

## PHASE 2 AND 5 MONITORING WAIVERS

The objective of the Phase 2 and 5 monitoring waiver program is to reduce monitoring, while assuring the safety of the drinking water currently provided by the public water supplies (“PWS”); to encourage supplies to reduce the vulnerability to the groundwater utilized; and to reduce monitoring where the supply is not vulnerable. The intent of this program is also to recognize where natural protection exists by differentiating between confined and unconfined aquifer systems. For aquifers determined to be unconfined this program includes: mapping the 5-year recharge area; identification of potential sources and routes of contamination located within the recharge area; contingency planning; and a program to manage potential sources and potential routes of contamination, thereby reducing vulnerability to contamination. The program only requires the identification and sealing of potential routes of contamination located within 1,000 feet for confined aquifer wells.

To obtain a waiver, the PWS must evaluate the vulnerability of their wells to potential contamination sources. Systems vulnerable to contamination must develop a management program for controlling potential contamination sources and routes.

Waivers will be specific for contaminant type and treatment application point (“TAP”). Waivers will be issued under Special Exception Permits in accordance with 35 Ill. Adm. Code 611.610. The waiver program applies to parent PWS only. **Those PWSs, which purchase water, are not required to sample for the Phase 2 and 5 constituents; therefore, do not need to apply for the waiver program.**

### CONSTITUENTS NOT DEPENDENT ON VULNERABILITY OF SUPPLY

Waivers for these contaminants will be based on knowledge of the contaminant in the area, in the distribution system, or use of chlorine as a disinfectant. **Since all the information needed for these waivers is available to the Agency, application is not needed to receive these waivers .**

#### **Cyanide and Glyphosate**

Cyanide and glyphosate are oxidized by chlorine and will not be detected in chlorinated samples. Waivers will be issued to all water supplies that chlorinate.

#### **Dioxin**

The Office of Chemical Safety will use existing documentation to identify supplies at risk to dioxin contamination. Waivers will be automatically issued to supplies not at risk.

#### **Asbestos**

Asbestos monitoring will only be required of supplies with asbestos-cement pipe present in the distribution system and corrosive water. If you do not have this type of water main in your system, you will automatically receive a waiver. If asbestos-cement water main is present in your distribution system, an aggressive index will be calculated using water quality sample results on file with the Agency. If the index is less than 12, you must monitor quarterly. If the index is greater than 12, your water is not corrosive and your supply will receive a waiver.

Since the information required for issuing the waivers has already been collected, waivers will be automatically issued. Please feel free to contact the Agency if you have other data pertaining to the aggressiveness index.

**RETURN COMPLETED APPLICATION TO:**

Illinois EPA, Bureau of Water  
Compliance Assurance Section  
Drinking Water Compliance Unit  
P.O. Box 19276  
Springfield, Illinois 62794-9276

**HELP**

For answers to questions or comments, contact the following:

Issuance of Waivers: Drinking Water Compliance Unit

Compliance Assurance 217/785-0561

Confined Aquifer Determinations: Hydrogeology Unit, Groundwater Section 217/785-4787

Potential Source Identification: Assessment Unit, Groundwater Section 217/785-4787

Recharge Area Delineation: Hydrogeology Unit, Groundwater Section 217/785-4787

Sanitary Surveys: Regional Office

Sample Analysis: Drinking Water Compliance Unit

Compliance Assurance Section 217/785-0561

## CONSTITUENTS DEPENDENT ON VULNERABILITY OF THE WATER SUPPLY

Waivers for all of the Phase 2 and 5 constituents not discussed above will be dependent on the vulnerability of the water supply and the result of at least one sample analysis. The contaminants listed below will be assessed based on use of a contaminant within the recharge area and on the vulnerability of the aquifer used by the supply.

### 1. Phase 2 Regulated Chemicals SOCs

Alachor  
Atrazine  
Carbofuran  
Chlordane  
DDT  
1,2-Dibromo-3-chloropropane (DBCP)  
2,4-Dichlorophenoxyacetic Acid (2,4-D)  
Dieldrin  
Endrin  
Ethylene Dibromide (EDB)  
Heptachlor  
Heptachlor Epoxide  
Lindane  
Methoxychlor  
Pentachlorophenol (PCP)  
Polychlorinated Biphenyls (PCBs)  
Toxaphene  
2,4,5-TP (Silvex)

### 2. Phase 5 Regulated SOCs Phase 2 Unregulated

Aldicarb  
Aldicarb Sulfone  
Aldicarb Sulfoxide  
Benzo(A)Pyrene  
Dalapon  
Di(2-thylhexyl)Adipate  
Di(2-Ethylhexyl)Phthalate  
Dinoseb  
Diquat  
Endothall  
Glyphosate  
Hexachlorobenzene  
Hexachlorocyclopentadiene  
Oxamyl(Vydate)  
Picloram  
Simazine  
2,3,7,8-TCDD (Dioxin)

### 3. Additional Phase 2 Unregulated Chemicals

Butachlor  
Carbaryl  
Dicamba  
3-Hydroxycarbofuran  
Methomyl  
Metolachlor  
Metribuzin  
Propachlor

**PHASE 2 and 5 WAIVER APPLICATION/VULNERABILITY ASSESSMENT  
PART 1**

Please provide documentation as outlined below:

- I. Facility Characterization
  - A. Facility Name
  - B. Facility Number
  - C. Treatment Application Point (TAP) Number
  - D. Water Source for TAP (list IEPA 5-digit well numbers for wells which contribute water to the TAP)
  
- II. Does your facility have a chlorine exemption?
  
- III. List the IEPA 5-digit well number and all potential routes\* within 1,000 feet of the well including:
  - A. Potential route owner's name;
  - B. Potential route location: provide address if applicable or locate well on the well site survey report map or topographic map;
  - C. Describe the route (e.g. improperly abandoned well, gravel pit, etc.);
  - D. Provide a schedule specifying the time frame in which improperly abandoned wells will be properly abandoned in accordance with Section 920.120 of The Illinois Water Well Construction code.
  
- IV. Well Integrity
  - A. List the IEPA 5-digit well number and any defects in the well casing or grouting.
  - B. Were any deficiencies noted in the most recent public water supply evaluation?
  - C. If the answer to B was yes, list on a separate sheet of paper the IEPA 5-digit well number and describe the action taken to correct the deficiency(ies).
  
- V. Previous Sample History
  - A. List the TAP number and any organic chemical contaminants that are not naturally occurring which have been detected in previous samples taken from the TAP.
  
- VI. Aquifer Classification
  - A. Provide a well log (boring material record) for each well and identify each well log using the IEPA 5-digit identification number. Appendix A contains the addresses of State agencies, which have geologic information available to the public, and a list of technical assistance documents available from the USEPA. List the IEPA 5-digit well number and determine if the aquifer utilized by each well(s) is confined or unconfined.
  - B. If the aquifer is confined, identify the confined unit (material) on the well log. For additional information on identifying a confined aquifer see Appendix B.
  - C. If the aquifer utilized by the well(s) is confined STOP HERE and sign the application at space on Section 7 on page 2. If the application is for a well(s) utilizing an unconfined aquifer, provide information in Part 2 on the following pages.

\*Potential route means abandoned and improperly plugged wells of all kinds, drainage wells, all injection wells, including closed loop heat pump wells and any excavation for discovery, development or production of stone, sand or gravel.

VII. Operator Certification

- A. Provide the following statement and the signature and printed name of the owner or official custodian and responsible operator in charge.

I have reviewed the above and all attached documents, and to the best of my knowledge all the information provided is true.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print  
Owner of Official Custodian

\_\_\_\_\_  
Print  
Responsible Operator in Charge

This agency is authorized to require this information under Ill. Rev. Stat., 1979, Chapter 111-1/2 Section 1019. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$10,000.00 and an additional civil penalty up to \$1,000.00 for each day the failure continues, a fine up to \$1,000.00 and imprisonment up to one year. This form has been approved by the Forms Management Center.

Return application to:

Illinois EPA, Bureau of Water  
Compliance Assurance Section  
Drinking Water Compliance Unit  
P.O. Box 19276  
Springfield, Illinois 62794-9276

**Phase 2 and 5 WAIVER APPLICATION/VULNERABILITY ASSESSMENT  
PART 2**

Please provide documentation as outlined below:

- I. Facility Characterization
  - A. Facility Name
  - B. Facility Number
  - C. Treatment Application Point (TAP) Number
  - D. Water Source for TAP (list IEPA 5-digit well numbers for wells which contribute water to the TAP)
  
- II. Recharge Area Mapping
  - A. Provide a map of the recharge area for each well based on a 5-year time of travel capture zone criteria. Aquifer flow directions and gradient must be verified using at least 3 appropriately spaced observation wells. Where appropriate, existing wells may be used for observation wells. See Appendix C for additional information on mapping recharge areas\*.
  
- III. Land Use Zoning Map
  - A. Provide the land use-zoning map, where appropriate, for the area located within the recharge area(s). Identify potential sources of contamination and identify any contaminants which are used, stored or produced within the recharge area including:
    1. Owner's name;
    2. Location - provide address, if applicable, or locate on the well site survey report map or topographic map;
    3. List contaminant and the amount stored or applied on site.
  
- IV. Recharge Management Program
  - A. Describe a management program that will be utilized for contaminants treated, stored, or disposed of within the recharge area. The management plan should also consider future development of new uses within the recharge area. The management plan must include an implementation schedule.
  
- V. Contingency Plan
  - A. Provide a contingency plan, which describes the PWS action plan in case of an emergency. The action plan must adequately address the potential threats caused by the contaminants treated, stored, produced, disposed of, or transported within the wellhead protection area.

\*Recharge areas are referred to as "wellhead protection areas" in the USEPA technical assistance documents contained in Appendix C.

VI. Operator Certification

- A. Provide the following statement and the signature and printed name of the owner or official custodian and responsible operator in charge.

I have reviewed the above and all attached documents, and to the best of my knowledge all the information provided is true.

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Print  
Owner of Official Custodian

\_\_\_\_\_  
Print  
Responsible Operator in Charge

This agency is authorized to require this information under Ill. Rev. Stat., 1979, Chapter 111-1/2 Section 1019. Disclosure of this information is required. Failure to do so may result in a civil penalty up to \$10,000.00 and an additional civil penalty up to \$1,000.00 for each day the failure continues, a fine up to \$1,000.00 and imprisonment up to one year. This form has been approved by the Forms Management Center.

Return application to:

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Compliance Assurance Section  
Drinking Water Compliance Unit  
P.O. Box 19276  
Springfield, Illinois 62794-9276

## APPENDIX A

### Getting started – Where to Find Available Information

#### **Step 1.** Utilizing Available Geologic Information

- Copies of well logs can be obtained from:

Illinois State Water Survey (ISWS)  
2204 Griffith Drive  
Champaign, IL 61820  
217/333-4300

- or -

Illinois State Geologic Survey (ISGS)  
Geologic Information Unit  
615 East Peabody  
Champaign, IL 61820  
217/333-4747

*\*Note: When requesting well logs, the following information is required:  
Township, Range, and Section*

- Aquifer Property Data (i.e., Transmissivity, Conductivity, etc.) Illinois State Water Survey (see above)

#### **Step 2.** Information about Potential Contamination Sources

- Well Site Survey Reports (WSSR)  
97% of surveys completed; 79% reports complete available from:

Illinois Environmental Protection Agency  
Division of Public Water Supplies  
Groundwater Section  
P.O. Box 19276  
Springfield, IL 62794-9276  
217/785-4787

- Undergrounds Storage Tanks (location, owner, age, etc.) available from:

Illinois State Fire Marshall  
1035 Stevenson Drive  
Springfield, IL 62703  
217/785-2427

- Agricultural Chemical Facilities, Chemical Application best management practices available from:

Illinois Department of Agriculture  
State Fairgrounds  
P.O. Box 19281  
Springfield, IL 62794-9581  
217/785-4723

- Septic System Maintenance/Problems, Private Well Information available from:

Illinois Department of Public Health  
Division of Environmental Health  
525 West Jefferson  
Springfield, IL 62761  
217/785-5830

- Groundwater Education Materials, Recycling Information available from:

Illinois Department of Energy and Natural Resources  
Public Information Office  
Room 300  
325 West Adams  
Springfield, IL 62704-1892  
217/785-2800

**Step 3.** Determine if Aquifer is Confined/Unconfined assistance available from:

Illinois Environmental Protection Agency  
Division of Public Water Supplies  
Groundwater Section (see above address)

- or -

Illinois State Water Survey (see above address)

- or -

Illinois State Geological Survey (see above address)

*\*Note: If determined to be unconfined, assistance may be required from local consultant for recharge area delineation (i.e. 5- year capture zone).*

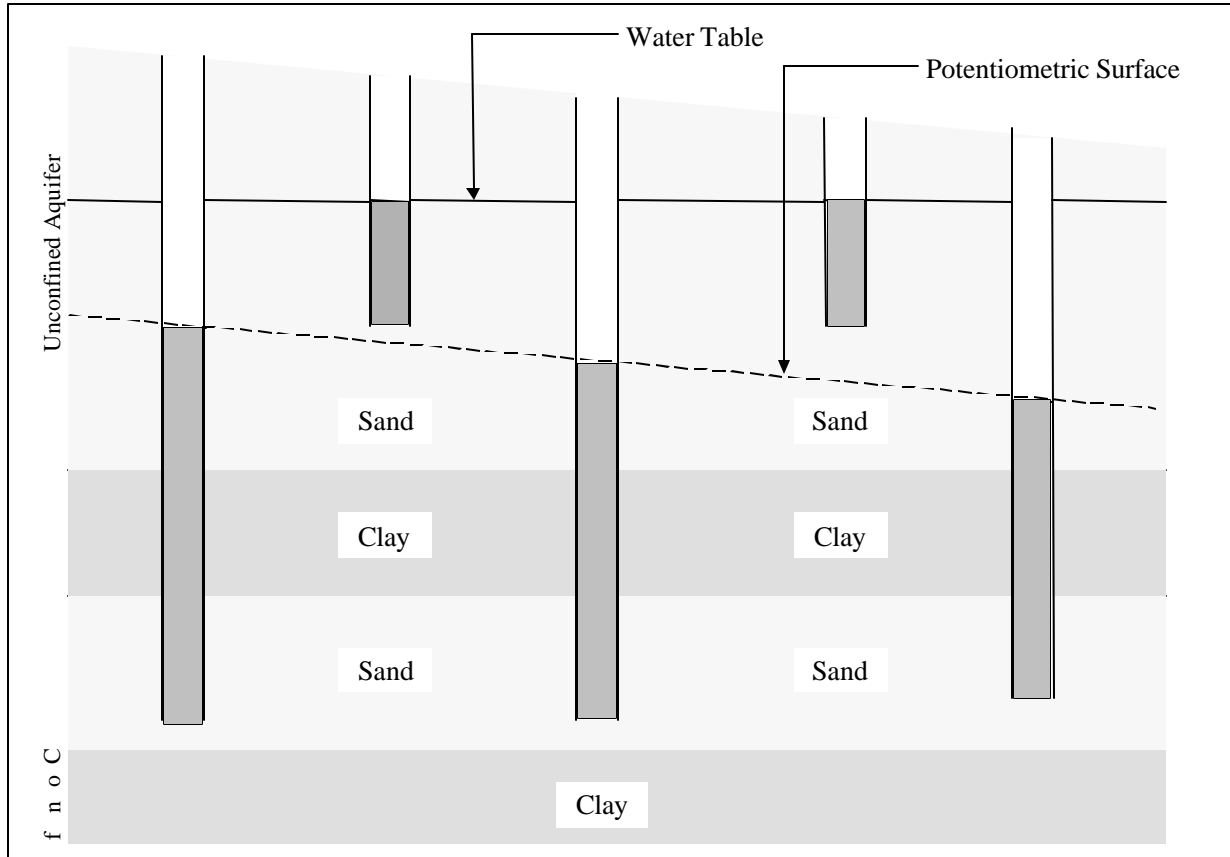
## **Chronological Bibliography of Ground Water Protection Technical Assistance Documents (TADs)**

- EPA, May 1987, *Wellhead Protection: A Decision-Maker's Guide*. (not summarized)
- EPA, June 1987, *Guidelines for Delineation of Wellhead Protection Areas*.
- EPA, July 1988, *Developing a State Wellhead Protection Program: A User's Guide to Assist State Agencies Under the Safe Drinking Water Act*.
- EPA, April 1989, *Wellhead Protection Programs: Tools for Local Governments*.
- EPA, June 1989, *Local Financing for Wellhead Protection*.
- EPA, April 1990, *Citizen's Guide to Ground Water Protection*.
- EPA, May 1990, *Guide to Ground Water Supply Contingency Planning for Local and State Governments*.
- EPA, May 1990, *A Review of Sources of Ground Water Contamination from Light Industry*.
- EPA, May 1991, *Protecting Local Ground Water Supplies Through Wellhead Protection*.
- EPA, June 1991, *Wellhead Protection Strategies for Confined-Aquifer Settings*.
- EPA, June 1991, *Delineation of Wellhead Protection Areas in Fractured Rocks*.
- EPA, June 1991, *Why Do Wellhead Protection?*
- EPA, Oct 1991, *Managing Ground Water Contamination Sources in Wellhead Protection Areas: A Priority Setting Approach*.
- EPA, Dec 1991, *Guide for Conducting Contaminant Source Inventories for Public Drinking Water Supplies*.
- EPA, Sept 1992, *Case Studies in Wellhead Protection: Ten Examples of Innovative Wellhead Management Programs*.

For information on how to order any of the documents listed above, contact either the Safe Drinking Water Hotline at 800/ 426-4791 or the Office of Ground Water and Drinking Water Resource Center at the following address:

US Environmental Protection Agency  
OGWDW-Resource Center WH-550  
Washington, DC 20460

## Appendix B Aquifer Description



The above illustration shows an unconfined aquifer underlain by a confined aquifer. In this illustration the confining material consists of clay. In order for an aquifer to be classified as confined for the waiver program, the confining material must be clay or shale and the static water level in the well must be above the top of the aquifer.

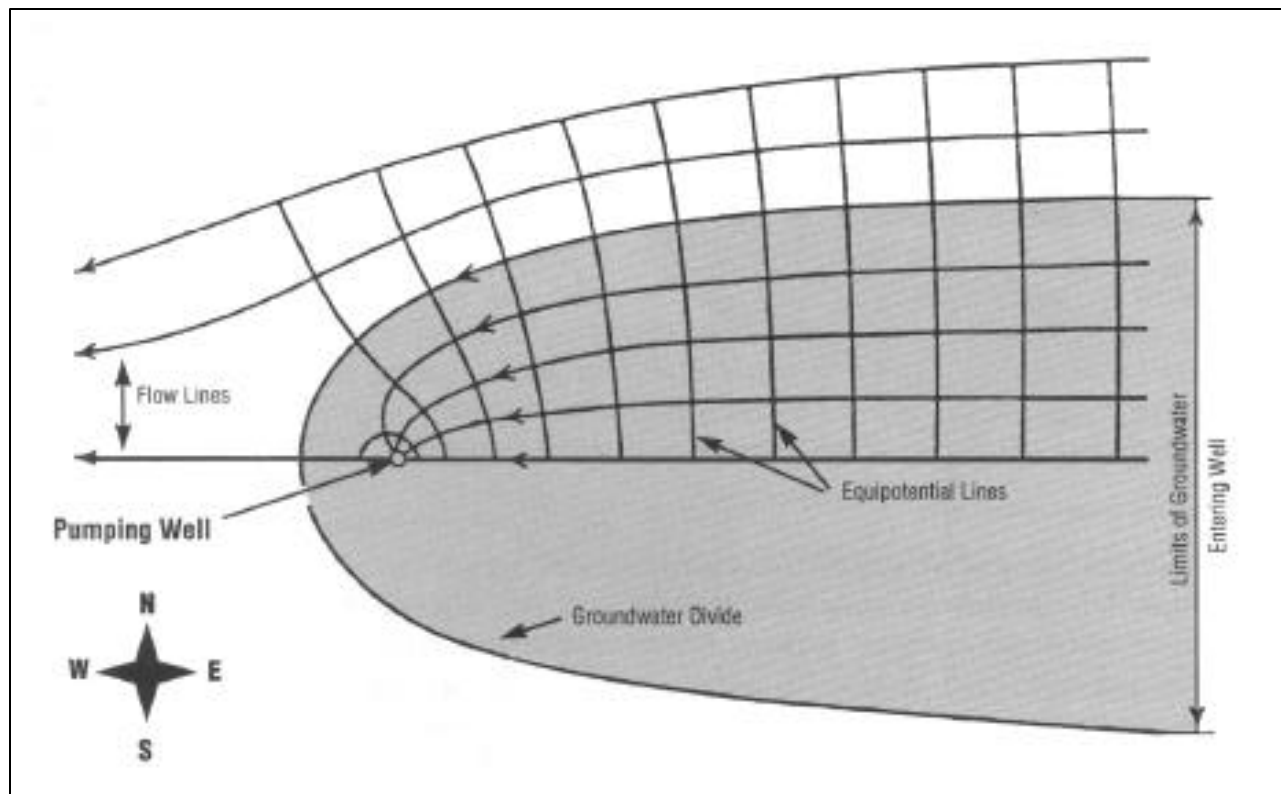
## Appendix C

### Recharge Area of a Pumping Well

As a well pump withdraws water and forces it to the surface, groundwater withdrawn from around the well is replaced by water stored within the aquifer. Drawing of distant water to the well is called groundwater capture. The area affected is termed the zone of capture or the recharge area. The edge of the recharge area is the dividing line between where a water particle will eventually reach the well and where the water particle will flow around the well, never being captured by the well (Figure 1).

It is important to identify a recharge area because any contaminant within the area will be drawn toward the well, eventually contaminating the water supply. The closer to the well that contamination occurs, the sooner it will be drawn into the water supply.

**Figure 1: Recharge Area of a Pumping Well**



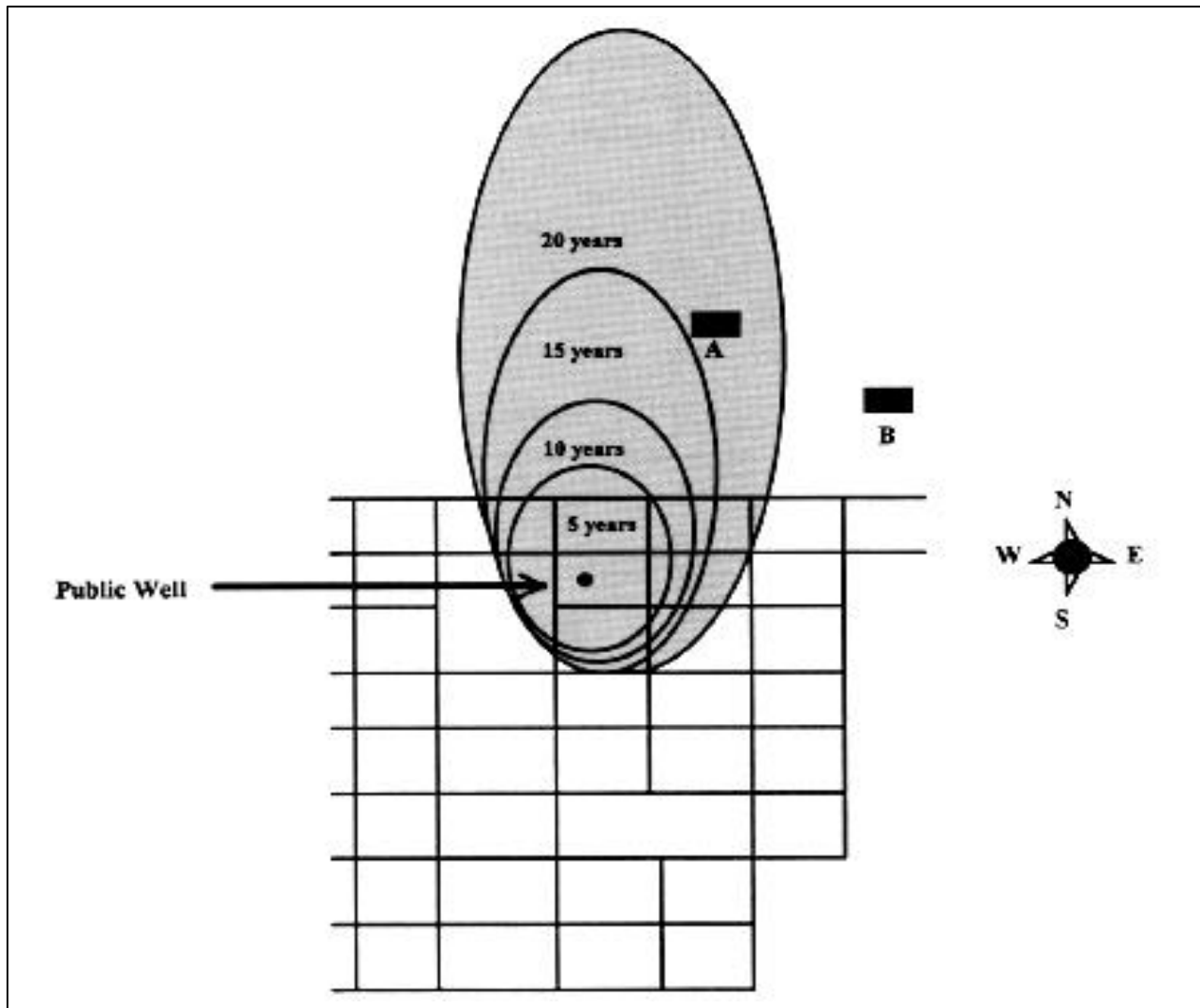
**Figure 1** shows the spatial characteristics of a recharge area of a well. The regional groundwater flow here is from east to west, as shown by the flow lines. The well disrupts the east-west flow by withdrawing some of the water. The flow lines that converge at the well show the portions of the regional flow that are intercepted, or captured, by the well. Groundwater and contaminants within the shaded area will be captured by the well.

Adapted from Gibb, et al. Hazardous Waste in Ogle and Winnebago Counties: Potential Risk Via Groundwater Due to Past and Present Activities (Illinois Department of Energy and Natural Resources, State Water Division, Doc. No. 83/26, September 1983).

Recharge areas are usually defines in terms of time of travel. For example, a “five- year recharge area” is the area within which water stored in the aquifer will be pulled into the well within five years. A numerical example follows: water that is being pulled into a well at 1 foot per day (speed= distance/time) and is 200 feet (distance) from the well has a capture time of 200 (feet) / (1 foot/day) = 200 days (time). Conversely, given groundwater flow of 5 feet per day the distance to the edge of the 2 year recharge area is 5 (feet) x 2 (years) x 365 (days/year) = 3650 feet.

Recharge areas are usually asymmetrical. Because they are affected by the natural flow direction and speed of groundwater flow, the recharge area will extend further upflow of the well than downflow (**FIGURE 2**). This is analogous to streamflow: a water intake pump in a stream will primarily take in water flowing from the upstream direction. Contamination upstream is more problematic than contamination downstream. Thus, well operators are more concerned with groundwater quality in the upflow direction than the downflow.

**Figure 2: Time-Related Recharge Area for a Public Well**



**Figure 2** shows the value of delineating a time-related recharge area for a public well. For example, it tells us that a contaminant spill at land use A could reach the well in 15 to 20 years, whereas a spill at land use B would not reach the well.

Recharge area analysis can be completed using semi-analytical or numerical computer modeling techniques. The WHPA (Blandford and Huyakorn) software was developed for the U.S. EPA and is available from the International Groundwater Modeling Center (see below). The WHPA code contains semi-analytical capture zone solutions and an uncertainty analysis capability, which allows the user to determine how the size of the capture zone will be affected by changing input variables. Numerical models for capture zone analysis include MODFLOW with MODPATH (McDonald and Harbaugh).

Information on available computer models may be obtained from:

International Groundwater Modeling Center  
Colorado School of Mines  
Golden, Colorado

Phone: 303/273-3103

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## References

Blandford, N.T. and Huyakorn, P.S. March 1991. WHPA: A Modular Semi-Analytical Model for the Delineation of Wellhead Protection Areas. U.S. EPA Office of Ground-Water Protection, Washington D.C. 20460.

McDonald, M.G. and Harbaugh, A.W. 1988. A Modular Three-Dimensional Finite-Difference Ground-Water Flow Model. Techniques of Water-Resources Investigations of the United States Geological Survey.