

Wells and Well Head Protection

What is the source of well water?

Well water comes from ground water. Ground water is water from rain and snow that filters through the soil into underground storage areas called aquifers or into small openings between rocks.

What are the different types of wells?

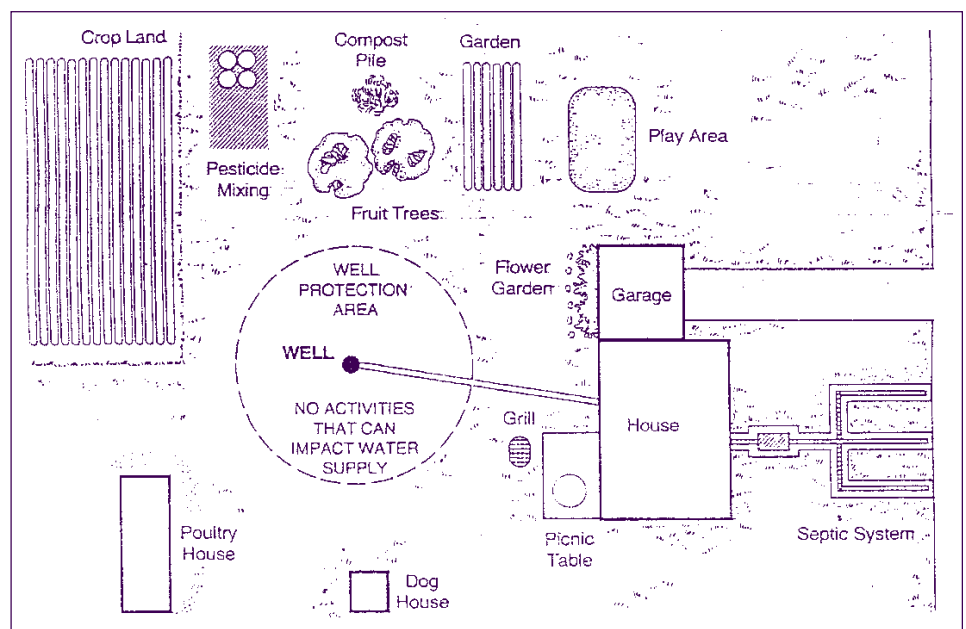
The five main types of wells are dug, drive, bored, drilled, and jetted (washed down).

- Most **dug** wells were either built before drilling equipment was available or because drilling was considered too expensive. Modern dug wells are typically lined with concrete tile and have a large diameter which provides a big opening to the aquifer. This allows them to obtain water from materials such as very fine sand, silt, or clay. Dug wells are shallow and lack a continuous casing, making them subject to contamination by nearby sources.
- **Driven** wells are made by driving a small-diameter pipe into shallow, water-bearing sand or gravel. These wells are relatively simple and economical to construct, but they can only tap shallow water and, like dug wells, are easily contaminated.
- **Bored** wells are constructed with a large auger. The depth of bored wells is usually about 50 to 70 feet, and they are usually built in soft materials such as sand, silt, clay, and soft rock.

- Either percussion or rotary-drilling machines are used to construct **drilled** wells. These wells can be more than 1,000 feet deep. Wells that penetrate land that is not hard and solid require a casing and a screen to prevent the inflow of sediment, which could cause the well to collapse.
- High-pressure water is forced into the ground to **drill jetted or washed down wells**. This method of construction can only be used in soft ground.

How can I ensure that I will get an adequate water supply from my well?

To provide an adequate household supply of water, a well should be able to supply about 5 gallons of water per minute. The availability of water in the surrounding soil or rock determines the water supply rate. Where shallow ground water is plentiful and of good quality, a shallow well may be adequate. To prevent contamination, state regulations require that the space around the casing be sealed in all wells.



Is well water pure?

Ground water is never completely pure. Minerals, chemicals, or microorganisms such as bacteria and viruses can easily move with the water as it moves down through the soil. Gasoline, diesel fuel, or other chemicals from leaking underground storage tanks may seep through the soil and into ground water. The type and amount of these materials may vary, depending on the type of soil and rock and the distance these materials travel.

What are the sources of ground water contaminants?

Examples of sources of ground water contamination which may threaten human and animal health as well as the environment include:

- Human and animal wastes from septic tanks, lagoons, and other waste storage facilities.
- Any chemicals or cleaners that are poured down household sinks.
- Landfills.
- Leaking underground storage tanks.
- Fuel pipelines.
- Saltwater encroachment in coastal areas.
- Improper use of fertilizers and pesticides.
- Injection wells for disposal of wastes and drainage water. (These wells are illegal in SC.)
- Chemical spills.

How do I know if my well water is contaminated?

Contaminated water may look, taste, and smell fine. The only way to determine if your well water contains harmful nitrate, bacteria, viruses, or chemicals is to have it tested. Generally, water testing is done only if there is sufficient reason to suspect that contamination is present.

The following symptoms or conditions could also indicate natural problems.

- A “rotten egg” odor may be caused by **HYDROGEN SULFIDE**.
- Problems with soap sudsing or cleaning, or scum build-up on shower curtains or fixtures may indicate **HARDNESS**.

- Red water and staining of laundry or plumbing fixtures may indicate the presence of **IRON** or **MANGANESE**.
- If pipes are corroding or blue copper stains are appearing on plumbing fixtures, the water should be checked for pH and **CORROSIVENESS**.
- Any sudden changes in taste, color, or odor may indicate a problem.

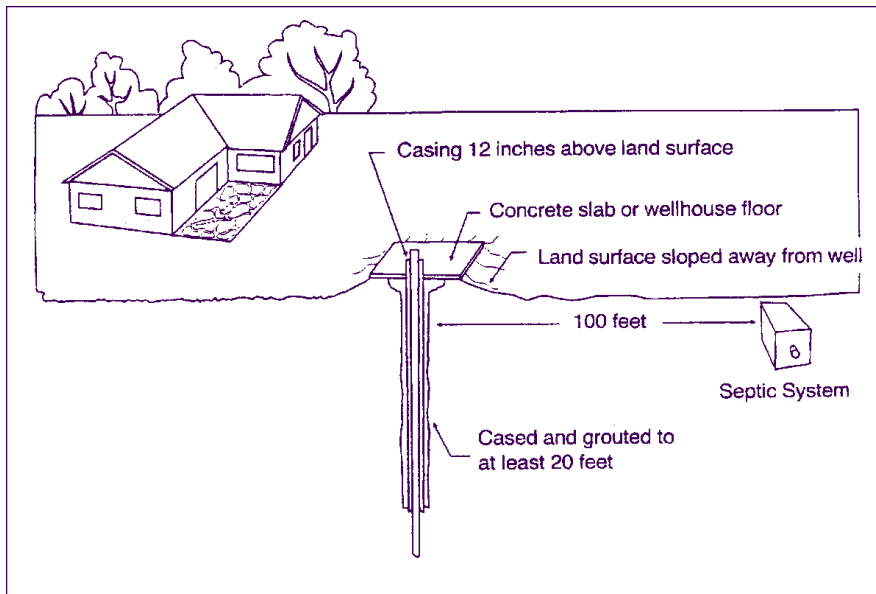
The presence of other contaminants (some of which could cause severe health problems) do not have any visible effects. If you suspect that there might be a problem with the quality of your water supply, have the water tested.

How do detergents, fertilizers, pesticides, and fuels affect well water quality?

The use of detergents, fertilizers, pesticides, or fuels does not automatically cause contamination. Misuse is the problem. Ground water contamination from domestic land use is most commonly associated with septic disposal systems or improper storage, use, or disposal of household and lawn chemicals. It is important to carefully follow the directions on labels, heed all warnings, and properly dispose of hazardous substances.

Does agriculture or industry pose a threat to water quality in South Carolina?

The use of farm fertilizers, pesticides, and animal-waste lagoons has caused some contamination of shallow aquifers, but when agricultural chemicals are used and stored properly, it is rare for them to reach ground water supplies in amounts that cause problems. In many cases of contamination involving wells located near agricultural land, contamination can be traced to spills that occurred during the preparation, mixing, or handling of chemicals before application or from infiltration of rinse water used to clean application equipment or tanks. All chemicals should be stored safely and far from water sources. Industrial areas also contribute pollutants. The most common industrial sources of ground water contamination are landfills, waste lagoons, and leaking



What can homeowners do to improve the quality of well water?

In a bacteria-contaminated water system, chlorination of the well is commonly recommended as a solution. Another option is filtering or treating the water at the tap. Otherwise, to fully correct the water supply, the source of contamination must be removed or the water must come from a new well that is not affected by the contaminated source or that taps a deeper aquifer.

Can a well go dry? How does it happen?

Wells do stop supplying water, either because they go dry or due to other factors. In some instances, what happens is that the water table drops below the pump intake level or the intake screen at the end of the pump becomes clogged. Once the problem is corrected or the ground water level rises, the wells are back in action.

Several situations can lower the water level to the point of “dry” wells. Drought or seasonal declines in the water level most commonly affect shallow wells. Increased pumping will also lower the water level. High rates of pumping for industrial, municipal, or agricultural purposes can drop the water table below existing wells.

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underground storage tanks. As we have seen with domestic and agricultural practices, with care and proper handling of potentially harmful materials the risk of contamination can be greatly decreased.

How do I get my well water tested? How expensive is it?

Contact your county health department or your county office of the South Carolina Cooperative Extension Service to find out which labs do water testing.

Normally, the cost of testing ranges from \$15 to \$250, depending on what the water is being tested for. Detecting specific viruses or individual chemicals is very time consuming and expensive. Before having your water tested, ask local experts such as Extension specialists, water treatment plant officials, or state and local health and environmental agencies for advice about which tests should be done on your water. When testing, make sure you follow the sampling techniques given by the lab.