



WATER SUPPLY WELL CONSTRUCTION

Introduction

Groundwater is a source of fresh, unpolluted water. More than half of the people who live in North Carolina rely on groundwater wells as their primary source of household water. Well pollution that does occur in water supply wells is typically due to improper well location or well construction.

The Division of Water Quality's mission is to protect and enhance North Carolina's surface water and groundwater resources for the citizens of North Carolina and future generations. In conjunction with this mission, the North Carolina Well Construction Standards (15A NCAC 02C .0100) were developed to require the location, construction, repair, and abandonment of wells, and the installation of pumps and pumping equipment to conform to such reasonable standards and requirements as may be necessary to protect the public welfare, safety, health, and ground water resources.

Permits

All wells must conform to minimum specifications for construction and testing. Before you can construct a well, you must first obtain a permit. Permits for domestic water supply wells are issued through your local county health department. For a list of county health departments:

<http://www.ncalhd.org/county.htm>

Certified Well Contractors

If you hire a well contractor to construct, repair or abandon your domestic water supply well or any other well, North Carolina requires that the driller must be certified by the State's Well Contractors Certification Commission. You can check to see if your driller is certified by visiting the North Carolina Well Contractor's Certification Commission website at:

<http://h2o.enr.state.nc.us/wc/index.htm>

Water Supply Well Construction

The following are general construction standards for Water Supply Wells. Construction standards for wells other than water supply can be found in 15A NCAC 02C .0108.

Location: Water supply wells have set back requirements to minimize the potential for contamination

to enter the well or seep around the well and into the groundwater. Some potential sources of contamination requiring setbacks are:

- Septic tanks, drainfields, drainfield repair areas, cesspools, and privies
- Animal barns and feedlots
- Building perimeters, including attached structures
- Chemical or petroleum storage tanks
- Landfills

For a complete list of set back requirements, please refer to 15A NCAC 02C .0107(a).

Casing: A casing is the pipe or tubing that is installed in the borehole of the well that helps support the sides of hole from caving and can also prevent contamination from entering the well. In general, a well must be cased with approved casing to a depth of at least 20 feet. However, some localities require greater casing depths and some localities will allow casing to depth of less than 20 feet. Check with your Department of Environment and Natural Resources (DENR) Aquifer Protection Section (APS) regional office to determine the required casing depth for your area. This information is also found in 15A NCAC 02C .0116 and .0117. If the well is constructed to obtain water from a consolidated rock formation, the casing must be seated at least five feet into the consolidated rock. Also, a drive shoe must be attached to the bottom of the casing if the casing is driven into rock. The drive shoe protects the casing from damage during installation. If the well is constructed to obtain water from an unconsolidated formation, the well must extend at least one foot into the water-bearing unit.

Grouting: When a hole is drilled to install the well casing, a void or open space, called an annular space, is left around the outside of the casing. The annular space must be sealed to prevent surface water and shallow undesirable groundwater from entering the well. Allowable grouts include neat cement, sand cement, concrete, bentonite slurry, bentonite chips or pellets, and specialty grouts. Specialty grouts require a variance. State well construction standards require that the well contractor grout the area from the top of the ground to a minimum of 20 feet below ground level. Some localities require greater depths of grout and some will allow less. Check with your DENR APS regional office for the grout depth required for your area. This information is also found in 15A NCAC 02C .0116 and .0117.

Well Head Completion: One of the main ways that pollution enters a well is from the surface around the top of the well. To prevent this, the top of the well casing must be completely sealed and maintained at least 12 inches above land surface. Also, a watertight enclosure should be built around the well. This protects the well head and piping from freezing and keeps the well accessible. To prevent contamination, never store herbicides, insecticides, gasoline, batteries or other toxic substances near a well.

Identification Plates: The well contractor must attach an identification plate to the well head. The plate must include the name of the well contractor, the date the well was completed, the total depth of the well, the depth and diameter of the well casing, screened intervals, packing intervals, static water level, date completed, and the yield (gallons per minute) of the well. A pump installation information plate is required to be placed on the pump that shows the name and certification number of the person installing the pump, the date the pump was installed, the depth of the pump intake, and horsepower rating of the pump.

Well Tests for Yield

Every domestic water supply well must be tested for capacity by one of the following methods: Pump, Bailer, Air Rotary Drill, or Air Lift. This is done after the well has been constructed.

Disinfection of Water Supply Wells

Well construction equipment and materials can carry bacteria that cause health or maintenance problems. Please refer to our "How to Disinfect Your Well" brochure for more information.

Well Abandonment

Specific rules on proper well abandonment are found in 15A NCAC 02C .0113 of the Well Construction Standards. Report unprotected wells to the nearest DENR APS regional office immediately! Please refer to our "Well Abandonment" brochure for more information.

Well Records

The well contractor must complete standardized records of the well construction (GW-1) and/or well abandonment (GW-30) and send it to DENR within 30 days of completion of the activities. For domestic water supply wells, the well contractor is also required to give a copy of these well records to the county health department. Homeowners should ask for a copy of these records and should keep them in a safe place. Future owners of the property will want a copy for their records.

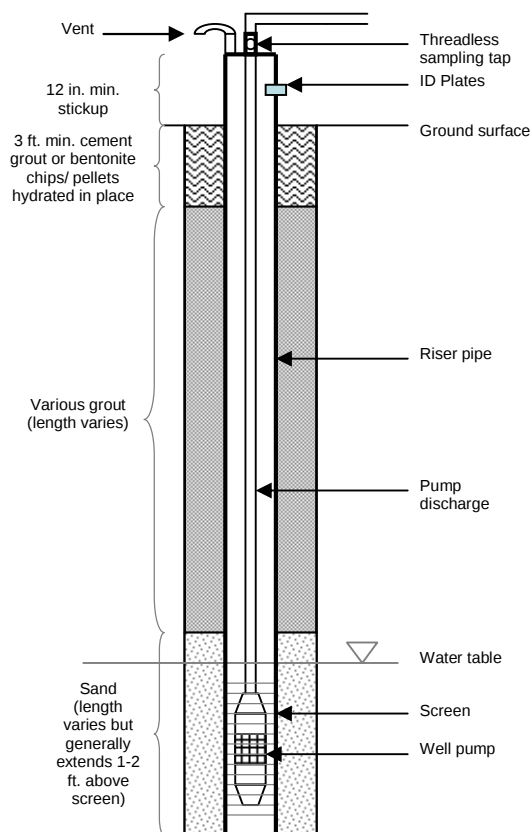
Variance

A variance is a type of permit that allows for one or more deviations from the Well Construction Standards. A variance must be approved by your DENR APS regional office **PRIOR** to well construction.

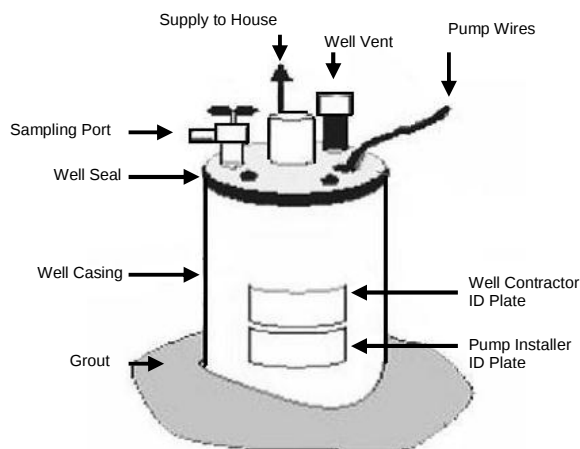
Well Construction Diagrams

The following are generalized diagrams of typical water supply well construction.

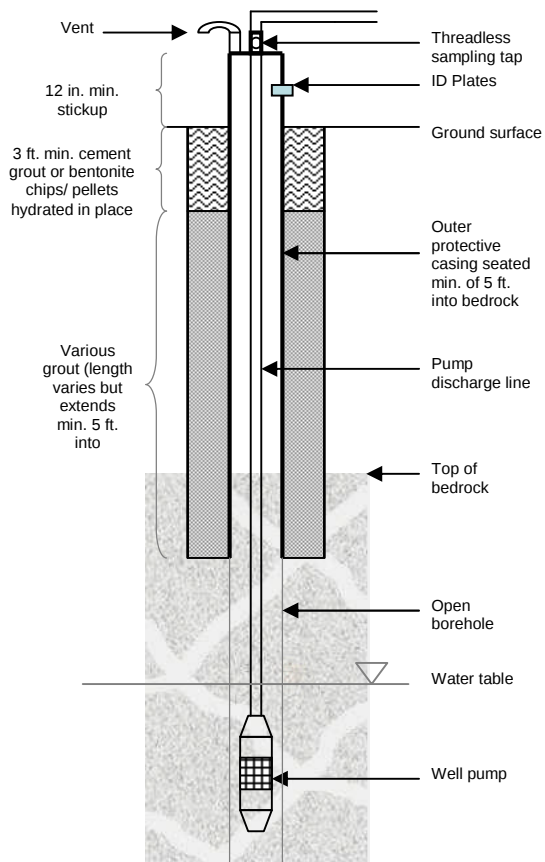
Wells Constructed in unconsolidated sediments:



Well head construction:



Wells Constructed in bedrock:



For more information or a copy of the 15A NCAC 02C .0100 Well Construction Standards Criteria and Standards Applicable to Water Supply and Certain Other Wells, you can visit our webpage

<http://www.ncwaterquality.org/aps/gpu.htm>

or contact us at:

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