



Borough of
Chambersburg

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



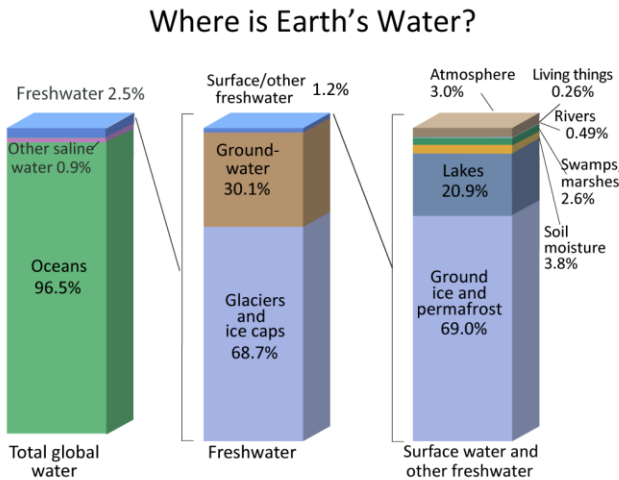
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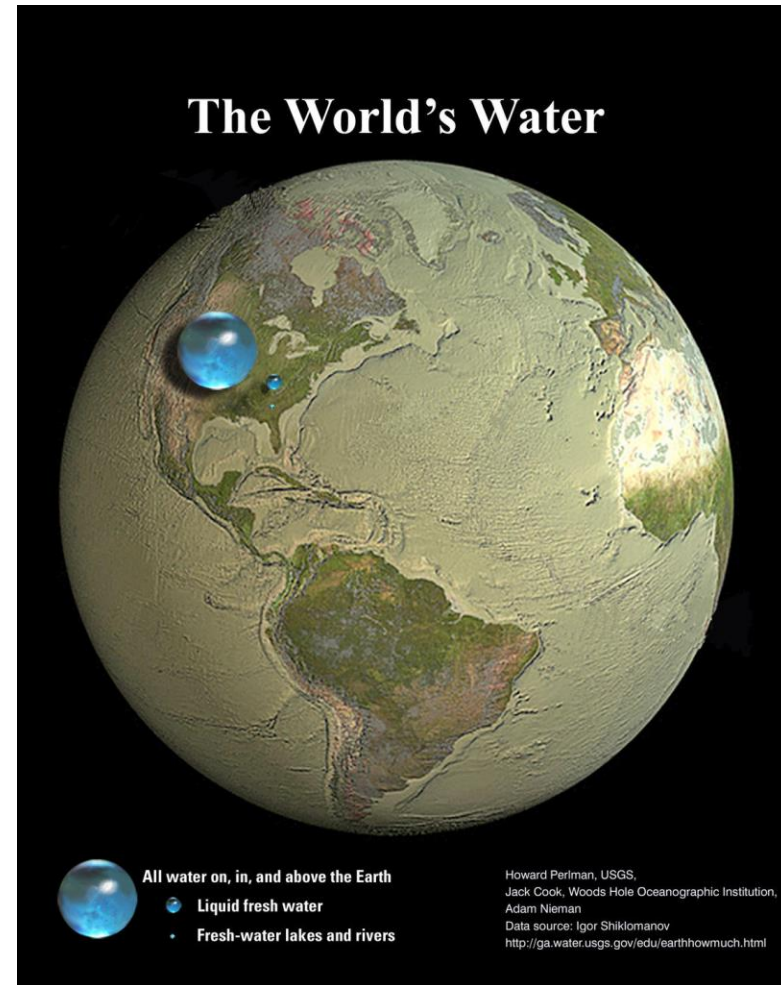
What is Source Water Protection?

- 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



Source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, *Water in Crisis: A Guide to the World's Fresh Water Resources*. (Numbers are rounded).



Could This Happen To You?

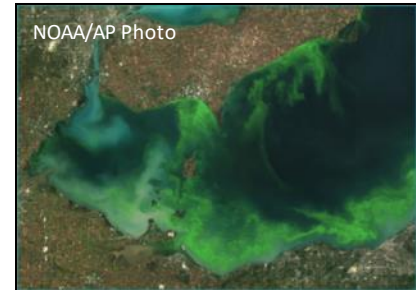
January 2014 – The chemical spill into the Elk River in WV affected 300,000 people in nine counties – banning water use for days.

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 derails 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.



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.

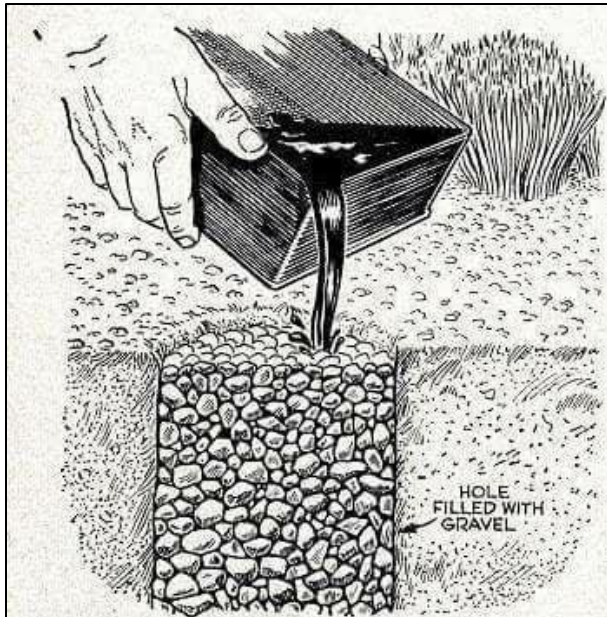
Estimated cost of incident >\$20M



Photo courtesy of Ivey DeJesus/PennLive

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 posthole 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.

166 POPULAR SCIENCE JANUARY 1963

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How DYNAMITE streamlines streams

CROOKED STREAMS are a menace to life and crops in the areas bordering on their banks. The twisting and turning of the channel retards the flow and reduces the capacity of the stream to handle large volumes of water. Floods result. Crops are ruined. Lives are lost. Banks are undermined, causing cave-ins that steal valuable acreage.

In many instances straightening out a stream has doubled its capacity for disposing of run-off water.

DYNAMITE may be used most efficiently and economically in taking the kinks out of a crooked stream. The dynamite is loaded along the length of "out-off" channel. When fired, the dirt and other debris is heaved high in the air and is scattered over the adjoining territory—leaving practically no spoil-banks. In addition to the material actually thrown out, much dirt is loosened and is later scoured out by the water which rushes swiftly through the straightened channel.

Du Pont Dynamite has straightened many thousands of miles of crooked streams. Du Pont engineers have worked for years to develop the best blasting methods for the cleaning out and straightening of streams. All their data is in a 44-page book, "Ditching with Dynamite." It is for your use. Write for it.

Dynamite can help you do other jobs, too. It can help you build highways, dams; fight soil erosion; work quarries. Du Pont has an explosive for every purpose.

DU PONT
THE U.S. PATENT

E. I. du Pont de Nemours & Co. Inc.
 Explosives Department
 6107 du Pont Building
 Washington, D.C.



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, 297 community water systems have signed up for program, and an additional 218 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.



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.



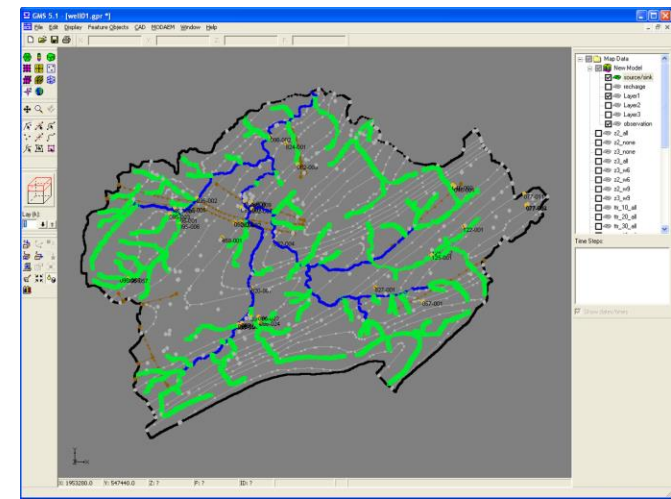


STEP 2: DELINEATION OF WATER SOURCES

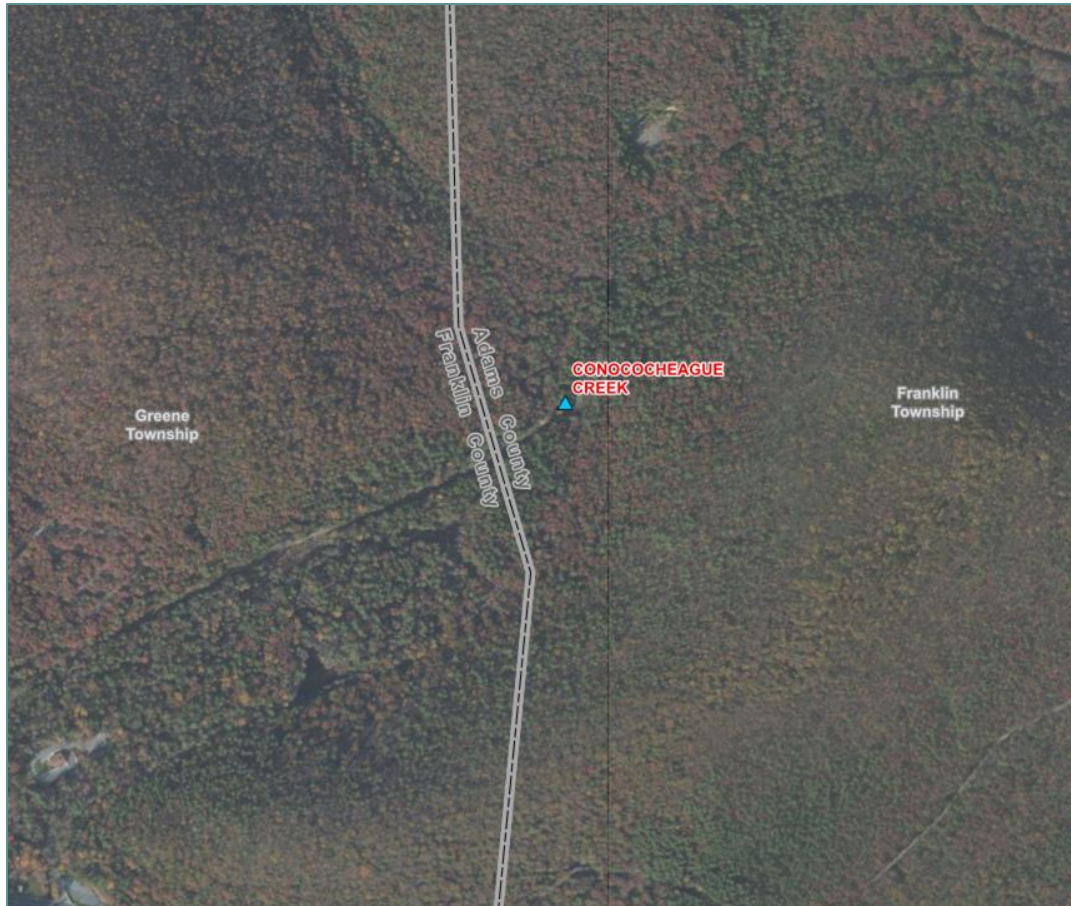
Evaluating the Water Sources

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

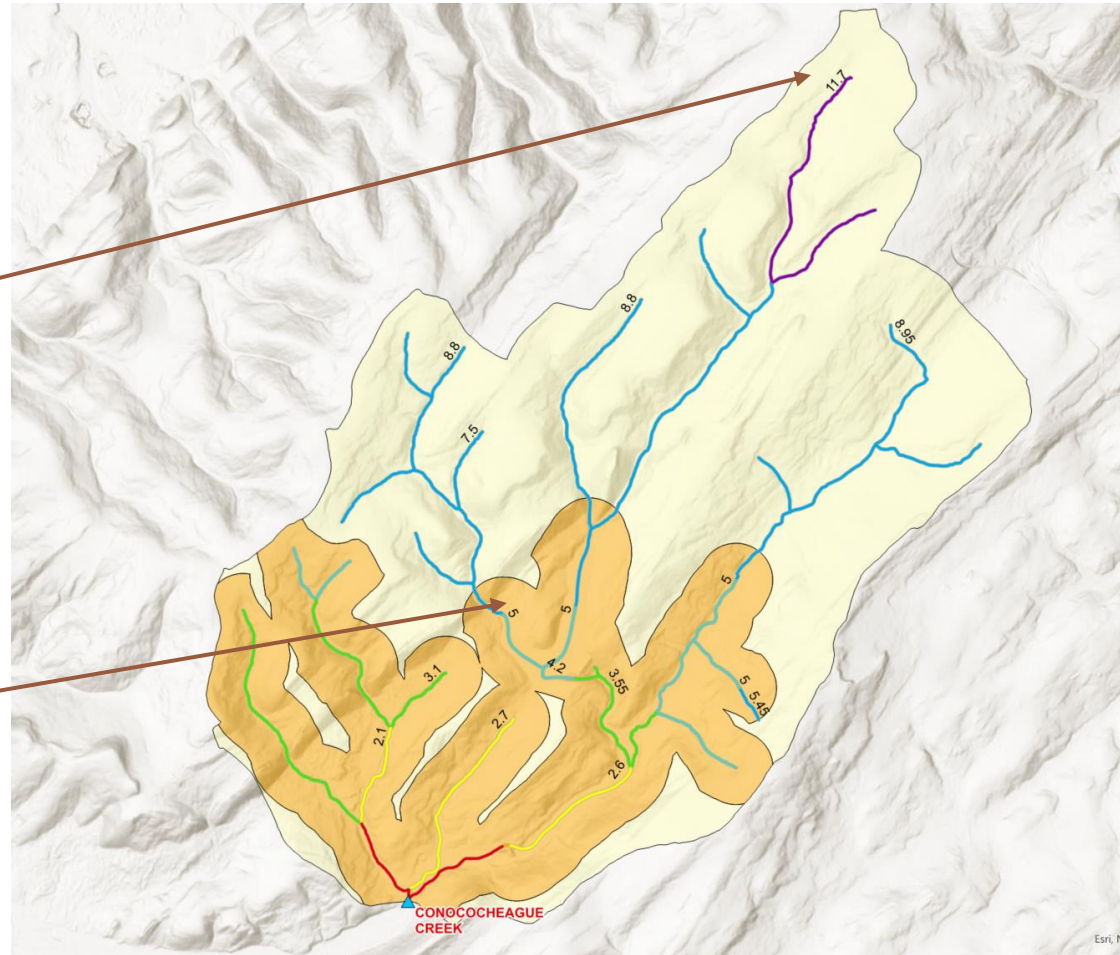


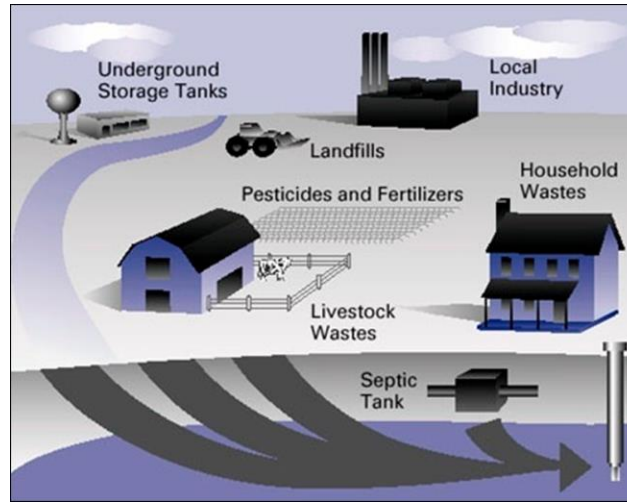
Surface Water Intake Time-of-Travel

Time to intake:

<12 hours

<5 hours

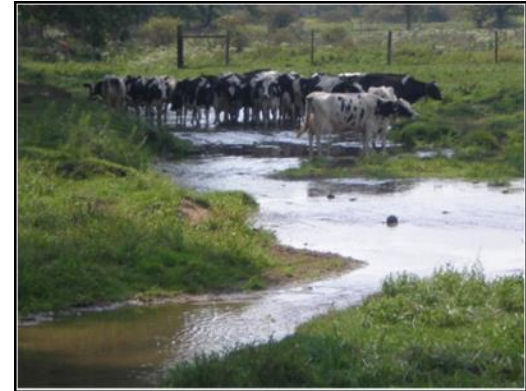




STEP 3: POTENTIAL SOURCES OF CONTAMINATION

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.



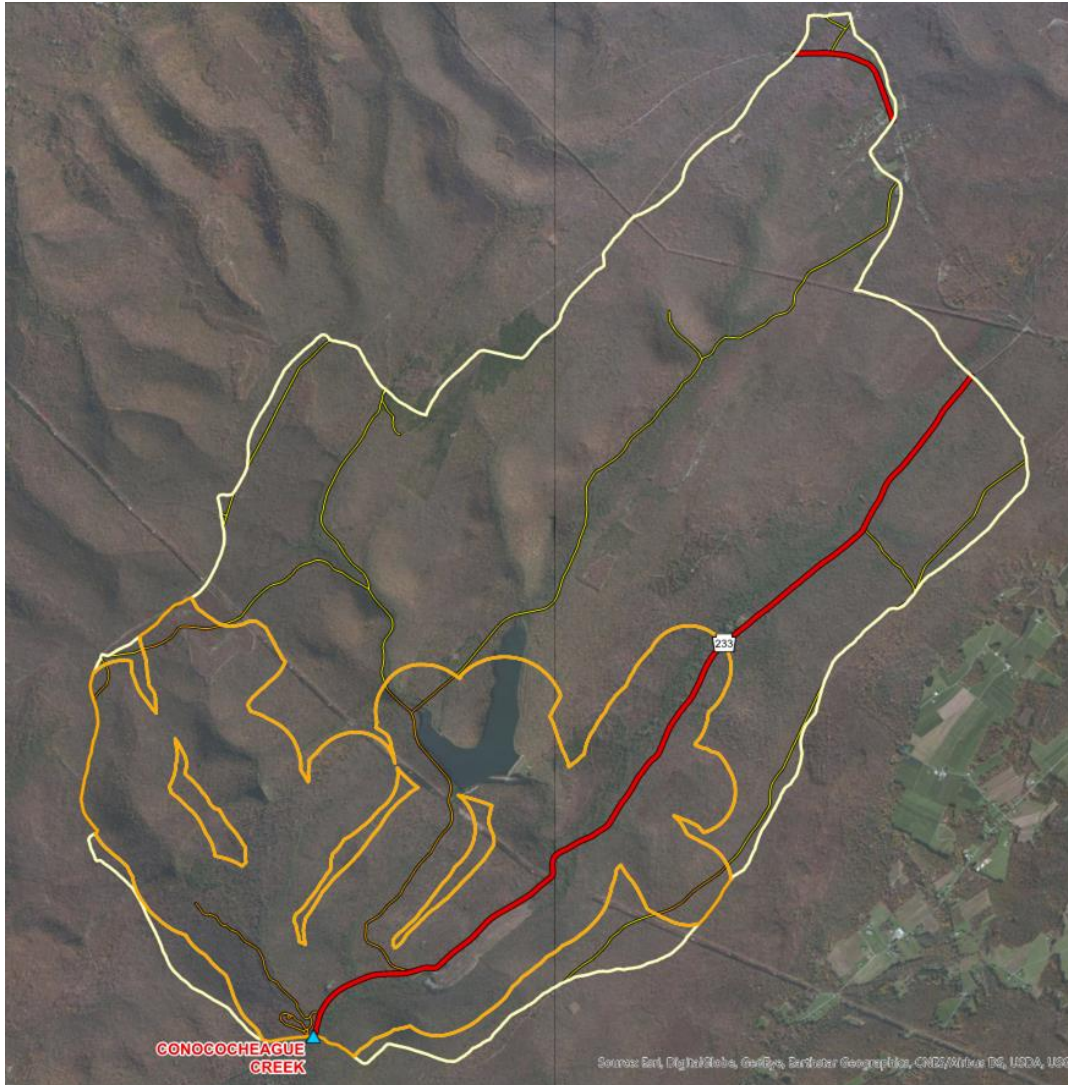
Land Cover

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%.



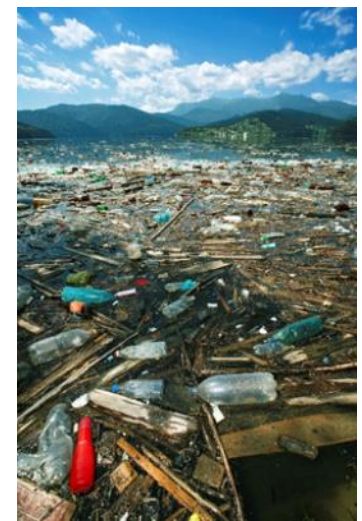
Transportation Corridors



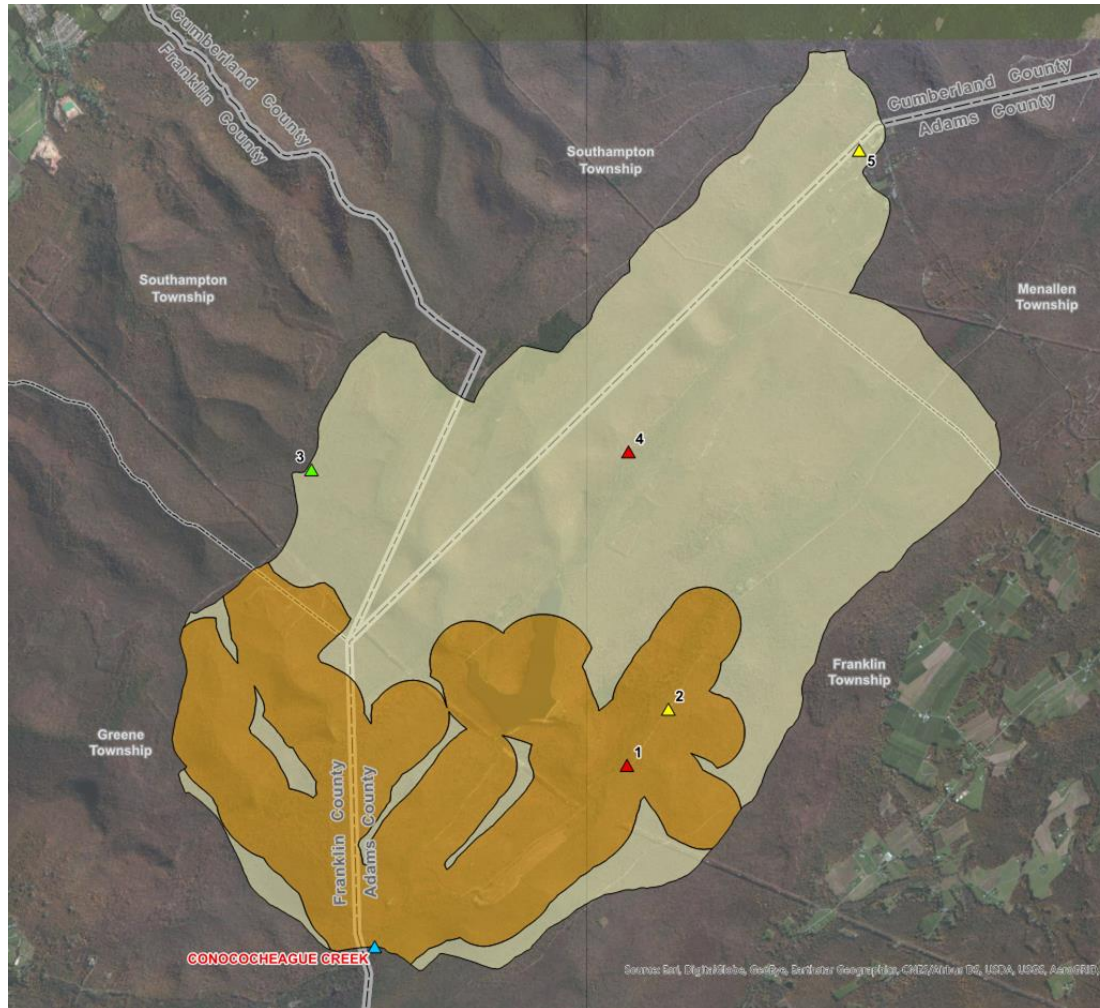
Route 233 is the major roadway through Zone A and Zone B.

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.

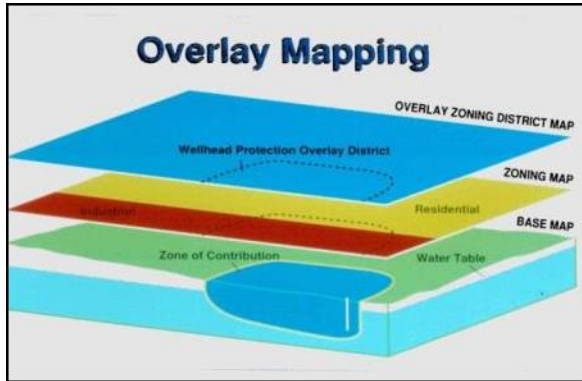


Point Source Potential Sources of Contamination



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



Photo courtesy of R. Zerbe



Photo courtesy of L. O'Hare

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.

Hamburg Municipal Authority Water Supply – The Furnace Creek Watershed

Protecting Habitat, Air, Drinking Water, & Source Water Resources

What happens in your small watershed affects the watershed downstream. The Furnace Creek flows into the Maiden Creek, and eventually Lake Ontonagon and the Schuylkill River, which is the drinking water supply to millions of people, including the City of Philadelphia!

WARNING!
Public Water Facility

Tampering with this Facility is a FEDERAL OFFENSE!!!!

INDIVIDUALS WHO ILLEGALLY ENTER OR TAMPER WILL BE PROSECUTED TO THE FULLEST EXTENT OF THE LAW!

FEDERAL LAW ENFORCEMENT (F.L.E.) 18 U.S.C. 3606 (2)
VIOLATION PENALTY OF UP TO 20 YEARS PRISON AND
MAXIMUM FINE OF \$250,000

FEDERAL LAW ENFORCEMENT (F.L.E.) 18 U.S.C. 3606 (2)
VIOLATION PENALTY OF UP TO 5 YEARS PRISON AND
MAXIMUM FINE OF \$50,000

To Report Suspicious Behavior:
Call 911 and

What is a Watershed?

A watershed is the land that water flows across, or under on its way to a stream, river, or lake. On its way, water travels surfaces such as farm fields, forests, suburban lawns, and city streets. It soaks into the soil and travels as groundwater through aquifers.

Watersheds come in many different shapes and sizes, and have many different features, like hills or mountains, or be nearly flat. They can contain farmland, woodland, small towns, and big cities. Do you know where your water comes from? What happens in your neighborhood affects people's drinking water downstream!

The Hamburg Municipal Authority is committed to keeping our watershed healthy. By managing their forest resources with buffers along Furnace Creek and maintaining trails, the Hamburg Municipal Authority is creating a healthy watershed for you and many others.

WESTERN BERKS WATER AUTHORITY

Your Drinking Water Quality

What is a Watershed?

It's the land that water flows across, or under, on its way to a stream, river or lake. Within each watershed, all water runs to the lowest point - a stream, river or lake. On its way, water travels over several types of surfaces such as farm fields, forests, suburban lawns and city streets, or it soaks into the soil and travels as groundwater through aquifers. Watersheds come in many different shapes and sizes and have many different features. Watersheds can have hills or mountains or be nearly flat. They can have farmland, woodland, small towns, and big cities. Parts of your watershed can be so rocky, or muddy that they're rated only for certain trees, plants, and wildlife.

Why should you care?

Protecting Habitat
The animals, birds and fish all live in your watershed. You influence what happens in your watershed, good or bad - by how you treat the natural resource - the soil, water, air, plants and animals.

Protecting Drinking Water
What happens in your small watershed affects the larger watershed downstream.

Protecting The Air We Breathe
By planting trees in your watershed, it cleans the air around you. Trees add value to your home. Help cool your home, break the cold winds to lower your heating costs, clean our air, and provide food for wildlife.

Protect your Watershed
Explore a local stream. Walk, canoe, or kayak. Find out where it starts and where it drains. It's difficult to preserve and protect what we don't know and care about.

Plant a tree. Did you know soil is our #1 contaminant to waterways? If you live by a watershed, plant trees and shrubs to hold soil in place.

Dispose of chemicals properly. Never pour chemicals, pharmaceuticals, oil or paint into the drain or toilet. Check with your county's household hazardous waste program to properly dispose of or recycle chemicals and keep them out of rivers and streams.

Do your part to conserve water. Be a good steward of the land and participate in community clean-ups.

The Western Berks Water Authority is committed to keeping its watershed healthy. The watershed for the drinking water supplied by Western Berks Water Authority includes Blue Marsh Lake and the Tulpehocken Creek Watershed. Western Berks Water Authority owns all of the residents of its Watershed to coordinate positively in the water quality of the watershed. Blue Marsh Lake and the Tulpehocken Creek eventually flows into the Schuylkill River - the drinking water supply to millions of people, including the City of Philadelphia!

Watershed Forums and Partnerships



Photo courtesy L. O'Ha

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

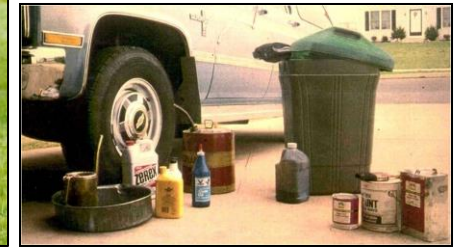
Participate in local community activities for sharing your message:

- 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

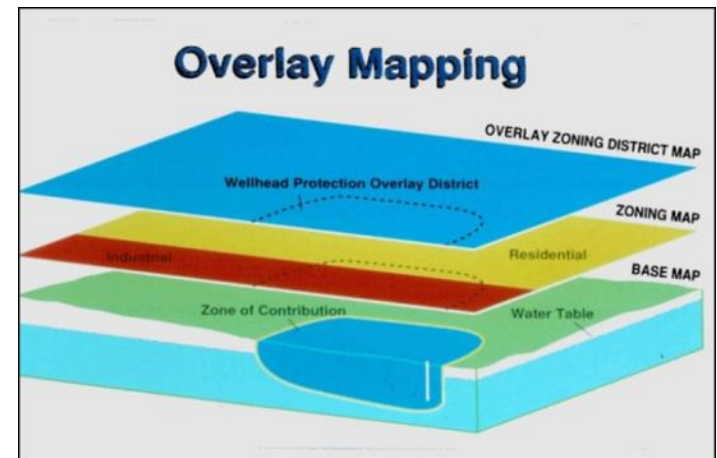


Stenciled stormdrains or decals



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.





Bottoms Up!



Yard Waste

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

Motor Oil

- Contains heavy metals
- Reduces oxygen in water

Litter

- Degrades stream quality and habitat

Pet Waste

- Contains harmful bacteria

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



Healthy Stream Habits!

