

Mount Penn Borough Municipal Authority

Berks 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 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.

Project Background

The Mount Penn Borough Municipal Authority (MPBMA, PWSID# 3060082) delivers drinking water to a population of approximately 10,400 people in Berks County, Pennsylvania, and is committed to providing high quality, reliable, and reasonably priced water to its customers (MPBMA, 2015). Although MPBMA has had no previous problems, it is concerned about the possibility of contamination to its groundwater wells and nearby Carsonia Lake. In 2014, MPBMA 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.

The objective of this project is to develop a source water protection plan that delineates the recharge areas for the MPBMA water sources, identifies potential sources of contamination, educates the public on the importance of source water protection, plan for potential pollution events, and complies with Pennsylvania Department of Environmental Protection's (DEP) Chapter 109 regulations.

Description of Study Area

The 78.5-square mile modeled area includes portions of Lower Alsace, Alsace, and Exeter townships, Mt. Penn and St. Lawrence boroughs, and nine watershed subbasins within in Berks County, southcentral Pennsylvania.

The study area is underlain by twenty geologic formations, which are characterized by rolling lowlands, shallow valleys and ridges. A major fault system lies west to east, with the northern half of the study area comprised of heavily faulted carbonate and crystalline uplands.

Carsonia Lake (also called Crystal Lake) and the adjacent 27-acre park span sections of Lower Alsace and Exeter townships, and is now a recreational area with a community center and playground used by local residents. The spring-fed lake is 3-feet deep, and occupies approximately 6.25 acres of land. The 643-acre Antietam Lake Park is located in Lower Alsace Township, and provides natural and scenic ecological resources, sustainable public use, and passive recreation and environmental education. The lake is a 13.5 acre impoundment of Antietam Creek, which once served as a water supply for the City of Reading, and drains to the Schuylkill River

Overview of Water System

Today, the MPBMA water system consists of seven groundwater wells located in Exeter Township, with a treatment system that utilizes chlorine gas for disinfection, and a fluoride additive. An eighth well is used for the pools in Carsonia Park. Finished water is stored in four storage facilities located throughout the system, and delivered to a population of 10,400 people in Mount Penn Borough, Lower Alsace Township, St. Lawrence Borough, and a portion of Exeter Township in Berks County.

Source Water Protection Zone Delineations

A significant purpose of the source water protection program is to delineate protection zones around each well. Source water protection zones for the eight water sources were delineated using a steady-state hydrogeologic computer model and other calculations based on well information, groundwater flow patterns and watershed configuration. The most protective zone, Zone I, is a circle around each well with a radius ranging from 100 to 400 feet. The Zone I radius varies from 100 to 331 feet among the eight wells.

The second most protective zone, Zone II, represents the 10-year time of travel – the area from which groundwater has a high probability of reaching the well in fewer than ten years. The combined Zone II areas covers 4.1 square miles within sections of Lower Alsace, Exeter, and Alsace Townships, and Mt. Penn and St. Lawrence Boroughs.

Zone III, or the zone of contribution, is the portion of the watershed that can contribute water to the Zone II. Zone III occupies 10.5 square miles, including the entire upgradient extent of the Antietam Creek Watershed.

Potential Sources of Contamination (PSOCs)

After the protection zones were delineated, numerous sources were used to identify potential sources of contamination (PSOCs) in the zones. Both point sources and non-point sources were identified. Example of non-point sources, where contamination occurs over a widespread area, include stormwater runoff from agricultural fields, residential development, and commercial and industrial properties. Point sources, where contamination originates from a single discharge point, can include industrial or commercial facilities, permitted pipe discharges, and cleanup sites. All of the PSOCs were ranked from A to F, with A posing the greatest potential threat and F the least potential threat.

Non-point PSOCs were identified through land use data, aerial photographs, and input from the DEP and water system. The most significant non-point source of pollution is runoff from transportation corridors like roadways, which received an A ranking when located in Zones I and II. Agricultural and industrial land is ranked B for potential threats to a water source when located in Zone II.

Publicly-available environmental databases, field surveys, and input from the steering committee and DEP were all used to identify point source PSOCs. 41 preliminary PSOCs were identified for the three protection areas. The steering committee members reviewed the list and added other priorities, for a final inventory of 46 sites of potential concern. A- and B-ranked results include land recycling and storage tank cleanup sites, underground storage tanks, captive hazardous waste facilities, a water pollution control discharge, and other areas of concern in Zones I and II.

Management Options

Mt. Penn Borough Municipal Authority will use a variety of management options to develop a comprehensive approach to source water protection and protect its water supplies from the PSOCs. MPBMA plans to partner with the school district and other organizations to provide public education to customers and residents. MPBMA will also work cooperatively with Exeter and Lower Alsace townships on a mutual stormwater program and other strategies to implement this source water protection plan.

Contingency Planning

In the event of an accident or spill that has the potential to impact the water supplies, the water system will initiate emergency response plans to minimize any potential impacts. MPBMA maintains an emergency response plan (ERP) and updates it regularly. The plan includes emergency contacts and provisions for alternate sources of water. MPBMA will also work closely with local and county first responders in the event of a spill or accident that may threaten the water supply.

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. If a contamination event occurred that results in MPBMA not being able to use any of their sources long-term, they would work with DEP and other partners to identify, develop, and permit additional sources.