

Wellhead Protection

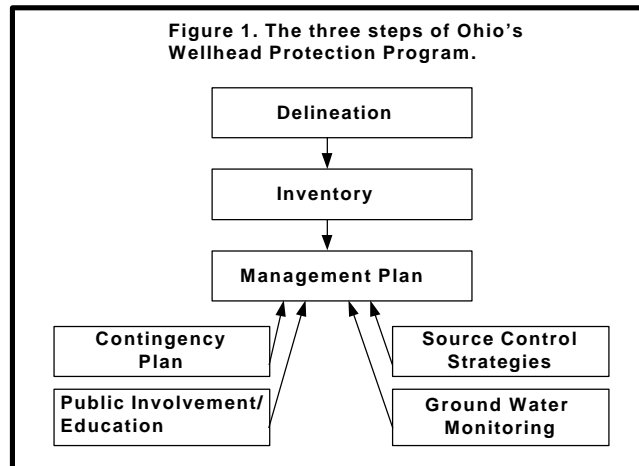
What it is and How to Get Started

October 1997

What is Wellhead Protection?

Almost all of Ohio's municipalities have a centralized public water system to provide water for homes, businesses and industries. Approximately 80 percent of the 1,450 community public water systems rely on ground water for all or most of their water supply. The rest rely on surface water.

A community public water system consists of a source water, some type of collection system, water treatment, and a distribution system. Efforts to ensure adequate supplies of safe water have typically focused on the collection, treatment and distribution systems. Source water protection provides additional safeguards by preventing contamination of the source water. Source water protection for public water systems using ground water is referred to as **wellhead protection**.



Wellhead protection planning in Ohio consists of three steps (Figure 1):

- Delineating a **Wellhead Protection area** surrounding the public water supply that contributes water to the well or wells;
- Identifying **potential sources of contamination** within and around the wellhead protection area that pose a threat to the public water supply well or wells;
- Developing a **Management Plan** to reduce the likelihood of contaminants impacting the public water supply.

Why Should Your Community Consider Wellhead Protection Planning?

The main reason for implementing wellhead protection is to *protect public health by preventing contamination of a public water supply*. Other benefits are:

- protecting the community's investment in its water supply;
- preserving water resources for future generations;
- potentially reducing regulatory costs by obtaining a waiver from specific monitoring requirements;
- encouraging economic growth by securing an abundant supply of clean water; and

- avoiding the expense of cleaning up a contaminated water supply or finding alternative sources of water.

Who is Responsible for Implementing Wellhead Protection?

The Federal Safe Drinking Water Act required each state to develop a program to protect public water supplies. In 1992, Ohio EPA's Wellhead Protection Program was approved by the US EPA.

Under Ohio's program, wellhead protection plans are to be developed and implemented by the owners/operators of public water supplies. However, to be truly effective, wellhead protection must be a community effort.

The Division of Drinking and Ground Waters at Ohio EPA is responsible for providing technical guidance and assistance to communities and their consultants in developing local wellhead protection plans. It also reviews the wellhead protection plans to ensure that they meet the requirements of Ohio's Program.

What are the Main Steps in Developing a Wellhead Protection Plan?

Developing a wellhead protection plan to protect ground water resources involves the three steps outlined in Figure 1.

Delineation

The FIRST step involves delineating the boundaries of a wellhead protection area. The wellhead protection area is delineated by determining the ground water that will reach the public water supply wells within approximately five years. Wellhead protection areas range in size from a few acres to a few square miles, depending on local geologic conditions. An

example of a delineated wellhead protection area is shown in Figure 2.

Because delineating a wellhead protection area requires some technical expertise and knowledge of the local geology and hydrogeology, many communities seek outside assistance with this step. Most commonly, the assistance comes from environmental consultants, but other options include:

- university students;
- retired geologists or engineers; or
- local planning agencies.

Whoever is chosen should be fully familiar with Ohio's wellhead protection program and with hydrogeologic investigations.

Inventory

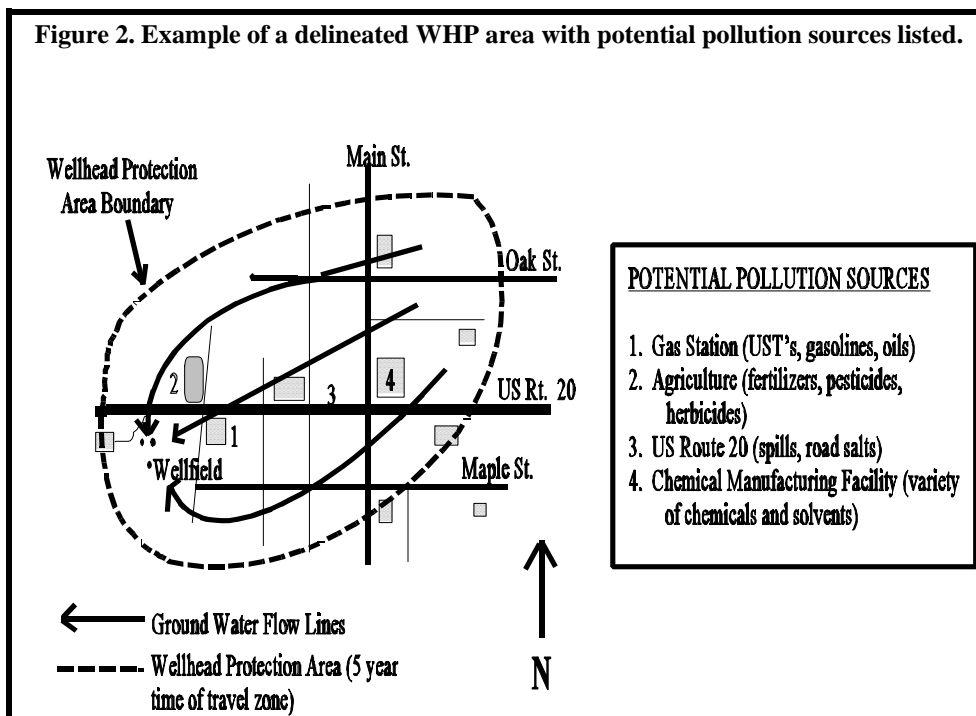
The SECOND step in wellhead protection planning involves identifying and inventorying potential pollution sources within and near the wellhead protection area. The purpose of the potential pollution source inventory is to identify all past, present and possible future land uses or activities that have the potential to contaminate the drinking water supply. Figure 2 lists the potential pollution sources located in the example delineation.

Figure 3 provides a list of activities that have the potential to pollute ground water. These sources do not always threaten drinking water supplies. However, unless managed properly, they have the potential to do so.

Figure 3. Typical Potential Pollution Sources.

- Waste Disposal**
 - Landfills and dumps
- Leaks and Spills**
 - Underground tanks
 - Storm and sewer pipes
 - Transportation accidents
 - Road salt
- Agricultural Areas**
 - Pesticides and fertilizers
 - Animal wastes/feedlots
- Commercial Businesses**
 - Airports
 - Golf courses
 - Paint shops
 - Photographic services
 - Railroad yards
 - Research labs
 - Dry cleaners
 - Gas stations
- Industries**
 - Settling ponds
 - Transfer areas
 - Storage piles/tanks
- Residential Areas**
 - Lawn fertilizers
 - Cleaners, paints, solvents
 - Motor oil
 - Old batteries
 - Pesticides
 - Septic tanks
 - Fuel oil tanks

Figure 2. Example of a delineated WHP area with potential pollution sources listed.



Evaluating future sources involves the looking at the projected land use and zoning in the area surrounding the wellfield. For example, the land adjacent to the wellfield may currently be used for agriculture, but it may be zoned for heavy industry, which could introduce a variety of significant pollution sources.

Management

The THIRD and final step required for a complete wellhead protection plan is the Management Plan. The management plan integrates the information collected in the delineation and inventory and provides workable strategies for preventing, detecting and responding to ground water contamination.

The Ohio EPA strongly recommends that the management plan be developed by a committee of local representatives. This helps to customize the plan to reflect specific administrative and financial capabilities. Figure 4 is a list of potential WHP Management Committee members.

The four elements that must be addressed within the management plan are:

1. Public participation and education;
2. Ground water monitoring;
3. Source control

Figure 4. Potential Wellhead Protection Committee Members.

Local, Township and County Government Representation
 Regional Planning Commission
 District Emergency Management Agency Coordinator (SERC or LEPC)
 State Fire Marshal's Office
 Local and Township Fire Department
 Public Works Director
 Soil Conservation Service
 Private Industry Representation
 Local Farmers
 Local Developers
 Community Service Organizations
 Local Chamber of Commerce
 Public Interest and/or Environmental Groups
 League of Women Voters
 Local Teachers or Education Professionals
 Senior Citizens Groups
 Local Newspapers and Radio Stations
 Retired Local Experts
 Residents

- strategies;
3. Ground water monitoring; and
 4. Contingency/ Emergency planning.

Public Participation and Education

The overall success of a wellhead protection plan depends upon the cooperation of people living and working within the WHP area. Residents and businesses

need to understand how their actions may affect the quality of their drinking water, and what they can do to prevent contamination from occurring. Some commonly used educational tools are inserts in water bills and employee training.

Source Control Strategies

Source control strategies describe specific actions or techniques that may be used to

reduce the risk of ground water contamination from specific potential pollution sources, such as zoning or other use restrictions.

Ground Water Monitoring

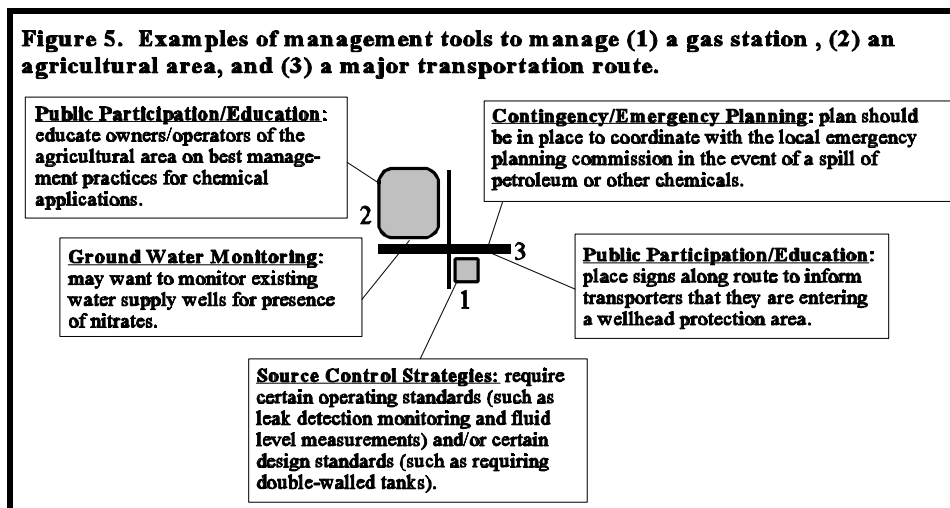
A public water system must assess the need for ground water monitoring. Ground water monitoring can provide an early warning to the public water supplier of contamination approaching the wellfield. The community must keep in mind that monitoring is not a preventive measure, and should not be the main focus of a wellhead protection management plan.

Contingency/ Emergency Planning

A public water supplier must have provisions for both a long and short term alternative source of water and the financial means to obtain it should the water supply become unusable due to contamination. The provisions must also take into account spill response, which is usually coordinated with the local emergency planning committee.

One source may be managed with one to all four of these elements. Figure 5 shows three potential pollution sources shown in the example in Figure 2 and lists some possible ways to manage them.

Figure 5. Examples of management tools to manage (1) a gas station, (2) an agricultural area, and (3) a major transportation route.

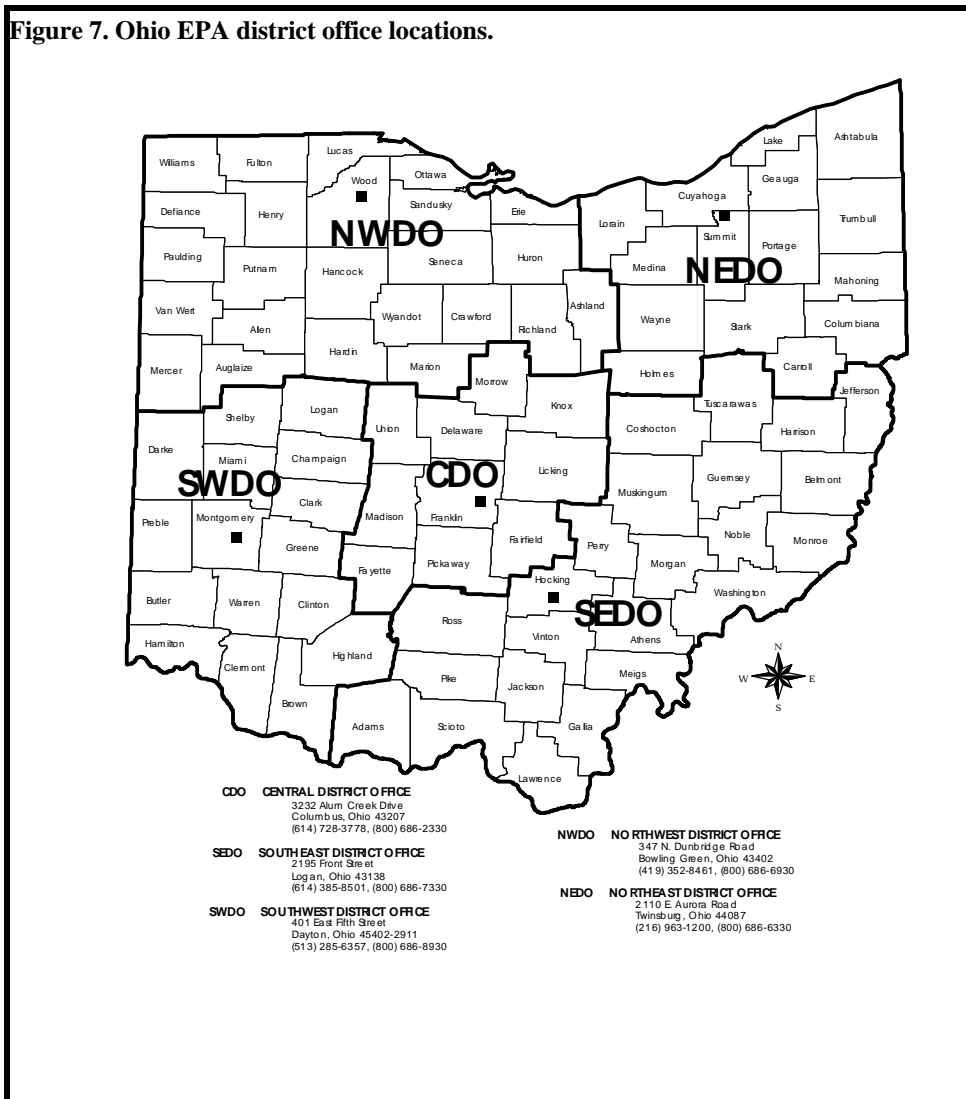


**START YOUR
COMMUNITY'S
WELLHEAD
PROTECTION
PROGRAM TODAY!**

If your water is supplied by a public water system, find out who provides your drinking water. If your community has already begun a WHP plan, find out how you can participate.

If your community has not yet initiated wellhead protection planning, find out why. Ohio EPA staff are available to give presentations on wellhead protection to your community. As a citizen you can write to your local officials and public water supplier presenting your concerns about threats to your public water supply. Start building a coalition of people who support wellhead protection within the community. Ongoing public support for the program is critical to its success.

Figure 7. Ohio EPA district office locations.



**FOR MORE
INFORMATION ...**

Ohio EPA Division of Drinking and Ground Waters has developed

several **guidance documents** to help communities and their consultants develop a well-head protection plan. These are listed in Figure 6.

For copies of these guidance documents, an educational video, or more information, please contact the Ohio EPA in your district (Figure 7), or contact the Central Office at:

Ohio EPA
Division of Drinking and Ground Waters
P.O. Box 1049
1800 WaterMark Drive
Columbus, OH 43216-1049
(614) 644-2752
email: whp@state.epa.oh.us

Or visit our web page at:

<http://www.epa.ohio.gov/ddagw/pdu/wellhead.html>

Figure 6. List of WHP Guidance Documents available from the Ohio EPA.

- “Ohio Wellhead Protection Program” (1992)
- “Wellhead Protection Area Delineation Guidance” (1994)
- “Guidance for Conducting Potential Pollution Source Inventories in Wellhead Protection Areas” (1996)
- “Ohio EPA General Guidance for Development of a Wellhead Protection Management Plan” (1997)