



Chambersburg Borough Water System Source Water Protection Plan July 2022



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Pennsylvania Department of Environmental Protection



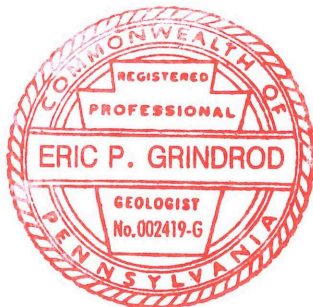
Chambersburg Borough Water System Source Water Protection Plan

Prepared for:

Borough of Chambersburg
7659 Lincoln Way East
Fayetteville, PA 17222
July 2022

Prepared by:

Spotts, Stevens and McCoy
Engineering and Environmental Services



Eric P. Grindrod, P.G. – Project Manager



August 9, 2022

Chambersburg Borough Water Supply
7659 Lincoln Highway East
Fayetteville, PA 17222

Re: Source Water Protection Program
Chambersburg Borough Water Supply
PWS ID No.7280005
Borough of Chambersburg, Franklin County

Dear Travis Amsley:

I am pleased to inform you that the Source Water Protection (SWP) Program for Chambersburg Borough Water Supply meets the minimum elements for local SWP programs and is hereby approved in accordance with the Pennsylvania Safe Drinking Water Regulations (25 Pa. Code § 109.713). This determination is based on our review of the *Chambersburg Borough Water Supply Source Water Protection Plan* and your request for approval received August 9, 2022.

Any person aggrieved by this action may appeal the action to the Environmental Hearing Board (Board), pursuant to Section 4 of the Environmental Hearing Board Act, 35 P.S. § 7514, and the Administrative Agency Law, 2 Pa.C.S. Chapter 5A. The Board's address is:

Environmental Hearing Board
Rachel Carson State Office Building, Second Floor
400 Market Street
P.O. Box 8457
Harrisburg, PA 17105-8457

TDD users may contact the Environmental Hearing Board through the Pennsylvania Relay Service, 800-654-5984.

Appeals must be filed with the Board within 30 days of receipt of notice of this action unless the appropriate statute provides a different time. This paragraph does not, in and of itself, create any right of appeal beyond that permitted by applicable statutes and decisional law.

A Notice of Appeal form and the Board's rules of practice and procedure may be obtained online at <http://ehb.courtapps.com> or by contacting the Secretary to the Board at 717-787-3483. The Notice of Appeal form and the Board's rules are also available in braille and on audiotape from the Secretary to the Board.

IMPORTANT LEGAL RIGHTS ARE AT STAKE. YOU SHOULD SHOW THIS DOCUMENT TO A LAWYER AT ONCE. IF YOU CANNOT AFFORD A LAWYER, YOU MAY QUALIFY FOR FREE PRO BONO REPRESENTATION. CALL THE SECRETARY TO THE BOARD AT 717-787-3483 FOR MORE INFORMATION. YOU DO NOT NEED A LAWYER TO FILE A NOTICE OF APPEAL WITH THE BOARD.

IF YOU WANT TO CHALLENGE THIS ACTION, YOUR APPEAL MUST BE FILED WITH AND RECEIVED BY THE BOARD WITHIN 30 DAYS OF RECEIPT OF NOTICE OF THIS ACTION.

Please be advised that DEP's approval of the program should not be construed as a specific authorization to engage in the SWP area management approaches described for the program. If the program involves land-use management, you are encouraged to work with the solicitor for the relevant municipality as you implement source protection activities.

Chambersburg Borough Water Supply is to be commended for taking this proactive step to ensure the quality of drinking water for their community. Please feel free to promote your approved program in your Annual Consumer Confidence Report. In order to maintain active status, an Annual Update Form should be submitted by March 31 of each year. A copy of this form is enclosed. You should be prepared to report on your steering committee meeting(s), resources applied to your program (including those of partners), as well as any changes in withdrawals, land use, and potential sources of contamination.

Thank you for your participation in the program. If you should have any questions, please feel free to contact Rhonda Hakundy-Jones of my staff at 717.705.4951.

Sincerely,



Joseph Mattucci
Program Manager
Safe Drinking Water Program

Enclosure: Annual Source Water Protection Program Update

cc: Ms. Lyn Rodino, SSM Group, Inc. (pdf)

Chambersburg Borough Water System

PWSID# 7280005

Franklin County, PA

Source Water Protection Plan

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Glossary of Water Terms

Note: Not all terms will be applicable to this report.

Aquifer – a natural underground layer of sand, gravel, or rock that contains water.

Aquifer Recharge - Recharge is the rate at which precipitation infiltrates in the ground to supply water to groundwater wells or springs.

Community Water System – a public water system that serves at least 15 service connections used by year-round residents, or regularly serves at least 25 year-round residents.

Contaminant – A physical, chemical, biological or radiological substance or matter in water.

Delineate – to mark the outline of a groundwater or surface water study area.

Emergency Response Plan – a preparedness plan developed by a water system to form consistent procedures to provide safe and adequate drinking water in an emergency situation. The reference outlining the requirements is found in 25 Pa. Code § 109.707.

Geology – The study of the Earth, and the Earth's materials and processes.

Groundwater – water that is located within the saturated zone below the water table and is available to supply wells and springs.

Point Source Pollution – pollutants that come from a single exit point, like a pipe.

Management Strategies – approaches or options selected by the water supplier and the Steering Committee to protect the sources of drinking water currently and in the future.

New Source – a source of water supply that is not covered by a valid permit or as a regular source of supply for the public water system.

Non-Point Source (NPS) Pollution – pollutants that are contained in water runoff from construction, roads, agriculture, or residential areas.

Municipal Separate Storm Sewer System (MS4) – a regulated stormwater management program required by municipalities with urbanized areas.

Source Water – the place from which water originates or is derived, including from wells, springs, reservoirs, streams, ponds, or lakes.

Source Water Assessments – an evaluation documented in writing of the potential contamination of a drinking water source, which includes identifying the contributing area to the source, an inventory of potential contaminants, and a determination of the susceptibility of the water source to contamination, as described in 25 Pa. Code § 109.705.

Source Water Protection Area – a surface water intake protection area, a wellhead protection area, or both.

Source Water Protection Program – a surface water intake protection program, a wellhead protection program, or both, as described in 25 Pa. Code § 109.713.

Study Area – the land in the vicinity of the community water supplier’s ground or surface water sources.

Surface Water – water open to the atmosphere to subject to surface or stormwater runoff. This does not include finished water intended for distribution.

Surface Water Intake Protection Area – the surface and subsurface area surrounding a surface water intake supplying a public water system, through which contaminants are reasonably likely to move toward and reach the water source. The protection areas consist of up to three (3) zones:

- **Zone A** – a ¼ mile wide area inland from the edge of a water or surface water body and from an area ¼ mile downstream of the intake to a 5-hour time of travel upstream.

- **Zone B** – a 2-mile wide area inland from the edge of a waterway or surface water body and extending upstream to the 25-hour time of travel.
- **Zone C** – typically for drainage basins greater than 100 square miles, the remainder of the upstream basin. Zone B and Zone C (if present) comprise the contributing area for the source.

Surface Water Intake Protection Program – a comprehensive program designed to protect each surface water source used by a public water system.

Time of Travel – the amount of time water will take to move from the upstream end of a stream segment to a downstream specific location by calculating average stream flow data.

Topography – graphic display of the Earth’s surface including the elevation, and position of natural and man-made features.

Watershed – the land area from which water eventually drains to a body of water or other specific location.

Wellhead Protection Area – the surface and subsurface area surrounding a groundwater well, wellfield, spring, or infiltration gallery that supplies a public water system, through which contaminants are reasonably likely to move toward and reach the water source. The wellhead protection area must consist of up to three (3) zones:

- **Zone I** – the protective area immediately surrounding the well, spring, or infiltration gallery with a radius between 100 and 400 feet, depending on site-specific source and aquifer characteristics.
- **Zone II** – the zone encompassing the portion of an aquifer where water is diverted to a well, or flows to a spring, or infiltration gallery.
- **Zone III** – as hydrogeologic conditions warrant, the zone beyond Zone II that provides groundwater recharge to Zone I and Zone II. Zones II and III, if present, comprise the contributing area for the water source.

Wellhead Protection Program - a comprehensive program designed to protect each well, spring, or infiltration gallery source used by a public water system.

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Acronym List

Note: Not all terms will be applicable to this report.

ARA	Aquifer Recharge Area
AST	Aboveground Storage Tank
BMP	Best Management Practice
CWA	Clean Water Act
DCNR	Pennsylvania Department of Conservation & Natural Resources
DEM	Digital Elevation Model
DEP	Pennsylvania Department of Environmental Protection
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
GIS	Geographic Information System
G.I.T.	Geologist in Training
GMS	Groundwater Modeling System
MGD	Million Gallons per Day
MODFLOW	Modular Three-Dimensional Finite-Difference Ground-Water Flow Model
MODPATH	Particle Tracking Post-Processing System
MS4	Municipal Separate Storm Sewer System
NCLD	National Land Cover Dataset
NPS	Non-Point Source
PAGWIS	Pennsylvania Ground Water Information System
PENNDOT	Pennsylvania Department of Transportation
P.G.	Professional Geologist

P.M.P.	Project Manager Professional
PS	Point-Source
PSOC	Potential Source of Contamination
PWSID	Public Water System Identification Number
SDWA	Safe Drinking Water Act
SSM	Spotts, Stevens and McCoy
SWAP	Source Water Assessment and Protection program
SWP	Source Water Protection
SWPTAP	Source Water Protection Technical Assistance Program
TMDL	Total Maximum Daily Load
TOT	Time of travel
USDA	United States Department of Agriculture
USGS	United States Geological Survey
WHP	Wellhead Protection
WMA	Watershed Management Area

Chambersburg Borough Water System

Franklin County, PA

Source Water Protection Plan

Executive Summary

Clean, safe drinking water is often taken for granted. Many people have no idea where their water comes from, how it is treated, or how it arrives at their faucet. Protecting the raw water supply is an important element in the overall mission of delivering a safe and reliable supply of drinking water to consumers. Comprehensive source water protection not only benefits the water supply, but ultimately the economic, social, and environmental well-being of a community.

Project Background

Chambersburg Borough Water System (CBWS) delivers drinking water to a population of approximately 31,048 people in Franklin County, southcentral Pennsylvania. Although CBWS has not experienced any pollution issues, there is a possibility of contamination from various other sources, including stormwater runoff, roadways, and recreational activities in nearby parks.

CBWS wishes to improve and protect the safety of its drinking water supply for its customers today and into the future. In 2021, the water system applied for assistance from the Pennsylvania Department of Environmental Protection's (DEP) Source Water Protection Technical Assistance Program (SWPTAP) to develop a source water protection plan for this system. This includes determining the land area from which water is drained and drawn, analyzing potential sources of contamination in the drainage area, and establishing management strategies to best protect the source water.

Description of Study Area and Water System

A study area includes nearby land regions that may impact the surface water or groundwater sources used by the community water supplier. Geologic features and formations may dictate the size and shape of the study area as well. While the water system is located in Franklin County, their surface water source intake is located in the Conococheague Creek in Adams County to the east. The creek is a tributary of the Potomac River, and approximately 18.3 square miles of this watershed contributes to the intake. The Michaux State Forest and the Caledonia State Park are present in the study area,

approximately 1.5 miles from the water system's treatment plant. In 2008, the U.S. Environmental Protection Agency approved a Total Maximum Daily Load (TMDL) requirement for the Conococheague Creek for sediment, developed by Maryland's Department of the Environment.

CBWS obtains its raw water from an intake within the Conococheague Creek in Adams County, which is supplemented by releases from the Long Pine Run Reservoir. Raw water flows to the treatment plant in Fayetteville, Franklin County, where it is treated, then stored in a 4.5 million gallon clearwell for distribution. The water system delivers an average of 4.03 million gallons per day (mgd) of finished water to approximately 31,048 people in Chambersburg Borough and several other municipalities through 7,439 residential and commercial connections. The Bear Valley Joint Authority (PWSID# 7280043) has an interconnection to purchase finished water from CBWS.

Steering Committee

A steering committee was formed for this project. The committee can be comprised of project stakeholders, including local officials, citizens, and other interested parties. The steering committee assists the water system by providing knowledge of issues in the watershed, as well as serving as messengers for education and outreach in the community.

Delineations of Protection Areas

The study area and its defining hydrologic and geologic features, as well as the source's structure specifications provide the basis for the delineation of protection areas for each raw water source.

Surface water intake protection areas are determined using geographic information system (GIS) software and hydrologic data from the United States Geologic Survey (USGS). Calculations are applied to the stream network within a watershed to determine the time it takes water to travel to the intake structure under normal flow conditions. These times of travel are used to delineate Zone A, the most protective zone, Zone B, and Zone C. Zone A is a 0.25 mile buffer of stream segments and water bodies within the 5-hour time of travel to an intake. Zone B is a 2-mile buffer of stream segments and water bodies within the 25-hour time of travel to an intake. Zone C is the remainder of the watershed.

The 0.25-mile buffer for Zone A encompasses part of Long Pine Run Reservoir in the Birch Run fork of the reservoir. Because of the system's concern for the water quality of the reservoir, the upper extent of the zone was extended to include the entire reservoir. Zone A covers 6.5 square miles for the intake, mostly within Greene Township in Franklin County, and Franklin Township in Adams County.

Zone B for the intake includes 11.7 square miles, extending into additional sections of Southampton Township in Franklin County, Menallen Township in Adams County, and Southampton Township in Cumberland County. Due to the size of the watershed draining to the intakes, the entire drainage area is designated as either Zone A or Zone B, and no Zone C exists.

After determining the CBWS protection areas, further investigation found that groundwater sources operated by the Guilford Water Authority were located within Zone A of the Chambersburg intake. Because of the close proximity of the intake to these other water sources, the two water systems may choose to work together on implementation and protection strategies.

Potential Sources of Contamination (PSOCs)

After the protection areas are delineated, publically available databases, land cover data, aerial imagery, and local knowledge from the water system are used to compile an inventory of potential sources of contamination (PSOCs). PSOCs can either be point sources, such as discharge points or storage tanks, or non-point sources, such as stormwater runoff from transportation corridors or agricultural land. Point sources and transportation corridors are analyzed and rated from A to F, with A posing the greatest potential threat and F the least potential threat. CBWS staff expressed concerns with water quality into the treatment plant. The water leaves the clean reservoir and flows into the Conococheague Creek and picks up some contaminants. PA Route 233 (Pine Grove Road) also runs very near the intake, with potential runoff contamination into the creek. Another concern is that potential contaminants entering the watershed could require the system to conduct additional monitoring.

Non-point sources are represented by land cover data, which displays developed land, tree cover and low vegetation, agricultural land, and water. The total size of land cover for the protection area is about 11,700 acres, or just over 18 square miles. Undeveloped areas, including tree canopy, low vegetation, and open water, comprise 96% of the protection areas. Developed areas, which includes structures, roads, and other impervious surfaces, comprise about 3.8% of the area, and less than 1% is made up of cultivated crops and hay/pasture. The highest-rated roadways are state roads, including State Route 233 (Pine Grove Road), which are rated A for susceptibility in both Zones A and B.

The initial point source PSOC inventory, as determined by publically available data, is verified and customized, based on local knowledge, by the water system and steering committee. The initial database search resulted in a total of 5 preliminary PSOCs identified for the protection areas, including illegal dump sites, above and underground storage tanks, and an EPA regulated site for air quality. The

highest-rated point source is the illegal dump site along PA Route 233, rated A for susceptibility in both Zone A.

Contingency Planning

25 Pa. Code § 109.707 requires that community water suppliers develop a plan for the provision of safe and adequate drinking water under emergency circumstances. In the event of an accident or spill that has the potential to impact the water supplies, the water system will initiate their emergency response plan (ERP) to minimize any potential impacts. In the event of an emergency that exhausted the emergency supply, CBWS may rely on a permitted bulk water vendor, or other mutual-aid organizations for assistance.

New Sources

As part of an approved source water protection plan, the community water supplier must review steps that would be taken to replace their sources in the event that an existing source becomes unusable. Additional water supply sources that may be identified and developed in the future will be protected with the same management strategies outlined in this plan.

Selected Management Strategies

CBWS has identified a variety of management options that they may choose to implement, in both the short-term and long-term. Management options may be implemented within the water system, or in partnership with appropriate agencies and organizations, such as the County Conservation District or local watershed groups. Examples of selected management strategies include education and outreach, installing water supply signs along roadways, and working with emergency responders. The management strategies outlined in this plan will be reviewed, evaluated, and prioritized by CBWS on an ongoing basis. New strategies may be added to the implementation list, and other options may be discontinued or suspended as human and financial resources are allocated.

Implementing and Sustaining the Source Water Protection Program

CBWS recognizes that the sustainability of this source water protection program is an important tool to maintain quality drinking water sources over time. New strategies may be added to the implementation list, and other options may be discontinued or suspended as human and financial resources are allocated. As other community water systems enter the DEP's Source Water Protection Technical Assistance Program, this written program can be amended and updated.

1.0 Introduction

1.1 Project History and Objectives

Clean, safe drinking water is often taken for granted. Many people have no idea where their water comes from, how it is purified, or how it arrives at their sink. Protecting the raw water supply has been increasingly recognized as a critical element in the overall mission of delivering a safe and reliable supply of drinking water to consumers. Comprehensive source water protection not only benefits the water supply, but ultimately the economic, social, and environmental well-being of a community.

Chambersburg Borough Water System (CBWS, PWSID #7280005) delivers drinking water to a population of approximately 31,048 people in Franklin County, southcentral Pennsylvania. The Chambersburg Water Company was originally organized about 1818, and pumped water from the Falling Spring to a reservoir sited on current Chambersburg Hospital land, using hollowed pine logs joined end-to-end to serve local customers. Around 1910, Town Council developed the Conococheague Creek in the valley above Caledonia Park as the main water source. Additional improvements continued through the years, including constructing the Long Pine Run Dam and a new water treatment plant in the late 1960s. [1]

Chambersburg Borough Water System wishes to preserve and improve the safety of its drinking water supply for its customers today and into the future. Although CBWS has not experienced pollution problems, there is a possibility of contamination from various sources including stormwater runoff, transportation corridors (roads), and recreational activities in nearby parks. In 2021, CBWS applied for assistance from the Pennsylvania Department of Environmental Protection (DEP) Source Water Protection Technical Assistance Program (SWPTAP) to develop a thorough and comprehensive source water protection plan. In 2022, DEP initiated the Chambersburg Borough Water System project.

The objective of this project is to develop a source water protection plan that delineates the recharge areas for the CBWS water sources, determines the transport times and pathways of potential contaminants, identifies potential sources of contamination, educates the public on the importance of source water protection, plan for potential pollution events, and complies with DEP's Chapter 109 regulations on minimum elements for local source water protection programs (see Section 1.3).

1.2 The Importance of Source Water Protection

Developing a source water protection plan has numerous benefits. Some benefits are financial – for example, the reduced cost of water treatment. Other benefits are less tangible, including:

- Reduced risk to human health
- Protection of a valuable resource for current and future generations
- Increased consumer confidence in water suppliers
- Support of healthy ecosystems, recreation and other beneficial uses
- Increased knowledge of the importance of protecting your public water supply sources
- Identifying potential sources of contamination
- Identifying source water protection areas
- Developing methods and management strategies to mitigate any potential sources of contamination
- Identifying and developing priorities to protect drinking water sources

The economic benefit of protecting a water supply from contamination can be significant. **Table 1-1** lists source water protection case studies throughout the United States. Each of the thirteen communities experienced a contamination problem that could have been avoided by better protection of the water supply. **Table 1-1** lists the contamination problem and the cost needed to either remediate the problem or develop a new water supply.

Scattered throughout this report are additional case studies that provide greater detail regarding how source water supplies can be contaminated and the impact the contamination can have on a community. These case studies are included to reinforce the need to remain vigilant in protecting drinking water for all Pennsylvanians.

Source Water Protection Case Study

Charleston, West Virginia *Chemical Spill into River, 2014*

In January 2014, industrial chemicals were released into the Elk River in Charleston, WV from a leaking aboveground storage tank with inadequate secondary containment. The chemicals reached the drinking water intake of the West Virginia American Water Kanawha Valley Treatment Plant, which ultimately resulted in a Do-Not-Use order that affected approximately 300,000 people in portions of nine counties.

Shortly thereafter, the West Virginia Legislature passed SB 373 requiring all water systems in the state with a surface water intake, or groundwater under the influence of surface water, to update or develop a new source water protection plan by July 1, 2016. Additional regulations were passed to establish standards and enforcement for proper management of aboveground storage tanks. [53]

1.3 Overview of Source Water Protection Regulations

In 1974, Congress developed the Safe Drinking Water Act (SDWA) to protect human health by ensuring clean drinking water was provided by public water systems. As the SDWA matured, States were required in 1986 to develop Wellhead Protection (WHP) Programs to protect public water systems using ground water sources from contamination that would adversely affect human health. The Pennsylvania Safe Drinking Water regulations (25 Pa. Code § 109) were updated in 1994 to include some basic aspects of WHP which established three-tiered WHP areas, required ownership/control of the innermost WHP Area (Zone I) and set minimum elements for systems seeking DEP approval of their local WHP program.

The US Environmental Protection Agency (EPA) recognized the success of WHP efforts in identifying potential contaminant threats and minimizing risk to wells and springs through proper management of the contributing area, and the WHP concept was subsequently expanded to all sources used by public water systems in 1996 when the SDWA was reauthorized. States were now required to develop a Source Water Assessment and Protection (SWAP) Program to assess all drinking water sources - surface water and ground water - serving public water systems for their susceptibility to pollution. The source water assessment serves as the skeletal framework for building a voluntary, community-based drinking water source protection program to prevent costly contamination of public drinking water sources. Most of these assessments for sources in existence at the time were completed by DEP or a contractor around 2003 and provided a general evaluation of the protection area for an existing water source. Efforts since then have focused on using the assessments as a basis for developing local source water protection (SWP) programs for community water systems. Source water assessments for unassessed sources are conducted as needed.

In August 2018, the PA Safe Drinking Water regulations were updated to incorporate source water assessments and expand protection efforts to all sources used by community water systems. As part of this update, DEP defined source water assessment, updated definitions of SWP Areas for surface-water and ground-water sources, revised permit application requirements to include a source water assessment of each new raw water source.

Community water systems may opt to voluntarily develop a comprehensive, community-oriented SWP program for DEP approval. At the very least, approval by DEP allows better tracking to facilitate environmental program coordination, legitimizes a community-based effort and provides an

opportunity for formal recognition and positive publicity. In order for DEP to approve a local SWP program, the plan must include the following elements: [2]

- Formation of a steering committee representing, but not limited to, the water supplier, local government entities, water supply customers, farming and business community representatives (as applicable).
- Encouragement of public participation through informational and educational activities.
- A map of the delineation of areas to be protected, using approved DEP methods.
- Assessment and inventory of potential and existing sources of contamination to each permitted water source.
- Development of a management plan to protect the water supply from potential contamination as part of a strategic long-term program, including potential adoption of municipal ordinances or transfer of development rights inside the protection areas, purchase of the source water protection area by the water system, public education, and other methods approved by DEP.
- Preparation of a contingency plan for emergency response and alternate sources.
- Provisions to protect sites identified for development of new water sources.
- Provisions to review and update the program annually.

Source Water Protection
Case Study

Pennsylvania
Heating Oil Contamination, 2014

A county 9-1-1 call center contacted the DEP Emergency Response hotline reporting a heating oil smell in the drinking water at an apartment building. Two tanks, located within 25 feet of the drinking water well appear to have leaked, and tap water samples had benzene levels above drinking water standards. The property owner provided bottled water for the residents and installed VOC treatment. Since both soil and ground water were contaminated by this release, the property owner is required to clean up the contaminated soil. Because this release was not covered under his policy, the owner was responsible for the soil cleanup and drinking water treatment at his own expense [45].

In 2007, DEP initiated the Source Water Protection Technical Assistance Program (SWPTAP) to help community water systems develop a protection plan that meet DEP's Minimum Elements for Local Source Water Protection Programs. Using the federal Drinking Water State Revolving Fund set-asides, DEP contracted the engineering firm Spotts, Stevens and McCoy (SSM) of Reading, PA to assist water suppliers throughout Pennsylvania develop source water protection plans. All CBWS are eligible to participate in this program through their regional DEP office.

1.4 Description of Study Area

A study area includes the nearby land regions that may impact the surface water or groundwater sources used by the community water supplier. The study area developed for this system, which includes a surface water source, is shown in **Figure 1-1**. While the water system is located in Franklin County, their surface water source intake is located in the Conococheague Creek in Adams County to the east. The creek is a tributary of the Potomac River, part of the drainage area between the states of New York and Virginia, that ultimately drains into the Atlantic Ocean. Approximately 18.3 square miles of this watershed contributes to the intake. The watershed is situated in the South Mountain section of the Ridge and Valley Province, which is characterized by linear ridges, deep valleys, and flat uplands with moderate to high relief. Geology in this section consists of metavolcanic rocks, quartzite, and some dolomite.

The Michaux State Forest and the Caledonia State Park are present in the study area, approximately 1.5 miles from the water system's treatment plant. These recreational areas contain camping facilities and hiking paths, including the Appalachian National Scenic Trail, the path that stretches over 2,180 miles from Georgia to Maine through the Appalachian Mountains [3].

In 2008, the U.S. Environmental Protection Agency approved a Total Maximum Daily Load (TMDL) requirement for the Conococheague Creek for sediment, developed by Maryland's Department of the Environment. A TMDL determines a pollution reduction target necessary for a waterway to meet a "fishable/swimmable" goal of the Clean Water Act. The specific objective of a TMDL is to achieve water quality standards set by the state [4].

1.5 Previous Studies

This study builds upon previous work completed for the Chambersburg Borough Water System. In 2004, DEP developed a report through their source water assessment program (SWAP). This assessment provided a cursory overview of the watershed and potential contamination sources that have some risk of polluting the water supply. Several non-point potential sources of contamination (PSOCs) to the source water were highlighted in the report. Concerns included transportation corridors, residential activities, unpaved roads, illegal dump sites, and timbering activities. [5]

In 2018, the *Michaux State Forest Resource Management Plan* was developed. This plan provides an overview of the Bureau of Forestry's goals and priorities for future management of this District for approximately 5-10 years. The Michaux State Forest occupies nearly 87,500 acres in Adams,

Cumberland, and Franklin counties in southcentral Pennsylvania. Protecting headwaters of major watersheds was a strategic priority while creating the state forest system. In addition to optimizing ecological conditions for the various habitats, another objective is to provide a sustainable flow of forest products to local and state economies. Yet another priority is recreational use, such as outdoor events, trail systems, equestrian use, and camping. Michaux has also been classified as a “high conservation value forest”, which offers oversight on areas that provide a source of community drinking water. Also noteworthy in the plan are Landscape Management Units (LMUs) for special consideration. The Conococheague/Mountain Creek LMU specifically describes the Borough of Chambersburg as a key stakeholder for water quality in this area. Priority goals for the LMU focus on the improvement of water quality and infrastructure to reduce impacts to the source water. [6]

1.6 Overview of Water System

CBWS obtains all of its raw water from an intake within the Conococheague Creek in Adams County, which is supplemented by releases from the Long Pine Run Reservoir, located further upstream in the watershed. Long Pine Run and Birch Run are the two feeder streams flowing into the reservoir, then water from the reservoir’s earthen dam is released to Birch Run to feed the Conococheague Creek. The reservoir holds approximately 1.78 billion gallons of water at an elevation of 1,360 feet, and supplies the majority of the water that is withdrawn from the Conococheague Creek.

Raw water flows to the treatment plant in Fayetteville, Franklin County, where it is treated with a primary coagulant and a pH adjuster, then filtered and processed with additional chemicals. Finished water is stored in a 4.5 million gallon clearwell for distribution.

The water system delivers an average of 4.03 million gallons per day (mgd) of finished water to approximately 31,048 people in Chambersburg Borough and several other municipalities through 7,439 residential and commercial connections. CBWS has reported a peak demand of 5.64 mgd, with a total permitted allocation of 6.0 mgd.

The Bear Valley Joint Authority (PWSID# 7280043) has an interconnection to purchase finished water from CBWS.

2.0 Steering Committee and Public Participation

2.1 Purpose of the Steering Committee

A steering committee was formed for this project. The committee can comprise project stakeholders, including local officials, citizens, and other interested parties. The steering committee has: (a) provided comments and ideas to the project team with respect to knowledge of issues in the watershed; (b) served as a sounding board for ideas and recommendations being developed as part of the source water protection plan; and (c) helped to carry the “message” of the source water protection plan back to its representative communities. Specific duties have not been assigned to individual members of the steering committee. The steering committee is an advisory body only; its recommendations are not binding.

2.2 Steering Committee Members

The steering committee members that participated in the development of this plan included:

- Travis Amsley, Assistant Water/Sewer Superintendent
- Lance Anderson, Water/Sewer Superintendent
- Scott McIntyre, Operations Chief
- Michael Stahl, Laboratory Chief
- Jeff Stonehill, Borough Manager/ Director of Utilities
- Matt Kendall, Franklin County Emergency Manager
- Roy Brubaker, PA Department of Conservation & Natural Resources
- G. Bryan Salzmman, Borough Solicitor
- Allen Coffman, Council President
- Kim Frank, Adams County Emergency Management Agency
- Greg Speicher, PA Department of Conservation & Natural Resources
- Ben Stoner, PA Department of Conservation & Natural Resources
- Anthony Quarracino, PA Fish & Boat Commission
- Jean Cooper, Operator
- Brooke Cooper, Operator

Rhonda Hakundy-Jones, P.G. was the DEP-Southcentral Region representative who guided development of this project. Technical advisors responsible for the source water protection plan include Lyn Rodino, P.M.P., Ashton Prifer, Alex Nawotka, G.I.T., Abby Knight, G.I.T., and Eric Grindrod,

P.G. of Spotts, Stevens and McCoy. Kurtis Wagner, USDA Sourcewater Specialist, for the PA Rural Water Association, assisted in the development of management strategies and will continue to assist with implementation efforts outlined in the Source Water Protection Plan.

2.3 Steering Committee Meetings

Steering committee meetings were held to gather local input, receive feedback about the project results and recommendations, and interact with government agencies.

The following meetings were scheduled for this project:

- January 26, 2022
- July 7, 2022

Appendix A includes information from these meetings. Source water protection is an ongoing and evolving process. The committee will continue to address the implementation of this plan. Although individual members may change, the committee will remain intact and will continue to meet at least once annually.

2.4 Public Education in the Community

Chambersburg Borough operates a dedicated website that provides information to customers and residents, including Water Conservation tips and annual Water Quality/Consumer Confidence Reports. [7]

2.5 Availability of Plan

Copies of the approved plan will be available for review at the Borough office. Appointments should be made in advance to view the plan, as review may be subject to the Borough's Right-to-Know policy.

Source Water Protection Case Study

Berks County, Pennsylvania ***Industrial Contamination 2003-2010***

In 2003, 1,4-dioxane was found in the Borough of Bally's municipal water, which is supplied by one groundwater well. It was determined that the solvent was used by a local manufacturer of refrigeration systems, which is located a short distance from the Bally municipal well. Seven years later, a new groundwater well was completed and placed online for the 500 homes and businesses currently using bottled water supplied by the industry responsible for the contamination [56] [43].

3.0 Delineation of Surface Water Intake Protection Areas

This section describes the methodology for identifying the protection areas for the Chambersburg Borough Water System surface water intake. These protection areas were determined using available data and hydrologic methods consistent with DEP guidance. The summary of the approach and resulting protection areas are described below. A detailed technical description of the analysis is included in **Appendix C**, with the data package electronic files available in **Appendix H**.

3.1 Description of Surface Water Sources

The Chambersburg Borough Water System obtains its water supply from an intake on Conococheague Creek, which is displayed in **Figure 3-1**. The intake is located in the midst of state park land in Franklin Township, Adams County.

3.2 Methodology for Determining Surface Water Intake Protection Areas

The water quality of an intake area is affected by the quality of all the water flowing into it and all the land upstream of it. Therefore, the entire drainage area upstream of a surface water source is considered part of a source water protection area, and is divided into Zones A, B, and C. The protection areas were determined using a geographic information system (GIS) and hydrologic data from the United States Geologic Survey (USGS). The USGS data includes the network of streams, drainage area, and mean annual stream velocity. Calculations are applied to the stream network in GIS to determine how long it takes water to move from the upstream end of a stream segment to the downstream end. By adding up the travel times along a series of stream segments, the 5-hour and 25-hour time of travel boundaries can be determined.

Because average velocities are used, the time of travel calculations represent average conditions; during floods, water flows much faster and the protection areas would be larger. During drought conditions, water flows more slowly and the protection areas would be smaller.

Due to the complexity of the hydrology within reservoirs and lakes contributing to an intake, velocities for these water bodies are typically not readily available. In these cases, a watershed average velocity is calculated and applied to the centerlines representing the water bodies within the stream network. These watershed average velocities are typically much faster than the rate at which water actually moves through a large body of water, resulting in a faster time of travel, and more protective zones.

3.3 Description of Surface Water Intake Protection Area

The protection areas delineated for Chambersburg Borough Water System source of supply span multiple municipalities in three counties, and are mapped in **Figure 3-2**.

3.3.1 Zone A

Zone A is the most protective area, and is the area within 0.25 miles on either side of the stream. In the case of wide rivers, reservoirs, or lakes in which intakes are located, Zone A is the area within 0.25 miles on either side of the bank, as opposed to the stream centerline. Along the contributing streams, Zone A extends upstream to a point that represents, on average, a 5-hour time of travel to the intake. Zone A typically also extends downstream 0.25 miles from the intake, except in the case of impoundments or other controlled water bodies.

The original 0.25-mile buffer of the streams within 5-hours of the intake resulted in Zone A encompassing part of Long Pine Run Reservoir in the Birch Run fork of the reservoir. Because of the uncertainty of the reservoir's actual average velocity, and the system's concern for the water quality of the reservoir, the upper extent of the zone was extended to include the 0.25-mile buffer of the entire Long Pine Run reservoir. Zone A covers 6.5 square miles for the intake, mostly within Greene Township in Franklin County, and Franklin Township in Adams County.

3.3.2 Zone B

Zone B of a surface water source is a 2-mile wide area inland from the edge of a waterway or surface water body and extending upstream to the 25-hour time of travel. Zone B for the intake includes 11.7 square miles, extending into additional sections of Southampton Township in Franklin County, Menallen Township in Adams County, and Southampton Township in Cumberland County.

3.3.3 Zone C

Zone C for an intake is typically the remainder of the watershed, or the drainage area contributing to streams greater than a 25-hour TOT. The maximum TOT for this intake was under 12 hours average flow time to the source. Since there are no areas greater than a 25-hour TOT, all protection areas are designated as either Zone A or Zone B.

3.4 Other Community Water Systems within Protection Areas

After determining the CBWS protection areas, further investigation found that groundwater sources operated by the Guilford Water Authority were located within Zone A of the Chambersburg intake. Because of the close proximity of the intake to these other water sources, the two water systems may choose to work together on implementation and protection strategies. A map displaying the Guilford groundwater well and spring locations is available in **Figure 3-3**.

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4.0 Contaminant Source Inventory

After the source water protection areas were delineated, a comprehensive inventory of potential sources of contamination (PSOCs) was compiled for the areas. PSOCs are locations or activities that can adversely affect the quality of the water supply. Note that land uses, activities, or individual industries identified in the PSOC inventory are not necessarily a source of pollution; however, they have the *potential* for contaminating surface water.

PSOCs include activities that use, store, transport, or dispose of the following types of contaminants:

- Regulated contaminants with federal primary and secondary maximum contaminant levels for safe drinking water
- Materials on the EPA contaminant candidate list and contaminants with EPA lifetime health advisories or cancer risk numbers; most of these are on the Clean Water Priority Pollutant List
- *Giardia* and *Cryptosporidium*
- Turbidity
- Disinfection by-products
- Contaminants that cause taste and odor problems
- Other contaminants, as necessary, based upon known potential contaminant sources.

PSOCs can be non-point sources (where contamination occurs over a widespread area) or point sources (where contamination originates from a single discharge point). Examples of non-point sources include stormwater runoff from agricultural fields, residential lawns, roads and parking lots, and commercial and industrial properties. Mobile threats like spills or releases along transportation corridors such as highways, railroads, and navigable waterways can also provide a source of non-point pollution.

Point sources can include stationary threats at a fixed location such as an industrial or commercial facility. Point source discharges can be hazardous substances that enter the groundwater or a stream through spills or releases that occur during transport, handling, use or storage. Accidents can occur even when proper precautions are taken and have the potential to release hazardous materials to the subsurface through percolation or to a surface water body through overland flow.

4.1 Priority Concerns of the Water System

The Chambersburg Borough Water System staff expressed concerns with water quality into the treatment plant. The water leaves the clean reservoir and flows into the Conococheague Creek and picks up some contaminants. PA Route 233 (Pine Grove Road) also runs very near the intake, with potential runoff contamination into the creek.

Another concern is described as potential contaminants entering the watershed which would require the system to conduct “Long Term 2 Enhanced Surface Water Treatment,” otherwise known as the LT2 Bin. These testing rules aim to address the presence of the parasite *Cryptosporidium* in public drinking water. *Cryptosporidium* can be introduced to a water supply via human or animal feces, and is hazardous to human health. It can be introduced to the waterway from a variety of sources, such as sewage overflows or leaks, area wildlife, such as geese, or improper agricultural practices. The 2003 Source Water Assessment study also mentioned unregulated dump sites, paved and unpaved roads, residential activities, and timbering activities.

4.2 PSOC Identification and Evaluation: Non-Point Sources as Land Cover

All the non-point source PSOCs discussed with the Chambersburg Borough Water System were identified using aerial photographs, land use maps, input from the water system operators, steering committee members, the DEP, and electronic databases. All data sources are referenced in **Section 9**, and identified by a bracketed number []:

For the purpose of this study, non-point sources are represented by land cover data, which displays the areas that are developed, and to what degree they are developed. Development of the land increases stormwater runoff, especially if the development creates impervious surfaces. Impervious surfaces are areas in which water cannot infiltrate into the ground, and instead, runs off into roads or streams, accumulating sediment, contaminants, and debris along the way. Land cover data is sourced from the 2016 National Land Cover Dataset (NLCD) [8]. Where applicable, certain activities and infrastructure may be added to the land cover analysis from the following electronic databases:

- Abandoned mine lands [9]
- Pipelines [10]
- Roads [11]
- Mined out areas [12]

- Railroads [13]
- National Pipeline Mapping System [14]

Non-point source examples can include agriculture, residential developments, logging, drilling and mining operations, pipelines, roads, and railways. Even though non-point PSOCs are not easily quantified or standardized, they are still potential threats to the water supply and should be monitored and managed.

The land cover inventory is listed in **Table 4-1**. **Figure 4-1** shows generalized land cover for the protection areas. The total size of land cover for the protection area is about 11,700 acres, or just over 18 square miles. Undeveloped areas, including tree canopy, low vegetation, and open water, comprise 96% of the protection areas – approximately 11,244 acres. Developed areas, which includes structures, roads, and other impervious surfaces, comprise about 453 acres (3.8% of the area), and a very small portion of the area, about 3 acres, or less than 1%, is made up of cultivated crops and hay/pasture.

Source Water Protection Case Study

Centre County, Pennsylvania *PCE in Groundwater Spring, 2010*

Tetrachloroethylene (PCE) contamination has been found in a Centre County spring since the 1980s, but recent sampling results show that PCE levels have begun to fall. One theory is that a groundwater-treatment system installed at a nearby industry has treated more than 546 million gallons of tainted water, with 4,800 pounds of volatile organic compounds removed. Contaminated soil has also been removed from the site. PCE ingestion has been tied to liver problems and an increased likelihood of cancer [44].

Because of the potential impact to the water supply, transportation corridors have been assigned a rating to assist the Steering Committee with management strategies. The rating is based on proximity to the water source, potential contaminants associated with the land use activity, and input from the steering committee and DEP staff. This information is then processed through a matrix system developed by the DEP to assign a susceptibility rating. The highest-rated roadways are state roads, including State Route 233 (Pine Grove Road), which are rated A for susceptibility in both Zones A and B. **Figure 4-2** displays the local and state roadways within the protection areas.

The descriptions below for the selected non-point sources are general in nature; however, each description includes an adequate amount of information that a reader with no knowledge of the non-point source PSOCs will be able to understand how it could impact and affect drinking water quality.

Agriculture: Polluted runoff is picked up and carried by surface water runoff and snowmelt that is then deposited in bodies of water and underground sources of drinking water. Agricultural activities related to row crops that cause these impacts include plowing too often or at the wrong time and improper, excessive, or poorly timed application of pesticides, irrigation water, and fertilizer. The types of pollutants generated include sediment, nutrients (phosphorus, nitrogen, and potassium), pesticides, metals, and salts. The improper handling, storage, application or disposal of fertilizers and pesticides (e.g., herbicides, insecticides, rodenticides, fungicides, and avicides) used by agricultural operations all have the potential to contaminate groundwater and surface waters.

Dirt and Gravel Roads: Erosion, sediment, and dust pollution from unpaved or low-volume paved roads can mix with stormwater runoff, and contaminate local waterways. “Environmentally sensitive maintenance” practices like blading, smoothing, and regrading can keep the roads smooth and stronger for a longer period of time.

Logging/Silviculture: Silviculture is the practice of forest management. When timber is harvested, the resulting cleared earth and areas that have been disturbed by heavy equipment operations and dragging of tree trunks may be susceptible to erosion. Sedimentation, accidental spills of fuel from forestry equipment, and the storage, handling, and management of fertilizers and pesticides all pose potential threats to groundwater and surface water. Sources of NPS pollution associated with forestry activities include removal of streamside vegetation, road construction and use, timber harvesting, and mechanical preparation for the planting of trees. Road construction and road use are the primary sources of NPS pollution on forested lands, contributing up to 90 percent of the total sediment from forestry operations. Harvesting trees in the area beside a stream can affect water quality by reducing the streambank shading that regulates water temperature and by removing vegetation that stabilizes the streambanks. These changes can harm aquatic life by limiting sources of food, shade, and shelter.

Outdoor Recreational Activities: A number of outdoor recreation activities can impact surface sources located nearby. Public parks, camping areas, swimming areas, fishing holes, hunting areas, and bicycle and hiking trails have the potential for contamination through litter, sanitary facilities, and vehicle use. Recreational use of off-road and all-terrain vehicles (ATVs) on unpaved trails and natural areas causes soil compaction and erosion, and also forms mud holes and gullies. Stormwater runoff increases the trail degradation and carries loosened sediment to streams and other bodies of water. Spills and leaks from ATV and other vehicle engines (typically gasoline or diesel fuel) onto pervious surfaces also pose a potential threat to source water.

Residential Land: Pollutants that are found in residential stormwater consist of suspended sediment (vehicle particles, chunks of pavement, and construction materials); lawn and garden chemicals and waste, household hazardous waste, pet waste, litter; and miscellaneous debris. The following residential items and activities also pose a risk to the groundwater supply:

Household Hazardous Materials: Various household tasks require the use of products that contain hazardous chemicals. Typical items include household products, wall and furniture treatments (paints, varnishes, stains, paint and varnish removers, paint brush cleaners, floor and furniture strippers); and mechanical repair or other maintenance products. The improper storage, use, and disposal of these products pose a threat to groundwater and surface water.

Residential Heating Oil Tanks: Heating oil tanks are also a concern to the water system. Heating oil can be stored in either aboveground or underground storage tanks. Uncontained spills or overfills, tank corrosion, and piping system and equipment failures may release oil to the environment and threaten the groundwater sources. Educational and guidance materials have been provided to the water system to help protect their sources from contamination events.

Residential Septic Systems: Septic systems (i.e., effluent from septic tanks, cesspools, privies, and leachfields) that are improperly sited, designed, constructed, or maintained are potentially serious sources for local water contamination. Potential contaminants from septic systems include bacteria, viruses, parasites, nitrates, hormones, phosphorus, surfactants, oils, cleaning chemicals, heavy metals, and pharmaceuticals. Use of septic system cleaners, which typically contain synthetic organic chemicals, may also contribute to the contamination of groundwater.

Transportation Corridors/Parking Lots/Railroads: Non-point source runoff from roads, highways, rail lines and parking lots contribute a significant source of pollutants into surface and groundwater. As rainwater or melting snow drains off of impervious surfaces, it picks up deposited pollutants. Uncontained spills and leaks associated with accidents within transportation corridors, as well as any contaminant that is carried in bulk on a truck or railcar can be spilled onto the ground or directly into a waterway at a bridge crossing. These events, particularly in close proximity to wells or intakes can contaminate a water source in a short amount of time.

Wildlife: Bacteria and nutrients in the water from wildlife waste, waterfowl droppings, and other means can create algal blooms on the surface water source, which are difficult to remove with standard

water treatment methods. Preventing nutrient pollutants from reaching the water source is a key factor in avoiding additional treatment procedures and associated costs. Reducing contaminants from wildlife and waterfowl can be attained through a number of environmentally-friendly approaches, such as elimination of feeding from humans, chasing or scaring the animals and birds, exclusion fencing, and landscaping that prevents feeding. Riparian buffer areas surrounding the water source can assist with filtering pollutants. Education of local customers can provide information on source water protection efforts.

4.3 PSOC Identification and Evaluation: Point Sources

The first step in identifying point source PSOCs in the protection areas was searching publicly-available environmental databases for regulated locations, as identified by a permit or an enforcement action. The PSOCs found through these database searches are point sources; non-point sources typically are not regulated. A preliminary list of point source PSOCs was prepared from the following data sources, which are referenced in **Section 9**, and identified by a bracketed number []:

- Air emission plants [15]
- Beneficial land uses [16]
- Captive hazardous waste operations [17]
- Cemeteries [18]
- Coal mining operations [19]
- Commercial hazardous waste operations [20]
- Conservation wells [21]
- Golf courses [22]
- Historic oil and gas wells [23]
- Industrial mineral mining operations [24]
- Land recycling cleanup locations [25]
- Municipal waste operations [26]
- Oil and gas water pollution control facilities [27]
- Oil and gas wells [28]
- PA CleanWays Illegal Dump Surveys [29]

Source Water Protection Case Study
Chester County, Pennsylvania Manure Storage Releases, 2018 Two releases from manure storage tanks were reported within a one-week period in Chester County. The first incident released 100,000 gallons of manure into two nearby creeks, creating a fish-kill scenario. The second incident released another 2,000 gallons into streams. These waterways feed the Octoraro Reservoir, a source of drinking water for the Chester Water Authority, serving 200,000 people. The PA Department of Environmental Protection monitored both incidents, but no adverse effects to the reservoir were reported by the Authority. [54]

- Public PSOCs obtained from 2002 Source Water Assessment Program [30]
- Radiation facilities [31]
- Regulated tank list [32]
- Residual waste operations [33]
- Storage tank cleanup locations [34]
- Storage tank locations [35]
- Water pollution control facilities [36]
- Water resources [37]
- USEPA Envirofacts geospatial data [38]

4.4 PSOC Rating and Susceptibility Analysis

The relative risk of point source PSOCs on source water is determined through a uniform method developed by DEP known as a susceptibility analysis. [39] The susceptibility analysis is a qualitative measure of the relative priority for concern of PSOCs based on the drinking water source sensitivity, the potential impacts posed by sources of contamination to the water source, and the possibility of release of the contaminant of concern. The intent of the analysis is to identify the most significant PSOCs to assist in making local voluntary source water protection programs more effective.

The susceptibility analysis uses a series of tables to determine high, medium, and low values for five parameters: time of travel, persistence, quantity of pollutant, sensitivity of the source, and potential for release. Some of these parameters are pre-established as a baseline for consistency between watersheds throughout the state. Each PSOC is given a rating from A to F, with A posing the greatest potential threat and F the least potential threat. The DEP's guidance document explaining the susceptibility analysis is available in **Appendix D**.

4.5 Susceptibility Analysis Results and Verification

The initial database search resulted in a total of 5 preliminary PSOCs identified for the protection areas, including illegal dump sites, above and underground storage tanks, and an EPA regulated site for air quality. Verification of the PSOC inventory was completed by the steering committee in 2022. As a result of the verification, some PSOCs may have been corrected, and other PSOCs added or deleted from the inventory. The highest-rated point source is the illegal dump site along PA Route 233, rated

A for susceptibility in both Zone A. The database results for these PSOCs are displayed in **Figure 4-2**, and summarized in **Table 4-2**.

PSOCs, particularly those in Zones A or B for surface sources, pose the greatest threat to the water supply and, in general, merit the most attention for preventing a contamination problem. Descriptions of the PSOCs are described below:

Aboveground Storage Tanks (ASTs): ASTs are used in industrial, commercial, and agricultural operations, as well as at individual residences, to store petroleum products and chemicals. Discharges of chemicals, petroleum, or non-petroleum oils from storage tanks can contaminate source water. Chemicals that are released due to spills, uncontained overfills, tank corrosion, and piping system and equipment failures may accumulate in soils and present a threat to source water.

EPA Regulated: These are sites from the EPA

Envirofacts data system, which is made up of information from multiple environmental databases. This is a wide range of sites that are subject to environmental regulation by the EPA. Reasons for regulation can vary greatly within the themes of air, land, water, waste, toxics, and radiation.

Illegal Dump Sites: These areas pose a significant threat to groundwater and surface water because they are unregulated and often located on private property where they are difficult to inspect, or along a roadside that no one claims responsibility for cleanup. Household hazardous waste dumped in these unregulated areas is also of concern, since various household tasks require the use of products that contain hazardous chemicals. Typical items include household cleaning products, wall and furniture treatments, and mechanical repair or other maintenance products. The improper storage, use, and disposal of these products pose a threat to groundwater and surface water.

Underground Storage Tanks (USTs): USTs are used primarily to store gasoline, heating fuel, or other petroleum products for home, commercial, and industrial use. Industries also store a wide range of

Source Water Protection
Case Study

**Lehigh Valley, Pennsylvania
Mobile Home Park Contamination, 2012**

The owners of dozens of mobile home parks, some in the Lehigh Valley area, have agreed to pay a \$1.3 million fine and clean up their act after being accused of thousands of violations of water pollution laws.

State and federal environmental authorities said mobile home parks exceeded federal drinking water standards for pollutants; failed to notify residents about drinking water problems; illegally discharged untreated or partially treated sewage into streams; and failed to properly operate and maintain sewage treatment facilities [46].

other substances in USTs, such as acids, metals, industrial solvents, technical grade chemicals, and chemical wastes. Although some new USTs have stringent installation requirements (gasoline stations, for example, require double-hulled tanks with an alarm system), old tanks may corrode and their contents leak into the soil and groundwater. In many cases, old USTs are abandoned in place. In addition, accidental overflow and spills during filling of USTs pose a threat to source water.

The complete data results of the preliminary PSOC inventory and susceptibility analysis for each drinking water source are provided in **Appendix D** as a comparison to the final list presented as **Table 4-2**. It lists as much of the following information as is readily available through the database searches for each PSOC. Note that information for some PSOCs was missing from the electronic databases. Although efforts were made to identify missing information, some of this data may not be available.

Notification to PSOC owners to educate them about their presence in a source water protection area is often an important early part of a water system's source water protection program. To aid this effort, **Appendix E** contains sample letters that can be sent to property owners to notify them of their designation as a PSOC. The letters can be altered to best fit the PSOC and can serve as a first step in opening a dialogue with the owner. The letter should help PSOC owners understand their importance to source water protection and the steps they can take to help protect the community's water supply. Electronic copies of these letters that can be edited by the water system are included on the **Report** media at the end of this report.

4.6 Continued Maintenance of the PSOC Database

PSOCs can change over time, so it is important to maintain updated information to understand potential threats to the water supply. A "live" database of PSOCs should be maintained so that the water system can remain aware of potential threats to the water supply. New PSOCs can be evaluated to assess its potential threat to a water source in a similar way to how the existing PSOCs were evaluated. 25 Pa. Code § 109.713(a)(4) requires an assessment for each source. **Appendix D** includes a document entitled "Source Water Assessment and Protection Program" which contains the DEP guidance information for determining the susceptibility rating of a PSOC.

Appendix D also contains a factsheet about free DEP database subscriptions that may help the water systems with permitted activities within their local area. The eNOTICE database allows citizens to

track environmental permit application by selection of a municipality or county, resulting in an e-mail notification. The DEP's eFACTS database provides information on permitted facilities such as inspection results and notices of violation.

To this end, municipal staff, individuals, and organizations should be enlisted to help safeguard the water supply area. Interested people/organizations will be the "eyes and ears" as they live, work, and travel through the watershed. Blank PSOC reporting forms (see **Appendix E**) should be provided to environmental groups and any individuals who are interested in watershed monitoring. If a possible PSOC is noticed – for example, a group of 55-gallon drums – then the observer can fill out and mail a reporting form for further investigation.

Appendix E also includes a blank one-page summary sheet that could be used to summarize information about priority PSOCs that would aid in spill response, such as the type, location, and quantity of chemicals stored at the facility. This summary sheet could be attached to the water system's emergency response plan.

5.0 Contingency Planning

In the event of an emergency that could impact the water supply, immediate action is often critical in preventing or minimizing contamination. As outlined in 25 Pa. Code § 109.707, the water supplier must maintain preparedness procedures for safe and adequate drinking water under emergency circumstances. [40] Possible emergency situations include a distribution system line break, power outages, drought conditions, disinfection system failure, contamination of water supply, source pump failure, and prolonged water outage. DEP provides additional Emergency Preparedness information for community water systems and wastewater facilities [41].

5.1 Types of Contamination Events

The DEP recognizes three general categories of contamination, and the general response required [42]:

1. Bacteriological contamination – The water supply should be chlorinated at all times to control bacterial contamination. Standby chlorination facilities – including a chlorinator, supporting equipment, and supply of chemicals – should be available at all times for adequate disinfection of the water supply.
2. Chemical contamination – In general, chemical contaminants will either be toxic, interfere with the normal treatment process, or create taste and odor problems in the finished water. In the event of contamination from a toxic chemical (e.g.,

heavy metal, cyanide, etc.), the water source should be shut down immediately and alternate sources of supply placed into service. Water rationing may be required, and public notification should be given. If the water is deemed safe but the quality of the finished water is affected, plans for additional or alternate treatment should be available. Emergency stores of certain chemicals – such as activated carbon – may be required.

Source Water Protection Success Story

Northampton County, Pennsylvania *Forest Protection Agreement, 2012*

Clean drinking water, wildlife, recreation, and Pennsylvania's forest products industry will benefit from a new agreement between The Nature Conservancy and the Bethlehem Authority. The agreement will protect 22,000 acres of forest in the watershed that provides drinking water to Bethlehem and surrounding communities. The city serves over 100,000 customers entirely from surface sources stored in reservoirs in the Pocono Mountains. Acting on a unanimous approval vote by the Bethlehem Authority Board, City Council agreed to join the Conservancy's "Working Woodlands Program", which provides forest landowners with a rigorous analysis of their property and access to forest certification and carbon markets, in exchange for a commitment to practice sustainable forestry [49].

3. Other biological contamination – Non-bacteriological contamination from a biological source, such as excessive algal growth, is more likely in surface water supplies than in groundwater. Alternate or additional treatment processes may be required.

5.2 Emergency Response Plan

25 Pa. Code § 109.713 requires that water suppliers seeking to obtain Department approval for a source water protection program must have contingency planning for the provision of alternate water supplies in the event of a source contamination, and emergency responses to incidents that may impact water supply source quality.

Chambersburg Borough Water System recognizes that threats to potable water supplies can occur through both accidental and intentional spills and releases. The water system is committed to minimizing the threat of a contamination event; it is also committed to having an effective response plan if contamination of the water supply occurs.

Staff maintains an Emergency Response Plan (ERP) that is updated annually and kept at the water system office. The plan includes contact information for all local officials, media, and emergency responders. As recommended in Section 5, the staff may wish to attach a one-page fact sheet for each major PSOC in the protection areas to the ERP. The fact sheet could include information that would aid in spill response, such as the type, location, and quantity of chemicals stored at the facility.

5.3 Contingency Procedures

Part of the contingency plan is that corrective actions for probable emergency situations are discussed, along with specific procedures, aid agreements, and equipment to be used. If a contamination event were to occur, the system has an emergency supply capacity. This supply is contained in several water storage facilities, including the Long Pine Reservoir, which holds approximately 1.78 billion gallons of raw water, and four additional covered storage tanks and reservoirs which hold approximately 11.5 million gallons of finished water.

In the event of an emergency that exhausted the emergency supply, CBWS may rely on a permitted bulk water vendor or other mutual-aid organizations for assistance.

If the ERP needs to be activated, the water system should first notify their DEP Sanitarian, who may determine the need for an emergency permit. Staff can then contact the bulk water vendor listed as a contingency supplier, and prepare for the transfer of water. The ERP must also describe how and where the water system intends to accept bulk water within their system.

In the event of an emergency, staff will contact DEP, local and county emergency management, and water customers. Chambersburg Borough Water System can also contact SSM, who developed the hydrologic model and determined the source water protection areas. SSM personnel can use the model to assess the potential impact from the spill and recommend an approach to prevent or minimize contamination of the intake.

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6.0 Feasibility of New Source Sites

As outlined in 25 Pa. Code § 109.707, the water supplier must maintain emergency preparedness as discussed in the previous Contingency Planning section. Being fully prepared includes a serious evaluation of alternative sources for both short-term and long-term supply, in the event that an existing source becomes unusable or needs supplemental quantity.

While many suppliers may have redundancy built into their system, some situations will still require the use of emergency sources. The establishment and maintenance of reserve sources is a necessary action for complete source water protection. This may mean examination of obtaining additional groundwater wells or springs, placing an intake in a nearby stream, or constructing an interconnection with another water system. Each of these alternatives requires a substantial monitoring and permitting process, so water systems are encouraged to discuss this issue with their staff and consultants as part of ongoing contingency planning. The plan must address the source protection measures that can be implemented today for the water supply needed for tomorrow.

To date, no new sources have been sited or developed since the current source of water produces adequate supply to maintain service to CBWS customers. However, CBWS continues to review options to ensure that they have sufficient water supply for their customers into the future. The water system may also consider pursuing alternative supplies and increased water production to address growth, drought, and system flexibility. In the event of a source failure, the water system will work with the DEP for a feasibility study and permitting of new sources. Additional sources that may be identified in the future will be protected with the same management strategies outlined in this plan.

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7.0 Source Water Protection Management Program

This section describes the management options that CBWS can implement as part of this source water protection plan. The management plan is intended to protect the source of water for the community from present and/or future potential contaminants, including those identified in Section 5.0, with reasonable and sustainable measures. The plan applies to the delineated protection areas and the potential sources of contamination in these areas.

7.1 Current Security and Protection Efforts

It is becoming increasingly important for community water systems to address cybersecurity and other risk and resilience issues as part of their source water protection program. A thorough evaluation and potential modifications to electronic/internet-based operations, including SCADA systems, can be costly and appear overwhelming. For those water systems serving more than 3,300 people, this includes completing a Risk and Resilience Assessment and updating their Emergency Response Plan according to EPA requirements. To help address impacts from these issues, CBWS has established security measures to protect their water sources from accidental or intentional damage, which include establishing a close working relationship with PFBC and DCNR

to patrol and monitor the reservoir and watershed areas, the addition of signage to various places through the reservoir and watershed, remote monitoring of raw water conditions at the intake, and updated and increased physical security at the intake and treatment plant. Additional resources to assist water suppliers reduce risk and increase resilience can be found in **Appendix F**.

Source Water Protection Success Story

Potter County, Pennsylvania *Source Water Protection Coalition, 2017*

Potter County has the distinction of being the first county in Pennsylvania to have all the public drinking water systems have a Source Water Protection Plan. The Triple Divide Coalition was formed to assist the water suppliers in communication, seeking grant funding, and improve overall efficiency. The Coalition is working with the PA Department of Environmental Protection to integrate all the protection areas into the DEP's permitting process. The protection areas have also been supplied to the County's emergency management agency, so that water suppliers are notified if a spill or release occurs within a protection area.

Potter County has also updated their Subdivision and Land Development Ordinance to include water suppliers in the commenting process for proposed projects, if the project falls within a protection area. This process seeks to open communication between the applicant, the public water supply, and the planning office. [50]

7.2 General Options

Community water suppliers may choose from a wide variety of management options, from voluntary activities to highly protective measures that require regulatory implementation. **Table 7-1** lists potential strategies that may be considered for source water protection. Not every option is relevant to every community. Some options can be easily implemented, while others require greater effort, expense, and administrative oversight.

The **Source Water Protection Resources** in **Appendix F** provides additional information that CBWS staff and the steering committee may use in implementing selected management strategies. A brochure from the American Water Works Association provides information for distribution to agricultural partners in this appendix. “*Finding the Green*” supplies information on possible funding and support programs for source water protection projects. Other current programs may be found by searching DEP’s “Funding Opportunities” website. With the approval of this source water protection plan, CBWS is eligible to install “Water Supply Area” signage within its protection areas. These signs are an education tool to alert drivers to notify emergency management if they witness an accident or spill, and information on developing and installing these signs is presented. Other information on security, cybersecurity, and updating emergency response plans is also available in **Appendix F**.

Since the protection areas are within several municipalities in three counties, the CBWS staff may wish to work with these municipalities when implementing this source water protection plan.

7.3 Management Strategies Selected by the Committee

This section describes the management options that CBWS may choose to pursue for source water protection. The list below is neither all-inclusive nor required. The list is tailored to include specific measures to address PSOCs in CBWS’s protection areas as well as general management options to ensure comprehensive source water protection. **Table 7-2** summarizes these options within specific categories, and provides potential partners and a general schedule for accomplishment:

- *Annual* – this identifies management options that should be completed once every year. Examples include updating the emergency response plan, holding a steering committee meeting, and updating the PSOC inventory.
- *Ongoing* – these management options should be implemented as an opportunity arises. For example, a farmer in a critical location for any water sources might request assistance with a

streambank protection project. The system could provide financial or other in-kind support for this project that will protect the water sources.

- *Immediate* – these are management options that the water system should consider implementing soon after their source water protection plan is approved. Immediate management options include those that get the word out to the community about the source water protection plan and future source water protection efforts.
- *Short-term* – this identifies a management option that staff should consider completing sooner rather than later, potentially within the first few years after approval of this plan. These options have a higher priority because they are more likely to have a significant effect protecting the water supply.
- *Long-term* – these management options are less critical and should be completed after most of the short-term tasks are implemented.

Steering Committee and Public Participation

1. Meet with the steering committee annually to address source water protection and other water resources issues in the protection area. Review and update the inventory of existing and potential PSOCs on a regular basis. An annual update form should be submitted to the DEP-Southcentral Region office by March 31 of each subsequent year following approval of the plan.

Source Water Protection Success Story

Berks County, Pennsylvania Source Water Protection Program, 2018

The Berks County Water & Sewer Association is a non-profit group to advance the operations of drinking water and sewer services, provide training, and promote cooperation among water and sewer service utilities and other members. The BCW&SA along with the Berks County Planning Commission supported the development of the Berks County Source Water Protection Program, which provided county-wide activities and education for all the drinking water suppliers participating on the committee.

The PA Department of Environmental Protection recently recognized this project for the 2018 Governor's Award for Environmental Excellence. [52]

Public Education

2. Conduct public education for area residents and customers regarding where their water originates, and the importance of source water protection. Consider participating in local events such as Earth Day or cleanup activities. Education tools include:
 - Distribute printed media in the community. Distribution methods can consist of information included in water bills, newsletters, articles in the local paper, and distribution of educational materials at fairs and other community events. Several educational

brochures were prepared and given to the water system for distribution to its residents and other interested parties. One brochure provides general information about source water protection, and lists simple things that residents can do to help protect the water supply. Another brochure focuses specifically on proper disposal of pharmaceutical waste and keeping medications out of the water supply. Additional brochures on agriculture, household hazardous waste disposal, residential fuel tanks, wastewater, and septic tanks are also shared with the water system. Copies of all brochures are included in **Appendix B**. Electronic versions of the brochures that can be updated are included on the **Report** media at the end of this plan, and can be edited as necessary.

- Show the PowerPoint slide presentation in **Appendix B** highlighting the elements of the source water protection plan, which can be shown to visitors, schools,

local organizations, and as a Public Service Announcement during community events or on local television stations. The slideshow can be used with a presenter, or “looped” for continuous play. A summary version is included in **Appendix B**, with an adaptable PowerPoint file located on the **Report** media.

3. Partner with the County Conservation Districts and other steering committee members to provide outreach in local school districts. Consider hosting plant tours for school students or other community groups. The ***Talking About Pennsylvania*** (TAP) Water Kit was developed by the American Water Works Association (AWWA). It contains lessons, activities, and a guide for teachers based on state guidelines on teaching about water, and can be provided to local schools and environmental clubs. An electronic storage device containing the entire curriculum is included in **Appendix B**.
4. Provide information via the CBWS website. Add copies of the plan’s Executive Summary and the brochures. Include general statements on the importance of source water protection and how

Source Water Protection
Success Story

Fayette County, Pennsylvania
Children’s Water Festival, 2014

For more than ten years, the Fayette County Children’s Water Festival has reached more than 9,000 sixth grade students by providing their schools with an educational field trip. The Festival is a one day educational event designed to teach students about different water concepts, and help make educated choices regarding water quality, quantity, and conservation. Resources and other educational information are then provided to participating teachers in order to meet the Watersheds and Wetlands Academic Standards for Environment and Ecology in their classrooms [47].

the public can participate. Offer the information to Franklin and Greene Townships for placement on their website or other media.

5. Modify language to the annual Consumer Confidence Report to explain current source water protection participation. Include general statements on the importance of source water protection and how the public can participate. The system can edit the following paragraph as needed: *In 2022, Chambersburg Borough Water System developed a comprehensive Source Water Protection Plan to protect their water sources. This project delineated protection areas for the water sources, identified potential sources of contamination, planned for potential pollution events, and selected management strategies that can be implemented in the future. This assessment found that our sources are potentially most susceptible to contaminated stormwater runoff. Public education and watershed improvements are the primary focus of the program, which will benefit all residents and companies working and living in our service area. More information is available by contacting CBWS at...*

Source Water Protection Area Notification

6. Provide the Geographic Information Systems (GIS) mapping files for the protection areas to the Franklin County and Adams County Planning Commissions for use in county comprehensive planning. Both County Conservation Districts would also benefit from the GIS files to assist with watershed improvement planning and projects.
7. Consider installing public awareness signs along Route 233 in Zone A and Zone B. Work with County and local emergency responders for notification if a driver contacts 9-1-1.
8. Partner with DCNR on forestry practices and recreational activities to minimize impacts to the reservoir and creeks, and provide the protection areas information for inclusion in their Forest Resource Management Plans.

Source Water Protection Success Story

Pike County, Pennsylvania Watershed Awareness Signs, 2011

The Hemlock Farms Community Association (HFCA), located in Pike County, was one of the first water systems to participate in the DEP's Source Water Protection Technical Assistance Program (SWPTAP). In 2011, HFCA decided to install Water Supply Area signs entering their protection areas along Interstate 84 and State Route 739. Each sign notifies the traveling public that they will be within a water supply area, the number of miles they will be traveling through the area, and the spill response number to call if there is a hazardous spill or accident.

HFCA also decided to increase their protection by developing informational placards that will be distributed to carriers of hazardous waste [48].

PSOCs: General

9. Work with the steering committee and other partners to review and update the inventory of existing and potential PSOCs on a regular basis in accordance with Chapter §109.713(a)(4).

Emergency Planning

10. Update the emergency response plan annually to make sure all contact information and provisions for an alternate water supply are current.
11. Provide the GIS shapefiles to the County and/or local Emergency Management Agency to be incorporated into the 9-1-1 call system for water system notification in the event of spill or release within source water protection areas.
12. Work with local emergency response personnel to ensure they are aware of the protection areas and who to contact in the event of a spill on roads or railroad.
13. Join the *PA Water/Wastewater Agency Response Network* (PaWARN) mutual-aid organization. PaWARN has “utilities helping utilities” for emergency and disaster response.

8.0 Implementing and Sustaining the Source Water Protection Program

Chambersburg Borough Water System recognizes that the sustainability of this source water protection program is an important tool to ensure successful improvements to the watersheds over time. During the development of this program, the Steering Committee discussed the need for ongoing leadership and financial support after the implementation/management plan has been completed. System Evaluations and Assessments are required to be performed annually by the water system in 25 Pa. Code § 109.705(a)(1) and (2) of the Safe Drinking Water Regulations.

8.1 Maintenance of Source Water Protection Committee and Leadership

CBWS has developed a robust steering committee in assisting with the development of the source water protection plan. It is expected that other organizations will connect with the Committee as projects are considered and implemented, such as additional environmental organizations, local commercial facilities, and other companies interested in protecting source water.

8.2 Short- and Long-Term Implementation Goals

Table 7-2 can be used as an implementation plan for protecting its water supply. The table includes potential partners and a general schedule for each management strategy selected. Staff will plan a steering committee meeting at least once per year for the entire membership. The management strategies outlined in this program will be reviewed, evaluated, and prioritized according to membership discussion. New strategies may be added to the implementation list, and other options may be discontinued or suspended as human and financial resources are allocated. Ad hoc committees may be considered as needed to pursue specific objectives decided by the members.

8.3 Annual Reporting

Community water systems must submit an annual report to DEP once their source water protection plan has been approved. The report may include a summary of steering committee meetings, educational efforts, or other steps taken to implement their source water protection plan. The annual reporting form is included in **Appendix G**. DEP requests that these forms be submitted to the DEP-Southcentral Region office by March 31 of each subsequent year following implementation of the program.

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Tables

Table 1-1
Source Water Protection Case Studies
Chambersburg Borough Water System
PWSID #7280005
Franklin County, PA
Source Water Protection Technical Assistance Program

Community	Type of Problem	Response to Problem	Costs
Willow Grove & Warminster, PA	PFCs from firefighting foam in groundwater	Redevelopment of land, well testing & remediation. Long term actions needed	\$27 million by Navy and Air Force as of 2016 (ongoing) www.philly.com
Hanover, PA	Excess runoff from fertilizer plant fire – contaminated drinking water and fish kill	Water system shutdown, remediation of ground and surface waters	\$10.5 million for environmental cleanup, and an undisclosed settlement to PA Fish & Boat Commission www.eveningsun.com
Charleston, WV	Coal washing chemical, MCMH, released into Elk River	Drinking water for 300,000 shut off for days, state of emergency in 9 counties, remediation of surface water	\$150 million settlement to residents and businesses plus cleanup costs www.npr.org
Flint, MI	Corrosive water from Flint River in an aged water system causing lead poisoning	Installation of water filters, state of emergency in Flint, distribution of bottled water, switch water source back to Detroit, replace water lines to thousands of homes, extensive investigations and lawsuits	\$16.4 million for initial response, Congress approves \$170 million to address ongoing issues. www.usnews.com
Tallahassee, FL	TCE in groundwater	Enhanced treatment	\$2.5 million plus \$110,000 per year to operate
Pittsfield, ME	Landfill leachate in groundwater	Replace supply, remediation	\$1.5 million
Rouseville, PA	Petroleum, chlorides in groundwater	Replace supply	\$300,000+ (to date)
Atlanta, MI	VOCs in groundwater	Replace supply	\$500,000 - \$600,000
Montgomery County, MD	Solvent, Freon in groundwater	Install county water lines, provide free water	\$3 million plus \$45,000/year for 50 years

Milwaukee, WI	Cryptosporidium in drinking water	Upgrade water system; immediate water utility, city health dept. costs	\$89 million to upgrade system; millions in immediate costs
Hereford, TX	Fuel oil in groundwater	Replace supply	\$180,000
Coeur d'Alene, ID	TCE in groundwater	Replace supply	\$500,000
Orange County Water District, CA	Nitrates, salts, selenium, VOCs in groundwater	Remediation, enhanced treatment, replace supply	\$54 million capital costs

Source: www.lgean.org/html/pdf/154.pdf. Local Government Environmental Assistance Network.

Table 4-1
Land Cover
Chambersburg Borough Water System
PWSID #7280005
Franklin County, PA
Source Water Protection Technical Assistance Program

Land Cover Detail	Land Cover Category	Percent Cover*	Acres*
Developed, High Intensity	Developed	0.002%	0.22
Developed, Low Intensity	Developed	0.084%	9.77
Developed, Medium Intensity	Developed	0.023%	2.66
Developed, Open Space	Developed	3.761%	439.97
Barren Land	Undeveloped	0.108%	12.65
Cultivated Crops	Undeveloped	0.006%	0.67
Deciduous Forest	Undeveloped	54.810%	6,412.57
Emergent Herbaceous Wetlands	Undeveloped	0.015%	1.78
Evergreen Forest	Undeveloped	13.503%	1,579.84
Hay/Pasture	Undeveloped	0.021%	2.44
Herbaceous	Undeveloped	0.347%	40.62
Mixed Forest	Undeveloped	23.921%	2,798.73
Open Water	Undeveloped	1.398%	163.60
Shrub/Scrub	Undeveloped	1.573%	184.02
Woody Wetlands	Undeveloped	0.429%	50.17

*Percent cover and areas are dependent upon the resolution of the land cover data. In this case, land cover statistics were sourced from the MRLC Consortium's NLCD 2016 Land Cover (CONUS) data.

<https://www.mrlc.gov/data/nlcd-2016-land-cover-conus>

Table 4-2
PSOC Summary Results
Chambersburg Borough Water System
PWSID #7280005
Franklin County, PA
Source Water Protection Technical Assistance Program

Map ID	Site Name	Address	PSOC Type	Zone	Susc	Comment	Dist (ft)
1	SR 233		PA Cleanways Illegal Dump Survey	A	A		11,081
2	CALEDONIA STATE PARK	101 PINE GROVE RD FAYETTEVILLE, PA 17222-8224	Aboveground Storage Tank	A	C	1500 gal GAS, 1000 gal HZSUB, 500 gal DIESEL	13,469
3	HIGH ELEVATION OZONE SITE	RIDGE RD	EPA Regulated	B	D	AIRS/AQS	17,158
4	Birch Run Road		PA Cleanways Illegal Dump Survey	B	A		19,834
5	RAFFENSBERGER CABIN TRACT 37339	BIG FLAT RD BIGLERVILLE, PA 17307	Underground Storage Tank	B	C	150 gal HO, INACTIVE	33,246

Table 7-1
Potential Management Options for Source Water Protection
Chambersburg Borough Water System
PWSID #7280005
Franklin County, PA
Source Water Protection Technical Assistance Program

Regulatory Options	Non-Regulatory Options
<i>Legal directives that require compliance and can be expensive to develop.</i>	<i>Do not have enforcement, and requires voluntary effort.</i>
1. Develop overlay district zoning, which identifies special conditions or requirements 2. Require special permitting for certain activities within protection zones 3. Implement subdivision controls 4. Encourage smart growth/cluster design/ low impact development subdivisions 5. Require nutrient management programs on agricultural land 6. Implement stormwater drainage requirements 7. Implement a septic system management ordinance with required inspections and pump-outs	1. Install water supply area signs on roads entering protection zones 2. Promote litter cleanups or waste collection events 3. Acquire land parcels bordering sources 4. Develop public education programs 5. Support septic system management and encourage regular pump-outs 6. Partner with local conservation organizations and environmental agencies 7. Develop a watershed or groundwater monitoring program

Table 7-2
Source Water Protection Management Strategies
Chambersburg Borough Water System
PWSID# 7280005
Franklin County, PA
Source Water Protection Technical Assistance Program

Activity		Chambersburg Borough Water System	Potential Partners					General Schedule
			Steering Committee	Adjacent Municipalities	Adams/Franklin Conservation Dist	Adams/Franklin Emergency Mgmt	DCNR/ Bureau of Forestry	
Steering Committee and Public Participation								
1	Maintain the steering committee to address water resources issues in the protection area. Meetings can be held annually to update PSOCs and management options. Annual updates due at DEP-Southcentral Region by March 31.	X	X	X	X	X	X	Annually
Public Education								
2	Conduct public education for customers and residents regarding the importance of source water protection. Display source water protection brochures at the Borough building, and participate in local events.	X	X	X	X		X	Short-Term
3	Assist the steering committee to provide outreach in local school districts.	X	X		X		X	Short-Term
4	Place articles on Source Water Protection and other information links on the Borough website and social media.	X						Priority
5	Add information about the Source Water Protection Plan to the system's annual Consumer Confidence Report.	X						Priority

Activity		Chambersburg Borough Water System	Potential Partners					General Schedule
			Steering Committee	Adjacent Municipalities	Adams/Franklin Conservation Dists	Adams/Franklin Emergency Mgmt	DCNR/ Bureau of Forestry	
Source Water Protection Area Notification								
6	Consider providing the GIS map files to the County Planning Commission for use in comprehensive planning, and to the County Conservation District for assisting with watershed improvement projects.	X			X			Short-Term
7	Work with the Borough and adjacent municipalities to consider installing public awareness signs along roads entering protection areas.	X	X	X		X		Long-Term
8	Partner with DCNR on forestry practices and recreational activities to minimize impacts to the reservoir and creeks, and provide the protection areas information for inclusion in their Forest Resource Management Plans.	X	X				X	Ongoing
PSOCs: General								
9	Work with the steering committee and other partners to review and update the inventory of existing and potential PSOCs on a regular basis in accordance with Chapter §109.713(a)(4).	X	X	X				Annually

Activity		Chambersburg Borough Water System	Potential Partners					General Schedule
			Steering Committee	Adjacent Municipalities	Adams/Franklin Conservation Dists	Adams/Franklin Emergency Mgmt	DCNR/ Bureau of Forestry	
Emergency Planning								
10	Update the emergency response plan annually to make sure all contact information and provisions for an alternate water supply are current.	X	X	X		X		Annually
11	Consider providing the GIS shapefiles to the County Emergency Management Agency to be incorporated into the 9-1-1 call system for water system notification in the event of spill or release within source water protection areas.	X				X		Short-Term
12	Coordinate with emergency (fire and hazmat) responders. Work with local emergency response personnel to ensure they are aware of the protection areas and who to contact in the event of a spill on roads or railroad.	X	X			X		Long-Term
13	Join or continue participation in the PA Water/Wastewater Agency Response Network (PaWARN) mutual-aid organization. PaWARN has “utilities helping utilities” for emergency and disaster response.	X						Short-Term

Figures

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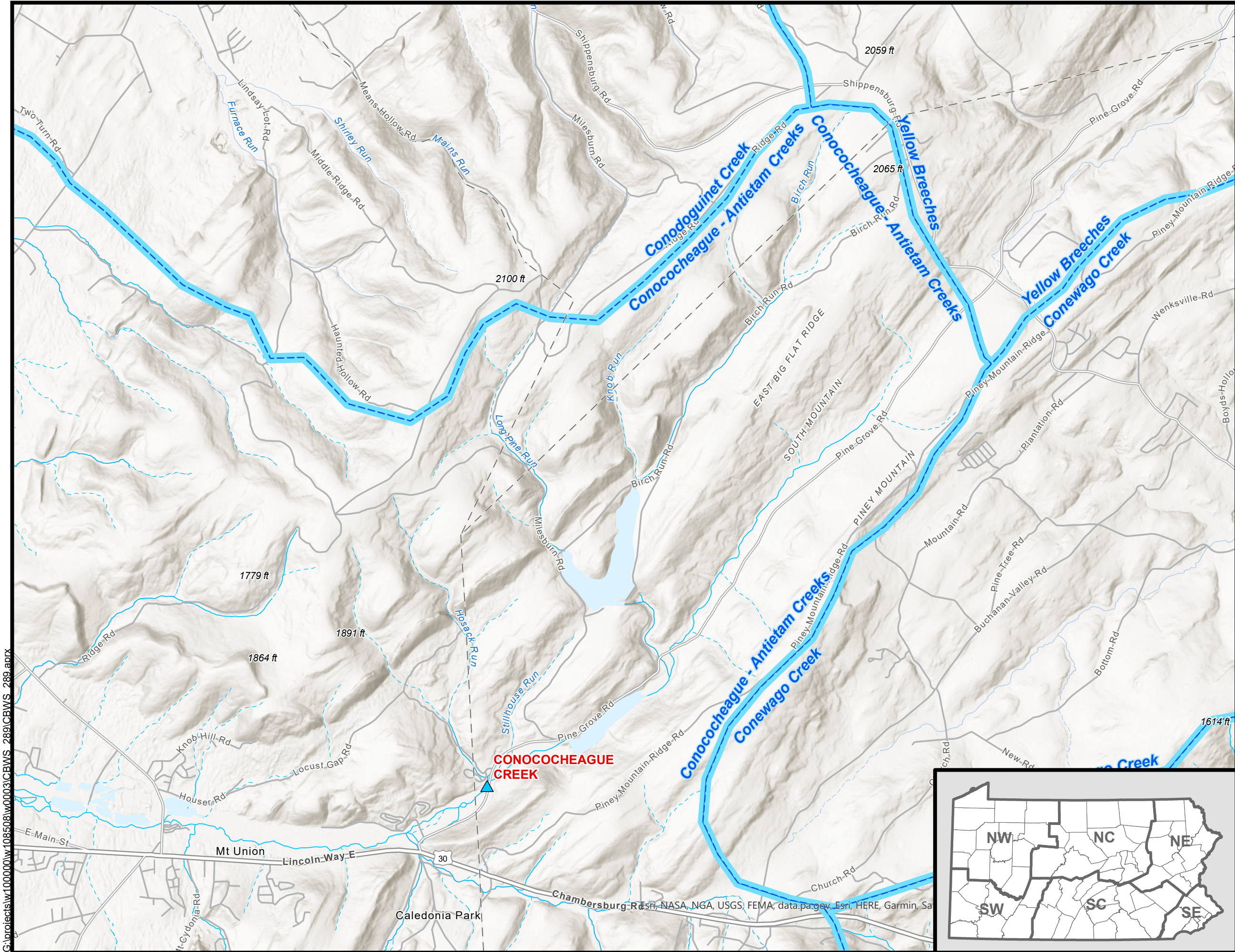
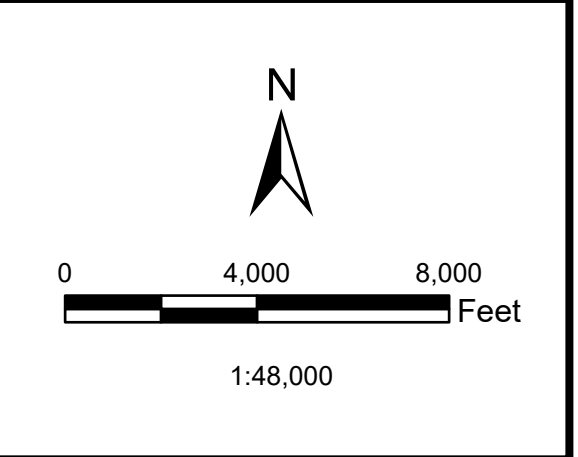
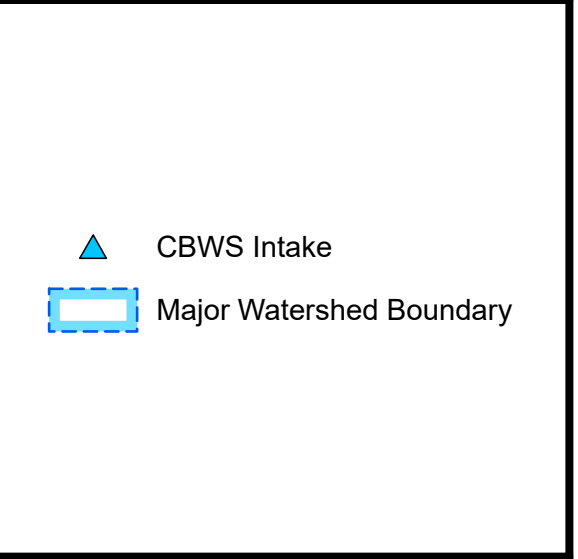


Figure 1-1
Overview of Study Area
Chambersburg Borough
Water System
PWSID# 7280005
Franklin County, PA
Source Water Protection
Technical Assistance Program



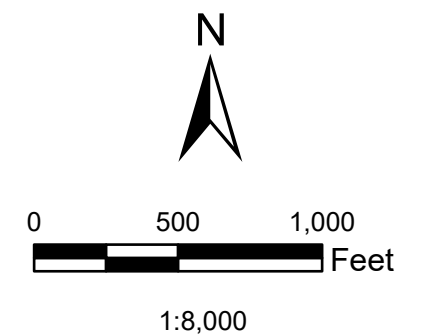
Data Source:
Intake, PA DEP, 2019
Watersheds, EPA NHD, 2021

 **SSM**
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Engineering and Environmental Services
Reading | Lehigh Valley | Lancaster
P: 610.621.2000 F: 610.621.2001
ssmgroup.com

07/08/22

Figure 3-1
Surface Water Sources
Chambersburg Borough
Water System
PWSID# 7280005
Franklin County, PA
Source Water Protection
Technical Assistance Program

- ▲ CBWS Intake
- ▭ Municipal Boundary
- ▭ County Boundary



Data Source:
Intake, PA DEP, 2019
Boundaries, PENNDOT, 2014



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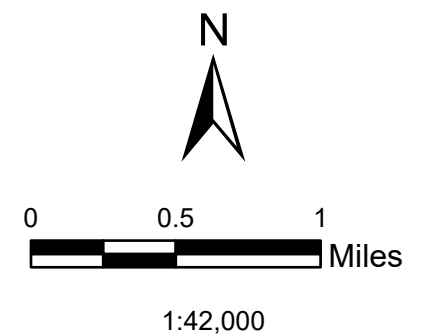


Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Figure 3-2
Surface Water Intake
Protection Area
Chambersburg Borough
Water System
PWSID# 7280005
Franklin County, PA
Source Water Protection
Technical Assistance Program

-  CBWS Intake
-  Zone A
-  Zone B

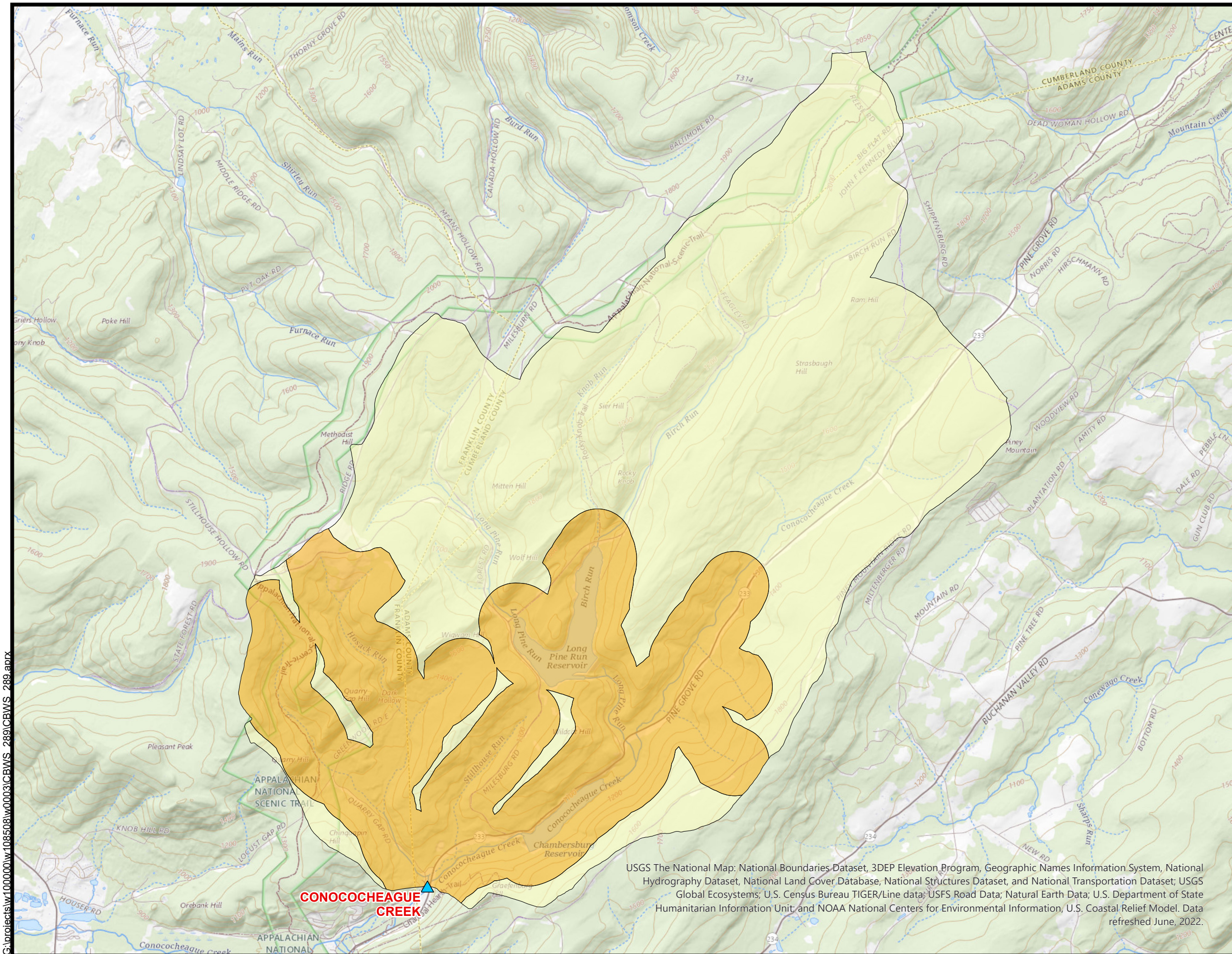


Data Source:
 Intake, PA DEP, 2019
 Zones, SSM, 2022



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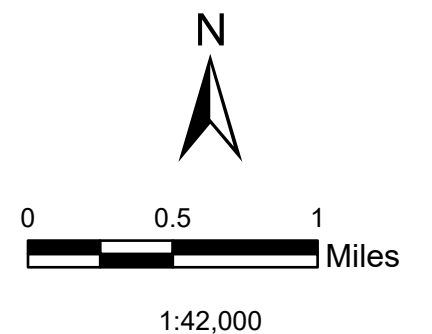
07/08/22



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Figure 3-3
Surface Water Intake
Protection Area and
Guilford Water
Authority Sources
Chambersburg Borough
Water System
PWSID# 7280005
Franklin County, PA
Source Water Protection
Technical Assistance Program

- GWA Spring
- GWA Well
- ▲ CBWS Intake
- Zone A
- Zone B

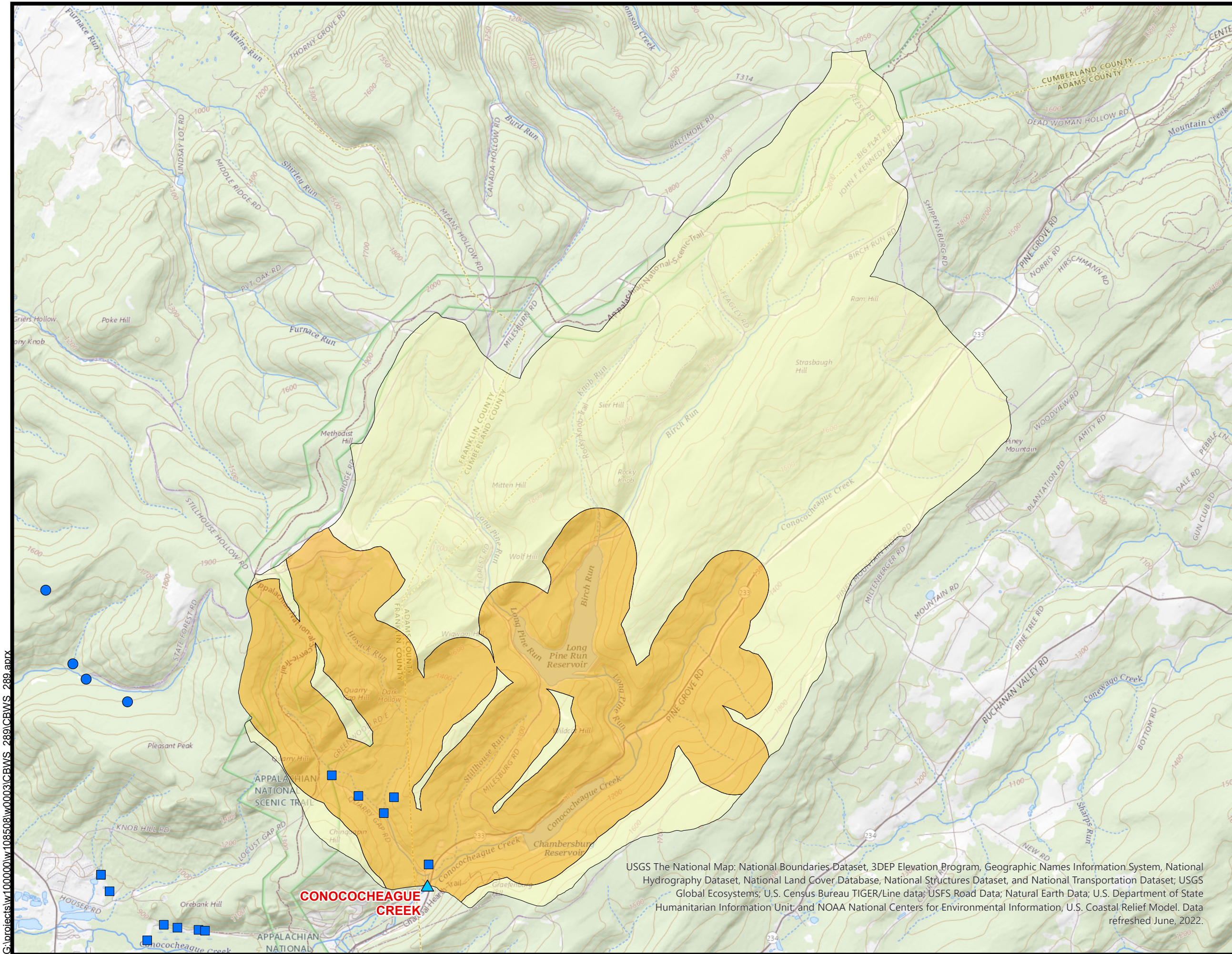


Data Source:
 Intake, PA DEP, 2019
 GWA Sources, PA DEP, 2019
 Zones, SSM, 2022



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07/08/22



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed June, 2022.

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**Figure 4-2
Transportation
Chambersburg Borough
Water System
PWSID# 7280005
Franklin County, PA
Source Water Protection
Technical Assistance Program**

▲ CBWS Intake

Transportation Type

— State Road

— Local Road

Susceptibility

— A

— B

— C

□ Zone A

□ Zone B



0 0.5 1
Miles

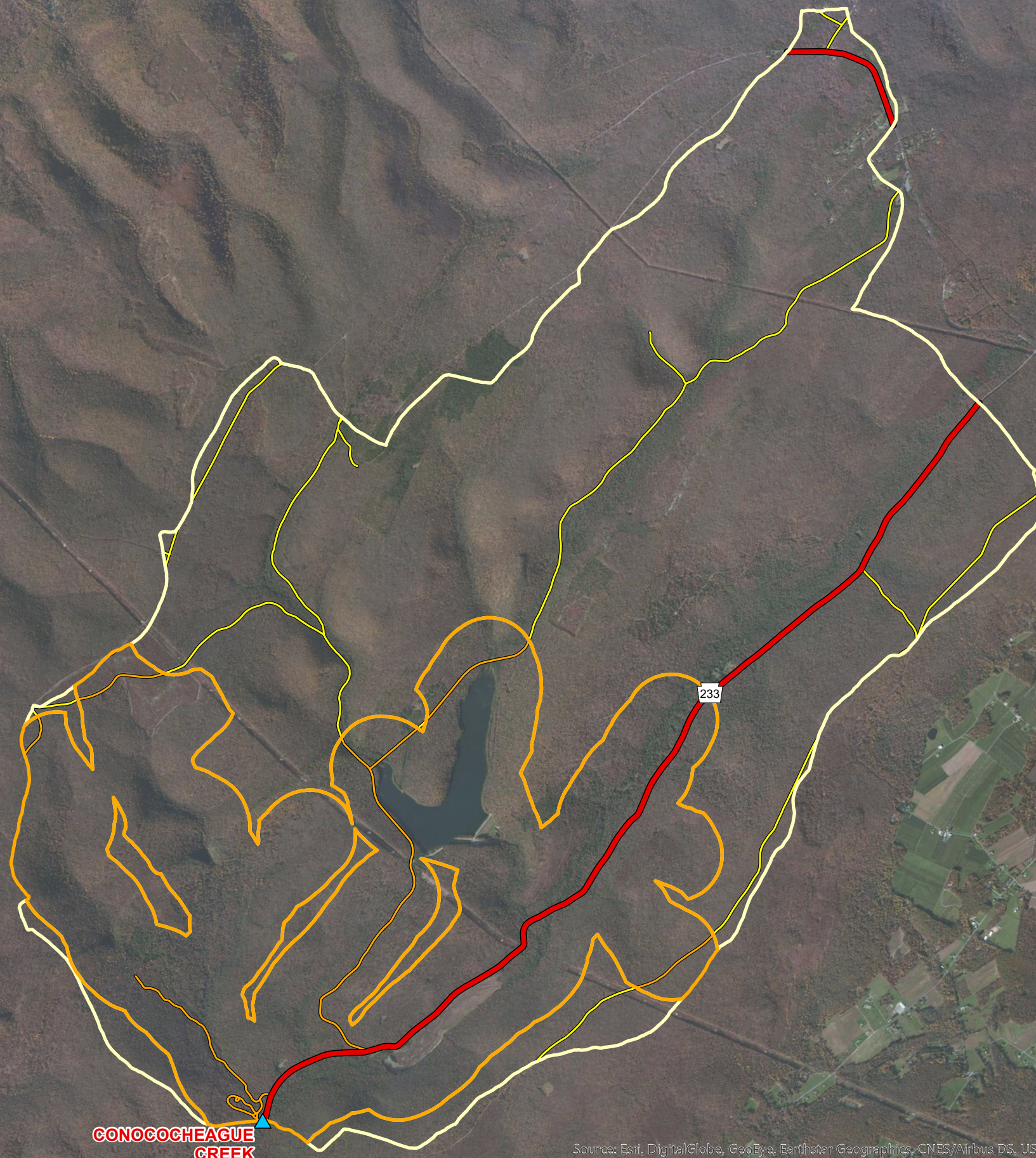
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Data Source:
Intake, PA DEP, 2019
Zones, SSM, 2022
Transportation, PENNDOT, 2020



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Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

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Figure 4-3
Point Source Potential
Sources of Contamination
Chambersburg Borough
Water System
PWSID# 7280005
Franklin County, PA
Source Water Protection
Technical Assistance Program

▲ CBWS Intake

Susceptibility

▲ A

▲ C

▲ D

Zone A

Zone B

Municipal Boundary

County Boundary

N

0 0.5 1 Miles

1:42,000

Data Source:
Intake, PA DEP, 2019
Zones, SSM, 2022
PS PSOC, PA DEP & EPA, 2021

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07/08/22

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix A

Steering Committee Meeting Documentation

Chambersburg Borough Water SWPTAP Steering Meeting

- January 26, 2022
- Remote Meeting

Attendees:

- Scott Melego (Plant supervisor)
- Tyler Seibert (Plant Operator)
- Lance Anderson (Water/Sewer Superintendent)
- G. Bryan Salzmänn (Borough Solicitor)
- Allen Coffman (Council President)
- Travis Amsley (Chambersburg Assistant Water/Sewer Superintendent)
- Jeffrey Stonehill (Chambersburg Borough Manager/Director of Utilities)
- Matt Kendall (Franklin County Emergency Manager)
- Roy Brubaker, PA DCNR
- Rhonda Hakundy-Jones, PG (PA DEP SC Region SWP Coordinator)
- Lyn Rodino, PMP (Spotts, Stevens, McCoy)
- Kurtis Wagner (PA Rural Water Association)

AGENDA

1. Project Introduction – Rhonda Hakundy-Jones, P.G. – DEP-Southcentral Region Office
2. Elements of a Source Water Protection Plan – Lyn Rodino
3. Next Steps - Discussion
 - a. Selection of Priority PSOCs and Verification
 - b. Selection of Management Strategies
 - c. Draft Plan

Notable Discussion

- Because the intake and a significant portion of the SWP Area is in Adams County, Adams County EMA should be invited to join subsequent meetings.
- Hagerstown is the next system downstream. Stormwater and education efforts in Chambersburg will be a benefit for their drinking water source.
- Chambersburg may consider some type of educational signage at the reservoir.

Next Steps

To Do

- Chambersburg will review Point Source PSOC Inventory.
- SSM will begin developing a Rough Draft for the plan.
- Roy Brubaker would like to meet with the Borough to discuss additional mapping of the Sourcewater Protection Area accessible to DCNR (from follow up correspondence).

Completed Steps

EMA

- Kim Frank, Adams County EMA, is pleased to join the steering committee.

Reservoir Details (from System)

- The earthen dam was constructed in 1969
- It holds approximately 1.78 billion gallons of water at an elevation of 1,360'.
- It is actually misnamed - the dam itself is on Birch Run, not Long Pine Run
- Long Pine Run and Birch Run are the two feeder streams into the reservoir; water from the reservoir is released to Birch Run.
- This means that the area of watershed that feeds into Long Pine Run and Birch Run prior to the reservoir would all be considered Zone C watershed (greater than 25 hours).
- The reservoir greatly supplements, if not altogether supplies the majority of the water that we withdrawal from the Conococheague Creek.

Fun Fact

- The word "Conococheague" is translated from the [Delaware Indian](#) or Unami-Lenapi term *òk'chaxk'hanna*, which means "many-turns-river."^[2]

Respectfully Submitted:

Kurtis Wagner

PA Rural Water Association

kwagner@prwa.com

814-360-4078



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER



**SOURCE WATER PROTECTION
TECHNICAL ASSISTANCE PROGRAM**

Program Title:	Steering Committee Meeting
System Name/ID:	Chambersburg Borough Water System
Subject:	Steering Committee Meeting Notes
Date:	07.07.2022
SSM File:	108508.0003.289

Attendees:

Travis Amsley, CBWS

Jean Cooper, CBWS

Brooke Cooper, CBWS

Rhonda Hakundy-Jones, PG, DEP-Southcentral Region

The steering committee meeting was conducted on a virtual platform.

SSM staff provided an overview of the draft Source Water Protection Plan (SWPP), and reviewed an updated Report containing the corrections sent from CBWS staff earlier in the week.

DEP discussed next steps, which include assembling the Final Plan, and the signature needed on the Request for Approval form. SSM will notify the CBWS staff when the Final Plan has been uploaded to the Extranet, so that they can register for access. CBWS can also consider hosting a Public Meeting after the approval has been issued, and DEP will have a presentation and deliver a certificate.

CBWS thanked the SWP partners for assisting with the project.

Appendix B

Public Education Materials

What is a Watershed?

A watershed is all the land that drains to the same river or lake. Water travels from the highest points at the watershed edge to the lowest point at the bottom of the watershed. Wherever you are, you are in a watershed!

When it rains, some water travels over the land surface to the nearest stream or creek. This water is called surface runoff or stormwater. As the stormwater flows, it picks up any contaminants lying on the surface – pesticides and fertilizer from lawns, manure from farms, sediment from construction sites, and oil and gas from roads. Small streams join to form larger and larger rivers, until the water – and any contaminants it is carrying – reaches the final lake or river.

Some precipitation, instead of traveling over the land, will percolate into the soil and reach the groundwater. Similarly, the groundwater may pick up nitrates from failing septic systems, gasoline from leaky storage tanks, and industrial chemicals from improper dumping. The groundwater ultimately flows into one of the rivers or lakes in the watershed.



Ways to Help

What can you do?

- Dispose of motor oil at a garage that will recycle it. Never pour oil on the ground or in a storm drain or sewer on the street.
- Pump out your septic system every two or three years. Look under "Septic Tanks" in the Yellow Pages to find a contractor.
- Bring household hazardous waste – such as paint, varnishes, and other chemicals – to a county waste collection site. Call ahead or check the county website for dates.
- Minimize the use of pesticides and herbicides on your lawn and garden.
- If you drill a new well, make sure the old one is properly closed and abandoned.
- Do not dump swimming pool water into a creek or storm drain at the end of the season. If possible, direct the water into the sanitary sewer. Otherwise, wait until the chlorine diminishes and then direct pool water onto grass, forest, or other natural area.
- Remember: anything you throw or store on the ground can find its way into the water supply. Store and handle chemicals properly.
- Call the regional Department of Environmental Protection office at **(800) 541-2050** immediately if you observe a chemical spill.

For more information

Pennsylvania DEP www.dep.pa.gov
Watershed Protection <http://water.epa.gov/type/watersheds/>
Center for Watershed Protection www.cwp.org
Source Water Collaborative www.sourcewatercollaborative.org
American Waterworks Association: www.awwa.org
PA Source Water Protection www.sourcewaterpa.org

CITIZEN'S GUIDE

Protecting Your Drinking Water



Chambersburg Borough Water System Source Water Protection Program

This brochure is funded by the PA Department of Environmental Protection's Source Water Protection Technical Assistance Program.

For more information:

Chambersburg Borough Water System
7659 Lincoln Way East
Fayetteville, PA 17222
(717) 352-7450

A Message from the Chambersburg Borough Water System

Everyone uses local water sources every day, but do you know where your water really comes from?

The staff at CBWS work around the clock to provide top quality water to every tap. They work hard to protect your water resources, which are the heart of your community, your way of life and your children's future. To maintain a clean, dependable water supply, they need your help!

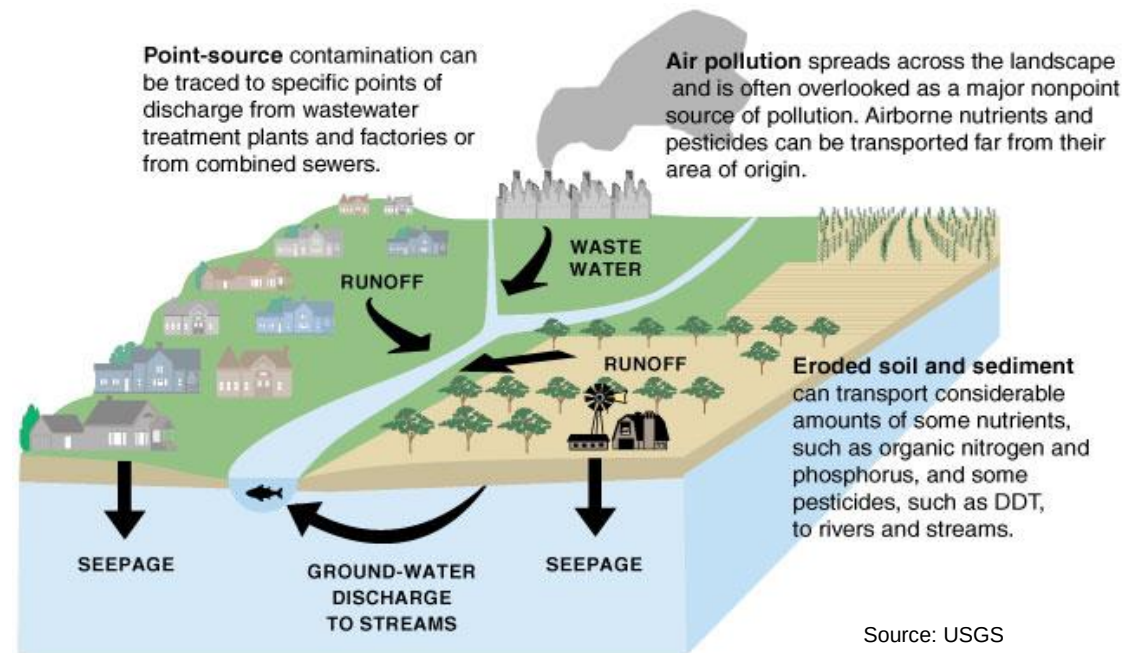
This brochure was developed to make your community aware of the importance of protecting your water supply. Once a water source becomes contaminated, the cleanup often takes many years and can be very expensive. It is in our community's best interest to take the proper precautions to prevent contaminants from entering our water supply.

Who is responsible for protecting your drinking water? EVERYONE!

If you have any questions about source water protection in your area, please contact the CBWS office at (717) 352-7450 for more information.



Examples of Source Water Contamination



The Chambersburg Borough Water System obtains your drinking water from the Conococheague Creek. Source water protection can help prevent your drinking water from becoming polluted by managing possible sources of contamination in the watershed. Everyone has an important part to play in protecting drinking water – today and for the future. Source water protection is a community effort – we hope you will read this and other information forwarded to you, and help protect our water supply.



Why do water sources sometimes become polluted? A water supply can become polluted when substances that are harmful to human health enter the groundwater, rivers, reservoir, or springs. Common pollutants include gasoline or oil from leaking tanks, nitrate and pesticides from agriculture and lawns, pathogens from livestock and pet waste, salt from winter road maintenance, and chemicals from industrial facilities. Once drinking water is contaminated, it must be treated or abandoned as a drinking water source. The expense of treating polluted water or finding a new source of drinking water can be avoided through source water protection.

What is Source Water Protection?

The goal of source water protection is preventing contaminants from entering waterways that serve as our drinking water sources. Protecting our source water from pollutants not only protects our drinking water supplies, but it also makes economic sense, as it can be extremely costly to remove pollutants from drinking water sources through complex treatments. Protecting our source water also helps protect the natural environment by providing a healthy habitat for countless species.

The source water for the Chambersburg Borough Water System customers is from a creek. To further strengthen our source water protection efforts, CBWS has volunteered to participate in the Pennsylvania Department of Environmental Protection's **Source Water Protection Technical Assistance Program (SWPTAP)**.

Through SWPTAP, a source water protection plan will be developed for the water system. The plan will guide the CBWS source water protection efforts in the future. Once the plan is complete, it will be available for review, so that all customers can learn how they can help assist our source water protection efforts.

More Ways to Help

The members of the Chambersburg Borough Water System are working nonstop to provide our customers with a clean and reliable source of drinking water, and we could use your help!

Steps to help us protect our water supplies

- Minimize the use of pesticides and herbicides on your lawn and garden.
- Do not dump swimming pool water into a creek or storm drain at the end of the season. If possible, direct the water into the sanitary sewer. Otherwise, wait until the chlorine diminishes and then direct water into grass, forest, or other natural areas.
- Remember: Anything you throw or store on the ground can find its way into waterways. Anything you flush down the toilet or rinse down a sink will end up in a waterway. Store, handle and dispose of all chemicals properly.
- Bring household hazardous waste – such as paint, varnishes, and other chemicals to recycling facilities. Check your County website for details of any collection events. Dispose of motor oil at a garage that will recycle it. Never pour oil on the ground or in a storm drain or sewer on the street.
- Call the PA Department of Environmental Protection at 800-541-2050 immediately if you observe a chemical spill.

CITIZEN'S GUIDE

Proper Disposal of Pharmaceuticals



Chambersburg Borough Water System Source Water Protection Program

This program is funded by the PA Department of Environmental Protection's Source Water Protection Technical Assistance Program

For more information:
Chambersburg Borough Water System
7659 Lincoln Way East
Fayetteville, PA 17222
(717) 352-7450

A Message from the Chambersburg Borough Water System



Your drinking water providers work around the clock to provide top quality water to every tap. It is a task that all water systems take very seriously. They work hard to protect our water resources, which are the heart of our community, our way of life and our children's future.

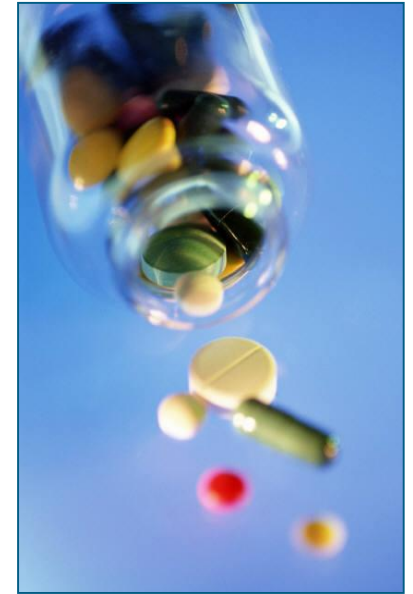
Pharmaceuticals can impact the quality of your drinking water. It can be very difficult to remove even trace amounts of pharmaceuticals from groundwater or surface sources. To maintain a clean, dependable water supply, your water system needs your help. This brochure was developed to make the community aware of the importance of proper disposal of prescription medications.

Please read this brochure carefully. If you have any additional questions, please refer to the guidelines cited in this brochure or contact the Franklin County Recycling Department for more information on collection events and drop-off boxes in your neighborhood.



Proper Disposal of Pharmaceuticals

- A few small steps can make a huge impact in safeguarding the environment and improving water quality.
- Do not flush unwanted or leftover medications down the toilet or sink drain. They may affect groundwater and private drinking water wells.
- Never give your unwanted medicine to someone else. Having unwanted medications around the home presents a danger to children, guests, and pets that could accidentally ingest them.
- Plan a community pharmaceutical take-back programs available in your area that allow the public to bring unused drugs to various locations for proper disposal. Visit the website below for additional information on collection events and dropoff points in your neighborhood.



For more information on the proper disposal of pharmaceuticals:

Franklin County Recycling App

<https://fcgis.franklincountypa.gov/recycling/>

National Take-Back Initiative

http://www.deadiversion.usdoj.gov/drug_disposal/takeback/

The Office of National Drug Control Website <http://www.whitehouse.gov/ondcp>

The SmarxT Disposal Campaign

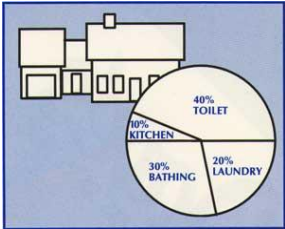
<https://www.justice.gov/sites/default/files/usao-ndga/legacy/2011/03/02/SMARxT%20Disposal%20Poster.pdf>

Caring for Your System

Remember that the Homeowner is responsible for the care and maintenance of the septic system! Here are some ideas to keep your system in top shape:

- Inspect the entire system every 1 to 3 years to ensure good working order.
- Pump the solids from the tank every three (3) years to avoid overfilling and failing tanks.
- Keep service and pumping records handy.
- Repair the system as soon as trouble signs appear, such as sluggish toilets, sewer odors, spongy ground around septic tank, or raw sewage backups.
- Conserve water and follow directions to prevent malfunctions.

Visit the PA Department of Environmental Protection website for more information at <http://www.elibrary.dep.state.pa.us/dsweb/View/Collection-11011>



Septic System Maintenance Record

Date	Company	Service	Comments

Do's and Don'ts

DO dispose of motor oil at a garage that will recycle it. Never pour oil down the sink or in a storm drain or sewer on the street.

DO limit the use of household chemicals. These substances can reduce the necessary bacteria that breaks down the waste solids. Resulting sludge can clog the drainfield.

DON'T dispose of non-degradable solids in the system. Examples include tissues, sanitary supplies, cigarette butts, and paper towels. A buildup will clog the inlet and effluent pipes.

DO regularly check faucets and toilets for leaks. This extra drainage can overload your system.

DO substitute less toxic substances like baking soda or borax for household hazardous wastes like ammonia and other cleaners. Use a phosphate-free laundry detergent.

DON'T clean paint brushes or dispose of paint into the septic system. Both latex-based and oil-based paint can clog the system and create problems.

For more information

Understanding Septic Systems

<http://www.elibrary.dep.state.pa.us/dsweb/Get/Document-117076/3850-FS-DEP1414.pdf>

On-lot System Operation and Maintenance

http://www.dep.state.pa.us/dep/deputate/watermgt/wqp/wqp_wm/facts/pa1608.htm

HOMEOWNER'S GUIDE

Septic Systems Care and Maintenance



Chambersburg Borough Water System Source Water Protection Program

This brochure is funded by the PA Department of Environmental Protection's Source Water Protection Technical Assistance Program

For more information:

Chambersburg Borough Water System
7659 Lincoln Way East
Fayetteville, PA 17222
(717) 352-7450

What is a Septic System?

Households that are not on a public sewer system use an on-lot septic system to dispose of their wastewater. Household wastewater contains all the wastes from our homes, including toilet use, bathroom and kitchen use, laundry, and other activities. It contains human waste, detergents, chemicals, grease, oils, and many other substances. If not treated properly, these substances can travel through soil and potentially contaminate local waterways.

Most systems have three components:

- **Septic Tank** – Tanks can be constructed from plastic, fiberglass, or concrete. Tank size and specifications are determined by state regulation, and systems are permitted and approved by local agencies.
- **Drainfield** – a drainfield is constructed from a series of perforated pipes buried in gravel-filled trenches in the soil. When wastewater enters the septic tank, an equal amount (known as *effluent*) is forced into the drainfield for treatment.
- **Soil** – the soil encompassing the trenches treats the wastewater by allowing infiltration of the liquids to neutralize most of the pollutants. The effluent eventually is incorporated into groundwater.

Example of Typical Septic System

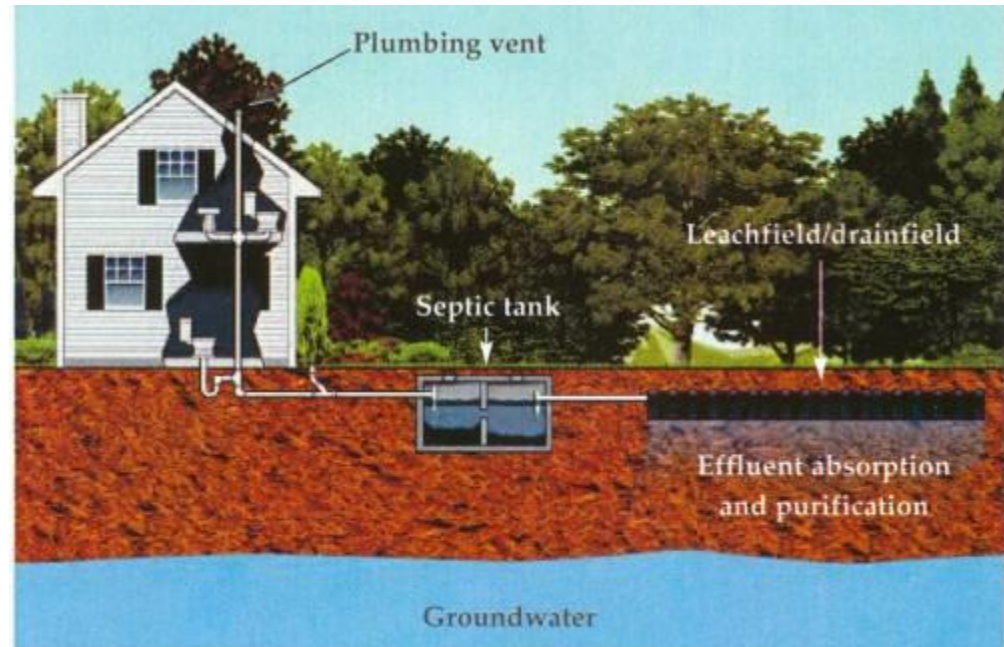


Photo courtesy of
Infiltrator Systems, Inc.

Why Should I Maintain My Septic System?

- ***Saves Money!*** Repairing or replacing a septic system can be very expensive. Inspecting and pumping the system every 3 years helps keep the components working correctly.
- ***Protects Your Health!*** Bacteria and viruses are found in the wastewater, and a functional septic system removes most of the organisms during treatment.
- ***Protects the Environment!*** What goes into your septic system may end up in your drinking water source. Refrain from using cleaners and other chemicals that may eventually be discharged from your system and soak into the ground.

What is a Watershed?

A watershed is all the land that drains to the same river or lake. Water travels from the highest points at the watershed edge to the lowest point at the bottom of the watershed. Wherever you are, you are in a watershed!

When it rains, some water travels over the land surface to the nearest stream or creek. This water is called surface runoff or stormwater. As the stormwater flows, it picks up any contaminants lying on the surface – pesticides and fertilizer from lawns, manure from farms, sediment from construction sites, and oil and gas from roads. Small streams join to form larger and larger rivers, until the water – and any contaminants it is carrying – reaches the water sources.

Some precipitation, instead of traveling over the land, will percolate into the soil and reach the groundwater. Similarly, the groundwater may pick up nitrates from failing septic systems, gasoline from leaky storage tanks, and industrial chemicals from improper dumping. The groundwater ultimately flows into one of the rivers or lakes in the watershed.



Ways to Help

What can you do?

- Dispose of motor oil at a garage that will recycle it. Never pour oil on the ground or in a storm drain or sewer on the street.
- Purchase alternative products that contain fewer hazardous ingredients.
- Use only as much as you need, and use up the product completely.
- Minimize the use of pesticides and herbicides on your lawn and garden. Use biodegradable products when available.
- Do not pour used or unused chemicals or paints down the drain or flush in the toilet.
- Use water-based paints if possible. Sweep up dust and paint chips from sanding or stripping activities.
- NEVER mix leftover chemicals with other materials.
- Make sure all chemicals are properly labeled and stored away from children and pets.
- Contact your county solid waste department for HHW collection events in your area.
- Remember: anything you throw or store on the ground can find its way into the groundwater. Store and handle chemicals properly.

For more information

Check the Franklin County Recycling App for programs available.

<https://fcgis.franklincountypa.gov/recycling/>

CITIZEN'S GUIDE

Proper Disposal of Household Hazardous Waste



Chambersburg Borough Water System Source Water Protection Program

This brochure is funded by the PA Department of Environmental Protection's Source Water Protection Technical Assistance Program

For more information:

Chambersburg Borough Water System
7659 Lincoln Way East
Fayetteville, PA 17222
(717) 352-7450

Remember, it's not just toxic to you!

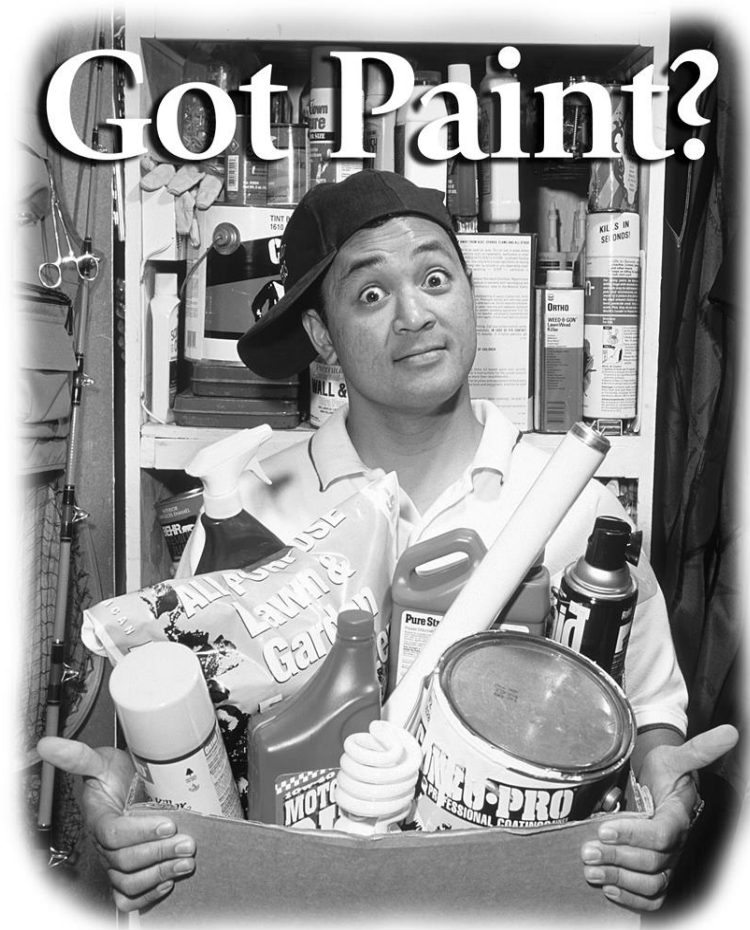
Did you know that many household products are dangerous to our children, pets, and the environment? Household cleaners, lawn and garden chemicals, gasoline, antifreeze, and many other substances need to be stored and disposed of properly.

When Household Hazardous Waste (HHW) makes its way into the environment, plants, animals, and humans can all be affected. Never throw away these materials into the trash or flushed down a drain.

All the items listed in this brochure should be carefully handled and disposed of according to directions. Check for HHW collection events sponsored by your municipality or the county government.

Examples of Household Hazardous Wastes

- ✓ Latex and oil-based paint
- ✓ Vehicle fluids like gasoline, used motor oil, and antifreeze
- ✓ Lawn & garden fertilizers, pesticides, and herbicides
- ✓ Pool Chemicals
- ✓ Solvents
- ✓ Household cleaners
- ✓ Electronic devices
- ✓ Asphalt and driveway sealants
- ✓ Ammunition
- ✓ Vehicle batteries
- ✓ Lithium/NiCad batteries
- ✓ Outdated or unused pharmaceuticals



How does drinking water sometimes become polluted?

Your drinking water may become polluted when substances that are harmful to human health enter the groundwater or surface source, like a lake or reservoir. Common pollutants include gasoline or oil from leaking tanks, homeowner lawn and garden activities, salt from winter road maintenance, and other chemicals from stormwater runoff. Once water is contaminated, it must be treated or abandoned as a drinking water source. The expense of treating polluted water or finding a new source of drinking water can be avoided through source water protection.

What is a Watershed?

A watershed is all the land that drains to the same river or lake. Water travels from the highest points at the watershed edge to the lowest point at the bottom of the watershed. Wherever you are, you are in a watershed!

When it rains, some water travels over the land surface to the nearest stream or creek. This water is called surface runoff or stormwater. As the stormwater flows, it picks up any contaminants lying on the surface – pesticides and fertilizer from lawns, manure from farms, sediment from construction sites, and oil and gas from roads. Small streams join to form larger and larger rivers, until the water – and any contaminants it is carrying – reaches the water sources.

Some precipitation, instead of traveling over the land, will percolate into the soil and reach the groundwater. Similarly, the groundwater may pick up nitrates from failing septic systems, gasoline from leaky storage tanks, and industrial chemicals from improper dumping. The groundwater may supply your drinking water wells, and ultimately flows into one of the rivers or lakes in the watershed.



Other Ways to Protect Your Drinking Water

What can you do?

- Dispose of used motor oil at a garage that will recycle it. Never pour oil on the ground or in a storm drain on the street.
- Minimize the use of pesticides and herbicides on your lawn and garden. Use biodegradable products when available.
- Do not pour unwanted pharmaceuticals or unused chemicals or paints down the drain or flush in the toilet. Take your pharmaceuticals to a collection area to avoid use by others.
- Participate in community cleanup events or planting projects.
- Contact your county solid waste department for Household Hazardous Waste collection events in your area.
- Clean up after your pet. Pet waste contains bacteria and other pathogens that can make its way into waterways through rain or snow melt.
- If you have an on-lot septic system, inspect it and arrange for pump-out every three years, or according to local ordinances.
- Remember: anything you throw or store on the ground can find its way into the groundwater. Store and handle chemicals properly.

For more information on recycling programs:

Check the Franklin County Recycling Department website for programs available.

CITIZEN'S GUIDE

Tips for Residential Heating Oil Tank Owners



Chambersburg Borough Water System Source Water Protection Program

This brochure is funded by the PA Department of Environmental Protection's Source Water Protection Technical Assistance Program

For more information:

Chambersburg Borough Water System
7659 Lincoln Way East
Fayetteville, PA 17222
(717) 352-7450

The Costs of Cleanup

When heating oil or other materials makes its way into the environment, plants, animals, and humans can all be affected. Leaking tanks can potentially contaminate public water supplies, private wells, contaminate soil, and cause fire or explosion hazards.

Cleanups to tank owners can also be very expensive. Owners of leaking underground storage tanks are required to clean up affected contaminated soil as well as polluted groundwater or surface water like creeks and streams.

If you notice a leak, it is in your best interest to clean it up promptly and properly to reduce expense, liability, and the potential for contamination. Your best bet is to prevent contamination by monitoring and maintaining your tank.

Access these informative factsheets at www.depweb.state.pa.us KEYWORD Tank Cleanup:

- *Home Heating Oil Releases*
- *Leaking Underground Storage Tanks: Controlling Cleanup Costs*
- *Prevention Tips (KEYWORD: Tank Tips)*

How can releases from residential tanks be prevented?

- ✓ Routinely inspect the exterior of an aboveground tank and all attached equipment.
- ✓ Install spill and overfill prevention devices.
- ✓ Ensure that the tank address is clear and the fill line is marked, to help avoid accidental deliveries.
- ✓ Consider a secondary containment structure to prevent spills or leaks from entering the environment.
- ✓ Be sure to take out the fill pipe if removing a tank from inside your home.
- ✓ If you notice drips or leaks, or you are using more oil than normal, call a professional for a detailed inspection of your tank.



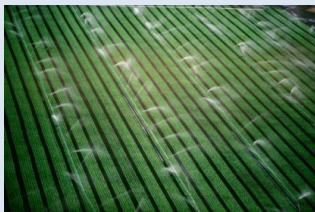
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Protecting Our Drinking Water

Much of the Pennsylvania countryside is in agricultural operations, and plays a huge role in our commonwealth's production of food. Conversely, agriculture also has a huge impact on the drinking water sources throughout the state. Farmers have a unique challenge in balancing efficient operations with environmental stewardship. This brochure is designed to provide information on various Best Management Practices (BMPs) that can help reduce nutrients found in manure and sediment from row crops.

All agricultural producers are encouraged to seek assistance from their County Conservation District and the Natural Resources Conservation Service for the installation and implementation of these practices.

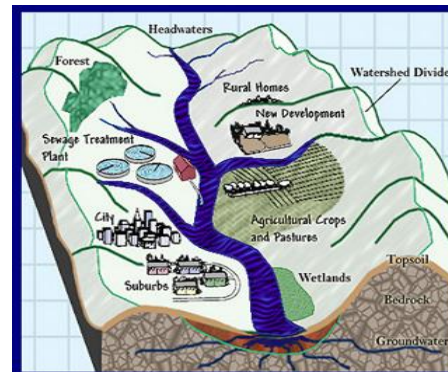


What is a Watershed?

A watershed is all the land that drains to the same river or lake. Water travels from the highest points at the watershed edge to the lowest point at the bottom of the watershed. Wherever you are, you are in a watershed!

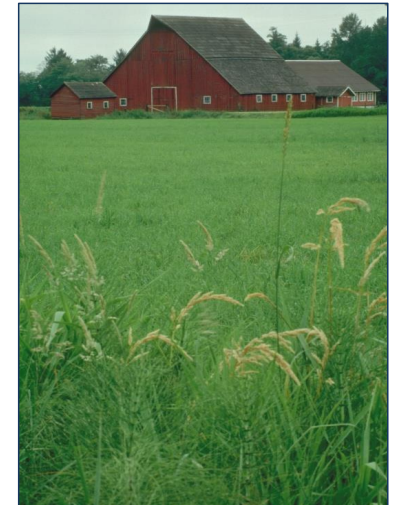
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Some precipitation, instead of traveling over the land, will percolate into the soil and reach the groundwater. Similarly, the groundwater may pick up these contaminants, which are then carried by the groundwater into one of the rivers or lakes in the watershed.



CITIZEN'S GUIDE

Agriculture and Your Drinking Water



Chambersburg Borough Water System Source Water Protection Program

This brochure was funded by the PA Department of Environmental Protection's Source Water Protection Technical Assistance Program

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7659 Lincoln Way East
Fayetteville, PA 17222
(717) 352-7450

How Does Drinking Water Become Polluted?

Your drinking water may become polluted when substances that are harmful to human health enter the groundwater or surface source, like a lake or reservoir. Sometimes pollutants like manure and sediment from stormwater runoff find their way into streams and creeks. Once water is contaminated, it must be treated or abandoned as a drinking water source. The expense of treating polluted water or finding a new source of drinking water can be avoided through source water protection.



For more information:

Natural Resources Conservation Service

<http://www.pa.nrcs.usda.gov/>

County Conservation District

<http://pacd.org>



Examples of Agriculture Practices That Reduce Pollution



No-Till Planting and **Contour Strips** reduce loss of sediment through stormwater runoff.



Grazing Management helps maintain plant life on pasture lands, reducing soil loss during rain events or snow melts.

Buffer Plantings along streams and creeks help filter pollutants in stormwater runoff from getting into the water.



Streambank Fencing prevents animals from depositing manure into streams. The fence also avoids destruction of the streambanks that add sediment to the water.



Conservation and Nutrient Plans help farmers with sustainable operations while complying with Pennsylvania Chapter 102 and Act 38 regulations.

Creek Crossings minimize animal access to streams, and reduces manure and sediment contamination.



Flushing Do's and Don'ts

*What are the **WORST** items to dump down the drain:*

- **WIPES** – Wipes (even “flushable” wipes) do not break down like toilet paper, and can clog household sewer pipes and pipes at the treatment plant. This can be expensive to fix.
- **HOUSHOLD CHEMICALS** like cleaners, painting products, and pesticides contain some chemicals that cannot be removed during the wastewater treatment process. If possible, used biodegradable or plant-based cleaning products that are more easily treated.
- **FATS, OILS, GREASE** (FOGs) Cooking grease, leftover animals fats, and motor



Photo Courtesy of Rock Hill, SC

What Else Should Never Go In A Drain:

- Medicines/Prescriptions
- Kitty Litter
- Feminine Products
- Cigarette Butts
- Diapers
- Disposable Toilet Brushes

Protecting Source Water

The staff at the Chambersburg Borough Water System are working nonstop to provide customers with a clean and reliable source of drinking water, and we could use your help!

The goal of source water protection is preventing pollution from entering waterways that serve as our drinking water sources. This not only protects our drinking water supplies, it also makes economic sense, as it can be extremely costly to remove pollutants from drinking water sources through complex treatments. Protecting our source water also helps provide a healthy habitat for countless species.

The source water for CBWS customers is from a local creek. To further strengthen our source water protection efforts, the CBWS has volunteered to participate in the Pennsylvania Department of Environmental Protection's **Source Water Protection Technical Assistance Program (SWPTAP)**.

Through SWPTAP, a source water protection plan will be developed for the water system. The plan will guide the CBWS source water protection efforts in the future. Once the plan is complete, it will be available for review, so that all customers can learn how they can help assist our source water protection efforts.

CITIZEN'S GUIDE

Wastewater in Your Home



Photo Courtesy of K Brobst

Chambersburg Borough Water System Source Water Protection Program

This brochure is funded by the PA Department of Environmental Protection's Source Water Protection Technical Assistance Program

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Fayetteville, PA 17222
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What Happens to Our Waste Water?

Household wastewater contains all the wastes from our homes, including toilet use, bathroom and kitchen use, laundry, and other activities. It contains human waste, detergents, chemicals, fats, oils, grease, and many other substances. This brochure helps people understand the complex process of treating



Households that are on a public sewer system have these wastes treated at a local wastewater treatment plant. They are designed to handle water, human waste, and toilet paper.

Anything else that goes down the drain can damage both the treatment system and the environment! Before you dump something in a sink, think ***Should this go down the drain?***

What Are The Worst Things To Dump in Drains?

- Wipes – even “flushable” wipes!
- Fats, Oils, and Grease
- Household Chemicals



Example of a Typical Waste Water Treatment Plant

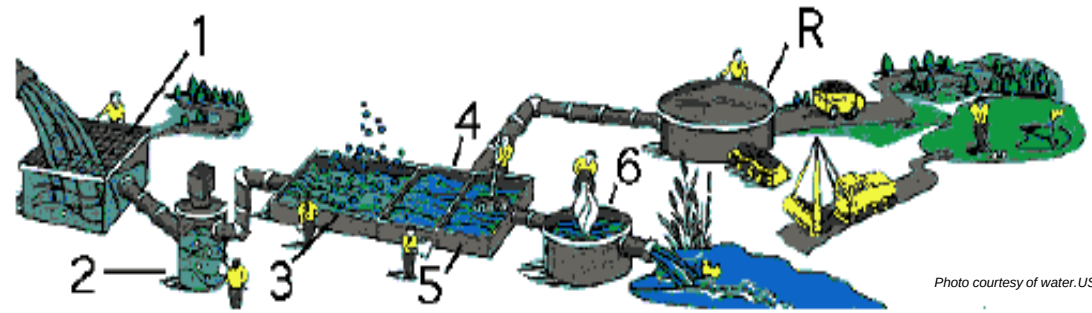


Photo courtesy of water.USGS.gov

The Primary Treatment Process

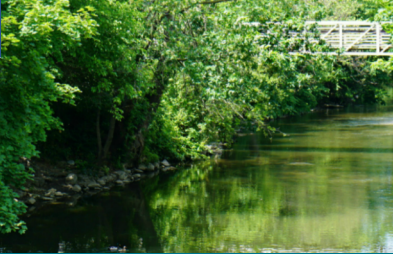
- 1. Screening:** Wastewater entering the treatment plant includes items like wood, rocks, and even dead animals. Unless they are removed, they could cause problems later in the treatment process.
- 2. Pumping:** Gravity moves sewage from your home to the treatment plant. If the plant is built above the ground level, the wastewater has to be pumped up to the aeration tanks (item 3).
- 3. Aerating:** One of the first steps is to shake up the sewage and expose it to air. This causes some of the dissolved gases (such as hydrogen sulfide, which smells like rotten eggs) that taste and smell bad to be released from the water. Wastewater enters a series of long, parallel concrete tanks. Each tank is divided into two sections. In the first section, air is pumped through the water. As organic matter decays, it uses up oxygen. Aeration replenishes the oxygen. The 'grit' (coffee grounds, sand and other small, dense particles) will settle out.
- 4. Removing sludge:** Wastewater then enters the second section or sedimentation tanks. Here, the organic sludge settles out of the wastewater and is pumped out of the tanks. Some of the water is removed in a step called thickening and then the sludge is processed in large tanks called digesters.
- 5. Removing scum:** As sludge is settling to the bottom of the sedimentation tanks, lighter materials are floating to the surface. This 'scum' includes grease, oils, plastics, and soap. Slow-moving rakes skim the scum off the surface of the wastewater. Scum is thickened and pumped to the digesters along with the sludge. Many cities also use filtration in sewage treatment. After the solids are removed, the liquid sewage is filtered through a substance, usually sand, by the action of gravity. This method gets rid of almost all bacteria, reduces turbidity and color, removes odors, reduces the amount of iron, and removes most other solid particles that remained in the water.
- 6. Killing bacteria:** Finally, the wastewater flows into a 'chlorine contact' tank, where the chemical chlorine is added to kill bacteria, which could pose a health risk, just as is done in swimming pools. The chlorine is mostly eliminated as the bacteria are destroyed, but sometimes it must be neutralized by adding other chemicals. This protects fish and other marine organisms, which can be harmed by the smallest amounts of chlorine.

The treated water (called effluent) is then discharged to a local river or the ocean.

Reproduced from <https://water.usgs.gov/edu/wwwisit.html>

Chambersburg Borough Water System Source Water Protection Program

1

CHAMBERSBURG BOROUGH WATER SYSTEM

SOURCE WATER PROTECTION PROGRAM



This Presentation is funded by the PA Department of Environmental Protection's Source Water Protection Technical Assistance Program



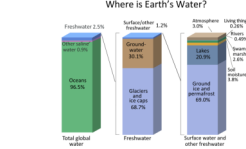
SPOTTS | STEVENS | MCCOY
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What is Source Water Protection?

- Taking proactive measures to prevent the pollution of lakes, rivers, streams and groundwater that serve as sources of drinking water.

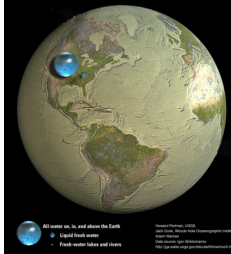
"Water from the ground may be free, but getting it to people's homes and making sure it is safe costs money!"
Windber Area Authority

Where is Earth's Water?



Category	Percentage
Oceans	96.7%
Freshwater	0.3%
Groundwater	0.61%

The World's Water



All water on, in, and above the Earth

- Liquid fresh water
- Fresh water lakes and rivers



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Could This Happen To You?

January 2014 – The chemical spill into the Elk River in WV affected 300,000 people in nine counties – banning water use for days.

August 2014 – Toledo, Ohio water ban due to massive algal blooms in Lake Erie. Authorities are blaming agricultural runoff, septic failures, and sludge from sewage treatment plants building up for a decade.

February 2015 – Train carrying crude oil derailed and explodes in West Virginia, sending the oil into the Kanawha River, causing a temporary closure of two water treatment plants.

June 2015 – An industrial fire in Adams County created 4 million gallons of contaminated stormwater, which flowed into a nearby creek, and shut down the water system for nearly 3 months.

January 2016 – Flint, MI has high lead levels in their finished water, leached from corroded pipes throughout the distribution system.




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Pennsylvania Case Study

In 2015, an Adams County chemical plant making water-soluble fertilizer caught fire during the night.

15 fire companies assisted with controlling the fire, generating **4,000,000 gallons** of contaminated runoff.

Stream modeling was done to predict plume reaching surface intakes downstream. However, the flow did not take the predicted path, and found its way through field ditches.

Multiple insurance companies involved – contradicting goals of property protection and spill cleanup costs.

Water use restrictions in place for 2.5 months, water provided by another supplier.

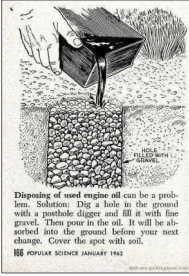
Estimated cost of incident >\$20M




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Why Have a Source Water Protection Plan?

"Conventional Wisdom"



Disposing of used engine oil can be a problem. Solution: Dig a hole in the ground with a portable digger and fill it with fine gravel. Then pour in the oil. It will be absorbed into the ground before your next change. Cover the spot with soil.

POPULAR SCIENCE JANUARY 1963




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Support for Source Water Protection

SWPTAP = Source Water Protection Technical Assistance Program

- Administered by the PA Department of Environmental Protection, through Environmental Protection Agency funding
- Currently, 292 community water systems have signed up for program, and an additional 191 small systems

A Source Water Protection Plan:

- Points out possible contamination issues.
- Provides some help with education and information for customers and residents.
- Improves water quality through local management practices and other partnerships.
- Can help with keeping costs down by reducing the amount of treatment needed.
- The plan is funded by the DEP, and **free-of-charge** to the water system.



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Developing a Source Water Protection Plan

Five Step Process

1. Form a steering committee with local partners.
2. Protection Areas were developed for the groundwater and surface water sources and provided to the system.
3. Steering Committee identifies & prioritizes potential pollution sources.
4. Steering Committee chooses management and protection strategies.
5. Considers contingency and new source planning.



STEP 1: CREATE YOUR TEAM



Developing a Steering Committee

The Steering Committee is an advisory group for the water system, which represents different aspects of the community.

The County Conservation District, Planning Commission, environmental organizations, schools, local businesses, and municipal staff can be considered for the committee.

Members provide local knowledge, make recommendations to the water system, and convey source water protection information back to the customers and the community.



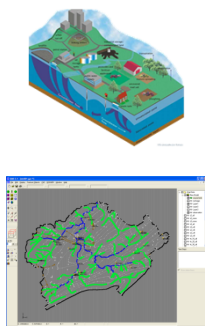
STEP 2: DELINEATION OF WATER SOURCES



Evaluating the Water Sources

Previous studies, field data, water system reports and interviews, and Geographical Information Systems (GIS) mapping is used to delineate water sources.

Computer and hydrogeologic modeling and stream velocity can be used for this process.



Surface Water Source



Chambersburg obtains its drinking water from an intake in the Conococheague Creek.



Summary of Surface Water Intake Protection Areas

Surface Water

- Zone A
 - ¼ mile buffer, 5-hour Time-of-Travel
- Zone B
 - 5 - 25 hours TOT
- Zone C
 - Over 25 hours to extent of Watershed

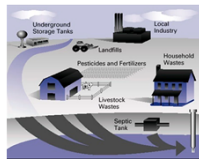
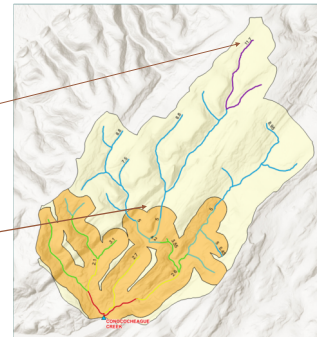


Surface Water Intake Time-of-Travel

Time to intake:

<12 hours

<5 hours



STEP 3: POTENTIAL SOURCES OF CONTAMINATION



Non-Point Sources of Pollution

Agricultural activities can contribute animal waste or sediment from barnyards, crops, and pastures into local waterways.

Residential/Stormwater – Developed areas can contribute sediment, chemicals, litter, and septic system failures.

Roads can add salt, dirt, and vehicle fluids from accidents to the rain or snow melt. Transportation corridors include local & state roads, railroads, and pipelines.



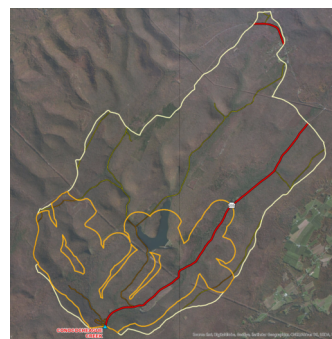
Land Cover

A Land Cover analysis was performed in order to determine non-point source PSOCs in the protection areas. Total acreage for the combined areas covers 11,700 acres.

Undeveloped and forested land for the combined areas covers 96% of the protection areas. Developed areas covered the remaining 4%.



Transportation Corridors



Route 233 is the major roadway through Zone A and Zone B.



Point-Source Inventory

- Potential contamination problems are researched through computer databases and the Steering Committee's local knowledge.
- A list is compiled to assist the Steering Committee in setting priorities for source water protection efforts.

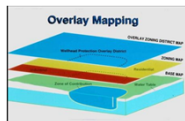


Point Source Potential Sources of Contamination



Due to the undeveloped nature of the protection areas, only 5 point source PSOCs were identified in the preliminary database search.

These PSOCs include 2 illegal dump cleanup sites, 2 storage tanks, and an EPA Regulated facility, which were ranked and mapped for committee review.



STEP 4: CONSIDER MANAGEMENT STRATEGIES



Management and Protection Strategies

Regulatory Tools

Legal directives that require compliance, usually by the municipality or other agency.

Can be expensive to develop and enforce

Non-Regulatory Tools

Don't have any enforcement rules to require people to do something

Less expensive to carry out; but requires voluntary effort



DEP Database Subscriptions

- Subscribe to the DEP database eNOTICE
- Determine locations on eMAP
- Search for permit and inspection information on eFACTS



Watershed Awareness Signs

Local signs for community roads

PennDOT Signs for major highways



Notification of Protection Areas

- Educate residents, recreation users, and local landowners that they are in a protection area.



Watershed Forums and Partnerships



Partner with other water systems, businesses, schools, environmental groups, and civic organizations in the region to discuss common PSOCs, typical issues, and potential solutions in Source Water Protection.



Community Involvement

Participate in local community activities for sharing your message:

- Earth Day
- Fairs, Carnivals
- Cleanup Events
- Recreational activities



Public Education and Outreach

- Partner with the Franklin and Adams County Conservation Districts and other organizations in educating customers on how their activities affect the source water.
- Post information on the Source Water Protection Plan on the Borough website or social media. Use the template brochures in your plan.
- Provide information via Consumer Confidence Reports, newsletters, and plant tours.



Municipality Partnerships

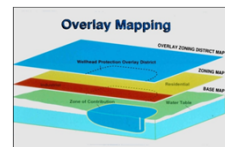
Removing litter from stormdrains

Stenciled stormdrains or decals



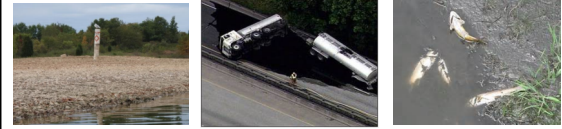
Zoning and Comprehensive Planning

- New development must meet established standards.
- Provide the GIS shapefiles of the protection areas to the Planning Commission for use in comprehensive planning.



Emergency Management Planning

- Cooperate with the Emergency Management Agency
 - Attend meetings for the Local Emergency Planning Committee
 - Provide mapping files for emergency responders
- Participation in Early Warning or other Mutual Aid Systems



STEP 5: CONTINGENCY AND NEW SOURCE PLANNING



Contingency and Emergency Response

If you have interconnections with other water systems, are they exercised regularly to ensure operation?

What is the contingency in an emergency if the system cannot provide demand? How is bulk water distributed?

Are agreements with other systems, vendors, and responders current?



Contingency and Emergency Response

The water system's Contingency Plan should be reviewed annually to update procedures and personnel.

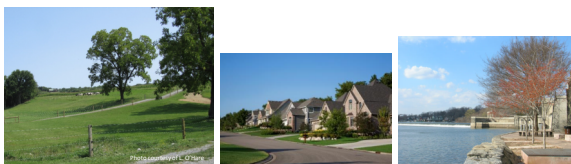
Potential threats to water supply are identified.

Short and long-term water supply options are considered in case of contamination.



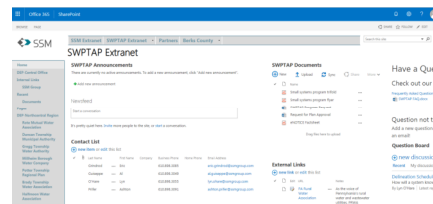
New Sources

- The water system also considers the potential for new water sources in case of contamination.



SSM Extranet

- SSM will provide a website for storage of your plan documents and maps. The files are too large for e-mail. SSM staff will assist the steering committee with registration for access.



High Streamflow from the Susquehanna River

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Bottoms Up!

Yard Waste

- Pesticides kill aquatic life
- Fertilizers cause excessive algae growth and degrade water quality

Pet Waste

- Contains harmful bacteria

Motor Oil

- Contains heavy metals
- Reduces oxygen in water

Litter

- Degrades stream quality and habitat

When it rains, pollutants from pet waste, cars, and our lawns find their way into our streams.

Healthy Stream Habitat

@ssmgroup.com

Protecting Drinking Water at the Source

Working With the USDA Forest Service



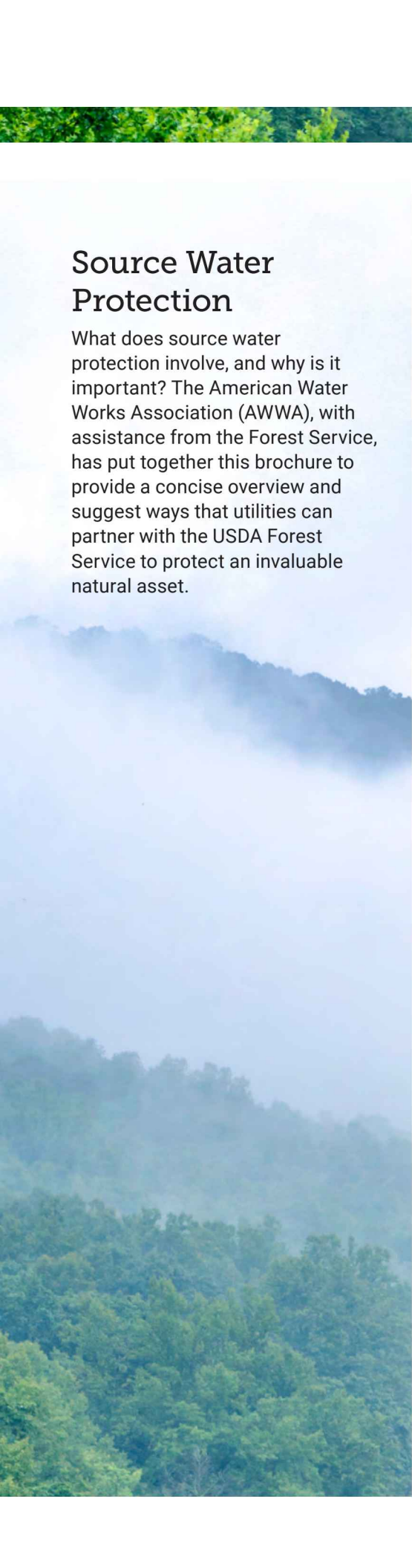
Malachi Jacoby/shutterstock.com



**American Water Works
Association**

Dedicated to the World's Most Important Resource®





Source Water Protection

What does source water protection involve, and why is it important? The American Water Works Association (AWWA), with assistance from the Forest Service, has put together this brochure to provide a concise overview and suggest ways that utilities can partner with the USDA Forest Service to protect an invaluable natural asset.

Working With the USDA Forest Service on Source Water Protection

A new era of source water protection is emerging. Utilities increasingly recognize that protecting sources of drinking water and securing sustainable supplies for the future are necessary as part of the multibarrier approach to deliver quality water service. These efforts also form lasting partnerships and build goodwill with customers and other stakeholders. Only a small fraction of utilities has direct control over their watersheds, and for the rest, finding ways to work collaboratively to implement source water protections is essential.

AWWA has published a number of pieces on ways to work with the agricultural community through the US Department of Agriculture's (USDA's) Natural Resources Conservation Service, but NRCS is not the only USDA agency with a stake in source water protection. Millions of people get their drinking water from a supply that ultimately originates on Forest Service (an agency of the U.S. Department of Agriculture) lands, opening the opportunity to find innovative and collaborative solutions to address source water needs.

Why should the water sector work with the Forest Service?

The Forest Service, a division of the USDA, manages 193 million acres of land across the country, with the goal of sustaining the health, diversity, and productivity of our nation's forests and grasslands to meet the needs of present and future generations. National Forest System (NFS) lands supply drinking water for close to 20 percent of the US population, and the agency's current [Strategic Plan](#) lays out the provision of *abundant and clean water* to the American public as a core strategic objective between 2015 and 2020.

The Forest Service and municipal/private utilities across the country serve the same local communities and have a shared interest in protecting and managing source watersheds for the array of benefits they yield. Throughout the National Forest System, 53 forests and grassland units have established land management

plan components around source water protection, with at least seven units having developed formal cooperative agreements with local municipalities. The Forest Service's [Forests to Faucets](#) program highlights this connection by using GIS data to display the forested landscapes that are most important to surface drinking water, and the extent to which these forests are threatened by development, insects and disease, and wildland fire.

As of spring 2020, agency project reporting has identified a watershed restoration backlog of approximately \$350 million to \$675 million in planned but unfunded activities. These projects range from forest health treatments to road maintenance, road-stream crossing upgrades, meadow/wetland/riparian restoration, streambank stabilization, and other activities intended to improve water quality and moderate water quantity.

Partnering with the Forest Service to plan and implement ecosystem-based

management can help water utilities ensure water quality and quantity for their customers. It can also help support the protection of headwaters, which is important because of the linkages between the forest cover/ forest health, stream health, and water treatment costs and long-term reliability of the drinking water source. Investing in management activities that support natural infrastructure can be a low-cost alternative or complement to maintaining, updating, or replacing utilities' expensive filtration, storage, and delivery infrastructure. As such, partnering with the Forest Service can help utilities reduce costs, increase revenues, increase resiliency to climate change over the long term, and avoid regulatory actions.

Why is forest-based management important to water utilities?

Healthy forests are a critical component of the network of built and natural infrastructure that supports clean and abundant water supply, safe recreation, flood protection, and more. The accompanying table provides examples of forest-based activities and the benefits they can deliver to water utilities and other end users of water.

OPPORTUNITY AREA	EXAMPLE INTERVENTIONS	EXAMPLE BENEFITS
Recreation and transportation infrastructure	• Road/trail management • Deferred maintenance on facilities • Visitor use planning • Road–stream crossing, aquatic organism passage	• Lower bacteria/nutrient treatments • Reduce energy and water use • Reduce sedimentation from dispersed recreation • Reduce traffic/safety costs • Improve resilience to flood events
Wetland and stream restoration	• Road–stream crossing, aquatic organism passage • Riparian planting • In-channel habitat • Non-native invasive species removal • Grazing improvements	• Reduce water temperature • Improve water storage and flow • Compensate for development impacts • Reduce turbidity • Reduce bacteria/nutrient treatments • Reduce risk of flood and impact of flooding to existing infrastructure • Improve habitat and recreation values
Forest health and climate resilience	• Insect and disease treatments • Reforestation • Wildland/urban interface readiness • Land protection • Improved forest management	• Maintain snowpack for recreation and water storage • Recover from stand-replacing disturbance • Reduce risk of fire and impact of fire for existing infrastructure • Protect habitat and recreation values • Improve carbon storage • Reduce wildfire risk
Legacy impacts	• Abandoned mine reclamation • Acid drainage treatment • Dam removal/improvement	• Reduce heavy-metal leaching • Stabilize soil and improve water storage • Improve aquatic ecosystem • Reduce cyanobacterial bloom risks



What Forest Service programs support source water protection?

Utilities can leverage the following Forest Service offerings to support their source water protection goals. Most of these offerings can be accessed through the agency's State & Private Forestry arm, which provides technical and financial assistance to state and private landowners and leverages the capacity of diverse partners to enhance cross-boundary land management.

- **Water Source Protection Program.** Through this program, the Forest Service can use matched partner funding to implement water source protection plans on NFS lands. Congress has authorized up to \$10 million annually, but it has not appropriated funding as of mid-2020.
- **Forest Legacy Program.** This State & Private Forestry program funds easements or fee-simple protection of private working forests. Projects are selected through a national competitive process.
- **Landscape Scale Restoration Program.** Collaborative, cross-boundary restoration projects on priority forest landscapes are funded by this program. Projects are selected through a competitive process.
- **Forest Stewardship Program.** Funds are awarded to state forestry agencies to work with private landowners to maintain healthy working forests and watersheds.
- **Stewardship Contracting.** Retained receipts from stewardship contracting sales can go toward restoration work in the watershed, either on or off forest land.
- **Urban and Community Forestry Program.** This program delivers resources for open-space protection, urban canopy replanting, and outreach to metropolitan residents.
- **Land and Resource Management Planning.** The 2012 National Forest System Land Management Planning rule states that plans must provide for social, economic, and ecological sustainability and include guidelines to maintain or restore water quality, water resources, and source water protection areas.

How has the Forest Service worked with utilities in the past?

Forest Service partnerships with utilities have taken a variety of forms, such as the following:

- **Direct Cost-Share Partnership (Denver, Colo.).** From 2010 to 2016, Denver Water matched the Forest Service's commitment of \$16.5 million through increases in standard water rates to municipal users. In 2017, the partners signed another five-year agreement to include treatments on private lands and engage the Colorado State Forest Service and NRCS.
- **Municipal Funding (Flagstaff, Ariz.).** In 2012, Flagstaff passed a municipal bond measure, with 74 percent approval, committing \$10 million for treatments to reduce severe wildfire and subsequent flooding risk. The project will fund 14,000 acres of thinning and prescribed burning/biomass removal across the Coconino National Forest, Navajo Nation, Arizona State Trust, and city parcels.
- **Collaborative Funding (Santa Fe, N.M.).** Santa Fe worked with the Forest Service to develop a Municipal Watershed Management Plan to protect source water through cross-boundary forest management. The Nature Conservancy teamed up with the city council of Santa Fe to create a water fund that helps the Forest Service and partners pay for planning, implementation, communication, and monitoring.
- **Pure Water Partners Program (Eugene, Ore.).** The Willamette National Forest, Eugene Water & Electric Board, and other partners are working together to protect Eugene's drinking water supply by providing incentives to private landowners to protect and restore riparian buffers. The Forest Service uses the Wyden Amendment to direct funds from stewardship contracting to high-priority private lands.
- **Landscape Scale Restoration (LSR) Grant Collaboration.** Two LSR awards helped launch the [Southeast Partnership for Forests and Water](#), which brings together the forestry and water communities to enhance communication and collaboration. Statewide meetings are organized to identify priorities of mutual interest. State- and watershed-level coordinators have been hired to accelerate implementation of shared goals.
- **Corporate Partnerships.** Coca Cola contributed \$1.1 million for watershed restoration on NFS land through the National Forest Foundation.

- **Consumer-Funded Partnerships.** The Ski Conservation Fund funds projects that improve forest health and outdoor experience with voluntary surcharges at ski areas adjacent to NFS lands.
- **State-Based Laws and Funding Mechanisms.** As an example of this funding, California Assembly Bill No. 2480 addresses the importance of source watersheds as integral components of water infrastructure. In the Pacific Northwest, the state-funded Oregon Water Enhancement Board provides grants for collaborative restoration projects—some of which occur on NFS land.

What is innovative finance for source water protection?

To address large-scale funding needs across National Forest System lands, the Forest Service is looking beyond traditional public and philanthropic funding sources to support work on the ground. The agency is piloting new models to finance forest-based management activities that leverage private capital, use public funds in new ways, and bring together diverse cost-sharing partners. The Forest Service Conservation Finance Program is piloting work in this area, including the following:

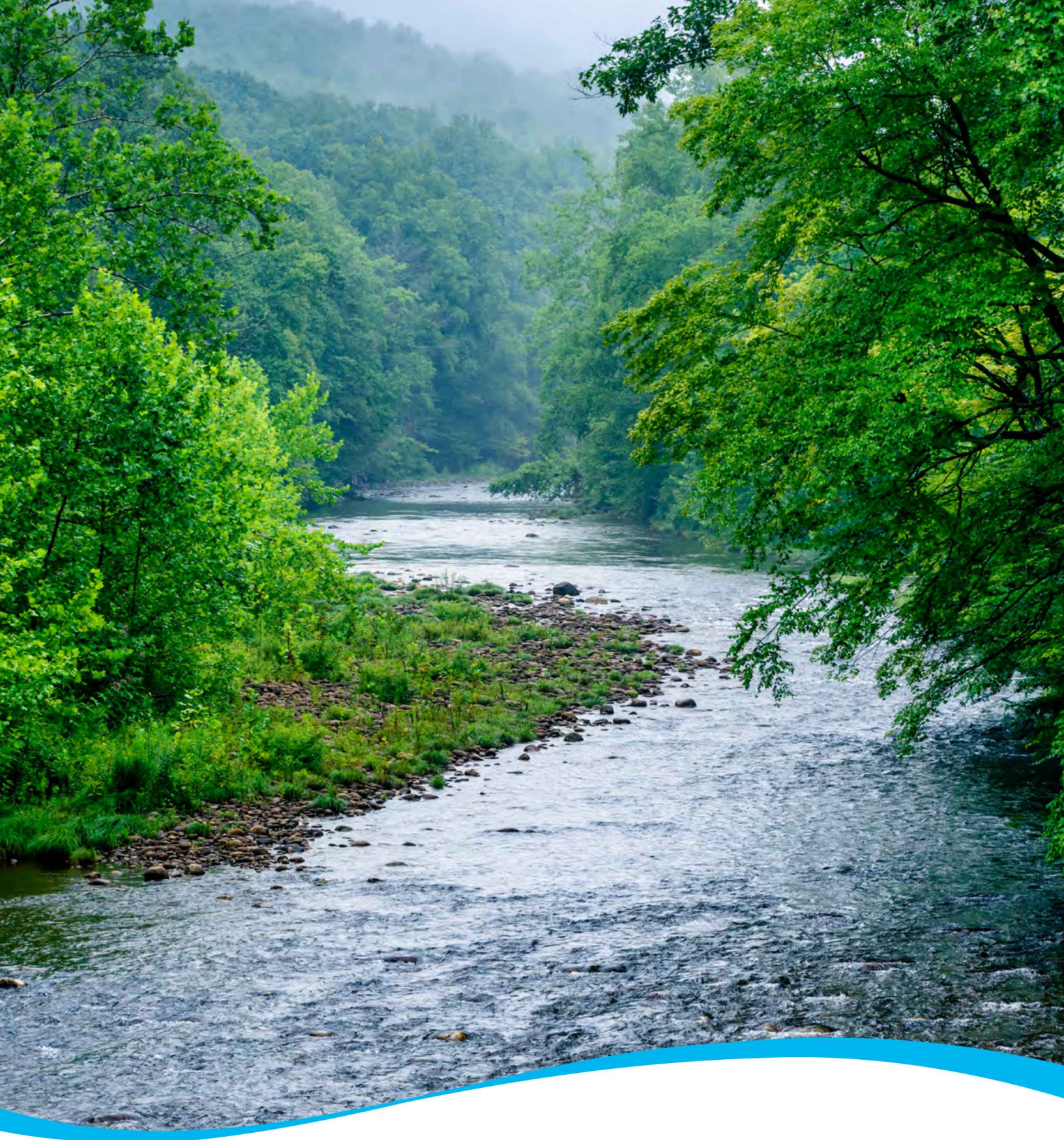
- **Forest Resilience Bond.** Developed by the Forest Service partner [Blue Forest Conservation](#), the Forest Resilience Bond raises upfront private capital to finance treatments focused on improving watershed health and mitigating fire risk on NFS lands, and uses a collaborative framework that brings together stakeholders who benefit from restoration to share the cost of reimbursing investors over time.
- **Innovative Finance Utility Partnerships.** [Encourage Capital](#), [World Resources Institute](#), the [US Endowment for Forestry & Communities](#), and the Forest Service are partnering to explore innovative approaches such as green bonds, environmental impact bonds, loan structures, carbon transactions, joint benefits, and joint powers authorities to accelerate investments in built and natural infrastructure.
- **USEPA State Revolving Funds.** The US Environmental Protection Agency has expressed interest in expanding its existing Clean Water and Drinking Water State Revolving Fund loans to municipalities, tribal entities, and local utilities to include proactive source water protection activities and natural infrastructure solutions on NFS lands, provided there are secure repayment streams. The 2014 [Water Infrastructure and Innovation Act](#) (WIFIA) expands financing options available to co-finance state-administrated source water protection loans.

How can water utilities engage with the Forest Service?

The Forest Service staff positions listed below are a good starting point to learn more about how to engage with the agency. Individuals will need to be identified on the basis of location and interest. For help getting connected, contact Nathalie Woolworth at the National Partnership Office (nathalie.woolworth@usda.gov), Adam Carpenter at AWWA (acarpenter@awwa.org), or your state forestry office.

- **Regional State & Private Forestry Director** (www.fs.fed.us/spf)—to learn about funding programs that support the stewardship and protection of state and private forests.
- **Regional Renewable Resources or Natural Resources Director** (www.fs.fed.us/managing-land/national-forests-grasslands)—to engage with regional program areas around hydrology, watershed improvement, fisheries, and soil resource management that directly support national forest and grassland units.
- **Regional Research Station Director** (www.fs.fed.us/research)—to identify opportunities to share data and research on the role of forests in delivering drinking water.
- **National Partnership Office**—to explore innovative finance partnerships through initiatives such as the Innovative Finance for National Forests program (www.ifnfggrants.org).





American Water Works
Association



*This document was developed in a non-financial collaboration between
the Forest Service and the American Water Works Association.*

Please see flash drive

Appendix C

Delineation of Surface Water Intake Protection Areas

Chambersburg Borough Water System

PWSID #7280005

Franklin County, PA

Delineation of Surface Water Intake Protection Areas

Appendix C

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Appendix C Delineation of Surface Water Intake Protection Areas

This appendix describes the methodology for identifying the protection areas for the Chambersburg Borough Water System (CBWS) surface water intake. These protection areas were determined using hydrologic methods consistent with DEP guidance and utilizing the newest available data and technology. The summary of the approach and resulting protection areas are described below.

C.1 Description of Surface Water Sources

The CBWS water system includes a surface water intake located in the Conococheague Creek (DEP Source ID 001). **Figure C-1** shows the location of the source.

C.2 Watershed Configuration

Conococheague Creek is a tributary of the Potomac River. The Potomac River and its tributaries are part of the Mid-Atlantic Region, USGS Hydrologic Unit 02 (HUC02). The Mid-Atlantic Region consists of the drainage area between the states of New York and Virginia that ultimately drains into the Atlantic Ocean. Approximately 18.3 square miles of watershed contribute to the CBWS intake. The watershed is situated in the South Mountain section of the Ridge and Valley Province, which is characterized by linear ridges, deep valleys, and flat uplands with moderate to high relief. Geology in this section consists of metavolcanic rocks, quartzite, and some dolomite. Stream patterns are dendritic [1].

C.3 Watershed Evaluation

Spotts, Stevens and McCoy (SSM) personnel used Geographic Information Systems (GIS) analysis to assess steady-state surface water time of travel (TOT) throughout the drainage area contributing to the CBWS intake. To perform the assessment, the ArcHydro data model was used in conjunction with data from the National Hydrography Dataset Plus High Resolution (NHDPlusHR) [2]. The ArcHydro data model is recognized as a best practices template to organize and analyze hydrologic data [3]. The NHDPlusHR is a high resolution (*i.e.* very good stream coverage and accuracy) dataset of stream locations throughout the United States, and contains stream velocity values that were calculated using methods published by the United States Geological Survey. Detailed descriptions of the ArcHydro data model and NHDPlusHR schema are provided in the **Documentation** folder of the Data Package CD.

The time of travel assessment is based on networked streams, drainage area, and mean annual velocity calculations provided with the NHDPlusHR dataset. Therefore, the resulting delineations provide an

assessment of critical zones under typical flow conditions. In addition to delineating the source water protection areas, the ArcHydro geodatabase can be used as a planning tool for water resource issues by enhancing emergency response to individual contamination events.

C.4 ArcHydro Data Model Inputs

The watershed area draining to the CBWS intake provided the extent and boundaries of the GIS assessment [4]. The time of travel assessment requires the preparation of a stream network with known or calculated velocity values. The drainage area, stream locations and stream velocity information were obtained from the NHDPlusHR dataset. Mean annual velocity values for all streams in the NHDPlusHR dataset were derived from Unit Runoff calculations and the Jobson Method [5]. Technical descriptions of these calculations are included in the **Documentation** folder of the Data Package CD.

Velocities in reservoirs and lakes are not typically available, due to the complex nature of water movement in larger water bodies. Because of this, a watershed average velocity is applied to centerlines representing reservoirs or lakes in the stream network. These average velocities are typically much faster than how water actually moves through a large water body, which results in a faster time of travel, and larger, more protective zones. For the water bodies contributing to the CBWS intake, a watershed average velocity of 0.9 ft/s was applied to the water body centerlines.

In the drainage areas for the intake, mean annual stream velocity ranged from 0.49 to 1.49. Mean annual velocity values for the intakes is displayed in **Figure C-2**.

C.5 Time of Travel Assessment

The time of travel source water protection approach establishes the distance traveled by water flowing in a stream during a 5-hour time period and a 25-hour time period. Time of travel was calculated using the mean annual velocity values described in **Section C.4**. Average time of travel throughout the protection area is shown in **Figure C-3**.

C.6 Source Water Intake Protection Area Delineations

The water quality of an intake area is affected by the quality of all the water flowing towards it and all the land upstream of it. Therefore, the entire drainage area upstream of a surface water source is considered part of a source water protection area. It is broken into Zones A, B, and C. The delineated protection areas for the CBWS intake are shown in **Figure C-4**.

C.6.1 Zone A

Zone A is the most protective area, and is the area within 0.25 miles on either side of the stream. In the case of wide rivers, reservoirs, or lakes in which intakes are located, Zone A is the area within 0.25 miles on either side of the bank, as opposed to the stream centerline. Along the contributing streams, Zone A extends upstream to a point that represents, on average, a 5-hour time of travel to the intake. Zone A typically also extends downstream 0.25 miles from the intake, except in the case of impoundments or other controlled water bodies.

The 0.25-mile buffer of the streams within 5-hours of the intake resulted in Zone A encompassing part, but not all, of Long Pine Run Reservoir in the Birch Run fork of the reservoir. Because of the uncertainty of the reservoir's actual average velocity, and the system's concern for the water quality of the reservoir, the upper extent of the zone in the vicinity of the Long Pine Run Reservoir was extended to include the 0.25-mile buffer of the entire reservoir. Zone A includes 6.5 square miles for the CBWS intake.

C.6.2 Zone B

Zone B of a surface water source encompasses a 2-mile area on either side of the stream centerline or water body edge, extending upgradient from Zone A to a 25-hour TOT along the contributing streams. Zone B for the CBWS intake includes 11.7 square miles.

C.6.3 Zone C

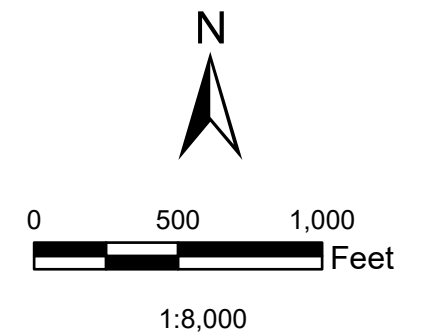
Zone C is portrayed as any drainage area upstream from Zone B (25 hours' time of travel to the intake) to the upgradient extent of the watershed. Typically, larger watersheds (approximately 100 square miles or greater) may have a Zone C. Due to the size of the watershed draining to the CBWS intake, the entire drainage area is designated as either Zone A or Zone B, and no Zone C protection area exists for this water system.

C.7 References

- [1] W. Sevon, "Physiographic Provinces of Pennsylvania," 2000.
- [2] U.S. Geological Survey (USGS), "NHDPlus High Resolution," 2017. [Online]. Available: http://nhd.usgs.gov/NHDPlus_HR.html.
- [3] Environmental Systems Research Institute (ESRI), "Hydro Data Model," 19 February 2016. [Online]. Available: <http://downloads.esri.com/archydro/archydro/>.
- [4] Environmental Resources Research Institute (ERRI), "PA Explorer: Small Watersheds of Pennsylvania," 1997. [Online]. Available: <http://www.pasda.psu.edu>.
- [5] H. E. Jobson, "Prediction of Traveltime and Longitudinal Dispersion in Rivers and Streams," U.S. Geological Survey, 1996.
- [6] Horizon Systems Corporation (HSC), "National Hydrography Dataset Plus Version 2," Developed in conjunction with the United States Environmental Protection Agency and United States Geological Survey, 2012. [Online]. Available: <http://www.horizon-systems.com/nhdplus/>.

Figure C-1
Surface Water Sources
Chambersburg Borough
Water System
PWSID# 7280005
Franklin County, PA
Source Water Protection
Technical Assistance Program

- ▲ CBWS Intake
- ▭ Municipal Boundary
- ▭ County Boundary



Data Source:
Intake, PA DEP, 2019
Boundaries, PENNDOT, 2014



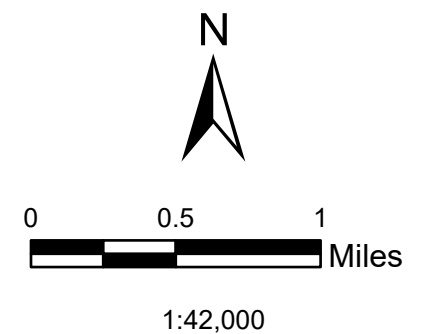
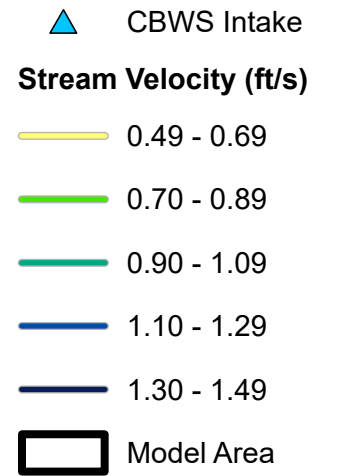
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Reading | Lehigh Valley | Lancaster
P: 610.621.2000 F: 610.621.2001
ssmgroup.com

07/08/22



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure C-2
Time of Travel Assessment
Model Elements
Chambersburg Borough
Water System
PWSID# 7280005
Franklin County, PA
Source Water Protection
Technical Assistance Program



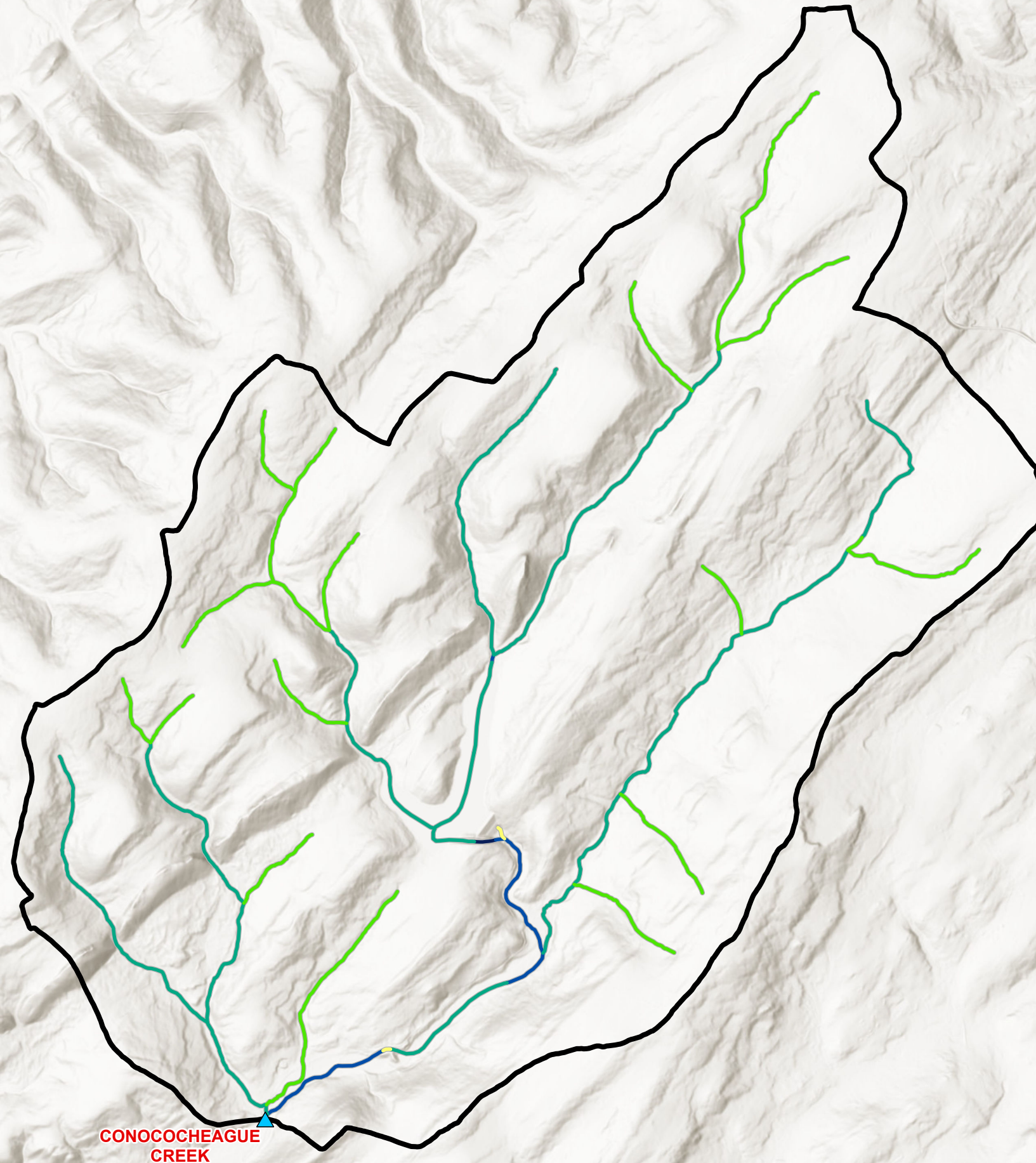
Data Source:
 Intake, PA DEP, 2019
 Model Area, SSM, 2022
 Stream, USGS NHD, 2021

SSM
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Esri, NASA, NGA, USGS, FEMA

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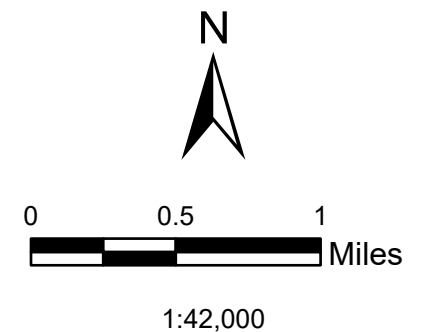


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Figure C-4
Surface Water Intake
Protection Area
Chambersburg Borough
Water System
PWSID# 7280005
Franklin County, PA
Source Water Protection
Technical Assistance Program

-  CBWS Intake
-  Zone A
-  Zone B

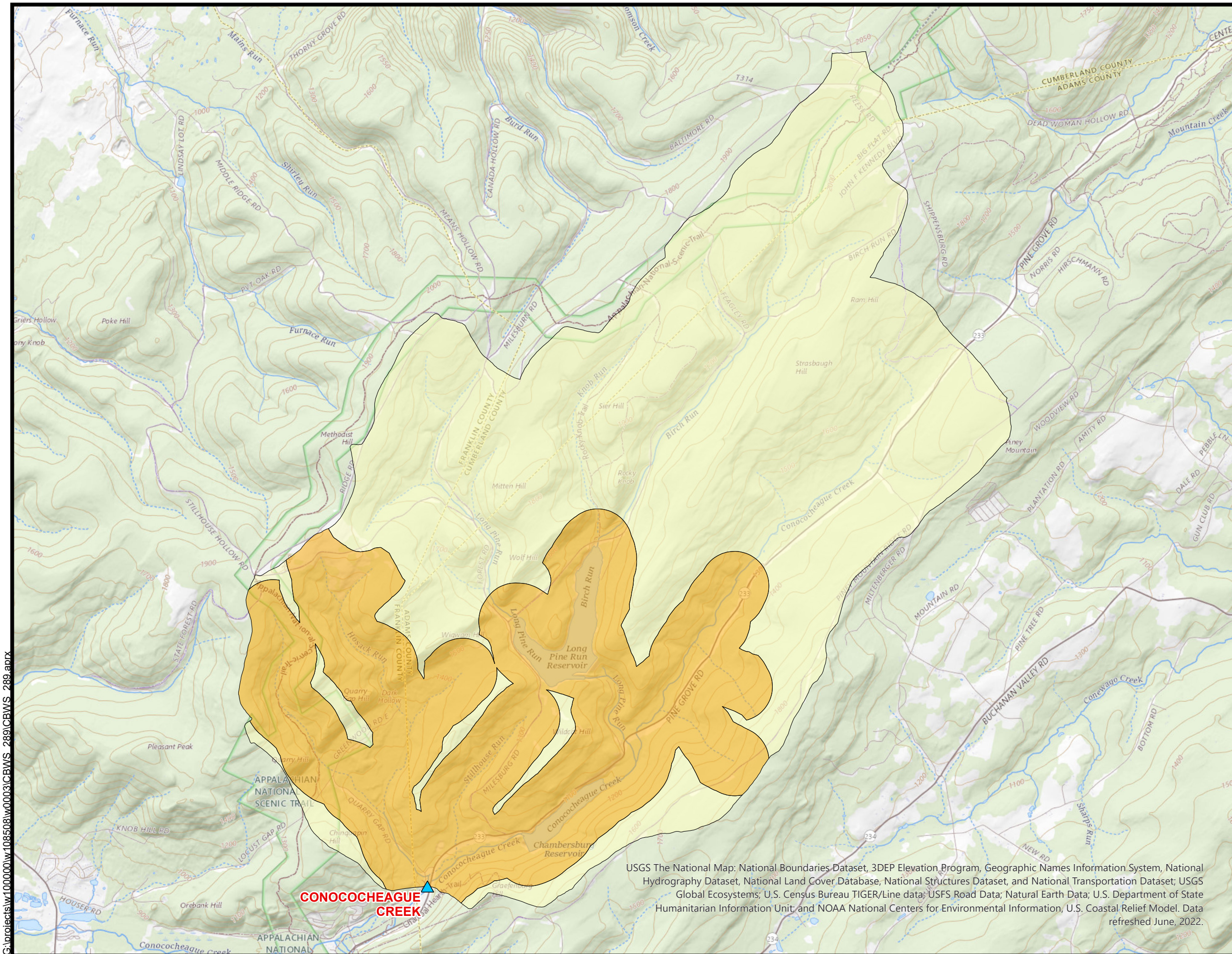


Data Source:
 Intake, PA DEP, 2019
 Zones, SSM, 2022



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 ssmgroup.com

07/08/22



USGS The National Map: National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; USGS Global Ecosystems; U.S. Census Bureau TIGER/Line data; USFS Road Data; Natural Earth Data; U.S. Department of State Humanitarian Information Unit; and NOAA National Centers for Environmental Information, U.S. Coastal Relief Model. Data refreshed June, 2022.

Appendix D

Susceptibility Analysis, Methods, and Results

Preliminary Point Source Potential Sources of Contamination
Chambersburg Borough Water System
PWSID #7280005
Franklin County, PA
Source Water Protection Technical Assistance Program

Map ID	Site Name	Address	PSOC Type	Zone	TOT	Pers	Quan	Sens	PFR	MA	PFC	PI	Susc	Site ID	Comment	Lat	Long	Dist (ft)
1	SR 233		PA Cleanways Illegal Dump Survey	A	S	M	H	H	H	H	H	H	A	0		39.9321	-77.4355	11,081
2	CALEDONIA STATE PARK	101 PINE GROVE RD FAYETTEVILLE, PA 17222-8224	Aboveground Storage Tank	A	S	M	H	H	M	H	H	H	C	443620	1500 gal GAS, 1000 gal HZSUB, 500 gal DIESEL	39.9375	-77.4303	13,469
3	HIGH ELEVATION OZONE SITE	RIDGE RD	EPA Regulated	B	M	H	M	L	M	H	H	M	D	0	AIRS/AQS	39.9611	-77.4756	17,158
4	Birch Run Road		PA Cleanways Illegal Dump Survey	B	M	M	H	M	H	M	H	H	A	0		39.9628	-77.4352	19,834
5	RAFFENSBERGER CABIN TRACT 37339	BIG FLAT RD BIGLERVILLE, PA 17307	Underground Storage Tank	B	M	M	H	L	MH	M	H	M	C	572047	150 gal HO, INACTIVE	39.9922	-77.4057	33,246

Non-Point and Point-Source Database Descriptions

Abandoned Mine Lands - approximate location of Abandoned Mine Land Problem Areas containing public health, safety, and public welfare problems created by past coal mining.

Air Emissions Plants facilities that receive and handle toxic chemicals during their processing, with potential releases from a stack.

Beneficial Land Use –The sub-facility type related to Beneficial Land Use is the Parcel. A parcel refers to the land application site that is proposed to received biosolids or residential septage. Land application for biosolids and septage means beneficial use, meaning it is applied to land as a soil amendment/fertilizer.

Captive Hazardous Waste Operations –The sub-facility types included are: Boiler/Industrial Furnace, Disposal Facility, Hazardous Generator, Incinerator, Recycling Facility, Storage Facility, and Treatment Facility

Cemetery – This is a database of cemetery locations that is managed by ESRI.

CERCLIS/ Superfund – This EPA-managed database includes information from the National Priorities List (NPL) – which is part of the Superfund cleanup process. The list includes hazardous waste sites that are eligible for long term remedial action financed by the Superfund program.

Coal Mining Operations - The sub-facility types include Deep Mine Underground mining of coal. Includes, but is not limited to, portal, tunnel, slope, and drift mines; Discharge Point Discharge of water from an area as a result of coal mining activities, Mineral Preparation Plant Facility, NPDES Discharge Point, Post Mining Treatment, Refuse Disposal Facility, Refuse Reprocessing Facility, and Surface mining.

Commercial Hazardous Waste Operations - The sub-facility types included are: Disposal Facility: permitted by DEP to accept hazardous waste generated off-site, and dispose of the waste by incineration, or by intentionally placing the waste in or on land or water in specially designed and constructed containment units where it will remain after closure of the facility. Hazardous Generator: A site where hazardous waste is first produced. The hazardous waste may be accumulated on-site 90-270 days without first obtaining a storage permit. Recycling Facility: can accept hazardous waste generated off-site, and treat the waste to make it suitable for upcoming recovery of a usable product or material. Storage Facility: can accept hazardous waste generated off-site, and hold the waste for a temporary period (not to exceed one year). Treatment Facility: Facility permitted by DEP to change the physical, chemical or biological character or composition of hazardous waste that is generated off-site.

Conservation Wells identifies the permitted surface location of oil and gas conservation wells that have not been plugged. These include active, regulatory inactive, orphaned, and abandoned wells. A conservation well is any well which penetrates the Onondaga horizon, or in those areas in which the Onondaga horizon is nearer to the surface than thirty-eight hundred feet, any well which exceeds a depth of thirty-eight hundred feet beneath the surface.

EPA Regulated - Includes: National Priorities List (CERCLIS / Superfund); Permit Compliance System; Resource Conservation Recovery Act; Toxic Release Inventory. See individual definitions.

Golf Courses (ESRI) – Point locations of a golf course facility.

Historic Oil and Gas Wells - The Independent Petroleum Association of America estimates approximately 325,000 wells were drilled in 150 years. Of those 325,000 wells, over 200,000 are still unaccounted for. As these wells are found and verified, they are cataloged in the Department of Environmental Protection's (DEP) Abandoned and Orphan Well database to facilitate plugging. There are currently over 8,200 wells listed in this database.

Industrial Mineral Mining – This DEP managed database includes non-coal mines. Sites in this database are typically quarries.

Land Recycling Cleanup (Brownfields) – This database includes sites that have entered either the state Act 2 program for contaminated sites or the Federal Superfund program. Contamination is can be transmitted through Air, Contained Release or Abandoned Container, Groundwater, Sediment, Soil, Surface Water, and Waste.

Leaking Underground Storage Tank – see *Storage Tank Cleanup locations*

Mined-out Areas – This database includes Coal Mining Operations (deep underground mines, discharge points, mineral preparation plants, post-mining treatment, refuse disposal facility, refuse processing facility), Industrial Mineral Mining Operations (deep underground non-coal mines, discharge points, mineral preparation plan facility), and Abandoned Mine Land Problem Areas.

Mine Drainage Treatment – This database includes clean-up projects that are working to eliminate some form of abandoned mine. The following sub-facility types are included: Abandoned Coal Refuse Pile Reclamation, Abandoned Deep Mine Reclamation, Abandoned Mine Drainage Treatment, Abandoned Oil & Gas Well Reclamation, Abandoned Surface Mine Reclamation, and Internal Monitoring Point

Municipal Waste Operations – This DEP-managed database includes sites related to the DEP's Waste Management Municipal Waste Program. Sub-facilities include composting, land application, sewage sludge, abandoned landfill, landfill, processing facility, resource recovery, and transfer station.

National Compliance Data Base (NCDB) supports implementation of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and the Toxic Substances Control Act (TSCA). The system tracks inspections in regions and states with cooperative agreements, enforcement actions, and settlements.

National Pollutant Discharge Elimination System Permit – The NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters.

Oil & Gas Water Pollution Control Facilities – This database lists Discharge Points -- The outfall from a wastewater treatment facility for oil and gas fluids Internal Monitoring Point -- A monitoring point within the wastewater treatment system where samples are collected; Treatment Plant -- A facility for treating oil and gas wastewater to achieve permit effluent limits

Oil and Gas Wells – This is a DEP managed database that includes the point locations of both conventional and unconventional oil and gas wells. A conventional well is a bore hole drilled or being drilled for the purpose of or to be used for the production of oil or natural gas from only conventional formation(s). A conventional formation is any formation that does not meet the statutory definition of an unconventional formation. An unconventional gas well is a bore hole drilled or being drilled for the purpose of or to be used for the production of natural gas from an unconventional formation.

PA Cleanways Illegal Dump Surveys – 2008-2013 lists of reported sites by county.

Pipelines – pipelines mapped by the US Department of Transportation.

Permit Compliance System (PCS) and Integrated Compliance Information System (ICIS) databases in EPA's Envirofacts regarding facilities registered with the federal enforcement and compliance (FE&C) and holding National Pollutant Discharge Elimination System (NPDES) permits. Specify the facilities by using any combination of facility name, National Pollutant Discharge Elimination System (NPDES) permit number, geographic location, facility industrial classification, and chemicals.

Public Meeting – These PSOCs were mapped by steering committee comments received during the DEP's 2002 Source Water Assessment Program (SWAP), as well as other source water protection plans created by SSM since 2000.

Radiation Facilities – These sites are related to the DEP's Radiation Protection Program. The sub-facility types include: Accelerator, Mammography, and X-ray Machine.

Railroads – inventory compiled by ESRI.

Regulated Tank list - DEP maintains a list that includes registered, regulated storage tanks, except aboveground tank systems storing highly hazardous substances, and aboveground tank systems with a capacity greater than 21,000 gallons (because of the sensitive nature of the information). Home heating oil tanks are not regulated and are not part of this list.

Residual Waste Operations – This DEP-managed database includes facilities related to the DEP's Waste Management Residual Waste Program. Residual waste is waste generated at an industrial, mining, or wastewater treatment facility. Sub-facility include Generator, Impoundment, Land Application, Landfill, Processing Facility, and Transfer Station.

Resource Conservation and Recovery Act/ Hazardous Waste – RCRA is a federal program which includes a management and inventory system about hazardous waste handlers. In general, all generators, transporters, and facilities that treat, store, or dispose of hazardous waste are required to provide information about their activities to state environmental agencies. These agencies, in turn pass on the information to regional and national EPA offices.

Roads - Interstate, state, and local roads compiled by Pennsylvania Department of Transportation.

Storage Tank Cleanups – a DEP database formerly titled “Leaking Underground Storage Tanks”. This DEP-managed database represents confirmed release incidents that have been reported to DEP since the enactment of the Storage Tank and Spill Prevention Act (Tank Act) in July 1989. These release incidents represent leaks, spills and overfills which have occurred from storage tank systems regulated by the Tank Act only. Releases from home heating oil tanks, which are not regulated by the Tank Act, are not part of this list.

Storage Tank Locations - a Storage Tank Location is a DEP primary facility type, and its sole sub-facility is the storage tank itself. Storage tanks are aboveground or underground, and are regulated under Chapter 245 pursuant to the Storage Tank and Spill Prevention Act. Storage tanks currently contain, have contained in the past, or will contain in the future, petroleum or a regulated hazardous substance. Above ground storage tanks that either contain hazardous materials or have a capacity greater than 21000 are removed.

Toxic Release Inventory – This EPA program was started in 1988 and contains information on releases of nearly 650 chemical and chemical categories by certain industries and federal facilities.

Water Pollution Control Facilities - Database includes Agricultural Activities - The management and use of farming resources for the production of crops, livestock or poultry. Compost/Processing -- Indicates that the facility treats sewage sludge by composting to produce a material that can be beneficially used, biosolids. Conveyance System -- Sewerage system without treatment Discharge Point -- Discharge point to stream Groundwater Monitoring Point -- Internal Monitoring Point -- Used to monitor internal processes-not a discharge Land Discharge -- Land application of wastewater Manure Management - Activities related to or supporting storage, collection, handling, transport, application, planning, record keeping, generation or other manure management activities. Outfall Structure -- Outfall structure to stream Pipeline or Conduit - Pipes or other smaller diameter conveyances that are used to transport or supply of liquids or slurries from collection, storage or supply facilities or areas to other facilities or areas for storage, modification or use. These can be for longer-term, medium-term or short-term and would include design, capacity, maintenance, safety, inspection, accident, and varying use and weather considerations. Pump Station -- Sewerage pump station Storage Unit -- Storage of wastewater Treatment Plant -- Sewage or industrial wastewater treatment plants.

Water Resource Discharge – The water resources database is managed by the DEP. A discharge in the databases represents the return of water used at a Water Resources primary facility. The subfacility type may be a sewage treatment plant, instream discharge, spray irrigation field, groundwater recharge, on-lot septic or an unidentified facility type.

Source Water Assessment and Protection Program



COMMONWEALTH OF PENNSYLVANIA
Department of Environmental Protection

Tom Ridge, Governor • James M. Seif, Secretary

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**DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF WATER SUPPLY MANAGEMENT**

DOCUMENT NUMBER: 383-5000-001

TITLE: *Source Water Assessment & Protection Program*

AUTHORITY: Pennsylvania's Safe Drinking Water Act; The Clean Streams Law, as amended

EFFECTIVE DATE: March 24, 2000

POLICY: This guidance defines the Pennsylvania Source Water Assessment and Protection Program (SWAPP) in accordance with the federal Safe Drinking Water Act and US EPA guidelines.

PURPOSE: The Source Water Assessment and Protection Program (SWAPP) is required to be submitted to US EPA for approval and describes how Pennsylvania assesses all drinking water sources serving public water systems for the potential for contamination. The assessments are to help "narrow down" and prioritize the potential sources for contamination to a public drinking water source to support voluntary local, source water protection programs. In addition, the SWAPP details the approach the state will take to support the development of voluntary local, source water protection program.

APPLICABILITY: This guidance applies to all local, state and federal agencies and programs with drinking water resource quality monitoring responsibilities.

DISCLAIMER: The policies and procedures outlined in this guidance document are intended to supplement existing requirements. Nothing in the policies or procedures shall affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of the DEP to give the rules in these policies that weight or deference. This document establishes the framework within which DEP will exercise its administrative discretion in the future. DEP reserves the discretion to deviate from this policy statement if circumstances warrant.

PAGE LENGTH: 66 pages

LOCATION: Volume 26, Tab 02

DEFINITIONS: See 25 Pa. Code Chapter 109

Susceptibility Analysis of Drinking Water Sources to Contamination

The susceptibility of a drinking water source serving a PWS is the potential for that source to draw water contaminated by inventoried sources of contamination at concentrations that would pose a concern. This susceptibility is determined at the point in the waterbody immediately preceding collection for the PWS. A drinking water source, as a whole, is considered highly sensitive to contamination if at this point an MCL has been exceeded for a regulated contaminant, 50 percent of an MCL has been reached for nutrients or heavy metals, or detections have been made of VOCs or SOCs above the detection limit. This does not complete the analysis of the individual potential sources of contamination for drinking water source susceptibility. The intent of the statute, as determined by EPA, is for the susceptibility analysis to “narrow down” the potential contaminant sources of concern to assist the effectiveness of local voluntary SWP programs.

The susceptibility analysis is a qualitative measure of relative priority for concern of the different potential and existing sources of contamination based on the following:

1. Drinking water source sensitivity
2. Potential impacts posed by sources of contamination to the PWS source
(This is a qualitative assessment of the impact on a PWS source if an uncontrolled contaminant release were to occur from a specific activity.)
3. Potential for release of contaminants of concern

The process is described on Flowchart 1.

The susceptibility analysis uses a series of matrices to determine high, medium and low values for the various factors in the process (matrix A – D). The parameters used in these matrices include time of travel (TOT), persistence and quantity. Although some of these parameters will be set for base assessments, the parameters for quantity and the “potential for release” table will be discussed at the public meetings and set for the site specific assessments conducted by DEP staff or DEP contractors to reflect local public concern. The changes in the threshold values for the parameters must be consistent with setting high, medium and low values for the resulting factors and must apply to the entire group of potential contaminant sources (i.e. Volatile organic chemicals).

The time of travel (TOT) to the drinking water intake from a source of a potential contaminant is measured in terms of short, medium, or long. For groundwater sources, WHP areas I, II, and III are synonymous with short, medium, or long TOT, respectively. For surface water intakes, the definitions of the segmented delineations are based on TOT (zone delineations: A = 5 hours, B = 25 hours, and C represents the remainder of the watershed). Accordingly, the TOT for Zones A, B and C are short, medium and long, respectively.

The persistence of a potential contaminant will be measured as high, medium or low. This will be based on the contaminant ability to move in the environment and is determined on the adsorption and/or half-life (or rate of removal). If the contaminant has been known to contaminate water supply sources with concentrations greater than the MCL or in significant concentrations it will have a high to medium persistence. For ground water sources, the soils and geologic materials ability to remove the contaminant will be factored in as well. This will be based on the clay content and the hydraulic conductivity of the material.

Quantity will be measured as high, medium and low. Low quantities are those that are clearly on a domestic scale and can be categorized as non-reportable or non-regulated releases, volumes or events. Medium quantities are those that can be categorized as reportable releases, regulated minimum volumes, or events, or equivalent, up to 10X such a quantity, or those quantities that are associated with commercial- or industrial-sized operations and distribution. High quantities are those that are clearly associated with commercial- or industrial-sized operations and distribution, with a minimum 10X a reportable release, regulated minimum volume, event, or the equivalent.

The sensitivity of a drinking water source is most critical in a groundwater source where the aquifer and overlying geologic materials above are expected to provide some treatment of infiltrating water. Surface water sources are highly susceptible because of short travel times of contaminants and limited processes for mitigation of contaminants other than dilution, settling, oxidation and volatilization. By definition, there is a higher susceptibility of contamination by potential sources within Zone I (Zone A) then Zone II (Zone B).

Determining the potential for impact of a contaminant source on a drinking water source is related to the properties of the contaminant of concern, the amount that could be released, the distance or travel time of the contaminant and contaminant concentration reduction that can be expected. Some of these factors are represented in a practical way in the rank of significance of the identified contaminant types ranked in the previous section. If the potential or existing potential sources of contamination are considered to be of a high density, their potential impact should be analyzed cumulatively.

One of the more important considerations in the susceptibility analysis is the potential for release of the contaminant of concern. This would include containment measures for stored potential contaminants. Of primary concern is the level of treatment, monitoring and quality assurance of any treatment process before release of a contaminant. This is the purpose of most permitting programs related to water quality and can be a measure of drinking water source susceptibility. If the activity or a contaminant potentially released from that facility or activity is not regulated, susceptibility can be related to the use of best management practices established voluntarily or as accepted practice. The definition of Best Management Practices here is broader than for agriculture and is the combination of practices accepted in the industry or supported by the department to protect surface and groundwater from contamination. This will include pollution prevention measures. Another tool for determining the potential for release of a contaminant is the establishment and implementation of emergency management plans to protect against release.

Susceptibility Analysis of Groundwater Sources to Contamination

The first step is to assess the potential for contamination of the drinking water source if all the contaminant were released from the potential contaminant source without consideration of any source protection (See Flowchart 1). Factors controlling the potential for contamination from a release are the fate and transport of the contaminant, the amount of contaminant of concern that might be released and the time of travel (or distance) to the drinking water source. The relative value for this potential are determined from Matrix A and Matrix B.

Groundwater sources of drinking water have the benefit of a level of protection from contamination relative to their integrity and the vulnerability of their source aquifer. This defines the sensitivity of the groundwater sources to contamination. Factors related to the integrity of the well are the construction standards, depth of the well, pumping rate, and the rate of infiltration and movement of the groundwater. If the aquifer is confined, the drinking water source should be well protected from man-induced contamination. DEP has used a relative ranking of aquifer vulnerability by the DRASTIC method by Aller *et al.* (1987). DRASTIC stands for: **D**epth to ground water, **A**quifer **R**echarge, **A**quifer media, **S**oil permeability, **T**opography, **I**mpact of the vadose zone, and **C**onductivity. The higher the DRASTIC score the more vulnerable the groundwater. Site-specific factors that increase aquifer sensitivity such as sinkholes can be included in the site-specific assessments.

The potential for impact can be assessed by considering the intrinsic sensitivity of the drinking water source Flowchart 2 and the potential for contamination or the value from Matrix B.

The potential for release is determined from the potential for release table and is based upon the following factors:

- 1 Containment
- 2 Regulatory control of the potential source of contamination
- 3 Compliance
- 4 Best Management Practices &/or Emergency Response Plan

If there is no control on the potential for release of the contaminant, the potential for release would be high.

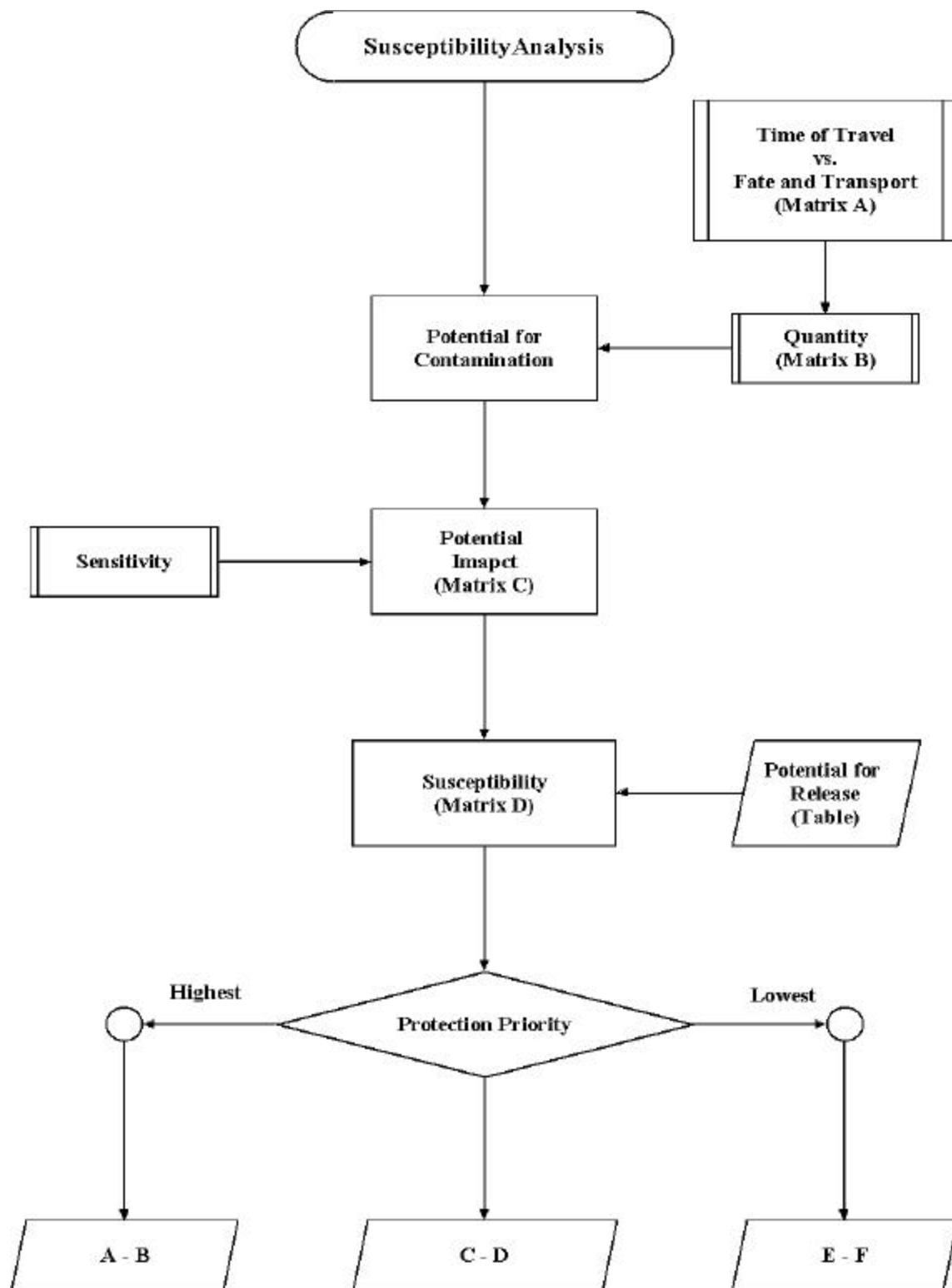
By relating the potential for impact described above to the potential for release, the susceptibility rating is determined from Matrix D. A potential source of contamination with a high potential for impact and a high potential for release would have an high susceptibility rating or priority.

Susceptibility Analysis of Surface Water Sources to Contamination

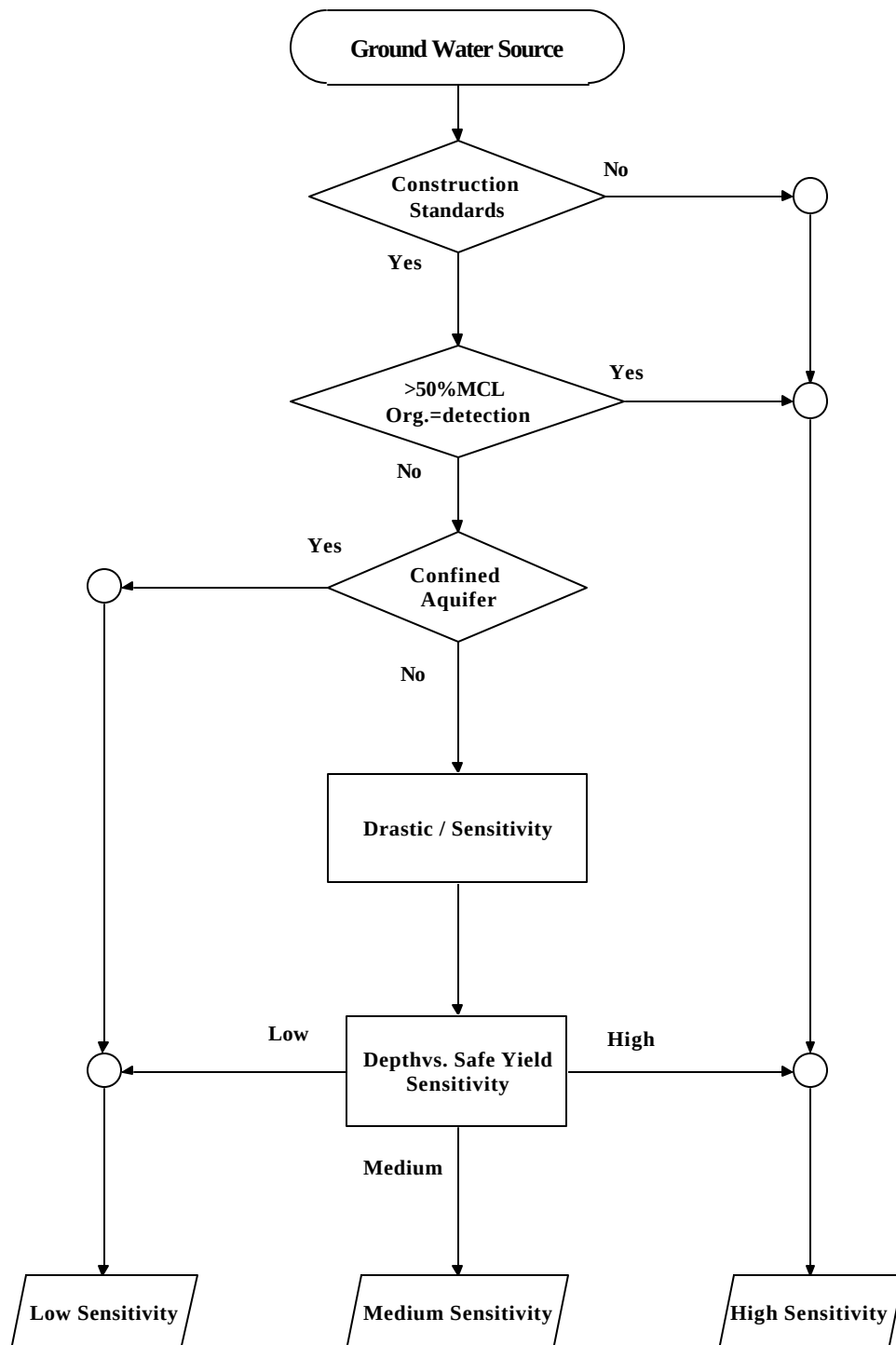
The susceptibility analysis for a surface water source of drinking water would not be substantially different from an analysis of a groundwater source except for the limited protection and resulting high sensitivity of surface water sources to contamination. Large reservoirs with at least a one month detention time at high flows could offer a medium sensitivity to upstream or distant potential sources of contamination.

Flow Chart 1

Susceptibility Analysis



Flow Chart 2 Susceptibility Analysis



Potential for Contamination

Matrix A (Step 1)

Time of Travel (TOT) vs. Fate & Transport (persistence)

\ Persistence TOT \	High	Medium	Low
Short	High	High	Medium
Medium	High	Medium	Low
Long	Medium	Low	Low

Matrix B (Step 2)

Matrix A vs. Quantity

\ Quantity Matrix A Result	High	Medium	Low
High	High	High	Medium
Medium	High	Medium	Low
Low	Medium	Low	Low

Potential Impact

Matrix C

Potential for Contamination vs. Sensitivity

\ Sensitivity Potential for Contamination \ (from Matrix B)	High	Medium	Low
High	High	High	Medium
Medium	High	Medium	Low
Low	Medium	Low	Low

Potential for Release Table

Potential for Release Control Practice \	Low	Medium	Medium-High	High
Regulated Containment &/or ERP	X			
Unregulated Containment / no ERP		X		
Regulated Discharge in Compliance			X	
“ “ Not in Compliance				X
NPS w/ Best Management Practices		X		
BMPs Not Operating			X	
No Control Practices				X

(ERP = Emergency Response Plan, NPS = Non-Point Source, BMP = Best Management Practice)

Susceptibility Rating Matrix D

Potential for Release vs. Potential Impact

\ Potential Impact (from Maxtrix C) Pot. For Release \ (from Table)	High	Medium	Low
High	A	B	C
Medium High	B	C	D
Medium	C	D	E
Low	D	E	F

Distribution and Availability of Source Water Assessments

The source water assessment results must be made available to the public and a summary is to be included in the Annual Consumer Confidence Report prepared by each CWS. DEP is proposing several avenues for presenting the assessment results to the consuming public. Copies of the completed SWAP for CWSs (with maps) will be provided to the CWS, the libraries in communities served by the CWS, local municipalities and planning agencies and the DEP regional offices. For the larger CWSs served primarily by groundwater and the CWSs served by surface water, a presentation will be made by DEP staff to a public meeting in the communities served by the CWS. A summary of the SWAP with a map will be in a GIS format and be available on the DEP web page or by request for a preparation fee. A summary of the SWAP will be provided to the PWS for distribution to consumers, local municipalities and emergency management personnel. An example of Source Water Assessment summary to be developed is in Appendix F.

The final source water assessment and protection report will contain the following:

SOURCE WATER ASSESSMENT REPORT

EXECUTIVE SUMMARY: Overview of the objectives and tasks relative to completing the Source Water Assessment (SWA) report for the target sources. Includes a brief description of the key water quality concerns, conclusions drawn and protection priorities from the study.

1.0 INTRODUCTION

The context for conducting the source water assessment. The focus of SWAP is on maintaining or improving the raw water quality of water sources serving public water supplies. A federal/state/local government partnership approach can work towards assisting the water supplier in protecting their surface or groundwater supplies.

1.1 NEW REQUIREMENTS UNDER THE SAFE DRINKING WATER ACT

This section references requirements for source water assessments through source water assessment area delineation, potential contaminant inventory, susceptibility analysis, and public participation.

2.0 THE DRINKING WATER SYSTEM AND THE WATERSHED

2.1 THE DRINKING WATER SYSTEM

The name of the system as well as the location (include county name). The system's sources including wells, springs, and surface water intakes are described in terms of general construction, yield, and location (include a site map in the Appendix).

2.2 WATERSHED (or WELLHEAD PROTECTION AREA)

A description of the location of the watershed (or general location of the wellhead protection area). Provide the size in square miles of the watershed and relevant hydrologic information. Provide a table of the municipalities with jurisdiction within this area.

2.3 GEOLOGY

A description of the regional and local geology from available Pa. Topographic and Geologic Survey geologic or water resource reports. If a groundwater source, a conceptual flow model should be described. Geology plays an important role in defining the hydrologic system.

2.4 TOPOGRAPHY

A description of the elevation differences and landscape characteristics such as karst terrain within the watershed.

Source Water Assessment Activity Table.xls

Activity	Activity Code	Contaminant Types	Persistence	Quantity	Potential for Release	
					Surface Water	Groundwater
Animal feedlots	a01	MP, NN, SOC, M, TO, D	high	medium	medium/high	medium
Dairy Farms	a02	MP, SOC, NN, D, TO	high	medium	medium/high	medium/high
Fertilizer Storage or use	a03	SOC, NN, TO	high	medium	medium/high	medium/high
Manure-spreading or storage	a04	MP, NN, D, TO	high	medium	medium/high	medium/high
Pesticide Storage or use	a05	SOC, NN, TO	high	medium	medium/high	medium/high
Silviculture	a06	T, SOC, D	high	medium	medium/high	low
Slaughterhouse	a07	MP, NN, D	high	medium	medium/high	low
Airports	c01	VOC, M, HM, PH	high	high	medium/high	medium/high
Auto Repair Shops	c02	VOC, HM, PH, M	high	medium	high	high
Bus and Truck terminals	c03	VOC, HM, SOC, PH	high	high	high	high
Construction areas	c04	VOC, HM, M, T	high	high	medium/high	medium/high
Car washes	c05	T, M	high	medium	medium/high	low
Dry cleaners	c06	VOC	high	medium	medium/high	high
Funeral Homes	c07	VOC, SOC, MP	high	medium	medium/high	low
Furniture Refinishing	c08	HM, VOC	high	medium	medium/high	medium/high
Gas/service stations	c09	VOC, PH, M	high	high	low	high
Golf courses	c10	SOC, NN, T, HM, M	high	medium	medium/high	medium
Junk yards	c11	VOC, HM, M, PH	high	high	medium/high	medium/high
Laundromats	c12	T	high	medium	medium/high	low
Lumber and wood treatment	c13	VOC, HM, D	medium	high	medium/high	medium/high
Medical facilities	c14	VOC, HM, M, SOC, R, MP	medium	medium	medium/high	medium/high
On-lot wastewater disposal	c15	MP, NN	high	high	medium/high	medium/high
Paint shops	c16	VOC, HM	high	medium	medium/high	medium/high
Photo processors	c17	VOC, SOC, HM	high	medium	medium/high	low
Printer and Blueprint shops	c18	VOC, SOC, HM	medium	medium	medium/high	low
Railroad tracks and yards	c19	VOC, SOC, HM, PH	high	high	medium/high	medium
Repair shops (engine, appliances, etc.)	c20	VOC, HM, PH	high	medium	medium/high	medium/high
Research Laboratories	c21	VOC, SOC, HM, M	high	medium	medium/high	medium/high
Rust proofers	c22	HM, VOC	high	high	medium/high	medium/high
Sand and Gravel mining/washing	c23	T, M, VOC, HM	high	high	medium/high	high
Asphalt, coal tar, and concrete plants	i01	VOC, PH, T	high	high	medium/high	medium/high
Chemical Manufacture	i02	VOC, SOC, HM, M	high	high	low	medium/high
Deep Coal Mining	i03	HM, M, T, Acidity	high	high	medium/high	high

Source Water Assessment Activity Table.xls

Activity	Activity Code	Contaminant Types	Persistence	Quantity	Potential for Release	
					Surface Water	Groundwater
Deep non-coal mining	i03	M, HM, T, Acidity	high	high	medium/high	high
Electronics manufacture	i04	VOC, SOC, HM, M	high	high	medium/high	medium/high
Electroplaters	i05	VOC, SOC, HM, M	high	high	medium/high	medium/high
Food processors	i06	HM, VOC, M, NN, TO, D	high	high	medium/high	medium/high
Foundries or metal fabricators	i07	HM, VOC, PH	medium	high	medium/high	medium/high
Fuel oil distributors	i08	PH, VOC	high	high	low	medium
Hazardous materials storage, treatment, and recycling	i09	VOC, SOC	high	high	low	medium/high
Industrial lagoons and pits	i10	VOC, HM, M	high	high	medium/high	high
Industrial parks	i11	VOC, SOC, HM, M, PH	high	high	medium/high	medium/high
Jewelry or Metalplating	i12	VOC, HM, M, SOC	high	high	medium/high	low
Machine/metalworking shops	i13	VOC, HM, M, SOC	high	high	medium/high	medium/high
Metal and Drum reconditioning	i14	VOC, HM, M, SOC	high	high	medium/high	medium/high
Oil and gas wells/production	i15	M, PH, VOC	high	high	medium/high	high
Oil refineries	i16	VOC, PH, HM, M	high	high	medium/high	medium/high
Plastics manufacturing	i17	PH, VOC, SOC, HM	high	high	medium/high	medium/high
Power plants (coal waste piles)	i18	HM, M	medium	high	medium/high	medium/high
RCRA facilities	i19	VOC, SOC	high	high	low	high
Storage facilities (petroleum and chemical)	i20	VOC, SOC, PH	high	high	low	medium/high
Surface coal mining	i21	T, M, HM, Acidity	high	high	medium/high	medium/high
Surface non-coal mining	i22	T, M, HM	high	high	medium/high	medium/high
Tanneries	i23	HM, M, VOC	medium	high	medium/high	medium/high
Wood preserving facilities	i24	SOC, HM	medium	high	medium/high	medium/high
Quarries	i25	T, M, VOC, HM	high	high	medium/high	high
Superfund Site	i26	VOC, SOC	high	high	high	high
Toxic Release Inventory Site	i27	VOC, SOC	high	high	high	high
Abandoned Coal Mine	i28		high	high	high	high
Abandoned Coal Mine Reclaimed	i29		high	high	high	high
Land Recycling Cleanup Locations	i30	VOC, SOC	high	high	high	high
Fuel oil storage	r01	VOC, PH	high	low	low	high
Household hazardous materials	r02	VOC, SOC	high	low	high	medium/high
Lawn care	r03	SOC, NN, M	medium	low	high	medium
On-lot waste disposal	r04	MP, NN	high	low	high	high
Swimming pools	r05	VOC	medium	low	high	high

Source Water Assessment Activity Table.xls

Activity	Activity Code	Contaminant Types	Persistence	Quantity	Potential for Release	
					Surface Water	Groundwater
Aboveground storage tanks	m01	VOC, PH	high	medium	medium	medium/high
Air pollution/local sources	m02	NN, VOC, M	high	medium	medium/high	low
Aquatic animal production	m03	MP, NN	high	medium	medium/high	high
Combined sewer outfalls	m04	VOC, SOC, MP, NN, HM, TO	high	high	high	high
Composting facilities	m05	TO, HM, VOC	medium	high	medium/high	medium/high
Dredge disposal	m06	T, VOC, SOC, M, HM	medium	high	medium/high	medium/high
Drinking water treatment plants	m07	M, T, VOC	medium	high	medium/high	medium/high
Fire training facilities	m08	VOC, PH, M, HM	high	high	medium/high	medium/high
Boating yards and marinas	m09	M, T, VOC	high	high	high	medium/high
Landfills and dumps	m10	VOC, HM, SOC, NN, MP, M	high	high	low	high
Land application of sewage sludge	m11	MP, NN, M, HM	medium	high	medium	medium
Large quantity hazardous waste generators	m12	VOC, SOC, HM	high	high	low	medium/high
Military facilities (past and present)	m13	VOC, SOC, HM, R, PH	high	high	medium/high	medium/high
NPDES locations	m14	MP, NN, HM	high	high	medium/high	medium/high
Pipelines-petroleum	m15	VOC, PH	high	high	low	high
Pipelines-sewer	m16	MP, NN, T	high	high	low	high
Recycling and Reduction facilities	m17	VOC, HM	high	high	medium/high	medium/high
River barges/shipping	m18	VOC, SOC, PH	high	high	high	medium/high
Road and Maintenance depots	m19	VOC, SOC, M	high	high	high	medium/high
Road salt storage	m20	M	high	high	high	medium/high
Small quantity hazardous waste generators	m21	VOC, SOC, HM	high	high	low	low
Snow dumps	m22	M, T	high	high	high	medium/high
Stormwater facilities	m23	T, VOC, SOC, NN, M	high	high	high	medium/high
Transportation corridors	m24	SOC, M, T	high	high	high	medium/high
Underground petroleum storage tank	m25	VOC	high	high	medium	high
Utility substation	m26	SOC, VOC, HM	medium	high	high	low
Waste incinerators	m27	HM, VOC, SOC	medium	high	low	low
Wastewater treatment plants	m28	D, MP, NN, VOC, SOC, M	high	high	medium/high	medium/high
Road deicing	m29	M	high	high	high	medium/high
Abandoned wells	m30	SOC, VOC, M, MP	high	high	high	high
Wells/Borehole drilling	m31	SOC, VOC, M, T	high	high	high	high
Cemetery	m32	HM, M	medium	low	low	medium/high
ATV Trail	m33	T	low	low	low	low

Source Water Assessment Activity Table.xls

Activity	Activity Code	Contaminant Types	Persistence	Quantity	Potential for Release	
					Surface Water	Groundwater
Leaking Underground Storage Tank	m34	VOC	high	high	high	high
Unknown	u01	unk	unk	unk	unk	unk

Notes: D = disinfection byproduct precursors; HM = heavy metals; M = metals; MP = microbial pathogens; NN = nitrate nitrogen; PH = petroleum hydrocarbons; SOC = synthetic organic compounds; T = turbidity; TO = taste and odor compounds; VOC = volatile organic compounds.

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Pennsylvania's Environment Facility Application Compliance Tracking System (eFACTS) allows individuals to search for authorizations, clients, sites and facilities. Users can also search the database to find inspection and pollution prevention visits as well as inspection results data, including enforcement information when violations are noted. DEP has also provided a name search to use when it is not known if the entity is a client, site or facility.

It is critical for DEP to provide permitting, inspection and compliance information about individuals, businesses and local governments to the public. These entities are subject to environmental requirements and reporting is a fundamental part of all environmental protection programs.

eFACTS contains DEP compliance information only. For more information, visit the Environmental Protection Agency's ECHO and Envirofacts websites that have federal compliance reports and data for individual entities. For additional information, or to provide feedback, please [contact us](#).

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Facility Search Results



Sort Order: Facility Name - ascending

Primary Facility (Facility ID)	Status	Program
WERNERSVILLE MUNI AUTH (481101) Wernersville Borough, Berks	Active	Water Planning and Conservation
WERNERSVILLE STATE HOSP (579658) PO BOX 600 WELFARE EBENSBURG CTR EBENSBURG, PA 15931 South Heidelberg Township, Berks	Active	Environmental Cleanup & Brownfields
WERNERSVILLE STATE HOSP (579658) RT 422 & SPORTSMAN RD WERNERSVILLE, PA 19565 South Heidelberg Township, Berks	Active	Environmental Cleanup & Brownfields
WERNERSVILLE STATE HOSP (579658) WERNERSVILLE STATE HOSPITAL ROUTE 422 & SPORTSMAN RD WERNERSVILLE, PA 19565 South Heidelberg Township, Berks	Active	Environmental Cleanup & Brownfields
WERNERSVILLE STATE HOSP (283878) Wernersville Borough, Berks	Active	Water Planning and Conservation
WERNERSVILLE STATE HOSPITAL (520387) US RTE 422 & SPORTSMAN RD WERNERSVILLE, PA 195650300 Wernersville Borough, Berks	Inactive	Clean Water

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Facility Search Details

Facility ID:	579658
Facility Name:	WERNERSVILLE STATE HOSP
Address:	RT 422 & SPORTSMAN RD WERNERSVILLE, PA 19565 South Heidelberg Township, Berks County
Status:	Active
Program:	Environmental Cleanup & Brownfields

Facility Search Sub-Facility Details

Sub Facility Name	Type:	Other ID:	Status:	eMap PA Location:
002A	Storage Tank	132020	Currently in Use	

Facility Search Permit Details

Authorization	Status:	Permit Number:	Date Received:
Storage Tank Registration/Permitting (425051)	Issued	06-07448	08/05/1989

Facility Search Inspection Details

No records matched the criteria.

Facility Search Tank Remediation

Incident Name	Confirmed Release Date	Type	Cleanup Status	Cleanup Status Date
WERNERSVILLE STATE HOSP (15145)	08/05/1989	UST (Petroleum)	Cleanup Completed	12/15/1994

Corrective Action/Tank Closure requirements remain outstanding for incidents in Inactive status.

Facility Search Land Recycling Information

No records matched the criteria.

Facility Search Air Emissions

No records matched the criteria.

Pennsylvania Department of Environmental Protection

DEP eNOTICE System

The Department of Environmental Protection's (DEP) eNOTICE system allows citizens to track environmental permit applications, draft technical documents and regulatory proposals throughout the review process. eNOTICE enhances DEP's Web-based Environment, Facility, Application, Compliance Tracking System (eFACTS). Introduced in 1999, eFACTS was designed to increase public participation in the environmental permitting process by making access to information easier and more efficient.

eNOTICE is unique because it goes beyond the traditional regulatory model that requires agencies to publish information with the hope that citizens will respond or comment. Instead, users can get information about their communities and the permits they are interested in delivered directly to their e-mail boxes when important milestones are reached. Currently, subscribers can receive eNOTICES to track environmental permit applications, draft technical documents and regulatory proposals.

Permit Applications

The eNOTICE system allows users to be notified by e-mail when anyone in their community submits a permit application to DEP for review. Individual permits can be tracked and notification sent when comments on the permit should be submitted.

The eNOTICE System covers permits for air and water pollution control facilities, waste facilities (landfills, incinerators, transfer stations), drinking water facilities (treatment plants, water sources), tanks, surface and deep coal mining operations, industrial mineral mines (quarries), wetlands and other stream encroachments, as well as X-ray and other radiation sources -- all permits included in the eFACTS system.

New applications, renewals or any amendments or modifications to each of these permit types are covered.

Permits can be tracked two ways:

- Pick your township, city, borough or county and you will be notified when any applications come from these areas; or
- Pick individual applications or permits by name already in eFACTS and get e-mail information as they move through review.

Permit application eNOTICES are sent out daily and include information on the status of the permit application as well as links to other information on the facility available through eFACTS -- results of inspections, enforcement actions, the facility address and phone number, and the DEP office responsible for reviewing the application.

Draft Technical Documents

Draft technical guidance documents provide practical and specialized direction to DEP program staff and the regulated community, often supportive of regulatory requirements. They often deal with a subject that requires scientific training and understanding, prepared into formats such as handbooks, manuals, lists and other non-regulatory documents.

The eNOTICE system allows users to receive personal notification of new draft technical documents as they are posted to the PA Bulletin for public comment. Draft Technical Document eNOTICES are sent out once a week and contain a simple text message with a link to take the user to a current and up-to-date list of documents.

Regulatory Proposals

The eNOTICE regulatory proposal notification system was specifically designed to provide subscribers with up-to-the-minute information on the status of environmental regulations currently being considered in the commonwealth. Subscribers can receive up to nine specific updates, depending on the status of the regulatory proposal:

- Submittal to a DEP advisory committee for review and comment;
- Submittal of proposed regulation to the Environmental Quality Board (EQB);
- Action taken by the EQB;
- Publication in the Pennsylvania Bulletin and the deadline to provide comments to the EQB on the proposed rulemaking;
- Submittal of the draft final regulation to a DEP advisory committee;
- Submittal of the final regulation to the EQB;
- Action taken by the EQB on the final regulation;
- Submittal of the final regulation to the House Environmental Resources and Energy Committee, the Senate Environmental Resources and Energy Committee and the Independent Regulatory Review Commission (IRRC) and the IRRC's tentatively scheduled meeting date to consider the final rulemaking; and
- Publication of the final rulemaking.

Regulatory proposal eNOTICES are sent out daily, and include links to the subject document, as well as links to:

- Advisory Committee Pages;
- Environmental Quality Board;
- PA Bulletin Web site;
- E-mail addresses of Regulation Contacts; and
- E-mail addresses of Regulatory Coordinators.

Starting an eNOTICE Account

To begin receiving eNOTICES tracking permit applications, draft technical documents and/or regulatory proposals visit DEP's Web site at www.depweb.state.pa.us, keyword: eNOTICE.

Create your own password-protected account through the *New eNOTICE Subscribers* box. Once registered, you will be prompted to check the eNOTICE notifications you wish to receive. Tracking selections on your eNOTICE list can be added or changed at any time.

Privacy Policy

The e-mail address you register as part of the eNOTICE system will not be used for any other purpose other than sending permit notices or other services and educational information you choose.

Users can change their username, passwords, and e-mail plus unsubscribe at any time by logging into the system, and going to the Edit My Profile Screen.

For more information on eNOTICE, please contact the Applications Support Help Desk at (717) 705-3768 or by e-mail at ep-efactshelpdeskteam@state.pa.us.

For more information, visit www.depweb.state.pa.us, keyword: eNOTICE.

Appendix E

Reporting Form and Notification Letters for PSOCs

VERSION 1

{DATE}

{OWNER NAME}

{FACILITY NAME}

{ADDRESS}

RE: Chambersburg Borough Water System
Source Water Protection Program
Potential Sources of Contamination

Dear {OWNER NAME}:

Chambersburg Borough Water System (CBWS) is in the process of developing a Source Water Protection Plan that will help safeguard our drinking water sources for years to come.

As part of the study, environmental databases were searched for activities near our reservoir that could potentially contaminate the local water supply. Based on the activities described in these databases, you may have the potential to affect the quality of the public water supply through accidental spills, releases, or other events.

To protect the community water supply, CBWS asks that you continue to operate your site in an environmentally-conscious manner. If a release of contaminants occurs at your facility, please contact CBWS and the Pennsylvania Department of Environmental Protection immediately so that appropriate steps can be taken to mitigate the environmental impact of the release and protect the drinking water supply. The DEP's emergency response line is 800-541-2050.

The source water protection plan is available at the CBWS office for your review. If you have any questions regarding this letter, please contact me at 717-352-7450.

Sincerely,

Chambersburg Borough Water System

VERSION 2

{DATE}

{OWNER NAME}

{FACILITY NAME}

{ADDRESS}

RE: YOU'RE INCREDIBLY IMPORTANT TO THE HEALTH OF OUR COMMUNITY

Dear {OWNER NAME}:

As a business in our community, you wouldn't believe how important you are to protecting our water supply!

You may not be aware that Chambersburg Borough Water System recently completed a Source Water Protection Plan for our drinking water sources. As part of the study, environmental databases were searched for permits and activities that could potentially contaminate the local water supply. Since your business was found in the area near our groundwater supply, CBWS is asking you to continue operating your property in an environmentally-conscious manner.

CBWS is contacting those properties that were identified during the study as being what we call a "potential source of contamination (PSOC)." This alerts our staff that you may use certain chemicals that, if they were handled inappropriately or spilled, could cause big problems in the water we provide to the community. Here's what you can do to make sure your neighborhood drinking water is safe:

- Ensure your employees know the importance of handling chemicals appropriately. Reinforce the need to do things properly and not take shortcuts that can lead to accidents. If everyone does the little things right, the big problems rarely occur.
- Look for ways to reduce the possibility of spills and accidental releases with the chemicals you handle. Remember, an ounce of prevention is worth a pound of cure, and could save you money in the long run. CBWS would be happy to assist you in identifying solutions if you request it.
- Keep spill response materials handy. The quickest response to a spill or release is often the most effective.
- Finally, in the event of a spill or release, immediately contact CBWS and DEP. DEP's 24-hour hotline number is 800-541-2050. We can offer help and we can take measures to prevent damage to our drinking water, but the sooner we know, the better.

If you would like to see a complete copy of the source water protection plan, please stop by the CBWS office. The plan is available for your review. If you have any questions about this letter, I would be pleased to answer them. The office phone number is 717-352-7450.

Thank you for taking the time to read this letter and doing your part to help keep our drinking water safe.

Sincerely,

Chambersburg Borough Water System

Chambersburg Borough Water System

Source Water Protection Program

Identification of Potential Sources of Contamination

Your name and organization: _____

Phone number: _____

Location of possible PSOC – please provide as much detail as possible (address, name of roads, township, etc.): _____

What type of property is it?

___ Residential	___ Industrial	Other: _____
___ Commercial	___ Agricultural	_____

Description of possible PSOC: _____

Please circle the appropriate category of the possible PSOC:

- | | | |
|---------------------------------------|---|------------------------------|
| 1. Abandoned well | 12. Fertilizer/pesticide storage/production | 23. Oil/gas pipeline |
| 2. Aboveground storage tank | 13. Golf course | 24. Photo processor |
| 3. Animal feedlot/waste storage | 14. Highway | 25. Printer |
| 4. Asphalt plant | 15. Holding pond/lagoon | 26. Railroad |
| 5. Auto repair/body shop | 16. Industrial – other | 27. Refinishing |
| 6. Cemetery | 17. Injection well | 28. Road salt storage |
| 7. Cesspool | 18. Irrigation practice | 29. Septic system |
| 8. Chemical mixing/production/storage | 19. Landfill | 30. Service/gas station |
| 9. Dry cleaners | 20. Laboratory | 31. Underground storage tank |
| 10. Electroplater/meter finisher | 21. Machine Shop | 32. Waste piles |
| 11. Farm/private dump | 22. Mining/quarry | 33. Wood preserving |

Please fold this sheet in thirds, staple or tape it shut, put a stamp on the reverse side, and drop it in the mail to the Chambersburg Borough Water System. Thank you for your assistance!

Place Stamp Here

Chambersburg Borough Water System
7650 Lincoln Way East
Fayetteville, PA 17222

**HAZARDOUS MATERIALS
INVENTORY SHEETS**

DATE: _____

FACILITY NAME: _____

FACILITY ADDRESS _____

MUNICIPALITY: _____

FACILITY PHONE # _____

EMERGENCY CONTACT NAME: _____

EMERGENCY CONTACT PHONE # _____

FIRE DEPARTMENT JURISDICTION: _____

OWNER'S NAME: _____

OWNER'S ADDRESS: _____

OWNER'S PHONE # _____

MSDS FORMS ATTACHED: YES ____ NO ____

HAZARDOUS MATERIALS STORED, USED, OR DISPOSED OF ON PROPERTY:

- _____
- _____
- _____
- _____
- _____

COMMENTS:

Appendix F

Source Water Protection Resources

AWWA Agricultural Brochure

Funding Sources and Supporting Programs

Water Supply Area Sign Information

Security Risk Resources

EPA Cybersecurity Assessment

Emergency Response Plan Development

Please see flash drive

Appendix G

DEP Annual Program Update Form



COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF SAFE DRINKING WATER

ANNUAL SOURCE WATER PROTECTION PROGRAM UPDATE

THIS FORM SHOULD BE COMPLETED IN ORDER TO MAINTAIN ACTIVE STATUS
OF AN APPROVED LOCAL SOURCE WATER PROTECTION (SWP) PROGRAM.

Report for Calendar Year: Jan. 1 To Dec. 31, _____ (Fill in Previous Year)

Source Water Protection Plan Approval Date: _____

RETURN BY MARCH 31 TO THE SAFE DRINKING WATER PROGRAM - REGIONAL SOURCE WATER PROTECTION MANAGER AT THE REGIONAL OFFICE THAT SERVES YOUR COUNTY (See page 5).

System Name		System Address
PWSID #	Municipality	System Phone #
Source ID(s) #		County
Contact Person Name & Title		Contact Person Address
Contact Person Phone #		Contact Person E-mail Address

Please answer the following questions as completely as possible,
and include additional pages as necessary.

1. What are your source water protection goals? Please check all that apply.

- ☐ Protection of existing source water quality.
☐ Improvement of existing source water quality.
☐ Protection of potential future drinking water source quality (e.g., possible new well locations).
☐ Other: _____

2. Did you have at least one steering committee meeting during the reporting year?

- ☐ Yes. Please indicate when and attach list of meeting attendees and meeting minutes.
☐ No. Please describe what barriers prevented you from having a meeting this year.

3. Were there any changes to your drinking water system with respect to your source(s)?

- ☐ Yes, increases or decreases in withdrawals. Please describe. _____
☐ Yes, changes in usage patterns. Please describe. _____
☐ Yes, sources abandoned or new sources added. Please describe. _____
☐ No.

4. Were there any changes to your drinking water system with respect to land use?

- ☐ Yes, land use changes in SWP zones. Please describe and attach map.

- ☐ Yes, system changes driven by land use. Please describe and attach map.

- ☐ No. (Verified by previous and current Annual Sanitary Survey (Chapter 109.705) by water supplier)

5. Which of the following land uses do you consider to be the biggest threat to source water quality? Please check all that apply.

- | | |
|---------------------------------------|--|
| ☐ Agricultural | ☐ Transportation Corridors |
| ☐ Residential | ☐ Oil and Gas Development |
| ☐ Industrial | ☐ Private or Public Forest Land (Timbering) |
| ☐ Commercial | ☐ Other: _____ |

➤ Is this a change from the land use analysis in your Source Water Protection Plan?

- ☐ Yes. Please describe.

- ☐ No. (Verified by previous and current Annual Sanitary Survey (Chapter 109.705) by water supplier)

6. Please list your current top three (3) potential sources of contamination (PSOCs):

1. _____
2. _____
3. _____

➤ Is this a change from the PSOCs listed in your Source Water Protection Plan?

- ☐ Yes. Please describe. _____
- ☐ No.

➤ Are there any new PSOCs?

- ☐ Yes. Please list the type, amount, and distance from each water source. Locate the contaminant source(s) on a map as well as the water source and attach to this form.

Type: _____

Amount: _____

Distance: _____

- ☐ No. (Verified by previous and current Annual Sanitary Survey (Chapter 109.705) by water supplier)

7. Is implementation of SWP area management measures in accordance with the implementation schedule in your plan? If not, please explain.

☐ Yes.

☐ No. Please describe parts of plan not on schedule and provide revised implementation dates.

➤ ***Which of the following management options have you implemented this year or already have in place/maintain? Please describe briefly.***

☐ Public Education.

☐ PSOC Outreach.

☐ Projects with Partner Groups.

☐ Coordination with Emergency Responders.

☐ Land Purchase.

☐ Overlay Zoning.

☐ Ordinances.

☐ Other:

➤ ***Please describe future plans and implementation dates for the upcoming year.***

8. What resources have you applied to your program? Please describe briefly.

☐ Personnel Time.

☐ Volunteer Time.

☐ Grants.

☐ Direct Funding.

☐ Other:

9. What partners have you worked with? Please describe briefly.

☐ County Conservation District.

☐ County Planning.

☐ Emergency Responders.

☐ Watershed Association.

☐ Conservation Organization.

☐ Other:

10. Have you updated and coordinated your emergency response plan to include responses to additional incidents that may impact the quality of your drinking water source?

☐ Yes. ☐ No.

11. Have you updated your contingency plan for providing an alternate supply of drinking water as a result of an actual or recently realized potential drinking water source contamination event?

☐ Yes. ☐ No.

12. What barriers, if any, are preventing you from implementing your Source Water Protection Plan in a manner that meets all of your source water protection goals? Please describe briefly.

☐ Lack of Personnel Time.

☐ Lack of Funding.

☐ Lack of Interest by Local Officials.

☐ Lack of Volunteer or Partner Interest.

☐ Lack of Knowledge.

☐ Other:

13. Please add any additional comments you may have.

Comments:

14. Has the Source Water Protection Plan ever been amended?

- ☐ Yes, and an addendum has been submitted to the Department. Revision Date: _____
- ☐ Yes, and an addendum will be submitted to the Department. Revision Date: _____
- ☐ No.

15. Please sign and date.

Signature: _____ Date: _____

DEP REGIONAL OFFICES SAFE DRINKING WATER PROGRAM		
Northwest Region 230 Chestnut St. Meadville, PA 16335-3481 814-332-6899 Counties: Butler, Clarion, Crawford, Elk, Erie, Forest, Jefferson, Lawrence, McKean, Mercer, Venango and Warren	Northcentral Region 208 W. Third St., Suite 101 Williamsport, PA 17701 570-327-3636 Counties: Bradford, Cameron, Centre, Clearfield, Clinton, Columbia, Lycoming, Montour, Northumberland, Potter, Snyder, Sullivan, Tioga and Union	Northeast Region 2 Public Square Wilkes-Barre, PA 18701-0790 570-826-2511 Counties: Carbon, Lackawanna, Lehigh, Luzerne, Monroe, Northampton, Pike, Schuylkill, Susquehanna, Wayne and Wyoming
Southwest Region 400 Waterfront Drive Pittsburgh, PA 15222-4745 412-442-4217 Counties: Allegheny, Armstrong, Beaver, Cambria, Fayette, Greene, Indiana, Somerset, Washington and Westmoreland	Southcentral Region 909 Elmerton Ave. Harrisburg, PA 17110 717-705-4708 Counties: Adams, Bedford, Berks, Blair, Cumberland, Dauphin, Franklin, Fulton, Huntingdon, Juniata, Lancaster, Lebanon, Mifflin, Perry and York	Southeast Region 2 E. Main Street Norristown, PA 19401 484-250-5900 Counties: Bucks, Chester, Delaware, Montgomery and Philadelphia

Appendix H

Data Package

Chambersburg Borough Water System

PWSID# 7280005

Franklin County, PA

Source Water Protection Plan

Data Package CD

Appendix H

Table of Contents

Model Data:

Documentation

- NHD Fact Sheet.....NHD_Fact_Sheet_USGS_10699.pdf
- NHDPlus High Resolution Data Dictionary.....
..... NHDPlus_HR_DataDictionary_20170525.pdf
- NHDPlus User Guide NHDPLUS_UserGuide_2009.pdf
- NHDPlus Version 2 User Guide..... NHDPlusV2_User_Guide.pdf
- H.E. Jobson Velocity Documentation USGS_96-4013.pdf

Internet Links

- ArcHydro Data Model.....Hydro Data Model – ESRI Support.mht
- NHD Homepage USGS National Hydrography Dataset.mht
- NHD Plus Homepage NHD Plus – NHDPlus.mht
- NHD Plus High Resolution Homepage NHD Plus High Resolution.mht

GIS Data:

Potential Sources of Contamination (PSOC)

- Land Coverlc_7280005.tif
- Point Source PSOCsps_psoc_7280005.shp
- Transportation.....transportation_7280005.shp

Surface Water Data

- Intakesw_intake_7280005.shp
- Model Area sw _model _7280005.shp
- Streamssw _stream _7280005.shp
- Watershed Sub-basins..... sw _watershed _7280005.shp

SWP Area

- Source Water Protection Areas.....SWP_Area_7280005.shp



READING

1047 North Park Road
Reading, PA 19610-0307
P. 610.621.2000

LEHIGH VALLEY

Roma Corporate Center, Suite 106
1605 N. Cedar Crest Boulevard
Allentown, PA 18104
P. 610.849.9700

LANCASTER

701 Creekside Lane
Lititz, PA 17543
P. 717.568.2678

WEST CHESTER

101 East Evans Street
West Chester, PA 19380
P: 610.430.1382