



Wellhead Protection

for safe drinking water in Indiana



Inventorying Potential Sources of Drinking Water Contamination

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Clean, safe drinking water is vital to our communities, to our economy, and to our health. If your ground water becomes contaminated, it may be lost forever as a water supply or may require very expensive treatment to remain usable. The best way you can ensure safe water, now and for the future, is to protect the area around your drinking water supply wells from potential hazards.

This publication provides guidance for the public water supply operators and local wellhead protection planning team members who will guide the completion of the contaminant source inventory. It explains the process of identifying regulated and unregulated, present and past, potential contaminant sources within the wellhead protection area. It assumes that your wellhead protection planning team has defined and mapped your wellhead protection area using an appropriate delineation method. (See "Useful Publications" for Purdue Extension publications offering information on these topics.)

Why Do a Contaminant Source Inventory?

Indiana's Wellhead Protection Rule (327 IAC 8-4.1) requires community water supply systems to "complete an inventory of potential sources of contamination (regulated and non-regulated) within the wellhead protection area." This

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



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rule requires a search of existing databases of regulated sources, but a database search alone will not reveal all potential sources of contamination. Volunteers your team recruits must also travel through the wellhead protection area to do a site inventory. And you should supplement this information by seeking historical land use data from long-time community residents.

By knowing what potential contamination sources exist near your drinking water supply wells, your community can help prevent ground water contamination through effective management of land activities. Experiences of other communities have shown that on average, wellhead protection is 27 times less costly than cleaning up a contaminated water source, according to the Environmental Protection Agency. Not only is wellhead protection a matter of common sense, it is a good idea from an economic point of view.

What Is a Potential Contaminant Source?

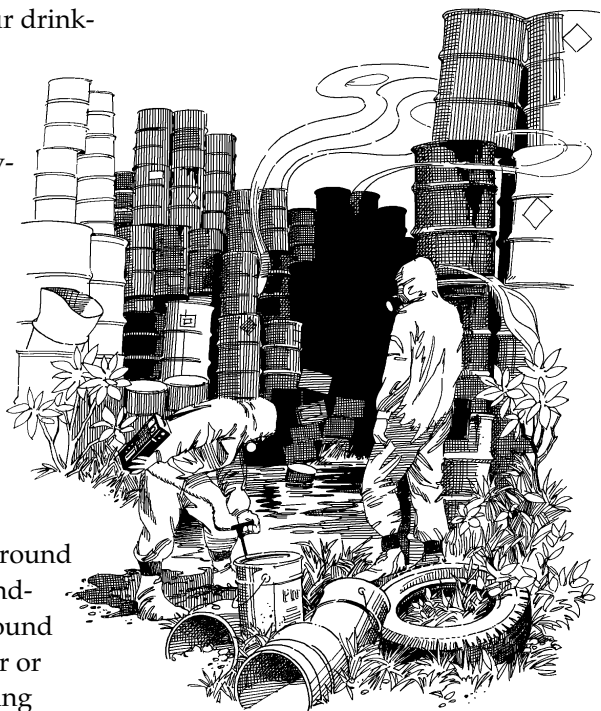
A potential contaminant is anything that might get into your drinking water that you would not want to drink. A source is a facility or land activity that could release a contaminant. While soil serves as a filter for many things that might otherwise enter the ground water, it is not capable of removing everything. So it is important to prevent contaminants at or near the surface of the ground from seeping into the ground water.

The most important potential sources of contamination to identify are those that are particularly hazardous to health and those occurring in large volumes. Some obvious potential sources of ground water contamination are hazardous chemicals that are stored, transferred, or used in the wellhead protection area.

However, many other things are potentially hazardous to ground water. Other potential sources include abandoned wells, landfills, animal feed lots, storage lagoons, abandoned underground storage tanks, quarries or mines, and septic systems. Former or abandoned gasoline stations, dry cleaners, and manufacturing facilities, even though no longer in operation, might also be potential sources of contamination. The contaminant source inventory is a list of *all* potential sources of contamination within the wellhead protection area.

How Do You Conduct a Contaminant Source Inventory?

To complete an inventory of potential contaminant sources, your team will need to identify existing regulated and non-regulated sources, locate and identify them on a map, and tabulate the collected information about the sources. So one of your first tasks is to get base maps your team can use for organizing this data.



A Note on Map Scale

A map is a representation of features on the land's surface, reduced to a size that can be viewed on a piece of paper. Every map has a specified *scale* that tells the user how much size reduction has taken place in the production of the map. An 8"x11" map of the world would be a smaller scale (and show less detail) than an 8"x11" map of your town. For a wellhead protection plan, IDEM requires the use of maps in which one inch on the map represents between 400 feet and 1000 feet on the ground. Map scales within this range will show enough detail to be easily readable.

How do you know if a map or photo is at an acceptable scale for use in the contaminant source inventory? Most maps are labeled with a scale that is a ratio between one unit of distance on the map and a corresponding unit of distance on the ground. It is written as two numbers with a colon between. A scale of 1:200 means that one inch on the map is 200 *inches* on the ground, or one centimeter on the map is 200 *centimeters* on the ground. The units, whether inches, centimeters, or something else, do not matter—the ratio is the significant information. To comply with the requirement in Indiana's Wellhead Protection Rule, the scale of your map must be between 1:4,800 (equivalent to one inch = 400 feet) and 1:12,000 (one inch = 1000 feet).

1. Get Maps of the Wellhead Protection Area

Maps are vital throughout the wellhead protection planning process. All the information gathered must be both tabulated and displayed on a map in the wellhead protection plan submitted to the Indiana Department of Environmental Management (IDEM). If your area lies at the edge or corner of an existing map sheet, you may need to obtain more than one published map to cover your wellhead protection area.

You will need at least three copies of your base map(s). One copy you will send to IDEM with your completed plan, one you will keep as a master copy for yourself, and one you will use as a working map to write and erase on as changes are made. You will also need to photocopy (and possibly enlarge) the working copy of the base map and divide it into sections for use by volunteers who will help with the site survey of the wellhead protection area. The site survey process is described in more detail in a later section of this publication.

Here are some options for types of maps your team can use as your base map. IDEM requires that you use either a USGS 7.5 minute topographic quadrangle or a map at a specific scale. (See the sidebar "A Note on Scale.") You can find information on where to acquire these maps at the end of this publication.

- **Engineering Map**—If you had the wellhead protection area delineated professionally, you should have received from the consultant a map of the delineated wellhead protection area at a scale of between 1:4,800 and 1:12,000. (See "A Note on Map Scale.") Depending on the detail included, your team could reproduce and use this delineation map as the base map for the contaminant source inventory.

- **Topographic Quadrangle Map**—If you have a system small enough (pumping less than 100,000 gallons per day) you are eligible to apply to IDEM to use the 3000-foot radius as the wellhead protection area. You are required to submit a topographic quadrangle map showing the delineated wellhead protection area to IDEM (Figure 1). You can enlarge this map to double its normal size and use it as your base map.

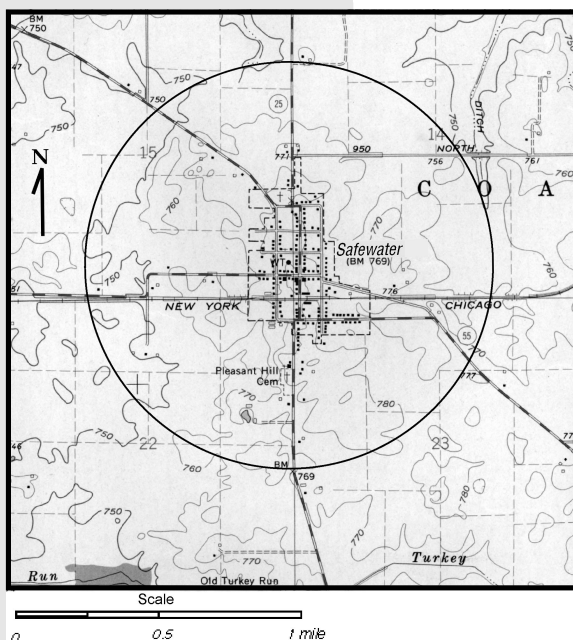


Figure 1. Topographic quadrangle map showing 3000-foot wellhead protection area

- **Plat Map**—Your team can also use a plat map as a base map, if it is of the appropriate scale. The advantage of using a plat map is that it already shows property boundaries and land ownership.
- **City or County Map**—If your wellhead protection area can be indicated on a city or county map and it is the proper scale of between 1:4,800 and 1:12,000, your team could use the city or county map as a base map.
- **Aerial Photos**—Aerial photography provides an option for the site survey portion of the contaminant source inventory. Because it is often difficult to get a clear photocopy, it is probably not the best choice for the base map. However, an advantage of aerial photos is that evidence of former hazardous land activities and present land activities can be identified, and that information can be transferred to your base map.

No matter what type base map your team chooses, the delineated wellhead protection area should be clearly marked on the map (Figure 2). It is important that the map you choose as a base map is easy to read even when photocopied.

Once you get a suitable base map, draw the delineated wellhead protection area on it. The delineated wellhead protection area is the area for which you will gather information on potential contaminant sources.

2. Gather Data.

Your team must use two techniques to gather the information needed to identify potential contaminant sources. These include:

- Reviewing records of regulated potential contamination sources in federal databases and in state and county databases and files, and
- Traveling through the wellhead protection area observing land activities that may not be included in any databases.

As you complete each of these data-collection processes, compile the data collected onto one copy of your map. This publication refers to the map on which you add or compile information as the “working map.” Create a table to list the information related to each map entry. (See “Organize Data.”) In large communities, there will a correspondingly large volume of data to be organized. So it is good to organize as you progress rather than waiting until all the information is collected.

The Records Review

Your database search should locate existing and former potential contaminant sources that are regulated by some government entity. Many potential sources of contamination, such as landfills, underground storage tanks, and pesticide storage sites, are regulated, and the

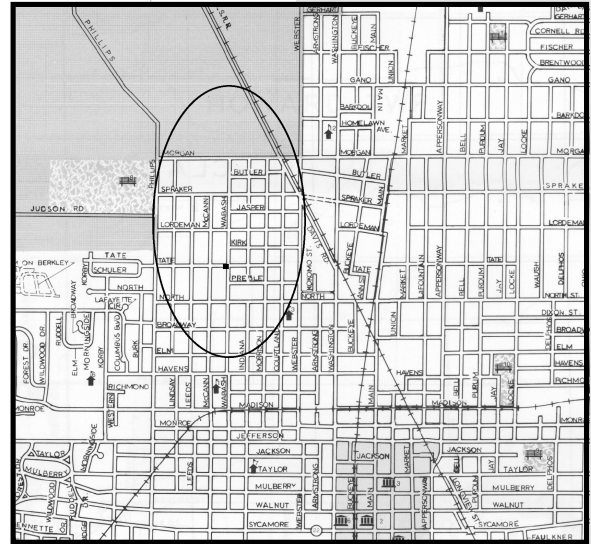


Figure 2. A delineated wellhead protection area shown here on a city map. When you submit your maps to IDEM, make sure it is the proper scale.

records about such sites are public information. A search of existing databases will provide identification of regulated sources.

You can obtain these records using one of two methods: by hiring a private consultant to complete a database search for your specific area or by searching the databases yourself using a computer with an Internet connection.

You can hire a consultant to perform the search of federal and some state databases for hazardous materials, past reported spills, and underground storage tanks. The price depends on the complexity of the delineated wellhead protection area and will range between a few hundred and a few thousand dollars. Some of these providers will plot the data on a map and provide the data in a table, as necessary for compliance with Indiana's Wellhead Protection Rule. Some consultants who can provide these services are listed on the Web at <<http://www.purdue.edu/safewater>>.

Whether you hire a consultant or search the databases yourself, be aware that the databases may not be totally accurate. Through personal experience, someone on your wellhead protection planning team may be aware of changes that have occurred which make the information on the databases inaccurate. So check the database information for accuracy and consistency.

Federal Database Search

If you or someone on the wellhead protection planning team chooses to search the databases, visit <<http://www.usepa.gov/enviro>> to find information about federally regulated facilities.

- Superfund—The federal government locates, investigates, and cleans up the worst hazardous waste sites throughout the United States. These sites are designated "Superfund sites." Common Superfund sites include abandoned warehouses, landfills, and industrial facilities that continually dumped hazardous waste into the environment before it was regulated.
- TRI (Toxics Release Inventory)—TRI contains information about more than 650 toxic chemicals that are being used, manufactured, treated, transported, or released into the environment. Manufacturers of these chemicals are required to report the locations and quantities of chemicals stored on-site to state and local governments.
- RCRIS—The database contains an inventory of waste handlers and information about their waste handling activities. The waste handlers are classified into three major groups: treatment, storage and disposal (TSD) facilities; waste generators; and transporters.
- Permit Compliance System (PCS)—The Clean Water Act requires wastewater dischargers to have a permit that establishes pollution limits and specifies monitoring and reporting requirements. National Pollutant Discharge Elimination System (NPDES) permits regulate

household and industrial wastes that are collected in sewers and treated at municipal wastewater treatment plants. Permits also regulate industrial point sources and concentrated animal feeding operations that discharge into other wastewater collection systems or that discharge directly into receiving waters.

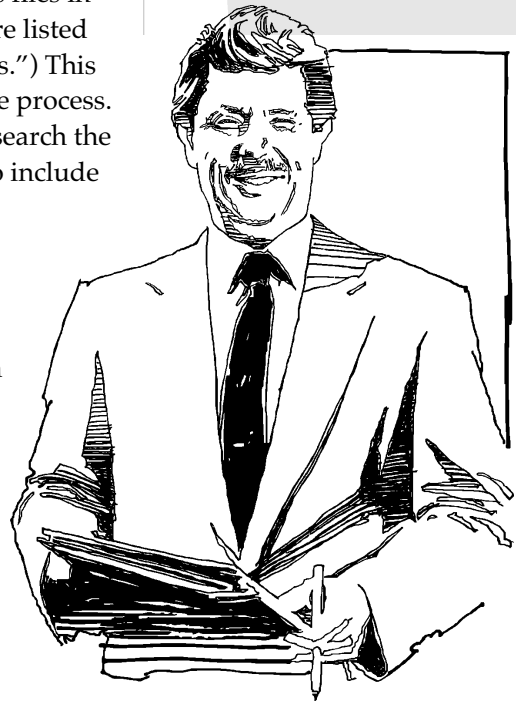
As you search each of these databases, number and note the facilities you find in your wellhead protection area on your working map. You might choose a distinct shape mark to indicate each type of potential pollutant. If a facility is on a database, but is no longer in operation, indicate its position on the map, list it in the table, but note its status with a term descriptive of its condition, like "closed," "abandoned," or "removed."

State and Local File Search

State and county files of regulated materials often contain data that has not been computerized, but recorded on paper in various government offices. Historic records of land activities and uses may also be available. These data files must also be searched.

Like the federal databases, the state and local data files can be searched in two ways, by hiring a consultant to do the search or by doing it yourself. Someone familiar with the process can search IDEM's files in three to eight hours. Some consultants who offer this service are listed on the Safe Water Web site. (See "Indiana Information Contacts.") This task is *not* recommended for anyone who is unfamiliar with the process. However, if you or someone on the planning team chooses to search the state and local files, you must be aware of the necessary files to include in your search.

- IDEM's Office of Land Quality maintains files pertaining to landfills, military bases, dumps, and municipal sewage operations. You may view and copy this information by visiting the Office of Land Quality file room on the eleventh floor of the Indiana Government Center North located at 100 North Senate Avenue in Indianapolis. Files are sorted by county and facility name.
- IDEM's Office of Land Quality maintains a database known by the acronym ULCERs. This database contains information on underground storage tanks, leaking underground storage tanks, the Community Right-to-Know Act, and Emergency Responses to spills. You may use this database by visiting the Office of Land Quality file room on the second floor of the IDEM office at 2525 North Shadeland Avenue in Indianapolis. These files are also sorted by county. (NOTE: The Office of Land Quality file room will be moved to Indiana Government Center North, 12th floor, by March of 2000.) While your local fire department and Local Emergency Planning Committee would be



another source for Community Right-to-Know data, they do not have information on underground storage tanks or on emergency response to spills.

- You can obtain information about pesticides and a request form for specific county information on pesticide storage in your wellhead protection area by calling the Office of the State Chemist at 765-494-1585. This information is on a database that is searched for the area that you need by personnel in the Office of the State Chemist.

Include the state and county file search information on your working map. Once the database and file search information is on the map, you can enlarge sections for your wellhead protection planning team to use in the site survey for unregulated or otherwise unidentified potential sources.

The Site Survey

Federal and state databases are not 100% accurate, are focused on facilities using of large quantities of chemicals, and are incomplete with regard to smaller facilities. Also, the requirement to register underground storage tanks applies only to those in use after 1986 and only to those larger than 500 gallons. A facility that closed before current regulations were in effect could have left behind a source of contamination. Thus a more thorough survey performed by people who know the area will offer better protection for your water supply.

This survey is usually completed by community volunteers who drive or walk through the designated wellhead protection area writing down observations about the various past and present activities taking place in an area. The process is often called a “windshield survey” because the observations are usually made through the windshield of a car. This type of site survey is the best way to obtain information on non-regulated hazardous materials that might be in the wellhead protection area.

By getting community members to assist with the collection of this information you also raise awareness within the community of the importance of wellhead protection. Try recruiting these volunteers from local service organizations and retired citizens groups. Try also to get your local newspaper, radio station, and /or television station to publicize the event and to communicate the importance of gathering as much information as possible. For very small communities, posting of fliers and bulletins can be highly effective. Because successful wellhead protection depends on cooperation from everyone, educating the public about the goals and requirements of wellhead protection is essential.

Most hazards to ground water are associated with certain activities. For example, fertilizer use and pesticide uses are associated with golf courses, residential and other lawns, and farms and other agricultural operations. Chemical solvents and oils are associated with machine shops, auto repair facilities, and certain industrial processes. To clean clothing, dry cleaning facilities use chemicals that are highly toxic to a

drinking water supply. Armed with the base map showing the delineated wellhead protection area, a few community volunteers can map these and other unregulated activities that are potentially harmful to a drinking water supply.

Historic land use data can be assembled through investigating old Chamber of Commerce membership files, historical maps and photos, Sanborn Insurance maps, and Soil and Water Conservation District aerial photos. A local history buff is a good resource for information. The collective memory of long-time residents is the best source for historic land use information, locations of abandoned wells and underground storage tanks, and other potential contaminant sources. You might also try asking the local newspaper to run an article requesting people with historical land use information to contact the local wellhead protection planning team.

Steps for Organizing a Site Survey

1. Prepare the maps you will need. Enlarged copies of your existing working map (the map on which you add or compile information about the sites where regulated use and storage of hazardous materials occurs) should be used for the site survey. The people who will help with this part of the survey can verify the presence or absence of the regulated facilities found in the database search while they drive or walk through their portion of the wellhead protection area. If your wellhead protection area is large or complex, divide the wellhead protection area into sections small enough that a couple of people can drive through each section noting land activities and potential contaminant sources within a couple of hours. Create a separate map for each section to be surveyed.
2. Assemble a group of community volunteers, and divide them into two-person teams. Try to let each pair choose a section they are familiar with to survey. Provide each survey pair with a large map of their specific area (Figure 3) and instructions on how to complete the survey. (See the "Guide for Wellhead Protection Survey Volunteers" handout master copy included at the end of this publication.)
3. Have the volunteers complete the survey and return their maps and notes to the coordinator, the person who will assemble the information from the various groups. The coordinator should also make sure each returned map has the names of the surveyors on it, in case there is a question about the information collected.
4. After the coordinator collects the maps and inventory tables, have one person assemble and organize the information from all the working maps onto the master map and a master table. Each group of volunteer surveyors will have numbered the potential contaminant sources in their particular section starting with the number "1."

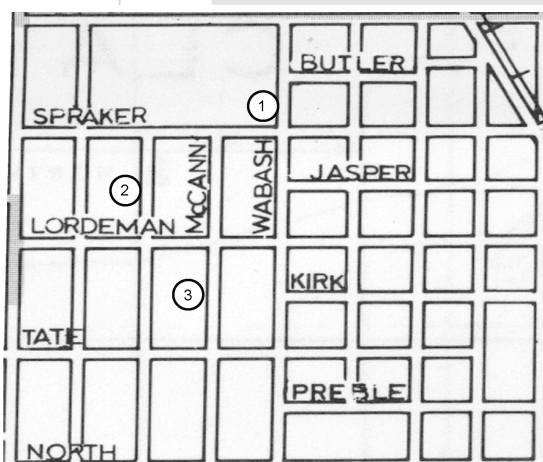


Figure 3. Here is an example of an enlarged portion of a delineated wellhead protection area map the site survey team can use to identify land uses, activities, and facilities that are potential sources of contamination in the wellhead protection area. These maps are not turned in to IDEM.

This information must be put onto the master map in a sequence that corresponds to the way it will be depicted on the table of potential contaminants. It is important that there is a one-to-one correspondence between the map and the table.

5. Organize the original inventory sheets according to location, and keep them as an appendix for your on-site, master copy of the wellhead protection plan. Later in the wellhead protection planning process, they may be useful in developing your management strategy.

3. Organize Data

IDEM requires that three things be included in the contaminant source inventory section of the wellhead protection plan:

- Narrative description of the land uses in the wellhead protection area,
- Map showing land uses and locations of both regulated and unregulated potential contaminant sources, and
- Table corresponding to the map.

Example of a Narrative Description

The delineated wellhead protection area for Small Town, IN is an oval shape extending approximately 2000 feet to the north and 1200 feet south, east and west of the well, covering an area of approximately 200 acres. The well is six inches in diameter. This well pumps approximately 150,000 gallons per day and serves a population of 825 people.

Slightly less than half of the delineated wellhead protection area (approximately 80 acres) is in commercial usage. The commercial area includes most of the downtown area and the country club. There is a small industrial area with a chemical manufacturing company. There is a small residential area on private septic systems, and the remainder of the wellhead protection area is in agricultural land use. Indiana Highway 32 traverses the wellhead protection area about 1000 feet south of the wells.

The Narrative Description

The narrative description you will eventually submit to IDEM with your completed wellhead protection plan should include background information on your community water supply system. Include what is known about its size and age, a description of the size of the wellhead protection area, and the land activities that are found in the wellhead protection area. As you can see in the sidebar, "Example of a Narrative Description," this does not have to be an elaborate or complicated document.

The Map

The master map you will submit to IDEM with your wellhead protection plan should show all the inventory information collected for both regulated and non-regulated contaminant sources from all the working maps. Double-check to make sure that every potential contaminant source is shown on the map, and make sure the master map is at the proper scale. (See "A Note on Map Scale.") Before you send

it to IDEM, remember to make a copy of this master map to keep with your other records.

The Table of Potential Contaminant Sources

The table that you submit to IDEM as the third component of the contaminant source inventory section of your wellhead protection plan should list the following information:

- Facility identification number corresponding to the map identification number;

Table 1. Example of tabulated information on potential contaminant sources in the wellhead protection area.

ID#	Facility Name	Address	Site Type	Contaminant Type	Federal and State Site Identification Numbers	Operating Status
1	Bill's Service Center	231 Main St	gas station	gasoline, oil, BTEX	RCRIS-IND0000000000 UST 000000	operating
2	MJB's Gas	2994 E. 6th	gas station	gasoline, oil, BTEX	RCRIS-IN0000000000 LUST 000000	closed-abandoned
3	Auto Care	1337 N 14th St.	auto repair	solvent, oil, batteries, antifreeze	RCRIS-IND0000000000	operating
4	Sam's Cleaners	831 Pine St.	Laundry / Dry Cleaners	PCE	RCRIS-00000000000000	operating
5	city landfill	18 River Road	landfill	unknown	CERCLIS IN0000000000	closed
6	ChemCorp	200 Beck Rd.	chemical research	VOC, solvents, bromine	TRI-IND0000000000 RCRIS-IND0000000000	operating
7	BJ's Nursery Supply	321 Juniper Lane	nursery and garden supply	fertilizers, pesticides	NA	operating
8	Circle R Dairy	250 SR 100 N	dairy farm	manure, fuel oil, diesel	UST 000000	operating
9	Moose Lodge Country Club	300 SR 100 W	country club	fertilizers, pesticides, swimming pool chemicals	RCRIS-IN0000000000	operating
10	State Highway 32		highway	road salt, gasoline, oil spills from vehicular accidents	NA	open
11						

- Facility name and address;
- Type of facility;
- Type of potential contaminant;
- Any permit numbers and the organization issuing the permits; and
- Operating status of the facility (open, closed, abandoned, or removed).

Depending on the complexity and size of your wellhead protection area and on your access to computer resources, you may find it helpful to use a spreadsheet to keep track of the contaminant source inventory information. Table 1 shows an example of how the information gathered in the site inventory can be displayed.

What's Next?

By completing the contaminant source inventory, your wellhead protection planning team will have identified the most likely sources of contamination in your wellhead protection area. At that point, Your team can begin working on formulating management and contingency plans, and on developing a program for public education about wellhead protection. You will find information on these topics in future Purdue Extension publications on wellhead protection planning.

Useful Publications

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

- WQ-2, "What Is Groundwater?"
- WQ-24, "Wellhead Protection in Indiana"
- 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"

You may find the following two Purdue Extension brochures to be useful in your community outreach efforts:

- "Wellhead Protection: What Every Farmer Should Know About Wellhead Protection"
- "Protecting Your Drinking Water: What Every Citizen Should Know About Wellhead Protection"

All of the above publications and brochures are available free of charge through your county Purdue Extension office or by calling 1-888-EXT-INFO.

The USEPA has an informative publication, "Wellhead Protection, A Guide for Small Communities," EPA/625/R-93/002, available free by calling 1-800-490-9198.

Sources for Maps and Aerial Photos

Topographic Maps

- Purdue University (765-496-3209). If you know the name of your quad, you can send a check for \$4 per map, plus \$2 for shipping, to LARS, Purdue University, 1202 Potter Engineering Center Room 376, West Lafayette IN 47907-1202, or e-mail esei@ecn.purdue.edu. Please include your telephone number in case more information is needed.
- The Indiana Department of Natural Resources, DNR Map Sales Section, 402 West Washington Street, W-160, Indianapolis, IN 46204-2742, (317-232-4180). Maps are \$4.20 each, including tax, with a \$3.50 shipping and handling fee.
- The Indiana Geological Survey Publication Sales Office at Indiana Geological Survey, 611 North Walnut Grove, Bloomington, IN 47405-2208, (812- 855-7636). They can determine the proper map to supply if you provide the name of a town, river, or other named landmark nearby. Maps are \$4 each, plus tax, with a \$3 shipping and handling charge.

Plat Maps

- Soil and Water Conservation Districts. Most Soil and Water Conservation Districts have plat maps of counties available for a small fee. (These maps are usually at a smaller scale than is required and need to be enlarged.)
- County Clerks, Tax Assessors, and City Engineers. They are other potential sources for plat maps.

Aerial Photos

- The State Land Office, 302 W. Washington St., Suite E032, Indianapolis, IN 46204. Their photos are at a scale of 1 inch equals 400 feet (1:4800) for most of the state, and 1 inch equals 100 feet (1:1200) for Marion County. Coverage for the whole state is available. The cost is \$3 per sheet (plus shipping). Call James Lewis at 317-232-3335 for information on how to choose the correct photo-map(s) for your area.

Indiana 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 statewide on wellhead protection and watershed protection. Call 765-496-6331, or visit our Web site at <http://www.ecn.purdue.edu/safewater>.

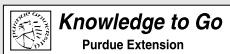
- Indiana Department of Environmental Management, Ground Water Section, can provide information on Indiana's Wellhead Protection Rule and compliance. Call the Groundwater Section at 317-308-3321 or 800-451-6027, ext. 308-3321. Information is also available on the Web at <<http://www.ai.org/idem/owm/dwb>>.
- Indiana Water and Wastewater Association provides training and on-site assistance to water supply operators. They can be reached at 1-888-937-4992 or on the Web at <<http://www.iwwa.com>>.
- The Indiana "Rural" Water Association also provides education and assistance to water supply operators. They can be reached at 812-988-6631 or (Fax) 812-988-696.
- The EPA Safe Drinking Water Hotline (800-427-4791) is available to help state and local officials and the public answer questions about drinking water. The hotline also has information about the National Rural Water Association's program to assist small communities develop local drinking water protection plans.

References

- USEPA, 1995, "Benefits and Costs of Prevention: Case Studies of Community Wellhead Protection-Volume 1," USEPA, EPA 813-B-95-005.
- USEPA, 1993, "Wellhead Protection: A Guide for Small Communities," a USEPA Seminar Publication, EPA/625/R-93/002.
- Whittman, Jack, 1996, "Wellhead Protection Guide," Center for Urban Policy and the Environment, School of Public and Environmental Affairs, Indianapolis, IN.
- Witten, Jon and Scott Horsley, 1995, "A Guide to Wellhead Protection," Planning and Advisory Service, American Planning Association, PAS Report #457/458.



On the following pages, you'll find the handout, "Guide for Wellhead Protection Survey Volunteers." You can make copies of this handout to distribute to the volunteers you recruit for the site survey.



NEW 3/00

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Guide for Wellhead Protection Survey Volunteers



Some normal activities that take place at the land's surface have the potential for contaminating our drinking water. In the course of the survey you have volunteered to do, you will gather all the information possible about present and past activities in the designated portion of your wellhead protection area that might affect drinking water quality.

This is a very important project, and members of the community, like you, are the best people to complete this type of survey. No one else knows your area better than you do!

Knowing what the potential contamination sources are will allow your community's wellhead protection team and your entire community plan how to manage your wellhead protection area to minimize the impact these potential contaminants might have on water quality.

After mentioning a couple of things you should *not* do in the course of your survey, this guide explains in more detail how you should conduct your survey of potential drinking water contaminants.

What Not to Do

Do not go onto private property.

Do not interview people. Your survey is a first pass at determining what is in the wellhead protection area. Your wellhead protection planning team will collect more information later, when they are deciding on a management strategy and in Phase II of the wellhead protection planning process.

What to Do & How to Do It

For this survey, your team leader will give you a map of a section of your community's wellhead

protection area. With that map in hand, you will walk or drive through the area you have been assigned, observing the various activities that are taking place or have taken place.

Be careful to stay on public rights of way during your survey. Be friendly and observant, but as unobtrusive as possible.

If someone asks what you are doing, explain that you are helping to put together part of a wellhead protection plan for the community, and refer the questioner to the water supply manager, or your wellhead protection team leader if he or she wants to know more.

Here's some advice about how to actually conduct your survey.

- Look over each property with an eye for things that might be a source of contamination for drinking water. The "List of Common Drinking Water Contaminant Sources" included with this guide lists the most common sources of contamination you are likely to encounter during your survey. You might want to take a copy of this list with you when you conduct your survey.
- When you see something that raises a question in your mind, note its location with a number on the map your team leader has given you. (See Figure 1 for an example of a survey map.)
- On another sheet of paper, write a brief description of what you saw and exactly where on the property you noticed it. Make sure you label each brief description with the same number

you used to note location on your map. (See Figure 2 for an example of some survey notes.)

- Past land activities are as important as present ones. So if you remember that the doctor's office on the corner used to be a gas station or dry cleaner, for example, record that information, as well. That way, someone else can use your notes to revisit the site or contact the property owner for more information.

- Please note *anything* that raises a question in your mind. Normal activities can cause drinking water pollution when things go wrong. Later, someone will check all the things you've noted to determine if they are causes for concern.

Thank you for volunteering to help with this very important job!

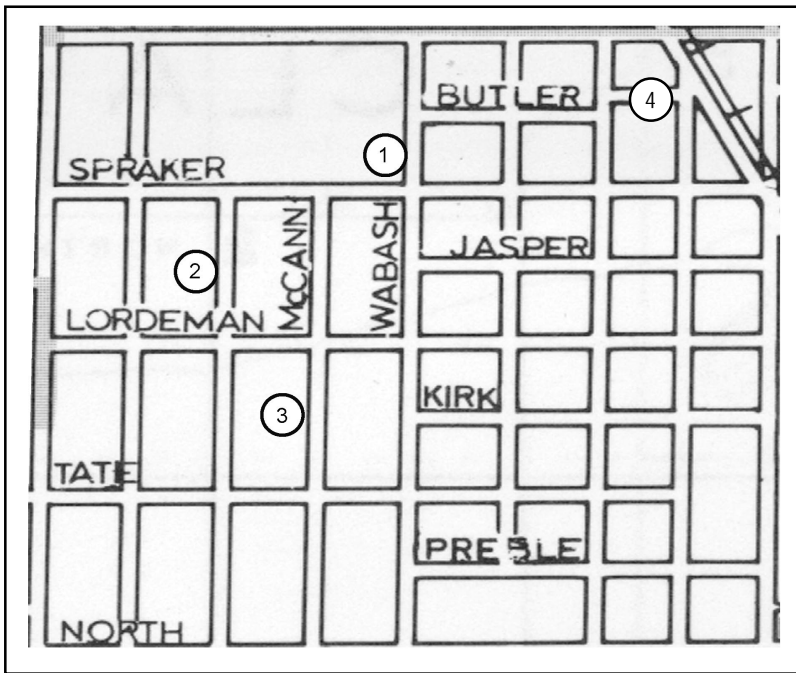


Figure 1. Example of a contaminant source inventory working map

Map ID Number	Address	Name of Facility	Description & Notes
1	254 Wabash Street	Spencer's Optometry	former gas station—have underground storage tanks been properly removed?
2	2252 Lordeman	Magic Dry Cleaners	
3	422 McCann	CTZ Today	pipe sticking up from ground on NE corner, possible underground storage tank
4	115 Brown Street	Max's Drug Emporium - parking lot	Stained soils - possible oil spill?
5			

Figure 2. Example of notes taken during site survey

List of Common Drinking Water Contaminant Sources

This list includes the most common sites and activities that you will find as you conduct your survey. To make it easier for you to use, the list is divided by land use category.

Agricultural

Abandoned Wells
Animal Burial Areas
Animal Feedlots
Chemical Production/Mixing/Storage
Manure Spreading
Storage Tanks (above or below ground)
Waste Storage or Pits

Commercial

Airports
Auto Repair/Body Shops
Boat Yards
Car Washes
Construction/Demolition Businesses
Cemeteries
Drainage Canals
Dry Cleaners and Laundromats
Dumps
Educational Institutes (e.g., labs, lawns, chemical storage areas)
Fertilizer and Pesticide Storage/ Production/ Mixing
Funeral Services and Crematories
Hardware and Carpet Stores (have supplies of glue, solvents, paints)
Golf Courses/Nurseries (chemical application)
Major Highways
Medical Facilities
Photo Processors
Ponds for Storing Storm Water
Printers
Railroads
Research Laboratories
Road Salt Storage Facilities
Salvage/Scrap/Junk Yards
Service Stations

Swimming Pool Cleaning and Maintenance
Underground Storage Tanks
Veterinary Services

Industrial

Asphalt Plants
Chemical Manufacturing/Warehousing
Electroplaters /Metal Finishers
Foundries
Injection Wells
Holding Ponds/Lagoon s
Machine Shops
Military Bases/Depots
Mining
Oil/Gas Pipelines
Production/ Other wells (oil, gas, or abandoned)
Public Utilities
Refineries
Refinishing
Storage Tanks (above or below ground)
Wood Preserving

Residential

Household Hazardous Products (painting / refinishing supplies; lawn chemicals; fuel storage)
Ponds for Storing Rain Water
Septic Systems
Sewer Lines
Storage Tanks (above or below ground)

Waste Management

Fire Training Facilities
Inactive/ Abandoned Hazardous Waste Sites
Municipal Incinerators
Municipal Landfills
Open Burning Sites
Sewage/Wastewater Treatment Plants
Waste Piles
Waste Transfer Stations