



Wellhead Protection

for safe drinking water in Indiana

Management Options for Wellhead Protection

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Wellhead protection is a way to protect a community's drinking water supply by managing the area around the well to prevent potential contamination. This management can be voluntary or regulatory and depends on the desires and concerns of the community.

One of the first wellhead protection ordinances in this country was written by Governor Gage of the Jamestown Colony in 1610. It states:

“There shall be no man or woman dare to wash any unclean linen, wash clothes, nor rinse or make clean any kettle, pot, or pan or any suchlike vessel within twenty feet of the old well or new pump. Nor shall anyone aforesaid, within less than a quarter of a mile of the fort, dare to do the necessities of nature, cinse by these unmanly, slothful, and loathsome immodesties, the whole fort may be choked and poisoned.”

Although different rules and courtesies now define what our behaviors should be near a well, the purpose is the same - to protect the health of a community by protecting its drinking water supply. Indiana's Wellhead Protection Rule (327 IAC 8-4.1) provides guidelines that communities can use to protect the quality of their drinking water and ensure that a safe water source is available in the future.

In the process of developing a wellhead protection plan, the community's local wellhead protection planning team will gather information about the physical characteristics, land uses, and activities that take place in their wellhead protection area. Those steps are covered in other Purdue Extension publications. (See *Useful Publications*.) This publication provides an overview of wellhead protection management options. It can be used by wellhead protection planning teams, water supply operators, and public officials, such as the Plan Commission, to develop a framework for wellhead protection management.

What Area Requires Management?

This publication assumes that your wellhead protection planning team has already had the wellhead protection area delineated by an approved method. This delineated wellhead protection area generally overlies all the ground water that would be pumped by the well in a five-year time period, assuming no significant changes in the pumping rates.

Wellhead Protection Planning Overview

- Local planning team
- Delineation of the wellhead protection area
- Identification of potential sources of contamination
- Management of the wellhead protection area
- Contingency plan
- Public participation, education, and outreach

Within the delineated wellhead protection area, *the sanitary setback area* is the 100-200 feet nearest the well. (The specific size required for the sanitary setback is dependent on the geology of the location. It is safest to assume a 200-foot sanitary setback, which represents a little less than 3 acres, and to protect that area.) Because it is the most critical zone around a water supply well, the sanitary setback area has special rules and restrictions.

The entire wellhead protection area also needs protection, but the procedures for protecting it are more flexible, and can be determined by the community.

How Do You Manage the Sanitary Setback Area?

The regulations are very specific concerning the sanitary setback area. The requirements detailed in the wellhead protection regulations (327 IAC 8-4.1-8) include, but are not limited to, the following:

- **All restrictions found in the well construction permit (327 IAC 8-3) must be complied with.** These restrictions include prohibitions of any construction over the well, other than that of the building associated with the well itself; prohibitions of roadways and parking lots within 50 feet of the production well, except those roads used to service the well; and prohibition of storm or sanitary sewer lines within 50 feet of the production well.
- **Storage and use of chemicals must be prohibited,** except those used in water purification or those pesticides regulated by the State Pesticide Review Board. A policy that is posted at the wellhead might serve as a good reminder. Even though the wellhead protection planning team cannot regulate the use of pesticides, they might work with land owners to set up an agreement not to store or mix pesticides within the sanitary setback area.
- **The wells must be protected against vandalism.** Building a fence or putting a building around the well are recommended ways to secure the well.
- **Roads within the sanitary setback area must be managed** in a way to prevent accidents from causing contamination to the well. Installation of curbs, gutters, and linings are recommended methods to protect this area. Limiting access, reducing speed limits, posting signs, and prohibiting the transport of dangerous chemicals are other ways to reduce the potential for accidents that might contaminate the water.

Having the wellhead protection planning team visit the well location is a good idea, so that the volunteers serving on the team can get a better “feel” for what the wellhead and surrounding area (which comprise the sanitary setback area) look like. After the visit, the team can discuss what steps might be implemented to meet the requirements of the regulation, the needs of the community, and the need for the managers of the water system to maintain it.

If the water utility does not own the land in the sanitary setback area, agreements with the land owner may be required to get their full cooperation in not using or storing chemicals in the designated area. The agreements will form part of the written documentation of the wellhead protection management plan.

How Do You Manage the Rest of the Wellhead Protection Area?

Except for the sanitary setback area, management of the wellhead protection area is not clearly defined by the Wellhead Protection Rule. Therefore, it is the role of the wellhead protection planning team to decide how to manage this area. Since the rest of the



Building a wellhouse or a fence protects wells from vandalism.



Labeling storm drains can help increase public awareness of the need to protect water quality.

wellhead protection area is much larger than the sanitary setback area, its management has wider implications for the community.

Two general management strategies can be used: voluntary and regulatory. Voluntary strategies, such as educating the public about best management practices, will be the most widely used management tools for wellhead protection. Regulatory measures may be beneficial in some instances, but many communities may not have the political authority to use regulatory management options. The best wellhead protection may involve a combination of both management strategies.

Voluntary Management Practices

Public education and involvement are essential aspects of wellhead protection. Sometimes environmental problems are caused by normal, legal activities. For example, in homes using septic systems, disposing of household solvents by pouring them down the drain often transfers them directly to the ground water. Paints, oils, and unused fertilizers and pesticides, that are poured onto the ground or down a drain can also end up in the ground water. Many of the people who dispose of chemicals improperly do so simply because they are unaware of the consequences of their actions. The publication *Effective Wellhead Protection Through Education*, suggests several ways to provide community education on wellhead protection for many diverse segments of the community. (See *Useful Publications*)

Best Management Practices (BMPs) are measures or practices designed to prevent or reduce pollution. Most are voluntary in nature, and are enacted by responsible individuals and companies to limit liability and increase productivity. A few examples of best management practices that are useful for ensuring good water quality and effective wellhead protection include:

- recycling and reuse of waste products
- regular septic tank pumping and inspections
- timing and placement of chemicals on agricultural land to provide for minimal runoff and leaching to the ground water
- secondary containment on fuel storage tanks

Land acquisition programs or conservation easements are other voluntary strategies to protect ground water supplies. These might include donations or purchases of sensitive lands so that these properties can be set-aside as green space, parkland, or wildlife preserves. Such land uses will protect them from being used in a way that might harm the ground water.

Community waste management and minimization programs are helpful in protecting ground water by reducing the volume of wastes that go into landfills. Hazardous waste collection and residential recycling efforts are well accepted in many communities and can be included as part of your wellhead protection management plan.

Regulatory Management Practices

The most widely used regulatory management tools for wellhead protection include health and zoning ordinances. Zoning techniques can be used to permit only land uses that are compatible with wellhead protection. Try discussing your zoning options with someone from your local Planning Commission.

Health ordinances can be implemented to minimize risks to ground water, for example, through requiring inspections of septic systems and training programs for workers who install them. Some counties have required filters to be installed between septic tanks and absorption fields. These filters prevent costly replacement of the absorption fields due to overflows of septic tanks. Other communities have banned substances that are known ground water contaminants, like solvent septic system cleaners, in wellhead



Waste recycling and minimization programs can help protect ground water.

protection areas. Health ordinances can also be used to require developers within the wellhead protection area to install monitoring wells down-gradient of the development and periodically test the ground water for likely contaminants. This procedure can detect contamination early, and allow for added protection of drinking water supply wells.

Restrictions on the use of toxic and hazardous materials may be used, but such restrictions can only be implemented when the community has the legal authority to do so. In Indiana, communities cannot restrict the use of pesticides that are regulated by the state Pesticide Review Board. The applicable State Codes for pesticides are IC 15-3-3.5 and IC 15-3-3.6. Wellhead protection planning teams should recognize that many regulations already exist that control the use of hazardous chemicals and regulate activities that might damage a drinking water supply.

How Does Your Community Decide What Management Options Will Work?

Differences in the geology of the area allow each community some latitude in their management planning. For example, if your community's wells are 200 feet deep and protected by a thick layer of clay-rich soil, the community can have more confidence that allowing some potentially hazardous land activities to take place is unlikely to harm the water supply. But for a community whose well is shallow or in unprotected sand and gravel soils, the potential for contamination is high and much more restrictive management procedures should be considered.

The form that management takes in each community must be decided by the community itself. It is inevitable that there will be some differences of opinion among community members when asked to decide on a management strategy. Providing information to the public about the issues involved in wellhead protection management is the first step toward gaining a consensus from the community on management strategies.

Gather Information from Qualified Speakers

One effective strategy is to invite several guest speakers to make presentations. Some suggestions:

- Ask a geologist, hydrogeologist, or consultant who could speak about the characteristics of the aquifer from which your community receives its water.
- Invite a local industry spokesperson who could talk about what chemicals they use and how they protect water quality.
- The Purdue Extension Educator in your county can provide information on agricultural practices and how farmers can protect water quality as well as land use issues faced by the community.
- A Plan Commission member might be willing to explain how land use decisions are made in your county.
- A representative of the fire department might speak about the regulations and procedures affecting underground storage tanks.
- A representative of the emergency response team could explain the procedures that are used to protect the ground water in an emergency.

Ask for Input from the Community

Once the community is better informed about some of the issues in the wellhead protection planning process, the wellhead protection planning team will need to determine the management options that the community is willing to support. Community buy-in is essential to minimize potential conflict.

Two processes have shown their usefulness in determining group preferences:

- discussion of the topic in “focus groups”
- obtaining information through a questionnaire

The wellhead protection planning team could use either of these processes, or a combination of the two to help gain consensus about management tools in their community.

Focus Groups

In the focus group approach, several discussion groups are formed to brainstorm ideas about wellhead protection management issues. Initial questions for them to tackle could be: “What ground water problems are we most likely to have?” or “What management options for protecting our ground water would work best for this community?”

Ten to twelve participants is an ideal number for good discussions in a focus group.

The idea behind a focus group is for the members to explore a large number of options for answering the focus question and to narrow down all these options into a few priority responses. The responses that are determined to be priorities are further discussed at a later time, either by this group or by different groups.



Focus groups can represent different segments of the population in the wellhead area. Group members should consider what management options they can realistically and practically do to protect their ground water. Participants can offer many common sense solutions to help local wellhead protection efforts. Some participant groups to consider are listed below.

- **Farmer Input** – Contact Purdue Extension for leaders from the farming community who could be involved. Make sure that each farmer living in the wellhead protection area is given an opportunity to be on the team. Consider sending them a personal invitation to attend the meeting.
- **Business Input** – Each business in the wellhead protection area should be contacted and invited. Ask the Chamber of Commerce for business professionals who could offer constructive comments on steps that businesses could easily implement.
- **Residential Input** – This is often a very difficult group to get involved. Like all groups, a letter, notice in the local newspaper, or broadcast on the local television might help to attract volunteers to attend the meeting to discuss what best management practices can be performed by homeowners. Consider visiting the local librarian to ask whether a notice could be placed or given to various groups using the library as a meeting place.

The wellhead protection planning team should come to the meetings with an open mind to listen to the many suggestions offered. From the discussion, a list of the best management tactics can be developed, and prioritized as to their probable effectiveness. Those considered should be written into the management plan.

Questionnaire

The other process is to survey community members using a questionnaire. An extensive listing of management options can be found in two publications listed in the *Useful Publications* section. (*Wellhead Protection: A Guide for Small Communities* and *A Guide to Wellhead Protection*.) The wellhead protection planning team can use this listing to develop a questionnaire for the public in which they ask which of these management options the community would prefer. The most commonly repeated responses could then be used to help decide on some management strategies.

Once the team receives a consensus from the public, determining a management strategy will meet with much less opposition.

What Goes into a Management Plan?

Everything that your community plans to do to protect your water supply should be discussed in the management section of your wellhead protection plan. Some of the essential components of management are listed in the following sections.

Managing Potential Contaminant Sources: Your management plan should include a section describing what is being done to manage or monitor every potential source of contamination that was listed in the Contaminant Source Inventory section of your wellhead protection plan. For example, if an agreement was reached with an industry in the wellhead protection area, this agreement should be documented. If the city agreed to move its stored road salt out of the wellhead protection area, that specific agreement should be a part of the management plan.

Well Compliance: Include a statement that production wells are in compliance with existing Indiana codes relating to construction and operation of the wells, and a description of standard monitoring procedures already in effect. While these may seem unnecessary statements to include, they need to be spelled out in the management plan for the sake of completeness.

Abandoned Wells: Because a well can be a direct pathway for contaminants to travel to the aquifer, it is important for the wellhead protection planning team to identify abandoned wells in the wellhead protection area. Many old farmsteads have been consolidated into larger farms, but the old household or stock watering wells are still in place, but unused. There are also numerous old gas and oil wells around the state that have never been sealed. These wells are a hazard to ground water and might also be a safety hazard to small children. The management plan should specify your plans for locating and plugging the abandoned wells within the wellhead protection area. Some guidance for plugging abandoned wells is available through other Purdue Extension publications. (See Useful Publications)

Pesticides: Each management plan is required to describe the strategy for ensuring that pesticides are properly used and stored (according to existing regulations) within the wellhead protection area. Since the regulations governing pesticides have been in place for a number of years, all that is necessary in the wellhead protection management plan is a statement about how compliance with the current regulations is monitored or encouraged.

Notification: Owners and operators of potential contaminant sources must be notified of the presence of the wellhead protection area. Those who use or store hazardous materials, property owners, mineral owners, and leaseholders need to be provided with information on where the wellhead protection plan is located so that the persons responsible for contaminant source management at their facilities can read it. A cooperative dialogue between the water supply management and managers of potential contaminant sources should also be established. If any accidents were to occur at these establishments, the community water supply could potentially be at risk, and the facility would be liable. Therefore, it is in everyone's best interest to form a cooperative partnership to protect the community's water supply.

Education: Education is an essential part of Indiana's Wellhead Protection Rule. Within the management plan section of the wellhead protection plan, there should be a statement referring to the existence of the public outreach and education section of the overall wellhead protection plan. The details of the education plan should be included



Abandoned wells can provide direct pathways for contaminants to reach groundwater.



Sign produced by Penn Industries to identify wellhead protection areas.

in a separate section, but because education is part of management, its existence should be mentioned. More information on wellhead protection education is available through other Purdue Extension publications. (See *Useful Publications*)

Signs: Indiana’s wellhead protection rule requires that signs be posted on every major thoroughfare that passes through the wellhead protection area. You can purchase signs from Penn Industries. (See *Information Contacts*.) You will need to get permission from the proper authority (City Street Department, County Highway Department, or Indiana Department of Transportation) to install the signs.

What Do You Do With Your Management Plan?

Management is only one component of your wellhead protection plan. Management describes the processes your community is using to prevent future contamination through regulation or voluntary measures.

Submit It

When you submit your Wellhead Protection Plan, IDEM personnel will ask the following questions in evaluating the management plan you submit. It may help to keep them in mind as you prepare your plan.

1. Does it have local management initiatives to prevent contamination from existing, as well as future, potential sources of contamination?
2. Does it fully describe the policies and procedures for protecting all existing and proposed new water supply wells?
3. Does it consider the locations and types of sources, as well as the hydrogeologic nature of the wellhead protection area in the selection of management approaches?
4. Does it outline a strategy to educate the public about the consequences of ground water contamination and the methods available to prevent ground water contamination?

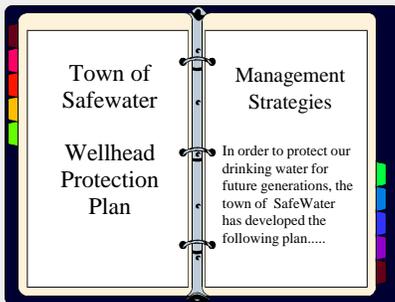
Update It

According to the Rule, your wellhead protection plan must be updated regularly. This update should include any changes in the potential contaminant sources within the wellhead protection area. The management plan should state how often and by whom the plan will be updated. The time frame for updates should be chosen based on the complexity of the area and how fast the community is changing. Annual or biannual updates work best for most communities.

Use It

Most importantly, the plan should serve as a guide to the wellhead protection planning team and the community as a whole. By setting time frames for public education activities and for plan updates, you insure that the plan will be used and referred to often. You should make the plan available to the public, perhaps by putting a copy in the local library.

Wellhead protection planning is not intended to burden citizens with unnecessary rules and regulations. It is meant to provide guidelines to assist communities in protecting their own drinking water supplies from future contamination.



Useful Publications

The following Purdue Extension publications provide information about other aspects of the wellhead protection process.

- WQ-21, "Plugging Abandoned Water Wells: A Landowners Guide"
- WQ-22, "Indiana Farmstead Assessment for Drinking Water Protection"
- WQ 24, "Wellhead Protection in Indiana"
- WQ-25, "Home*A*Syst; An Environmental Risk-Assessment Guide for the Home"
- WQ-28, "Forming the Wellhead Protection Planning Team"
- WQ-29, "A Shortcut to Wellhead Protection Delineation for Some Systems"
- WQ-30, "Choosing a Consultant to Delineate the Wellhead Protection Area"
- WQ-31, "Inventorying Potential Sources of Drinking Water Contamination"
- PPP-42, "Pesticides and Environmental Site Assessment"
- WQ-35, "Effective Wellhead Protection Through Education"

All the above are available through your county Purdue Extension office or by calling 1-888-EXT-INFO.

Wellhead Protection: A Guide for Small Communities, EPA/625/R-93/002. This EPA publication gives a detailed description of the entire wellhead protection process and is available free from the USEPA publication office (1-800-490-9198).

Wellhead Protection Programs: Tools For Local Governments, EPA 440/6-89-002, April 1989.

Witten, Jon and Scott Horsley, *A Guide to Wellhead Protection*, American Planning Association Report Number 457/458, 1995. This publication gives a detailed description of the entire wellhead protection process and contains tables of wellhead protection management tools.

Information Contacts

- The Purdue Extension office in your county can provide you with information and resources on water quality protection. Look in the phone book under county government, or call 1-888-EXT-INFO.
- "Safe Water for the Future" is a Purdue Extension program that provides resources including this and other publications on wellhead protection and watershed protection. Call 765-496-6331 or visit our Web site at <<http://www.ecn.purdue.edu/safewater>>.
- Indiana Department of Environmental Management, Ground Water Section, can provide information on Indiana's Wellhead Protection Rule and compliance. Call the Groundwater Section at 317-308-3321 or 800-451-6027, ext. 308-3321. Information is also available on the Web at <<http://www.ai.org/idem/owm/dwb>>.
- The EPA Safe Drinking Water Hotline (800-426-4791) is available to help local officials and the public answer questions about drinking water.
- Office of the Indiana State Chemist, 1154 Biochemistry Building, West Lafayette, IN 47907-1154, 765-494-1492. This is the state agency involved in regulating all pesticide uses.
- Indiana Clean Manufacturing Technology and Safe Materials Institute, 2655 Yeager Road, West Lafayette, IN 47907, 765-463-4749, provides information on current safe technologies and best management practices for industries.

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