WATER MANAGEMENT & CONSERVATION

Chapter 4

How Will This Chapter Help You Protect Your Drinking Water and Home Environment?

This chapter is a guide to help you better understand the condition of your well and how to take care of it. Easy-to-understand assessments tables help identify situations and practices that are safe as well as ones that may require prompt attention. Additional information on how to safeguard all water sources may be obtained from your local health department, your county Extension office, and your county conservation district staff.

Use the table below to rate your risks related to your well usage and maintenance. For each question, check your risk level in the right-hand column. Some choices may not be exactly like your situation, so choose the response that fits best. Then look to the appropriate section for tips.

Assessment - Water Management

	Low Risk	Medium Risk	High Risk	Your Risk
Well Location	My well is uphill from all potential pollution sources. Surface water does not reach the well or is diverted.	My well is level with or uphill from most potential pollution sources. Some surface water runoff may reach the well.	My well is downhill from potential pollution sources or is in a pit or depression. Surface water runoff reaches the well.	❒Low ❒Medium ❒High
Subsurface Conditions	The water table or fractured bedrock is deeper than 20 ft.	The water table or fractured bedrock is 15 – 20 ft. deep	The water table or fractured bedrock is shallower than 15 ft.	❒Low ❒Medium ❒High
Age of Well	My well is less than 20 years old.	My well is 20 – 50 years old.	My well is more than 50 years old.	❒Low ❒Medium ❒High
Height of Well Casing	The casing is 12 or more inches above the surface and 1-2 feet above the highest recorded flood level.	The casing is at the surface or up to 12 inches above the surface.	The casing is below the surface, in a pit or depression, or the well has no casing.	❒Low ❒Medium ❒High
Backflow Prevention	Measures are taken to prevent backflow, and where necessary, air gaps or back-flow prevention devices are installed.	Measures are sometimes taken to prevent backflow. No backflow prevention devices are installed.	No measures are taken to prevent backflow. No backflow prevention devices are installed.	❒Low ❒Medium ❒High
Last Inspection	My well has been inspected within the last 10 years.	My well was inspected 10 – 20 years ago.	My well was inspected more than 20 years ago, or I do not know when the well was last inspected.	❒Low ❒Medium ❒High
Records from Inspections or Maintenance	I have copies of all inspection and maintenance reports.	I have some records on inspections and maintenance.	I do not have any inspection or maintenance records.	❒Low ❒Medium ❒High

Assessment - Water Management (con't.)

	Low Risk	Medium Risk	High Risk	Your Risk
Type of Water Testing Schedule and Results	My water is tested at least once a year. Test results are consistent and indicate good water quality. Results meet standards for bacteria, nitrate, and other contaminants.	I have tested my water before, but it has been a few years.	My water is not tested. Water is discolored after a rainstorm, and it changes noticeably in color, odor, and taste.	❒Low ❒Medium ❒High
Unused Wells	There are no known unused wells on my property, or unused wells have been properly sealed	Unused wells are not sealed, but they are capped and isolated from potential contaminants.	Unused, unsealed wells are located on my property. They are in poor condition, near pollution sources, and/or uncapped.	❒Low ❒Medium ❒High
Water Conservation	Water-conserving fixtures and practices are always used. Drips and leaks are fixed immediately.	Some water-conserving steps are taken (such as using low-flow shower heads or fully loading the washing machine and/or dishwasher).	Standard high-volume bathroom fixtures are used. No effort is made to conserve water. Leaks are not repaired.	❒Low ❒Medium ❒High

Why Should You Be Concerned?

Wells are a source of drinking water for many rural residents and are intended to provide clean, safe drinking water from groundwater sources. However, improperly installed or poorly maintained wells can create a direct pathway for contaminants to enter the water supply. Contaminants such as fertilizers, pesticides, and bacteria often have no odor or color and are therefore hard to detect. In addition to problems that can be caused by the wells themselves. Limestone regions known as karst, are easily contaminated by impurities in runoff that directly enters groundwater supplies. This contaminated water then can enter your well water supply. By managing your well and activities on or near your property, you can greatly reduce the risk of a contaminated water supply.

A good understanding of your well is a step toward a protected water supply. This chapter has been designed to help you better understand the factors that affect the condition of your well and how to take care of it. Your answers will help you identify any potential problems. If you would like more help in assessing your management of your well for drinking water, contact your local Health Department office.

Well Location

Your well's location in relation to other components of your property or those near your property can determine some pollution risks. Where your well is located on the land surface is important, but the critical factor is where it is located in relation to potential sources of pollution. Wells located downhill from a septic system, animal feeding lot, over-fertilized farm field, or leaking fuel storage tank have a greater risk of contamination than does a well located uphill from these pollution sources. Changing the location or depth of your well may protect your water supply, but any condition likely to cause groundwater contamination also should be addressed.

Subsurface Conditions

Contamination of groundwater is more likely if soils are shallow (a few feet above bedrock) or if they are highly porous (sandy or gravelly). Generally, the more time it takes for surface water to reach the aquifer, or groundwater, the better and more complete filtration will be. Shallow soil increases risk of pollution because contaminants do not have far to travel before reaching groundwater. If bedrock below the soil is fractured so that water can seep down rapidly, the chance of groundwater contamination increases.

Shallow wells that draw from groundwater nearest the land surface, are most likely to be affected by local sources of contamination.

Age of Your Well

The age of your well also affects the likelihood of contamination. Wells built more than 50 years ago are more likely to be shallow and poorly constructed than those built recently. Older wells also are more likely to have thinner casings that may be cracked and likely to leak lubricating oils that can pollute the water. If your well is several years old, you may want to have it inspected for any possible defects by a qualified person such a Health Department sanitarian or a licensed well driller. If you do not know how old your well is, assume it needs an inspection.

Well Casing and Cap

Well drillers install a steel or plastic pipe casing to prevent the collapse of the well hole during drilling. The space between the casing and sides of the hole is a direct pathway for contaminants and surface water to reach the water table. The driller seals this channel by filling it with grout. Visually inspect the portion of your well casing that extends above the ground by removing the cap and inspecting the inside with a flashlight. If the casing moves with light pressure, you may have a problem with the ability of the well casing to keep out pollutants. Sometimes damaged casings can be detected by listening for water falling into the well when the pump is not running. If you hear water, there might be a crack in the casing, or the casing may not reach the water table. Either situation is risky.

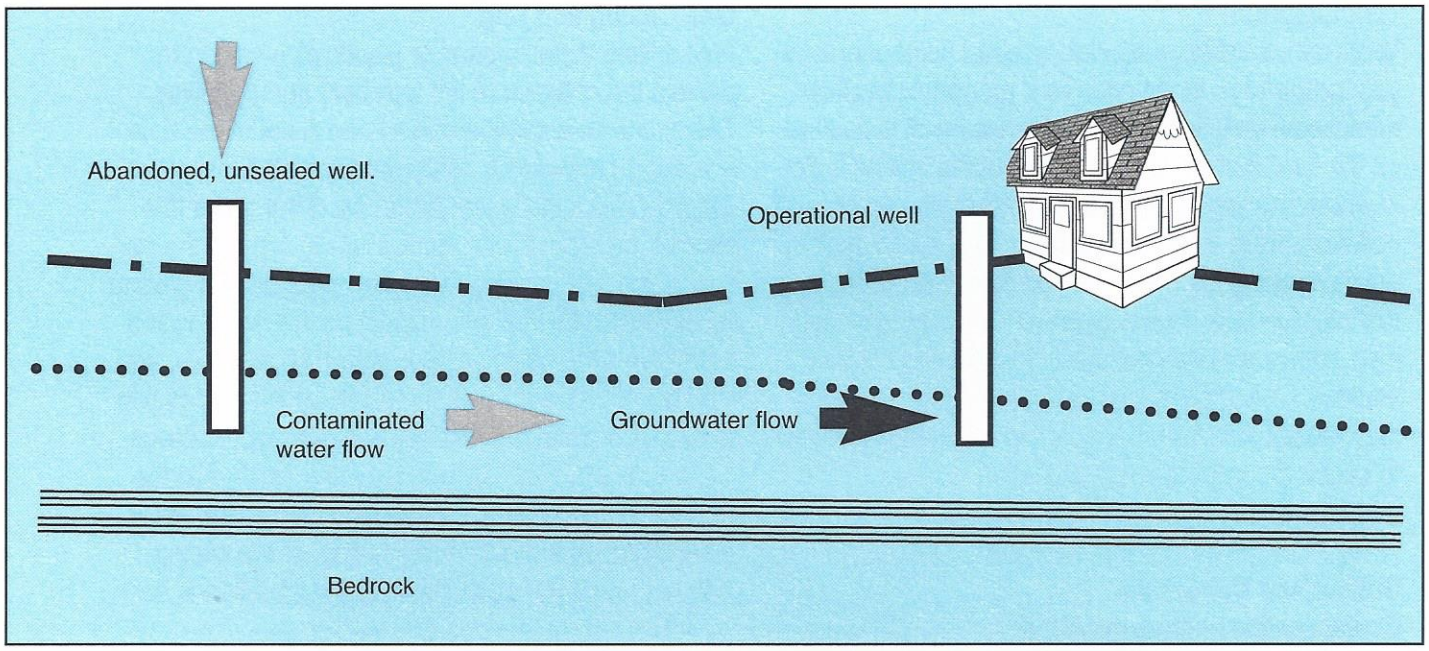
Shallow wells that draw from groundwater nearest the land surface, are most likely to be affected by local sources of contamination.

The well casing should extend at least 12 inches above the ground surface. If there are occasional floods in your area, the casing should extend 1 to 2 feet above the highest flood level recorded for the site. Also, the well cap should be attached firmly to the casing with a vent that allows only air to enter. If your well has a vent, make sure it is connected tightly to the well cap or seal, faces the ground, and is properly screened to keep out insects.

Backflow Prevention

Backflow is defined as the movement of water opposite to the normal pressurized flow. When the backflow occurs between a chemical or water source of poor quality and the drinking water source, pollutants are carried into the potable water, contaminating it. Backflow of contaminated water into your water supply can occur if your system undergoes sudden pressure loss. Pressure loss can occur if the well pump fails or, if you are on a public water system, if there is a line break in the system.

The simplest way to guard against backflow is to leave an air gap between the water supply line and any reservoir of "dirty" water. For example, if you are filling a swimming pool with a hose, make sure that



you leave an air gap between the hose and the water in the pool. Toilet tanks should be equipped with a fill valve labeled with the words "anti-siphon"; when the fill valve is replaced be sure to use the anti-siphon type. Washing machines have built-in air gaps. Where an air gap cannot be maintained, a backflow prevention device such a check valve or vacuum breaker should be installed on the water supply line. For example, if you are using a pesticide sprayer that attaches directly to a hose, a hose bib vacuum breaker or check valve should be installed on the faucet to which the hose is connected.

Inexpensive backflow prevention devices can be purchased from plumbing suppliers. It must be recognized that waters which are hard or contain dissolved lime will leave deposits that in time render the devices useless, and they will need to be replaced. If water must be provided to a chemical reservoir, always use an air gap. Whenever a hose is used, think about whether or not you would like to drink the liquid in which the hose is submerged.

Well Inspections and Record Keeping

You would not let a car go too long without a tune-up or oil change. Your well deserves the same attention. Well equipment does not last forever. Visually inspect your well often, and have it inspected by a qualified well driller or pump installer every 10 to 15 years. Regular well inspections can help you ensure that your water supply is safe. You should keep well construction details, as well as the dates and results of maintenance visits for the well and pump. It is important to keep good records so you and future owners can follow a good maintenance schedule.

Water Testing

Water testing helps you monitor water quality and identify potential risks to your health. Contaminants enter drinking water from many sources. Many contaminants can only be detected through a water test. Your water should be tested at least once a year for the four most common indicators of trouble: bacteria, nitrates, pH, and total dissolved solids.

A more complete water analysis for a private well will tell you about its hardness; corrosivity; and iron, sodium, and chloride content. In addition, you may choose to obtain additional tests targeted to specific contaminants such as chemicals or pesticides, if pesticides are used on or near your property, especially in the vicinity of the well. A good source of information to determine further testing can be obtained by contacting your local Health Department office.

Unused Wells

Many properties have wells that are no longer used, including older homes or sites where homes have stood previously. Unsealed wells not only provide a direct channel for waterborne pollutants to reach groundwater, they also pose a hazard to small children who may be playing nearby. A state licensed well driller should be hired to close these wells. Effective well plugging calls for experience with well construction materials and methods, as well as knowledge of the geology of the site and the regulations of the state. The cost to close a well varies because of well depth, well diameter, and soil/rock type, but the money spent sealing a well will be a bargain compared to the potential cost of cleanup and potential hazards to your family and others. For more information, call the Arkansas Water Well Construction Commission at (501) 682-3900.

Conserving Water

If you reduce the amount of water being used from your well, you will also reduce the flow of wastewater through the septic tank. This will allow more time for solids to settle out, providing less chance of solid particles being carried into the drain field. Less water in the drain field means better aeration for the soil microbes at work in your system. Here are a few ways to reduce the volume of water you use:

- Install low-flow toilets
- Take shorter showers
- Repair leaks immediately
- Run the washing machine or dishwasher only when full
- Turn off water when brushing your teeth or shaving
- Spread out laundry and other major water-using activities over a day or week

Using less water is better at reducing pollution all the way around. It will also save energy!

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