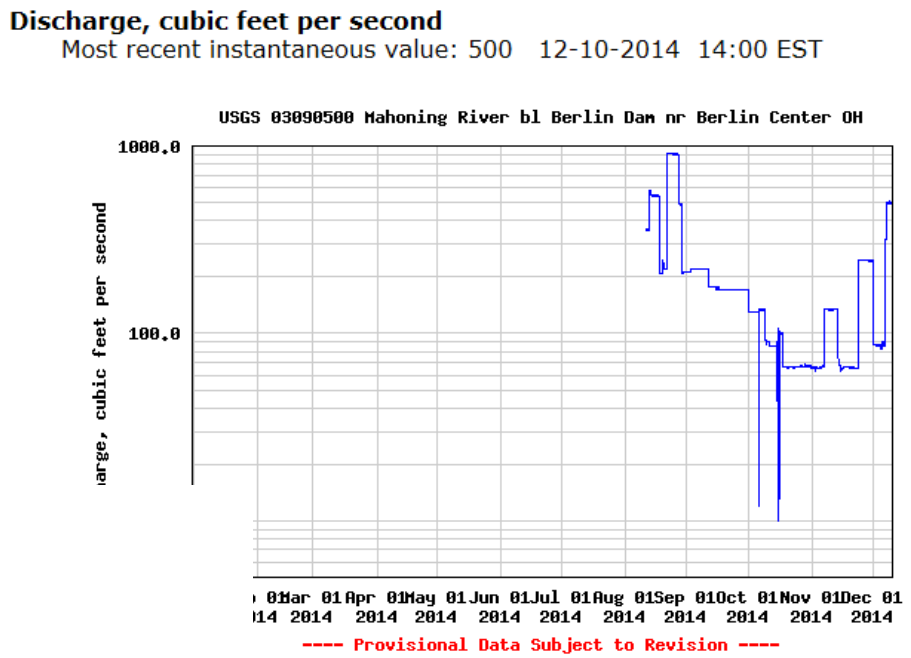
A. Current average water use = 0.6 million gallons per day (mgd) as of 2014
B. Current daily system design capacity = 1.5 million gallons per day
C. Flow capacity of Mahoning River = regulated by dam releases, see Figure 5.

Newton Falls is currently using 40% of its treatment capacity.

Census figures indicate that Newton Falls has maintained a relatively steady population, with slight declines over the past 20 years. Currently, no significant growth or decline of population is anticipated. Also, at this time Newton Falls is not aggressively developing and does not anticipate a sudden spike in industrial use of the water.

Based on this, Newton Falls does not anticipate the need to expand the treatment plant or significantly increase water usage within the next decade.

Mahoning River Gage below Berlin Dam, upstream from Lake Milton and Newton Falls.



Mahoning River at Pricetown, downstream from Lake Milton, but upstream from Newton Falls

Direction of Flow

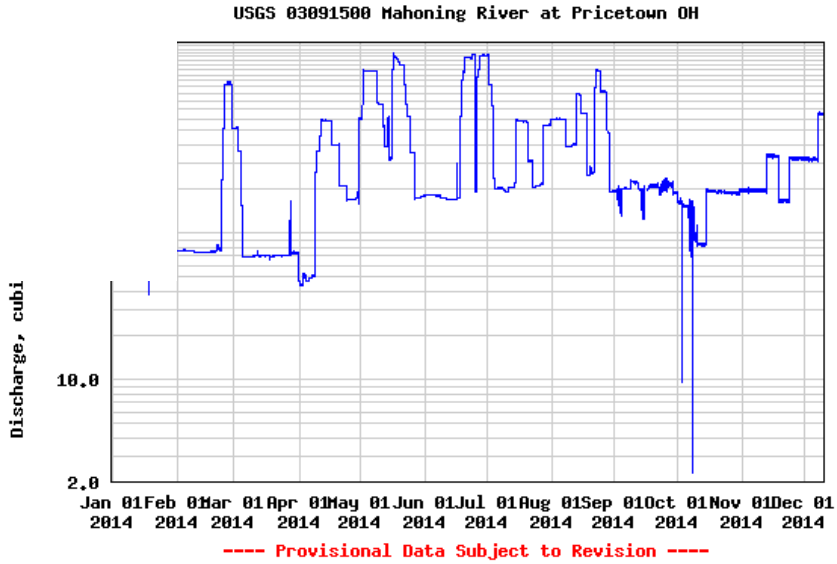


Figure 5. Gage information from the United States Geological Survey (USGS) for Jan.1-Dec. 10, 2014, indicates that the Mahoning River below Lake Milton varies in discharge from approximately 2 to 2,000 cubic feet per second, or 1.3 million gallons per day to 1.3 billion gallons per day. Source: http://waterwatch.usgs.gov/?m=real&r=oh

Public Education and Outreach

Consumer Confidence Report. The Newton Falls public water system publishes a Consumer Confidence Report (CCR) annually, as required by the Safe Drinking Water Act and Ohio Administrative Code 3745-96. The CCR is sent to all water customers and is available on the village's web site at www.ci.newtonfalls.oh.us. The CCR will be revised for 2015 to include information from this source water protection plan.

Plant Tours. The Newton Falls public water system staff conduct plant tours upon request. In the past, the City has had regular visits from the local schools, however, the trips are no longer conducted. As part of this plan, the City will try to reinstate these visits.

Web Page. The City of Newton Falls has a professionally designed web page that includes information on the water plant and links to other sources of information. The Water Plant web page will be expanded to include links to this document and other useful sources of information (see Appendix A).

Trumbull and Mahoning County SWCD. Trumbull and Mahoning County Soil and Water Conservation Districts conduct regular youth educational outreach activities in and around the City of Newton Falls. Trumbull SWCD activities include Discover Water, Enviroscape, Common Water, and Oceans in A Bottle/Water Pollution, to name a few. The following table summarizes the numbers of youth reached in the City and County for the years 2012 – 2014 (to date). A complete list of Trumbull SWCD activities and educational materials are included in Appendix A.

Trumbull SWCD Youth Education and Outreach		
Year	**All County Youth**	**Newton Falls Youth**
2012	729	135
2013	752	225
2014	419	115

The City will coordinate with Trumbull SWCD to maintain educational opportunities for Newton Falls youth.

Festivals. Brochures with information about Newton Falls' source water protection program will be made available at the City's annual Fourth of July festival and also at the annual Fireman's Chili Cook-off and annual Earth Day clean-up.

Water Quality Monitoring

Newton Falls monitors raw water daily for pH, alkalinity, hardness, turbidity, and fluoride. Samples for common SOCs are collected as often as bimonthly from May to August. Volatile Organic Compounds (VOCs) are monitored every six months and Total Organic Carbon (TOC) is monitored every quarter. In addition, raw river water samples are collected weekly on the mainstem (2 sites), West Branch, Kale Creek and Pricetown Bridge. These are monitored for pH, alkalinity, hardness, turbidity, and fluoride.

Updating the Plan

A protection plan is not a static document. Over time many issues related to protection planning will change- existing potential contaminant sources will close, new education and outreach opportunities will become available, new partners in protecting the drinking water source will be identified. The protection plan needs to plan for these and other events.

The City of Newton Falls commits to reviewing the Drinking Water Source Protection Plan annually, beginning with January 2016.

Updating the SWAP Assessment
Each review of this plan will include consideration of the following questions:

Water Treatment Plant Updates
- Has the water usage increased or decreased since the last review?
- Have any new treatment protocols been added?
- Has a reservoir or intake been added or removed, or will wells be installed?
- Have there been any significant changes in flow in the Mahoning River?

Changes to the intake or the addition of wells will be reported to Ohio EPA's source water protection program so that the source water assessment can be adjusted (if necessary) to reflect new sources of drinking water.

Potential Contaminant Source Inventory
- Has the extent of the protection area changed?
- Has the community developed rapidly?
- Have land uses in and around the protection area changed?
- Has management of businesses in the protection area changed?

If the answer to any of the above questions is yes, Newton Falls will update the inventory or conduct a new inventory. Newton Falls may contact Ohio EPA's Source Water Protection staff in the district office for guidance or assistance in conducting the inventory.

Evaluating the Effectiveness of the Protective Strategies
In order to evaluate if the protective strategies in this Source Water Protection Plan are achieving the desired outcomes, Newton Falls will consider the following types of questions and write any changes into the Protection Plan.

- Do we have reason to be concerned about how the drinking water source protection area may be used in the future?
- Should we consider trying to better protect it through a county resolution or township ordinance?

Pollution Source Control Strategies

- Have we followed our own schedule of implementation/timeline for each of the pollution source control strategies?
- Are there new potential contaminant sources that need to be addressed with new pollution source control strategies?
- Have we implemented any new protective strategies that are not documented here?
- Did any of our strategies result in removal or elimination of a potential source?
- Did any of our strategies result in individuals modifying practices to decrease the risk of contaminating the drinking water source?
- Did our coordination with other groups (SWCDs, county EMAs, local health dept., local watershed group, etc.) contribute to the implementation of protective strategies?
- Have the partnerships developed during plan implementation been productive?

Education and Outreach

- Have we followed our own schedule of implementation/timeline for each of the educational strategies?
- Are there any new groups in the population that we need to target with education and outreach strategies?
- Have we implemented any new educational strategies that are not already documented here?
- Has education and outreach targeting any specific group resulted in actions that reduced or could potentially reduce the risk of contaminating the drinking water source (e.g., septic system owners conducting regular maintenance, farmers adopting best management practices)?
- Have we received additional funding to continue any particular education and outreach strategy?
- Have we received any accolades, awards or recognition from outside entities or organizations for our educational efforts?
- Have we had any unsolicited requests for SWAP-related education (such as requests for plant tours, requests for presenters/speakers at events, etc.)?
- Did our coordination with other groups (SWCDs, SWEET Team, local health dept., local watershed group, etc.) contribute to the successful development and dissemination of SWAP-related information?
- Did we have sufficient staff and resources to complete all the planned educational efforts?
- Have educational efforts been cost effective? Efficient? (Consider level of attendance, attentiveness and participation by audience, comments received, etc., vs. the cost to facilitate the event) Should the frequency of the outreach be increased, decreased, or remain the same?
- Have the partnerships developed during plan implementation been productive?
- Have any of the target groups contacted the public water system for additional information about something they saw or heard about through these activities?

Drinking Water Shortage/Emergency Response

- Are there any updates to the Drinking Water Shortage/Emergency Response Plan?
- Did our coordination with emergency responders at the local and county level result in better communication and handling of spill incidents that could impact our drinking water?

Raw Water Monitoring

- Have we followed our raw water monitoring plan (i.e., sampled at the specific frequency, analyzed for the appropriate parameters, etc.)?
- Have there been any significant changes to our water quality?
- Do we have sufficient water quality data or other reasons (e.g., the source was removed) to conclude that ground water monitoring can be cut back or is no longer needed?
- Are there new water quality, potential contaminant source, or land use issues that would influence the need to expand our water quality monitoring network?
- Does our raw water monitoring plan need to be updated for any reason?

Revising the Plan

Upon review, if any revisions of the SWAP Assessment Report are needed, Newton Falls will contact Ohio EPA's Northeast District office for guidance. Also, if the local planning team makes any substantial changes to Newton Falls' Protection Plan, a copy will be forwarded to Ohio EPA for concurrence. The revision will be documented on the front cover by adding "Revised [date]" beneath the date at the bottom of the page.

Primary References

Ohio EPA, 2003, Drinking Water Source Assessment Report for the City of Newton Falls

Ohio EPA, 2006, Biological and Water Quality Study of the upper Mahoning River and Selected Tributaries

Ohio EPA, 2011, Total Maximum Daily Loads for the Upper Mahoning River Watershed

City of Newton Falls, Division of Water, water quality files

Appendix A

Educational Materials From Trumbull SWCD