

# wellcare® information for you about Wells

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There are 43 million people in the United States that use individual wells to supply water for their families. Water from modern wells is naturally filtered, cool and pure.

## Three Basic Types of Wells

Bored or “Shallow” Wells are usually bored into an unconfined water source, generally found at depths of about 100 feet or less.

Consolidated or “Rock” Wells are drilled into a formation consisting entirely of a natural rock formation that contains no soil and does not collapse. Their average depth is about 250 feet.

Unconsolidated or “Sand” Wells are drilled into a formation consisting of soil, sand, gravel or clay material that collapses upon itself.

## Well Construction

All private well construction is based on establishing the right location for the well, sizing the system correctly and choosing the proper construction techniques. Only a professional water well contractor should install a well! They know the hydrogeology in your area and all the local codes and regulations for wells. They also have the modern equipment and expertise needed to make sure that your well is properly constructed to meet the water needs of your family.

Your well is located on your property according to certain regulations required by the state, county or other locality. These regulations are designed to protect the integrity of your water supply. In addition, the well contractor uses his experience and expertise to locate the well on your property that is suited to your lot size, the location of existing structures and utilities and the most likely location for a good supply of water.

Proper sizing is crucial to the construction and performance of your well system. Your system is designed to suit the needs of your household. Factors considered when sizing your system include such things as number of bathrooms, bedrooms and occupants, and anticipated water use for extras such as swimming pools, irrigation, spas or whirlpool baths.

Proper well construction is the key to operating and maintaining your well. The initial cost of a properly constructed well may be somewhat higher. However, in the long run, a properly constructed well results in improved efficiency, less maintenance and longer well life.

## Your Well

Your well is constructed of quality materials, designed to prolong its life and performance. The following is a list of the most important materials used in construction of your well:

**Casing** is used to maintain an open access in the earth while not allowing any entrance or leakage into the well from the surrounding formations. The most popular materials used for casing are black steel, galvanized steel, PVC pipe or concrete pipe.

**Grout** is a sealant that is used to fill in the spaces around the outside of the well. It protects the well against the intrusion of contaminants. A grout mixture can be made of neat cement, bentonite or concrete, each used separately.

**Screen** keeps sand and gravel out while allowing ground water and water from formations to enter into the well. Screen is available in many materials, the most popular being stainless steel and PVC. Screen is used when wells are drilled in unconsolidated materials.

**Gravel Pack** is placed around the outside of the screen to prevent sand from entering the well or clogging the screen and to stabilize the well assembly.

The modern drilling process makes use of sophisticated technology. Two drilling methods are commonly used for private wells:

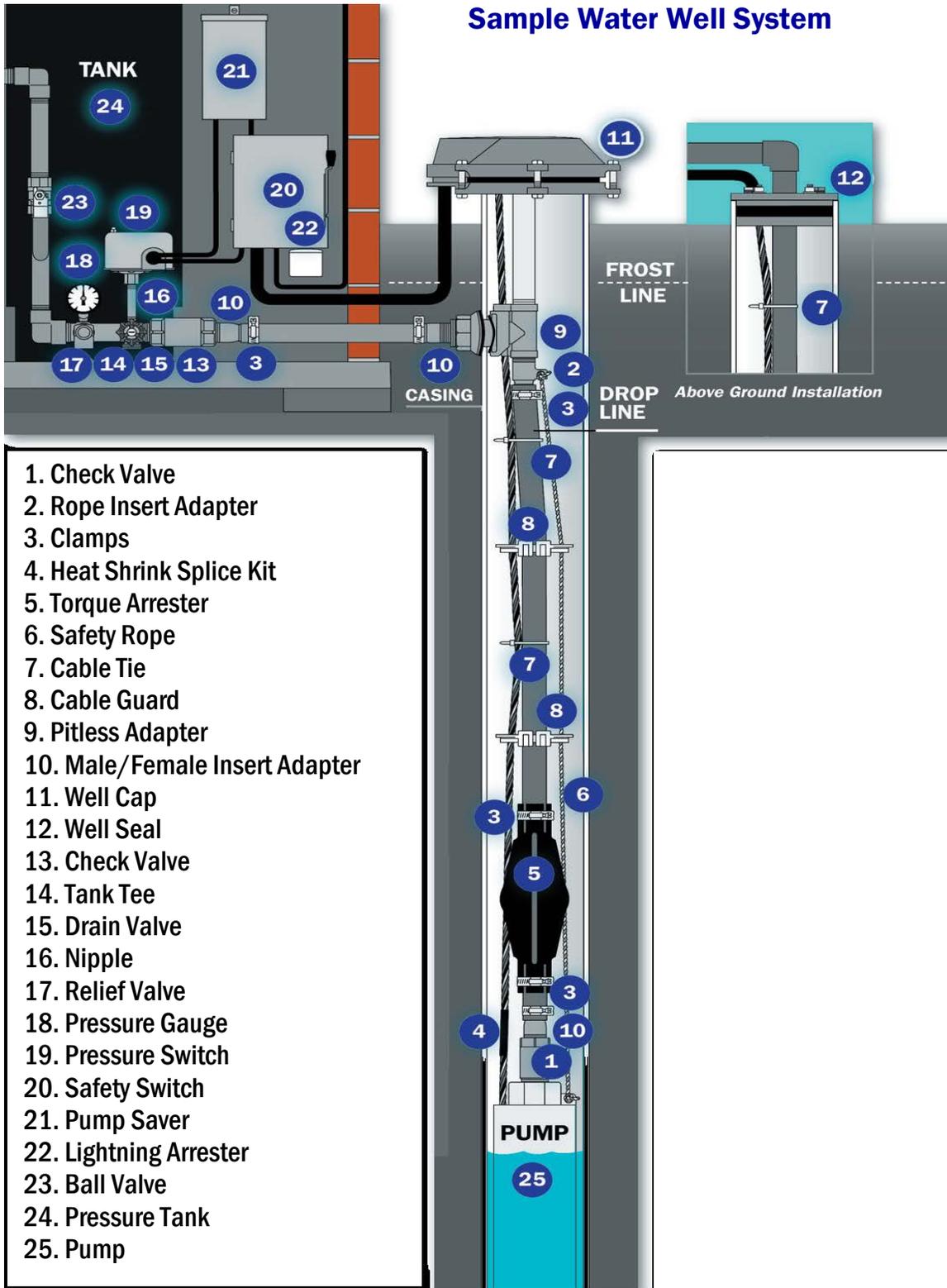
**Air rotary drilling:** A drill rig or truck outfitted with a large drill is driven onto the well site. The drill is lowered to the ground and turned on. As the drill spins, a hammer at its end smashes rock and soil creating the well shaft. The hammer is powered by air that is shot through the drill at very high speed.

At the same time, water is pumped around the drill to make the drilling easier. As the drill moves down, the same air that moves the hammer clears out the broken rock, dirt and excess water. When the drill hits a solid rock formation, a casing is placed in the well shaft to keep unwanted materials from entering the opening. Drilling then continues into the rock until water is found. The space between the casing and the ground is then filled with grout and the well is cleaned and capped.

**Mud rotary drilling:** Mud rotary drilling is used to drill where the soil is loose and sandy. It is similar to rotary drilling except that as the drill bit spins, a fluid (drilling mud) shoots down through the middle of the drill, then flows out at very high speeds at the sides and the tip of the drill. Without this fluid moving up and around the drill, the walls of the hole would cave in and the well could not be made.

The fluid and sand that come out of the hole are pumped to a pit. The fluid in the pit is pumped out and used again, while the extra sand stays put. After the drill hits an area of sand that is filled with water, the casing and screen are put in to keep things from getting in the well. When the drilling is finished, the driller grouts the well, cleans the well and puts a cap on it.

### Sample Water Well System



1. Check Valve
2. Rope Insert Adapter
3. Clamps
4. Heat Shrink Splice Kit
5. Torque Arrester
6. Safety Rope
7. Cable Tie
8. Cable Guard
9. Pitless Adapter
10. Male/Female Insert Adapter
11. Well Cap
12. Well Seal
13. Check Valve
14. Tank Tee
15. Drain Valve
16. Nipple
17. Relief Valve
18. Pressure Gauge
19. Pressure Switch
20. Safety Switch
21. Pump Saver
22. Lightning Arrester
23. Ball Valve
24. Pressure Tank
25. Pump

*This illustration is intended to represent some of the components that can be included in a water well system and is not intended as an installation guide. Check local codes for actual requirements and restrictions.*

## Well Pumps and Tanks

Your private water system has two important components in addition to the well itself – a pump and a tank.

**Pumps:** There are many types and sizes of pumps for water systems. Some are only designed to remove water from a source. Others not only remove the water, but also force it through the rest of the water system. Some pumps are for special jobs such as boosting pressure or supplying a special outlet. Selecting the appropriate pump size and type is critical to good well performance.

**Tanks:** Tanks provide storage for your water system. There are three general types of water storage tanks: (1) diaphragm bladder tanks with permanent separation between the air and water; (2) tanks with a float or wafer separating the air from the water; and (3) plain steel tanks. Each kind of tank serves a specific purpose. If your water supply provides plenty of water for your needs and you have selected the proper pump, it is easy to select the right size and type of tank. The amount of stored water in the tank is equal to the pump discharge in gallons per minute.

**Additional storage:** Some well owners may consider additional water storage tanks. Generally speaking, additional storage capacity of one day's water supply is sufficient. Additional water storage is useful when there are power outages and other emergencies. Be sure to have the installer provide manual access to your storage unit.

### For more information on your Well

Contact the well contractor who installed your well. Or find a water well contractor in your area by looking in your local telephone directory. Many states maintain lists of licensed or registered well contractors. Most states also have state water well associations, state well driller associations or state groundwater associations that maintain a list of contractor members. Contact your local or state health department or environmental agency, your state water well or groundwater association or the wellcare® Hotline to find out where you can obtain a list of well contractors.

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## For more information to help you maintain your well and protect your water supply



wellcare® is a program of the **Water Systems Council** (WSC). WSC is the only national organization solely focused on protecting the health and water supply of the 43 million people nationwide who depend on household wells for their water supply.

This publication is one in a series of wellcare® information sheets. There are more than 90 available FREE on the WSC website at [www.watersystemscouncil.org](http://www.watersystemscouncil.org).

Well owners and others with questions about wells or groundwater can also contact the FREE wellcare® Hotline at 1-888-395-1033 or visit [www.wellcarehotline.org](http://www.wellcarehotline.org)

**JOIN THE WELLCARE® WELL OWNERS NETWORK! You can join the well owners network and receive regular information on how to maintain your well and protect your well water...it's FREE!**

Contact us at 1-888-395-1033 or visit [www.wellcarehotline.org](http://www.wellcarehotline.org) or [www.watersystemscouncil.org](http://www.watersystemscouncil.org).