

Private Wells Exam Orientation and Study Guide

Exam Instructions

1. Use pencil only when completing the exam.
2. This exam is a combination of multiple choice and true/false questions. When you select your answer, be sure you completely color in the respective box. Refer to the sample answer sheet on the second page.
3. The exam will have a total of 50 questions.
4. You will have two hours to complete the exam.
5. The minimum passing score is 70 percent.
6. When you have finished with the exam, you will need to turn in your answer sheet, the exam questions, and all scratch paper.

Exam Structure

The following list outlines each reference source (bold font) and the approximate number of questions that will be taken from that source.

1. **15A NCAC 02C .0102** (Definitions) – 8 questions.
2. **15A NCAC 02C .0107 & .0109** (Standards of Construction: Water Supply Wells) – 15 questions.
3. **15A NCAC 02C .0113 & 15A NCAC 18A .1724** (Disinfection of Wells) – 2 to 3 questions.
4. **15A NCAC 02C .0113 & .0114** (Abandonment and Records) – 1 to 2 questions
5. **15A NCAC 02C .0118** (Variances) – 2 questions.
6. **15A NCAC 02C .0301 through .0304** (Application, Permitting, and Inspection) – 4 questions.
7. **15A NCAC 02C .0305 & .0306** (Grout Inspection and Well Completion) – 2 or 3 questions.
8. **15A NCAC 27 .0110 & .0301 & GS 87-98 (.1-4)** (Well Contractor Certification) – 4 questions.
9. **15A NCAC 18A .3800 and GS 87-85 and 87-97** (Wells, Sampling, and Programs) – 6 to 7 questions. Until the .3800 rules are finalized only information that is in both the draft .3800 rules and also in the GS will be on the test.
10. **15A NCAC 18C .0100** (Water Systems) – 2 to 3 questions, dealing with public, community, and non-community definitions.
11. **General Knowledge** – 2 or 3 questions. This section will cover basics of groundwater occurrence and flow (as presented in SOP and CIT courses), an understanding of lab reporting information (i.e. concentration units, pH, etc.), and required tasks for becoming authorized to administer a well program.

Despite exam questions being developed only from the above listed sections, it is imperative for you to thoroughly know 15A NCAC 02C .0100, .0300, and 15A NCAC 18A .1700, when administering your well program. Therefore, these and other references are included in the following pages. Additionally, the sections listed above are highlighted in the references to assist you with focusing your study time. Questions will come from these highlighted areas.

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Exam Answer Sheet

Name: _____

Test No: _____

1	A	B	C	D	TRUE	FALSE
2	A	B	C	D	TRUE	FALSE
3	A	B	C	D	TRUE	FALSE
4	A	B	C	D	TRUE	FALSE
5	A	B	C	D	TRUE	FALSE
6	A	B	C	D	TRUE	FALSE
7	A	B	C	D	TRUE	FALSE
8	A	B	C	D	TRUE	FALSE
9	A	B	C	D	TRUE	FALSE
10	A	B	C	D	TRUE	FALSE
11	A	B	C	D	TRUE	FALSE
12	A	B	C	D	TRUE	FALSE
13	A	B	C	D	TRUE	FALSE
14	A	B	C	D	TRUE	FALSE
15	A	B	C	D	TRUE	FALSE
16	A	B	C	D	TRUE	FALSE
17	A	B	C	D	TRUE	FALSE
18	A	B	C	D	TRUE	FALSE
19	A	B	C	D	TRUE	FALSE
20	A	B	C	D	TRUE	FALSE
21	A	B	C	D	TRUE	FALSE
22	A	B	C	D	TRUE	FALSE
23	A	B	C	D	TRUE	FALSE
24	A	B	C	D	TRUE	FALSE
25	A	B	C	D	TRUE	FALSE

26	A	B	C	D	TRUE	FALSE
27	A	B	C	D	TRUE	FALSE
28	A	B	C	D	TRUE	FALSE
29	A	B	C	D	TRUE	FALSE
30	A	B	C	D	TRUE	FALSE
31	A	B	C	D	TRUE	FALSE
32	A	B	C	D	TRUE	FALSE
33	A	B	C	D	TRUE	FALSE
34	A	B	C	D	TRUE	FALSE
35	A	B	C	D	TRUE	FALSE
36	A	B	C	D	TRUE	FALSE
37	A	B	C	D	TRUE	FALSE
38	A	B	C	D	TRUE	FALSE
39	A	B	C	D	TRUE	FALSE
40	A	B	C	D	TRUE	FALSE
41	A	B	C	D	TRUE	FALSE
42	A	B	C	D	TRUE	FALSE
43	A	B	C	D	TRUE	FALSE
44	A	B	C	D	TRUE	FALSE
45	A	B	C	D	TRUE	FALSE
46	A	B	C	D	TRUE	FALSE
47	A	B	C	D	TRUE	FALSE
48	A	B	C	D	TRUE	FALSE
49	A	B	C	D	TRUE	FALSE
50	A	B	C	D	TRUE	FALSE

Color in your answers with pencil

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References

SUBCHAPTER 2C - WELL CONSTRUCTION STANDARDS

SECTION .0100 - CRITERIA AND STANDARDS APPLICABLE TO WATER-SUPPLY AND CERTAIN OTHER TYPE WELLS

15A NCAC 02C .0101 GENERAL PROVISIONS

(a) Authorization. The North Carolina Environmental Management Commission is required, under the provisions of Chapter 87, Article 7, Section 87, General Statutes of North Carolina (short title: North Carolina Well Construction Act) to adopt appropriate rules governing the location, construction, repair, and abandonment of wells, and the installation and repair of pumps and pumping equipment.

(b) Purpose. Consistent with the duty to safeguard the public welfare, safety, health, and to protect and beneficially develop the groundwater resources of the state, it is declared to be the policy of this state to require that the location, construction, repair and abandonment of wells, and the installation of pumps and pumping equipment conform to such reasonable standards and requirements as may be necessary to protect the public welfare, safety, health, and ground water resources.

History Note: Authority G.S. 87-87;
Eff. February 1, 1976;
Amended Eff. December 1, 1992; July 1, 1988.

15A NCAC 02C .0102 DEFINITIONS

As used herein, unless the context otherwise requires:

- (1) "Abandon" means to discontinue the use of and to seal the well according to the requirements of 15A NCAC 2C .0113 of this Section.
- (2) "Access port" means an opening in the well casing or well head installed for the primary purpose of determining the position of the water level in the well.
- (3) "Agent" means any person who by mutual and legal agreement with a well owner has authority to act in his behalf in executing applications for permits. The agent may be either general agent or a limited agent authorized to do one particular act.
- (4) "ASTM" means the American Society for Testing and Materials.
- (5) "Casing" means pipe or tubing constructed of specified materials and having specified dimensions and weights, that is installed in a borehole, during or after completion of the borehole, to support the side of the hole and thereby prevent caving, to allow completion of a well, to prevent formation material from entering the well, to prevent the loss of drilling fluids into permeable formations, and to prevent entry of contamination.
- (6) "Clay" means a substance comprised of natural, inorganic, finely ground crystalline mineral fragments which, when mixed with water, forms a pasty, moldable mass that preserves its shape when air dried.
- (7) "Commission" means the North Carolina Environmental Management Commission or its successor, unless otherwise indicated.
- (8) "Consolidated rock" means rock that is firm and coherent, solidified or cemented, such as granite, gneiss, limestone, slate or sandstone, that has not been decomposed by weathering.
- (9) "Contamination" means the introduction of foreign materials of such nature, quality, and quantity into the groundwaters as to exceed the groundwater quality standards specified in 15A NCAC 2L (Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina).
- (10) "Department" means the Department of Environment and Natural Resources.
- (11) "Designed capacity" shall mean that capacity that is equal to the yield that is specified prior to construction of the well.
- (12) "Director" means the Director of the Division of Water Quality.
- (13) "Division" means the Division of Water Quality.

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- (14) "Domestic use" means water used for drinking, bathing, or other household purposes, livestock, or gardens.
- (15) "Formation Material" means naturally occurring material generated during the drilling process that is composed of sands, silts, clays or fragments of rock and which is not in a dissolved state.
- (16) "GPM" and "GPD" mean gallons per minute and gallons per day, respectively.
- (17) "Grout" shall mean and include the following:
- (a) "Neat cement grout" means a mixture of not more than six gallons of clear, potable water to one 94 pound bag of portland cement. Up to five percent, by weight, of bentonite clay may be used to improve flow and reduce shrinkage.
 - (b) "Sand cement grout" means a mixture of not more than two parts sand and one part cement and not more than six gallons of clear, potable water per 94 pound bag of portland cement.
 - (c) "Concrete grout" means a mixture of not more than two parts gravel to one part cement and not more than six gallons of clear, potable water per 94 pound bag of portland cement. One hundred percent of the gravel must pass through a one-half inch mesh screen.
 - (d) "Gravel cement grout, sand cement grout or rock cutting cement grout" means a mixture of not more than two parts gravel and sand or rock cuttings to one part cement and not more than six gallons of clear, potable water per 94 pound bag of portland cement.
 - (e) "Bentonite grout" means the mixture of no less than one and one-half pounds of commercial bentonite with sufficient clear, potable water to produce a grout weighing no less than 9.4 pounds per gallon of mixture. Non-organic, non-toxic substances may be added to improve particle distribution and pumpability. Bentonite grout may only be used in those instances where specifically approved in this Section and only as recommended by the manufacturer.
 - (f) "Specialty grout" means a mixture of non-organic, non-toxic materials with characteristics of expansion, chemical-resistance, rate or heat of hydration, viscosity, density or temperature-sensitivity applicable to specific grouting requirements. Specialty grouts may not be used without prior approval by the Director. Approval of the use of specialty grouts shall be based on a demonstration that the mixture will not adversely impact human health or the environment.
- (18) "Liner pipe" means pipe that is installed inside a completed and cased well for the purpose of preventing the entrance of contamination into the well or for repairing ruptured or punctured casing or screens.
- (19) "Monitoring well" means any well constructed for the primary purpose of obtaining samples of groundwater or other liquids for examination or testing, or for the observation or measurement of groundwater levels. This definition excludes lysimeters, tensiometers, and other devices used to investigate the characteristics of the unsaturated zone but includes piezometers, a type of monitor well constructed solely for the purpose of determining groundwater levels.
- (20) "Owner" means any person who holds the fee or other property rights in the well being constructed. A well is real property and its construction on land rests ownership in the land owner in the absence of contrary agreement in writing.
- (21) "Pitless adapters" or "pitless units" are devices specifically manufactured to the standards specified under 15A NCAC 2C .0107(i)(5) of this Section for the purpose of allowing a subsurface lateral connection between a well and plumbing appurtenances.
- (22) "Public water system" means a water system as defined in 15A NCAC 18C (Rules Governing Public Water Supplies).
- (23) "Recovery well" means any well constructed for the purpose of removing contaminated groundwater or other liquids from the subsurface.
- (24) "Settleable solids" means the volume of solid particles in a well-mixed one liter sample which will settle out of suspension, in the bottom of an Imhoff Cone, after one hour.

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- (25) "Site" means the land or water area where any facility, activity or situation is physically located, including adjacent or nearby land used in connection with the facility, activity or situation.
- (26) "Specific capacity" means the yield of the well expressed in gallons per minute per foot of draw-down of the water level (gpm/ft.-dd) per unit of time.
- (27) "Static water level" means the level at which the water stands in the well when the well is not being pumped and is expressed as the distance from a fixed reference point to the water level in the well.
- (28) "Suspended solids" means the weight of those solid particles in a sample which are retained by a standard glass microfiber filter, with pore openings of one and one-half microns, when dried at a temperature of 103 to 105 degrees Fahrenheit.
- (29) "Temporary well" means a well, other than a water supply well, that is constructed to determine aquifer characteristics, and which will be properly abandoned or converted to a permanent well within five days (120 hours) of the completion of drilling of the borehole.
- (30) "Turbidity" means the cloudiness in water, due to the presence of suspended particles such as clay and silt, that may create esthetic problems or analytical difficulties for determining contamination. Turbidity, measured in Nephelometric Turbidity Units (NTU), is based on a comparison of the cloudiness in the water with that in a specially prepared standard.
- (31) "Vent" means an opening in the well casing or well head, installed for the purpose of allowing changes in the water level in a well due to natural atmospheric changes or to pumping. A vent can also serve as an access port.
- (32) "Well" means any excavation that is cored, bored, drilled, jetted, dug or otherwise constructed for the purpose of locating, testing, developing, draining or recharging any groundwater reservoirs or aquifer, or that may control, divert, or otherwise cause the movement of water from or into any aquifer.
- (33) "Well capacity" shall mean the maximum quantity of water that a well will yield continuously as determined by methods outlined in 15A NCAC 2C .0110.
- (34) "Well head" means the upper terminal of the well including adapters, ports, valves, seals, and other attachments.
- (35) "Well system" means two or more cross-connected wells.
- (36) "Yield" means the amount of water or other fluid that can be extracted from a well under a given set of conditions.

History Note: Authority G.S. 87-85; 87-87; 143-214.2; 143-215.3;
Eff. February 1, 1976;
Amended Eff. April 1, 2001; December 1, 1992; July 1, 1988; March 1, 1985; September 1, 1984.

15A NCAC 02C .0103 REGISTRATION

Pump Installer Registration:

- (1) All persons, firms, or corporations engaged in the business of installing or repairing pumps or other equipment in wells shall register bi-annually with the Department.
- (2) Registration shall be accomplished, during the period from April 1 to April 30 of every odd-numbered year, by completing and submitting to the department a registration form provided by the department for this purpose.
- (3) Upon receipt of a properly completed application form, the applicant will be issued a certificate of registration.

History Note: Authority G.S. 87-87; 143-215.3(a)(1a); 143-355(e);
Eff. February 1, 1976;
Amended Eff. April 1, 2001; December 1, 1992; July 1, 1988; April 20, 1978.

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15A NCAC 02C .0104 PUMP INSTALLATION REGISTRATION

History Note: Authority G.S. 87-87;
Eff. February 1, 1976;
Repealed Eff. July 1, 1988.

15A NCAC 02C .0105 PERMITS

(a) It is the finding of the Commission that the entire geographical area of the state is vulnerable to groundwater pollution from improperly located, constructed, operated, altered, or abandoned non-water supply wells and water supply wells not constructed in accordance with the standards set forth in 15A NCAC 2C .0107 of this Section. Therefore, in order to ensure reasonable protection of the groundwater resources, prior permission from the Division must be obtained for the construction of the types of wells enumerated in Paragraph (b) of this Rule.

(b) No person shall locate or construct any of the following wells until a permit has been issued by the Director:

- (1) any water-well or well system with a design capacity of 100,000 gallons per day (gpd) or greater;
- (2) any well added to an existing system where the total design capacity of such existing well system and added well will equal or exceed 100,000 gpd;
- (3) any monitoring well, constructed to assess the impact of an activity not permitted by the state, when installed on property other than that on which the unpermitted activity took place;
- (4) any recovery well;
- (5) any well for recharge or injection purposes;
- (6) any well with a design deviation from the standards specified under the rules of this Subchapter.

(c) The Director may delegate, through a Memorandum of Agreement, to another governmental agency, the authority to permit wells that are an integral part of a facility requiring a permit from the agency. Provided, however, that the permittee comply with all provisions of this Subchapter, including construction standards and the reporting requirements as specified in 15A NCAC 2C .0114. In the absence of such agreement, all wells specified in Paragraph (b) of this Rule require a well construction permit in addition to any other permits.

(d) An application for a permit shall be submitted by the owner or his agent. In the event that the permit applicant is not the owner of the property on which the well or well system is to be constructed, the permit application must contain written approval from the property owner and a statement that the applicant assumes total responsibility for ensuring that the well(s) will be located, constructed, maintained and abandoned in accordance with the requirements of this Subchapter.

(e) The application shall be submitted to the Division, on forms furnished by the Division, and shall include the following:

- (1) For all wells:
 - (A) the owner's name (facility name);
 - (B) the owner's mailing address (facility address);
 - (C) description of the well type and activity requiring a permit;
 - (D) facility location (map);
 - (E) a map of the facility and general site area, to scale, showing the locations of:
 - (i) all property boundaries, at least one of which is referenced to a minimum of two landmarks such as identified roads, intersections, streams or lakes within 500 feet of proposed well or well system;
 - (ii) all existing wells, identified by type of use, within 500 feet of proposed well or well system;
 - (iii) the proposed well or well system;
 - (iv) any test borings within 500 feet of proposed well or well system; and
 - (v) all sources of known or potential groundwater contamination (such as septic tank systems; pesticide, chemical or fuel storage areas; animal

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- feedlots; landfills or other waste disposal areas) within 500 feet of the proposed well site;
- (F) the well drilling contractor's name and state certification number, if known;
 - (G) construction diagram of the proposed well(s) including specifications describing all materials to be used, methods of construction and means for assuring the integrity and quality of the finished well(s).
- (2) For water supply wells or well systems with a designed capacity of 100,000 gpd or greater the application shall include, in addition to the information required in Subparagraph (e)(1) of this Rule:
- (A) the number, yield and location of existing wells in the system;
 - (B) the design capacity of the proposed well(s);
 - (C) any other well construction information or site specific information deemed necessary by the Director for the protection of human health and the environment.
- (3) For those monitoring wells with a design deviation from the specifications of 15A NCAC 2C .0108 of this Section, in addition to the information required in Subparagraph (e)(1) of this Rule:
- (A) a description of the subsurface conditions sufficient to evaluate the site. Data from test borings, wells pumping tests, etc., may be required as necessary;
 - (B) a description of the quantity, character and origin of the contamination;
 - (C) justification for the necessity of the design deviation; and
 - (D) any other well construction information or site specific information deemed necessary by the Director for the protection of human health and the environment.
- (4) For those recovery wells with a design deviation from the specifications in 15A NCAC 2C .0108 of this Section, in addition to the information required in Subparagraph (e)(1) and Parts (e)(3)(A), (B) and (C) of this Rule, the application shall describe the disposition of any fluids recovered if the disposal of those fluids will have an impact on any existing wells other than those installed for the express purpose of measuring the effectiveness of the recovery well(s).
- (f) In the event of an emergency, monitoring wells or recovery wells may be constructed after verbal approval is provided by the Director or his delegate. After-the-fact applications shall be submitted by the driller or owner within ten days after construction begins. The application shall include construction details of the monitoring well(s) or recovery well(s) and include the name of the person who gave verbal approval and the time and date that approval was given.
- (g) It shall be the responsibility of the well owner or his agent to see that a permit is secured prior to the beginning of construction of any well for which a permit is required under the rules of this Subchapter.

History Note: Authority G.S. 87-87; 143-215.1;
Eff. February 1, 1976;
Amended Eff. April 1, 2001; December 1, 1992; March 1, 1985; September 1, 1984;
April 20, 1978.

15A NCAC 02C .0106 WATER USE PERMIT

History Note: Authority G.S. 143-215.14; 143-215.15;
Eff. February 1, 1976;
Repealed Eff. April 20, 1978.

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15A NCAC 02C .0107 STANDARDS OF CONSTRUCTION: WATER-SUPPLY WELLS

(a) Location.

- (1) The well shall not be located in an area generally subject to flooding. Areas which have a propensity for flooding include those with concave slope, alluvial or colluvial soils, gullies, depressions, and drainage ways;
- (2) The minimum horizontal separation between a well, intended for a single-family residence or other non-public water system, and potential sources of groundwater contamination, which exists at the time the well is constructed, shall be as follows unless otherwise specified:
 - (A) Septic tank and drainfield 100 ft.
 - (B) Other subsurface ground absorption waste disposal system 100 ft.
 - (C) Industrial or municipal sludge-spreading or wastewater-irrigation sites 100 ft.
 - (D) Water-tight sewage or liquid-waste collection or transfer facility 50 ft.
 - (E) Other sewage and liquid-waste collection or transfer facility 100 ft.
 - (F) Cesspools and privies 100 ft.
 - (G) Animal feedlots or manure piles 100 ft.
 - (H) Fertilizer, pesticide, herbicide or other chemical storage areas 100 ft.
 - (I) Non-hazardous waste storage, treatment or disposal lagoons 100 ft.
 - (J) Sanitary landfills 500 ft.
 - (K) Other non-hazardous solid waste landfills, such as Land Clearing and Inert Debris (LCID) landfills 100 ft.
 - (L) Animal barns 100 ft.
 - (M) Building foundations, excluding the foundation of a structure housing the well head 25 ft.
 - (N) Surface water bodies which act as sources of groundwater recharge, such as ponds, lakes and reservoirs 50 ft.
 - (O) All other surface water bodies, such as brooks, creeks, streams, rivers, sounds, bays and tidal estuaries 25 ft.
 - (P) Chemical or petroleum fuel underground storage tanks regulated under 15A NCAC 02N:
 - (i) with secondary containment 50 ft.
 - (ii) without secondary containment 100 ft.
 - (Q) Above ground or underground storage tanks which contain petroleum fuels used for heating equipment, boilers or furnaces 50 ft.
 - (R) All other potential sources of groundwater contamination 50 ft.
- (3) For a well serving a single-family dwelling where lot size or other fixed conditions preclude the separation distances specified in Subparagraph (a)(2) of this Rule, the required horizontal separation distances shall be the maximum possible but shall in no case be less than the following:
 - (A) Septic tank and drainfield 50 ft.
 - (B) Water-tight sewage or liquid-waste collection or transfer facility 25 ft.
 - (C) Animal barns 50 ft.
 - (D) Cesspool or privies 50 ft.
- (4) A well or well system, serving more than one single-family dwelling but with a designed capacity of less than 100,000 gpd, must meet the separation requirements specified in Subparagraph (a)(2) of this Rule;
- (5) A well or well system with a designed capacity of 100,000 gpd or greater must be located a sufficient distance from known or anticipated sources of groundwater contamination so as to prevent a violation of applicable groundwater quality standards, resulting from the movement of contaminants, in response to the operation of the well or well system at the proposed rate and schedule of pumping;
- (6) Actual separation distances must conform with the most stringent of applicable federal, state or local requirements;
- (7) Wells drilled for public water supply systems regulated by the Division of Environmental Health shall meet the siting and all other requirements of that Division.

(b) Source of water.

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- (1) The source of water for any well intended for domestic use shall not be from a water bearing zone or aquifer that is known to be contaminated;
 - (2) In designated areas described in 15A NCAC 02C .0117 of this Section, the source shall be greater than 35 feet below land surface;
 - (3) In designated areas described in 15A NCAC 02C .0116 of this Section, the source may be less than 20 feet below land surface, but in no case less than 10 feet below land surface; and
 - (4) In all other areas the source shall be at least 20 feet below land surface.
- (c) Drilling Fluids and Additives. Drilling Fluids and Additives shall not contain organic or toxic substances or include water obtained from surface water bodies or water from a non-potable supply and may be comprised only of:
- (1) the formational material encountered during drilling; or
 - (2) materials manufactured specifically for the purpose of borehole conditioning or water well construction.
- (d) Casing.
- (1) If steel casing is used, then:
 - (A) The casing shall be new, seamless or electric-resistance welded galvanized or black steel pipe. Galvanizing shall be done in accordance with requirements of ASTM A-120;
 - (B) The casing, threads and couplings shall meet or exceed the specifications of ASTM A-53, A-120 or A589;
 - (C) The minimum wall thickness for a given diameter shall equal or exceed that specified in Table 1;

TABLE 1: MINIMUM WALL THICKNESS FOR STEEL CASING:

Nominal Diameter (in.)	Wall Thickness (in.)
For 3-1/2" or smaller pipe, schedule 40 is required	
4	0.142
5	0.156
5-1/2	0.164
6	0.185
8	0.250
10	0.279

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12 0.330

14 and larger 0.375

- (D) Stainless steel casing, threads, and couplings shall conform in specifications to the general requirements in ASTM A-530 and also shall conform to the specific requirements in the ASTM standard that best describes the chemical makeup of the stainless steel casing that is intended for use in the construction of the well;
- (E) Stainless steel casing shall have a minimum wall thickness that is equivalent to standard schedule number 10S; and
- (F) Steel casing shall be equipped with a drive shoe if the casing is driven in a consolidated rock formation. The drive shoe shall be made of forged, high carbon, tempered seamless steel and shall have a beveled, hardened cutting edge. A drive shoe shall not be required for wells in which a cement or concrete grout surrounds and extends the entire length of the casing.
- (2) If Thermoplastic Casing is used, then:
 - (A) the casing shall be new;
 - (B) the casing and joints shall meet or exceed all the specifications of ASTM F-480-81, except that the outside diameters shall not be restricted to those listed in F-480; and
 - (C) the maximum depth of installation for a given SDR or Schedule number shall not exceed that listed in Table 2 unless the well drilling contractor can provide the Division, upon request, with written documentation from the manufacturer of the casing stating that the casing may safely be used at the depth at which it is to be installed.

TABLE 2: Maximum allowable depths (in feet) of Installation of Thermoplastic Water Well Casing

Schedule number-		Nominal Diameter (in inches)											
		2.5	3	3.5	4	5	6	8	10	12	14	16	
Schedule 40-		485	635	415	315	253	180	130	85	65	65	50	50
Schedule 80-		1460	1685	1170	920	755	550	495	340	290	270	265	255
SDR Number		All Diameters (in inches)											

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SDR 41	20
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SDR 32.5	50
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SDR 27.5	100
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SDR 26	95
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SDR 21	185
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SDR 17	355
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SDR 13.5	735
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- (D) The top of the casing shall be terminated by the drilling contractor at least twelve inches above land surface.
- (E) For wells in which the casing will extend into consolidated rock, thermoplastic casing shall be equipped with a coupling, or other device approved by the manufacturer of the casing, that is sufficient to protect the physical integrity of the thermoplastic casing during the processes of seating and grouting the casing and subsequent drilling operations.
- (F) Thermoplastic casing shall not be driven into consolidated rock.
- (3) In constructing any well, all water-bearing zones that are known to contain polluted, saline, or other non-potable water shall be adequately cased and cemented off so that pollution of overlying and underlying groundwater zones shall not occur.
- (4) Every well shall be cased so that the bottom of the casing extends to a minimum depth as follows:
 - (A) Wells located within the area described in 15A NCAC 02C .0117 of this Section shall be cased from land surface to a depth of at least 35 feet.
 - (B) Wells located within the area described in 15A NCAC 02C .0116 of this Section shall be cased from land surface to a depth of at least 10 feet.
 - (C) Wells located in any other area shall be cased from land surface to a depth of at least 20 feet.
- (5) The top of the casing shall be terminated by the drilling contractor at least 12 inches above land surface.
- (6) The casing in wells constructed to obtain water from a consolidated rock formation shall be:
 - (A) adequate to prevent any formational material from entering the well in excess of the levels specified in Paragraph (h) of this Rule; and
 - (B) firmly seated at least five feet into the rock.
- (7) The casing in wells constructed to obtain water from an unconsolidated rock formation (such as gravel, sand or shells) shall extend at least one foot into the top of the water-bearing formation.

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- (8) Upon completion of the well, the well shall be sufficiently free of obstacles including formation material as necessary to allow for the installation and proper operation of pumps and associated equipment.

(e) Grouting.

- (1) Casing shall be grouted to a minimum depth of twenty feet below land surface except that:
- (A) In those areas designated by the Director to meet the criteria of 15A NCAC 02C .0116 of this Section, grout shall extend to a depth of two feet above the screen or, for open end wells, to the bottom of the casing, but in no case less than 10 feet.
 - (B) In those areas designated in 15A NCAC 02C .0117 of this Section, grout shall extend to a minimum of 35 feet below land surface.
 - (C) The casing shall be grouted as necessary to seal off, from the producing zone(s), all aquifers or zones with water containing organic or other contaminants of such type and quantity as to render water from those aquifers or zones unsafe or harmful or unsuitable for human consumption and general use.
- (2) For large diameter wells cased with concrete pipe or ceramic tile of a pipe diameter equal to or greater than 20 inches, the following shall apply:
- (A) The diameter of the bore hole shall be at least six inches larger than the outside diameter of the casing;
 - (B) The annular space around the casing shall be filled with a cement-type grout to a depth of at least 20 feet, excepting those designated areas specified in 15A NCAC 02C .0116 and 15A NCAC 02C .0117 of this Section. The grout shall be placed in accordance with the requirements of this Paragraph.
- (3) Bentonite grout may be used in that portion of the borehole that is at least three feet below land surface. That portion of the borehole above the bentonite grout, up to land surface, shall be filled with a concrete or cement-type grout.
- (4) Grout shall be placed around the casing by one of the following methods:
- (A) Pressure. Grout shall be pumped or forced under pressure through the bottom of the casing until it fills the annular area around the casing and overflows at the surface; or
 - (B) Pumping. Grout shall be pumped into place through a hose or pipe extended to the bottom of the annular space which can be raised as the grout is applied. The grout hose or pipe shall remain submerged in grout during the entire application; or
 - (C) Other. Grout may be emplaced in the annular space by gravity flow in such a way to ensure complete filling of the space to a maximum depth of 20 feet below land surface.
- (5) If an outer casing is installed, it shall be grouted by either the pumping or pressure method.
- (6) The liquid and solid components of all grout mixtures shall be thoroughly blended prior to emplacement below land surface.
- (7) The well shall be grouted within five working days after the casing is set.
- (8) No additives which will accelerate the process of hydration shall be used in grout for thermoplastic well casing.
- (9) Where grouting is required by the provisions of this Section, the grout shall extend outward from the casing wall to a minimum thickness equal to either one-third of the diameter of the outside dimension of the casing or two inches, whichever is greater; excepting, however, that large diameter bored wells shall meet the requirements of Subparagraph (e)(2) of this Rule.

(f) Well Screens.

- (1) The well, if constructed to obtain water from an unconsolidated rock formation, shall be equipped with a screen that will prevent the entrance of formation material into the well after the well has been developed and completed by the well contractor.
- (2) The well screen be of a design to permit the optimum development of the aquifer with minimum head loss consistent with the intended use of the well. The openings shall be

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designed to prevent clogging and shall be free of rough edges, irregularities or other defects that may accelerate or contribute to corrosion or clogging.

- (3) Multi-screen wells shall not connect aquifers or zones which have differences in water quality which would result in contamination of any aquifer or zone.

(g) Gravel-and Sand-Packed Wells.

- (1) In constructing a gravel-or sand-packed well:

- (A) The packing material shall be composed of quartz, granite, or similar mineral or rock material and shall be clean, of uniform size, water-washed and free from clay, silt, or other deleterious material.

- (B) The size of the packing material shall be determined from a grain size analysis of the formation material and shall be of a size sufficient to prohibit the entrance of formation material into the well in concentrations above those permitted by Paragraph (h) of this Rule.

- (C) The packing material shall be placed in the annular space around the screens and casing by a fluid circulation method, preferably through a conductor pipe to ensure accurate placement and avoid bridging.

- (D) The packing material shall be disinfected.

- (E) Centering guides must be installed within five feet of the top packing material to ensure even distribution of the packing material in the borehole.

- (2) The packing material shall not connect aquifers or zones which have differences in water quality that would result in deterioration of the water quality in any aquifer or zone.

(h) Well Development.

- (1) All water supply wells shall be developed by the well driller;

- (2) Development shall include removal of formation materials, mud, drilling fluids and additives such that the water contains no more than:

- (A) five milliliters per liter of settleable solids; and

- (B) 10 NTUs of turbidity as suspended solids.

- (3) Development shall not require efforts to reduce or eliminate the presence of dissolved constituents which are indigenous to the ground water quality in that area. Typical dissolved constituents include, but are not limited to, aluminum, calcium, chloride, iron, magnesium, manganese, sodium and sulphate.

(i) Well Head Completion.

- (1) Access Port. Every water supply well and such other wells as may be specified by the Commission shall be equipped with a usable access port or air line. The access port shall be at least one half inch inside diameter opening so that the position of the water level can be determined at any time. Such port shall be installed and maintained in such manner as to prevent entrance of water or foreign material.

- (2) Well Contractor Identification Plate.

- (A) An identification plate, showing the drilling contractor and certification number and the information specified in Part (i)(2)(E) of this Rule, shall be installed on the well within 72 hours after completion of the drilling.

- (B) The identification plate shall be constructed of a durable weatherproof, rustproof metal, or equivalent material approved by the Director.

- (C) The identification plate shall be securely attached to either the aboveground portion of the well casing, surface grout pad or enclosure floor around the casing where it is readily visible.

- (D) The identification plate shall not be removed by any person.

- (E) The identification plate shall be stamped or otherwise imprinted with permanent legible markings to show the:

- (i) total depth of well;

- (ii) casing depth (ft.) and inside diameter (in.);

- (iii) screened intervals of screened wells;

- (iv) packing interval of gravel-or sand-packed wells;

- (v) yield, in gallons per minute (gpm), or specific capacity in gallons per minute per foot of drawdown (gpm/ft.-dd);

- (vi) static water level and date measured; and

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- (vii) date well completed.
- (3) Pump Installer Identification Plate.
 - (A) An identification plate, showing the name and registration number of the pump installation contractor, and the information specified in Part (i)(3)(D) of this Rule, shall be securely attached to either the aboveground portion of the well casing, surface grout pad or the enclosure floor if present, within 72 hours after completion of the pump installation;
 - (B) The identification plate shall be constructed of a durable waterproof, rustproof metal, or equivalent material approved by the Director;
 - (C) The identification plate shall not be removed by any person; and
 - (D) The identification plate shall be stamped or otherwise imprinted with permanent legible, markings to show the:
 - (i) date the pump was installed;
 - (ii) the depth of the pump intake; and
 - (iii) the horsepower rating of the pump.
- (4) Valved flow. Every artesian well that flows under natural artesian pressure shall be equipped with a valve so that the flow can be completely stopped. Well owners shall be responsible for the installation, operation and maintenance of the valve.
- (5) Pitless adapters or pitless units shall be allowed as a method of well head completion under the following conditions:
 - (A) The pitless device shall be manufactured specifically for the purpose of water well construction;
 - (B) Design, installation and performance standards shall be those specified in PAS-1 (Pitless Adapter Standard No. 1) as adopted by the Water System Council's Pitless Adapter Division;
 - (C) The pitless device shall be compatible with the well casing;
 - (D) The top of the pitless device shall extend at least eight inches above land surface;
 - (E) The pitless device shall have an access port.
- (6) All openings for piping, wiring, and vents shall enter into the well at least 12 inches above land surface, except where pitless adapters or pitless units are used, and shall be adequately sealed to preclude the entrance of contaminants into the well.

*History Note: Authority G.S. 87-87; 87-88;
Eff. February 1, 1976;
Amended Eff. May 14, 2001; December 1, 1992; March 1, 1985; September 1, 1984;
April 20, 1978;
Temporary Amendment Eff. August 3, 2001;
Amended Eff. August 1, 2002.*

15A NCAC 02C .0108 STANDARDS OF CONSTRUCTION: WELLS OTHER THAN WATER SUPPLY

- (a) No well shall be located, constructed, operated, or repaired in any manner that may adversely impact the quality of groundwater.
- (b) Injection wells shall conform to the standards set forth in Section .0200 of this Subchapter.
- (c) Monitoring wells and recovery wells shall be located, designed, constructed, operated and abandoned with materials and by methods which are compatible with the chemical and physical properties of the contaminants involved, specific site conditions and specific subsurface conditions. Specific construction standards will be itemized in the construction permit, if such a permit is required, but the following general requirements will apply:
 - (1) The borehole shall not penetrate to a depth greater than the depth to be monitored or the depth from which contaminants are to be recovered.
 - (2) The well shall not hydraulically connect:
 - (A) separate aquifers; or

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- (B) those portions of a single aquifer where known or suspected contamination would occur in separate and definable layers within the aquifer.
 - (3) The well construction materials shall be compatible with the depth of the well and the contaminants to be monitored or recovered.
 - (4) The well shall be constructed in such a manner that water or contaminants from the land surface cannot migrate along the borehole annulus into any packing material or well screen area.
 - (5) Packing material placed around the screen shall extend at least one foot above the top of the screen. Unless the depth of the screen necessitates a thinner seal; a one foot thick seal, comprised of bentonitic clay or other material approved by the Director, shall be emplaced directly above and in contact with the packing material.
 - (6) Grout shall be placed in the annular space between the outermost casing and the borehole wall from the land surface to the top of the bentonite clay seal above any well screen or to the bottom of the casing for open end wells. To provide stability for the well casing, the uppermost three feet of grout below land surface must be a concrete or cement-type grout.
 - (7) All wells shall be secured, with a locking well cap, to reasonably ensure against unauthorized access and use.
 - (8) All wells shall be afforded reasonable protection against damage during construction and use.
 - (9) Any wells that would flow under natural artesian conditions shall be valved so that the flow can be regulated.
 - (10) The well casing shall be terminated no less than 12 inches above land surface datum unless both of the following conditions are met:
 - (A) site-specific conditions directly related to business activities, such as vehicle traffic, would endanger the physical integrity of the well; and
 - (B) the well head is completed in such a manner so as to preclude surficial contaminants from entering the well.
 - (11) Each well shall have securely affixed an identification plate constructed of a durable material and shall contain the following information:
 - (A) drilling contractor, or pump installation contractor, name and applicable certification or registration numbers;
 - (B) date well completed;
 - (C) total depth of well;
 - (D) a warning that the well is not for water supply and that the groundwater may contain hazardous materials; and
 - (E) depth(s) to the top(s) and bottom(s) of the screen(s).
 - (12) Each well shall be developed such that the level of turbidity or settleable solids does not preclude accurate chemical analyses of any fluid samples collected.
- (d) Wells constructed for the purpose of monitoring or testing for the presence of liquids associated with tanks regulated under 15A NCAC 02N (Criteria and Standards Applicable to Underground Storage Tanks) shall be constructed in accordance with 15A NCAC 02N .0504.
- (e) Wells constructed for the purpose of monitoring for the presence of vapors associated with tanks regulated under 15A NCAC 02N shall:
- (1) be constructed in such a manner as to prevent the entrance of surficial contaminants or water into or alongside the well casing; and
 - (2) be provided with a lockable cap in order to reasonably ensure against unauthorized access and use.
- (f) Temporary wells and all other non-water supply wells shall be constructed in such a manner as to preclude the vertical migration of contaminants within and along the borehole channel.
- (g) For monitoring, sand-or gravel packed wells, centering guides must be evenly distributed in the borehole.

*History Note: Authority G.S. 87-87; 87-88;
Eff. February 1, 1976;
Amended Eff. April 1, 2001; December 1, 1992; September 1, 1984; April 20, 1978.*

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15A NCAC 02C .0109 PUMPS AND PUMPING EQUIPMENT

- (a) The pumping capacity of the pump shall be consistent with the intended use and yield characteristics of the well.
- (b) The pump and related equipment for the well shall be conveniently located to permit easy access and removal for repair and maintenance.
- (c) The base plate of a pump placed directly over the well shall be designed to form a watertight seal with the well casing or pump foundation.
- (d) In installations where the pump is not located directly over the well, the annular space between the casing and pump intake or discharge piping shall be closed with a watertight seal preferably designed specifically for this purpose.
- (e) The well shall be properly vented at the well head to allow for the pressure changes within the well except when a suction lift type pump is used.
- (f) A hose bibb shall be installed at the well head by the person installing the pump for obtaining water samples. In the case of offset jet pump installations the hose bibb shall be installed on the return (pressure) side of the jet pump piping.
- (g) A priming tee shall be installed at the well head in conjunction with offset jet pump installations.
- (h) Joints of any suction line installed underground between the well and pump shall be tight under system pressure.
- (i) The drop piping and electrical wiring used in connection with the pump shall meet all applicable underwriters specifications.
- (j) Contaminated water shall not be used for priming the pump.

History Note: Authority G.S. 87-87; 87-88;
Eff. February 1, 1976;
Amended Eff. December 1, 1992; April 20, 1978.

15A NCAC 02C .0110 WELL TESTS FOR YIELD

- (a) Every water supply well shall be tested for capacity by a method and for a period of time as specified in this Rule.
- (b) The permittee may be required as a permit condition to test any well for capacity by a method stipulated in the permit.
- (c) Standard methods for testing domestic well capacities include:
 - (1) Pump Method
 - (A) select a permanent measuring point, such as the top of the casing;
 - (B) measure and record the static water level below or above the measuring point prior to starting the pump;
 - (C) measure and record the discharge rate at intervals of 10 minutes or less;
 - (D) measure and record water levels using a steel or electric tape at intervals of 10 minutes or less;
 - (E) continue the test for a period of at least one hour;
 - (F) make measurements within an accuracy of plus or minus one inch.
 - (2) Bailer Method
 - (A) select a permanent measuring point, such as the top of the casing;
 - (B) measure and record the static water level below or above the measuring point prior to starting the bailing procedure;
 - (C) bail the water out of the well as rapidly as possible for a period of at least one hour; determine and record the bailing rate in gallons per minute at the end of the bailing period;
 - (D) measure and record the water level immediately after stopping bailing process.
 - (3) Air Rotary Drill Method
 - (A) measure and record the amount of water being injected into the well during drilling operations;

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- (B) measure and record the discharge rate in gallons per minute at intervals of one hour or less during drilling operations;
 - (C) after completion of the drilling, continue to blow the water out of the well for at least 30 minutes and measure and record the discharge rate in gallons per minute at intervals of 10 minutes or less during the period;
 - (D) measure and record the water level immediately after discharge ceases.
- (4) Air Lift Method
- (A) Measurements shall be made through a pipe placed in the well;
 - (B) The pipe shall have a minimum inside diameter of at least five-tenths of an inch and shall extend from top of the well head to a point inside the well that is below the bottom of the air line;
 - (C) Measure and record the static water level prior to starting the air compressor;
 - (D) Measure and record the discharge rate at intervals of 10 minutes or less;
 - (E) Measure and record the pumping level using a steel or electric tape at intervals of 10 minutes or less;
 - (F) Continue the test for a period of at least one hour.
- (d) Public, Industrial and Irrigation Wells. Every public, industrial and irrigation well upon completion, shall be tested for capacity by the drilling contractor (except when the owner specifies another agent) by the following or equivalent method:
- (1) The water level in the well to be pumped and any observation wells shall be measured and recorded prior to starting the test.
 - (2) The well shall be tested by a pump of sufficient size and lift capacity to satisfactorily test the yield of the well, consistent with the well diameter and purpose.
 - (3) The pump shall be equipped with sufficient throttling devices to reduce the discharge rate to approximately 25 percent of the maximum capacity of the pump.
 - (4) The test shall be conducted for a period of at least 24 hours without interruption and shall be continued for a period of at least four hours after the pumping water level stabilizes (ceases to decline). When the total water requirements for wells other than public, community or municipal supply wells are less than 100,000 gpd, the well shall be tested for a period and in a manner to satisfactorily show the capacity of the well, or that the capacity of the well is sufficient to meet the intended purpose.
 - (5) The pump discharge shall be set at a constant rate or rates that can be maintained throughout the testing period. If the well is tested at two or more pumping rates (a step-drawdown test), the pumping water level shall be stabilized for a period of at least four hours for each pumping rate.
 - (6) The pump discharge rate shall be measured by an orifice meter, flowmeter, weir, or equivalent metering device. The metering device shall have an accuracy within plus or minus five percent.
 - (7) The discharge rate of the pump and time shall be measured and recorded at intervals of 10 minutes or less during the first two hours of the pumping period for each pumping rate. If the pumping rate is relatively constant after the first two hours of pumping, discharge measurements and recording may be made at longer time intervals but not to exceed one hour.
 - (8) The water level in each well and time shall be measured and recorded at intervals of five minutes or less during the first hour of pumping and at intervals of 10 minutes or less during the second hour of pumping. After the second hour of pumping, the water level in each well shall be measured at such intervals that the lowering of the pumping water level does not exceed three inches between measurements.
 - (9) A reference point for water level measurements (preferably the top of the casing) shall be selected and recorded for the pumping well and each observation well to be measured during the test. All water level measurements shall be made from the selected reference points.
 - (10) All water level measurements shall be made with a steel or electric tape or equivalent measuring device.

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- (11) All water level measurements shall be made within an accuracy of plus or minus one inch.
- (12) After the completion of the pumping period, measurements of the water level recovery rate, in the pumped well, shall be made for a period of at least two hours in the same manner as the drawdown.

History Note: Authority G.S. 87-87; 87-88;
Eff. February 1, 1976;
Amended Eff. April 1, 2001; December 1, 1992; September 1, 1984; April 20, 1978.

15A NCAC 02C .0111 DISINFECTION OF WATER SUPPLY WELLS

All water supply wells shall be disinfected upon completion of construction, maintenance, repairs, pump installation and testing as follows:

- (1) Chlorination.
 - (a) Chlorine shall be placed in the well in sufficient quantities to produce a chlorine residual of at least 100 parts per million (ppm) in the well. A chlorine solution may be prepared by dissolving high test calcium hypochlorite (trade names include HTH, Chlor-Tabs, etc.) in water. Do not use stabilized chlorine tablets or hypochlorite products containing fungicides, algacides, or other disinfectants. Follow manufacturers directions with storing, transporting, and using calcium hypochlorite products. About three ounces of hypochlorite containing 65 percent to 75 percent available chlorine is needed per 100 gallons of water for at least a 100 ppm chlorine residual. As an example, a well having a diameter of six inches, has a volume of about 1.5 gallons per foot. If the well has 200 feet of water, the minimum amount of hypochlorite required would be 9 ounces. (1.5 gallons/foot x 200 feet = 300 gallons at 3 ounces per 100 gallons; 3 ounces x 3 = 9 ounces.)
 - (b) The chlorine shall be placed in the well by one of the following or equivalent methods:
 - (i) Chlorine tablets may be dropped in the top of the well and allowed to settle to the bottom;
 - (ii) Chlorine solutions shall be placed in the bottom of the well by using a bailer or by pouring the solution through the drill rod, hose, or pipe placed in the bottom of the well. The solution shall be flushed out of the drill rod, hose, or pipe by using water or air.
 - (c) Agitate the water in the well to ensure thorough dispersion of the chlorine.
 - (d) The well casing, pump column and any other equipment above the water level in the well shall be thoroughly rinsed with the chlorine solution as a part of the disinfecting process.
 - (e) The chlorine solution shall stand in the well for a period of at least 24 hours.
 - (f) The well shall be pumped until the system is clear of the chlorine before the system is placed in use.
- (2) Other materials and methods of disinfection, at least as effective as those in Item (1) of this Rule, may be used upon prior approval by the Director.

History Note: Authority G.S. 87-87; 87-88;
Eff. February 1, 1976;
Amended Eff. April 1, 2001; December 1, 1992; July 1, 1988; September 1, 1984.

15A NCAC 02C .0112 WELL MAINTENANCE: REPAIR: GROUNDWATER RESOURCES

- (a) Every well shall be maintained by the owner in a condition whereby it will conserve and protect the groundwater resources, and whereby it will not be a source or channel of contamination or pollution to the water supply or any aquifer.
- (b) All materials used in the maintenance, replacement, or repair of any well shall meet the requirements for new installation.

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(c) Broken, punctured or otherwise defective or unserviceable casing, screens, fixtures, seals, or any part of the well head shall be repaired or replaced, or the well shall be abandoned pursuant to the requirements of 15A NCAC 02C .0113.

(d) National Science Foundation (NSF) approved PVC pipe rated at 160 PSI may be used for liner casing. The annular space around the liner casing shall be at least five-eighths inches and shall be completely filled with neat-cement grout. The well liner shall be completely grouted within 10 working days after the liner has been installed.

History Note: Authority G.S. 87-87; 87-88;
Eff. February 1, 1976;
Amended Eff. August 1, 2002; April 1, 2001; December 1, 1992; September 1, 1984.

15A NCAC 02C .0113 ABANDONMENT OF WELLS

(a) Any well which has been temporarily abandoned, shall be abandoned in accordance with one of the following procedures:

- (1) Upon temporary removal from service or prior to being put into service, the well shall be sealed with a water-tight cap or seal compatible with casing and installed so that it cannot be removed easily by hand.
- (2) The well shall be maintained whereby it is not a source or channel of contamination during temporary abandonment.
- (3) Every temporarily abandoned well shall be protected with a casing.

(b) Any well which has been abandoned permanently shall be abandoned in accordance with the following procedures:

- (1) Procedures for permanent abandonment of wells, other than bored and hand dug wells:
 - (A) All casing and screen materials may be removed prior to initiation of abandonment procedures if such removal will not cause or contribute to contamination of the groundwaters. Any casing not grouted in accordance with 15A NCAC 2C .0107(e) of this Section shall be removed or properly grouted.
 - (B) The entire depth of the well shall be sounded before it is sealed to ensure freedom from obstructions that may interfere with sealing operations.
 - (C) Using a hypochlorite solution (such as HTH), disinfect the well in accordance with 15A NCAC 2C .0111. Do not use a common commercial household liquid bleach, as this is too weak a solution to ensure proper disinfection.
 - (D) In the case of gravel-packed wells in which the casing and screens have not been removed, neat-cement, or bentonite grout shall be injected into the well completely filling it from the bottom of the casing to the top.
 - (E) Wells, other than "bored" wells, constructed in unconsolidated formations shall be completely filled with cement grout, or bentonite grout by introducing it through a pipe extending to the bottom of the well which can be raised as the well is filled.
 - (F) Wells constructed in consolidated rock formations or that penetrate zones of consolidated rock may be filled with cement grout, bentonite grout, sand, gravel or drill cuttings opposite the zones of consolidated rock. The top of the cement grout, bentonite grout, sand, gravel or cutting fill shall terminate at least 10 feet below the top of the consolidated rock or five feet below the bottom of casing. Cement grout or bentonite grout shall be placed beginning 10 feet below the top of the consolidated rock or five feet below the bottom of casing and extend five feet above the top of consolidated rock. The remainder of the well, above the upper zone of consolidated rock, shall be filled with cement grout or bentonite grout up to land surface. For any well in which the depth of casing or the depth of the bedrock is not known or cannot be confirmed, then the entire length of the well shall be filled with cement grout or bentonite grout up to land surface.
 - (G) Temporary wells or monitor wells:
 - (i) less than 20 feet in depth which do not penetrate the water table shall be abandoned by filling the entire well up to land surface with cement

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- grout, dry clay, bentonite grout, or material excavated during drilling of the well and then compacted in place; and
- (ii) that penetrate the water table shall be abandoned by completely filling with a bentonite or cement - type grout.
- (2) For bored wells or hand dug wells, constructed into unconsolidated material.
- (A) For wells that do not have standing water in them at any time during the year:
 - (i) Remove all plumbing or piping entering the well, along with any obstructions in the well;
 - (ii) Remove as much of the well casing as possible and then fill the entire well up to land surface with cement grout, concrete grout, bentonite grout, dry clay, or material excavated during drilling of the well and then compacted in place.
 - (B) For wells that do have standing water in them during all or part of the year:
 - (i) Remove all plumbing or piping into the well, along with any obstructions inside the well; and
 - (ii) Remove as much of the well tile casing as possible, but no less than to a depth of three feet below land surface;
 - (iii) Remove all soil or other subsurface material present down to the top of the remaining well casing, and extending to a width of at least 12 inches outside of the well casing on all sides;
 - (iv) Using a hypochlorite solution (such as HTH), disinfect the well in accordance with 15A NCAC 2C .0111 of this Subchapter. Do not use a common commercial household liquid bleach, as this is too weak a solution to ensure proper disinfection;
 - (v) Fill the well up to the top of the remaining casing with cement grout, concrete grout, bentonite grout, dry clay, or material excavated during drilling of the well and then compacted in place;
 - (vi) Pour a one foot thick concrete grout or cement grout plug that fills the entire excavated area above the top of the casing, including the area extending on all sides of the casing out to a width of at least 12 inches on all sides; and
 - (vii) Complete the abandonment process by filling the remainder of the well above the concrete or cement plug with additional concrete grout, cement grout, or soil.
- (c) Any well which acts as a source or channel of contamination shall be repaired or permanently abandoned within 30 days of receipt of notice from the department.
- (d) The drilling contractor shall permanently abandon any well in which the casing has not been installed or from which the casing has been removed, prior to removing his equipment from the site.
- (e) The owner shall be responsible for permanent abandonment of a well except that:
- (1) the well driller is responsible for well abandonment if abandonment is required because the driller improperly locates, constructs, repairs or completes the well; or
 - (2) the person who installs, repairs or removes the well pump is responsible for well abandonment if that abandonment is required because of improper well pump installation, repair or removal.

History Note: Authority G.S. 87-87; 87-88;
Eff. February 1, 1976;
Amended Eff. April 1, 2001; December 1, 1992; September 1, 1984; April 20, 1978.

15A NCAC 02C .0114 DATA AND RECORDS REQUIRED

- (a) Well Cuttings.
- (1) Samples of formation cuttings shall be collected and furnished to the Division from any well when such samples are requested by the Division prior to completion of the drilling or boring activities.

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- (2) Samples or representative cuttings shall be obtained for depth intervals of 10 feet or less beginning at the land surface. Representative cuttings shall also be collected at depths of each significant change in formation.
- (3) Samples of cuttings shall be placed in containers furnished by the Division and such containers shall be filled, sealed and properly labeled with indelible-type markers, showing the well owner, well number if applicable, and depth interval the sample represents.
- (4) Each set of samples shall be placed in a suitable container(s) showing the location, owner, well number if applicable, driller, depth interval, and date.
- (5) Samples shall be retained by the driller until delivery instructions are received from the Division or for a period of at least 60 days after the well record form (GW-1), indicating said samples are available, has been received by the Division.
- (6) The furnishing of samples to any person or agency other than the Division shall not constitute compliance with the department's request and shall not relieve the driller of his obligation to the department.

(b) Reports.

- (1) Any person completing or abandoning any well shall submit to the Division a record of the construction or abandonment. For public water supply wells, a copy of each completion or abandonment record shall also be submitted to the Health Department responsible for the county in which the well is located. The record shall be on forms provided by the Division and shall include certification that construction or abandonment was completed as required by these Rules, the owner's name and address, well location, diameter, depth, yield, and any other information the Division may reasonably require.
- (2) The certified record of completion or abandonment shall be submitted within a period of thirty days after completion or abandonment.
- (3) The furnishing of records to any person or agency other than the Division shall not constitute compliance with the reporting requirement and shall not relieve the driller of his obligation to the Department.

History Note: Authority G.S. 87-87; 87-88;
Eff. February 1, 1976;
Amended Eff. April 1, 2001; December 1, 1992; September 1, 1984; April 20, 1978.

15A NCAC 02C .0115 DIAGRAMS AND FORMS

History Note: Authority G.S. 87-87;
Eff. February 1, 1976;
Amended Eff. April 20, 1978;
Repealed Eff. September 1, 1984.

15A NCAC 02C .0116 DESIGNATED AREAS: WELLS CASED TO LESS THAN 20 FEET

- (a) In some areas the best or only source of potable water supply exists between ten and twenty feet below the surface of the land. In consideration of this, the Director may designate areas of the state where wells may be cased to a depth less than twenty feet. To make this determination, the Director will find:
 - (1) that the only or best source of drinking water exists between a depth of ten and twenty feet below the surface of the land;
 - (2) that utilization of said source of water is in the best interest of the public.
- (b) The following areas are so designated:
 - (1) in Currituck County on Terres Quarter Island and in an area between the sound and a line beginning at the end of SR 1130 near Currituck Sound, thence north to the end of SR 1133, thence north to the end of NC 3 at the intersection with the sound;
 - (2) on the Outer Banks from the northern corporate limit of Nags Head on Bodie Island, south to Ocracoke Inlet;
 - (3) all areas lying between the Intercoastal Waterway and the ocean from New River Inlet south to New Topsail Inlet;

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- (4) all areas lying between the Intercoastal Waterway and the ocean from the Cape Fear River south to the South Carolina line.
- (c) In all other areas, the source of water shall be at least 20 feet below land surface, except when adequate quantities of potable water cannot be obtained below a depth of twenty feet, and at sites not within areas designated in Subparagraph (b) of this Rule the source of water may be obtained from unconsolidated rock formations at depths less than twenty feet provided that:
- (1) the well driller can show to the satisfaction of the Division, that sufficient water of acceptable quality is not available to a minimum depth of fifty feet; and
 - (2) the proposed source of water is the maximum feasible depth above fifty feet, but in no case less than ten feet.
 - (3) the regional office of the department shall be notified prior to the construction of a well obtaining water from a depth between 10 and 20 feet below land surface.

*History Note: Authority G.S. 87-87;
Eff. April 20, 1978;
Amended Eff. December 1, 1992; July 1, 1988; September 1, 1984.*

15A NCAC 02C .0117 DESIGNATED AREAS: WELLS CASED TO MINIMUM DEPTH OF 35 FEET

- (a) Wells drilled in areas underlain by metavolcanic rocks identified on the 1985 State Geologic Map as bedded argillites of the Carolina Slate Belt shall be cased to a minimum depth of 35 feet. These areas are generally described as follows:
- (1) Anson County generally west of a line beginning at the intersection of the runs of the Pee Dee River and Buffalo Creek, thence generally northeast to SR 1627, thence generally south along SR 1627 to the intersection with SR 1632, thence generally west along SR 1632 to the intersection with US 52, thence generally south along US 52 to the intersection with SR 1418, thence generally southwest along SR 1418 to the intersection of US 74, thence generally west along US 74 to the intersection of SR 1251, thence generally southwest along SR 1251 to the intersection with SR 1240, thence generally southeast along SR 1240 to the intersection with SR 1252, thence generally south along SR 1252 to the intersection with SR 1003, thence generally west along SR 1003 to the Union County line;
 - (2) Cabarrus County generally east of a line beginning at the intersection of SR 1113 and the Union County line, thence generally northeast along SR 1113 to the intersection with SR 1114, thence generally east along SR 1114 to the Stanly County line, thence generally northeast along the county line to the intersection with SR 1100, thence generally northeast along SR 1100 to the intersection of with SR 2622, thence generally southeast along SR 2622 to the intersection with SR 2617, thence generally northeast along SR 2617 to the intersection with SR 2611, thence generally north along SR 2611 to the intersection with NC 73, thence generally east along NC 73 to the intersection with SR 2453, thence generally northeast along SR 2453 to the intersection with SR 2444, thence generally northeast along SR 2444 to the Rowan County line;
 - (3) Davidson County generally east of a line starting at the intersection of the runs of Abbotts Creek and the Yadkin River in High Rock Lake, thence generally north along Abbotts Creek to NC 8 bridge, thence generally north along NC 8 to the intersection with Interstate 85, thence generally northeast along Interstate 85 to the intersection with US 64, thence generally southeast along US 64 to the Randolph County line;
 - (4) Montgomery County generally west of a line beginning at the intersection of SR 1134 with the Randolph County line, thence generally south along SR 1134 to the intersection with SR 1303, thence generally south along SR 1303 to the intersection with NC 109, thence generally southeast along NC 109 to the intersection with SR 1150, thence generally south along SR 1150 to the intersection with NC 73, thence generally southeast along NC 73 to the intersection with SR 1112, thence generally east along SR 1112 to the intersection with SR 1130, thence generally northeast along SR 1130 to the intersection with SR 1132, thence generally southeast along SR 1132 to the intersection with SR

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1174, thence generally east along SR 1174 to the intersection with NC 109, thence generally north along NC 109 to the intersection with SR 1546, generally southeast along SR 1546 to the intersection of SR 1543, thence generally south along SR 1543 to the intersection with NC 73, thence generally west along NC 73 to the intersection with SR 1118, thence generally southwest along SR 1118 to the intersection with SR 1116, thence generally west along SR 1116 to the intersection with NC 109, thence generally south along NC 109 to the intersection with the Richmond County line;

- (5) Randolph County generally west of a line beginning at the intersection of US 64 with the Davidson County line, thence generally east along US 64 to the intersection with NC 49, thence generally southwest along NC 49 to the intersection with SR 1107, thence generally south along SR 1107 to the intersection with SR 1105, thence southeast along SR 1105 to the intersection with the Montgomery County line;
- (6) Rowan County generally east of a line beginning at the intersection of SR 2142 with the Cabarrus County line, thence north along SR 2142 to the intersection with SR 2162, thence generally northeast along SR 2162 to the intersection with the run of the Yadkin River in High Rock Lake;
- (7) Union County generally east of a line beginning at the intersection of SR 1117 with the South Carolina-North Carolina State line, thence generally north along SR 1117 to the intersection with SR 1008, thence generally northeast along SR 1008 to the intersection with SR 1514, thence generally north along SR 1514 to the intersection with SR 1520, thence generally northeast along SR 1520 to the intersection with NC 218, thence generally east along NC 218 to the intersection with US 601, thence generally north along US 601 to the intersection with SR 1600, thence generally northeast along SR 1600 to the intersection with the Cabarrus County line;
- (8) Stanly County -- all.

(b) The roads describing the boundaries of the designated areas do not necessarily coincide with the rock unit boundaries. Therefore, any well drilled within 400 feet of a road described as a boundary of a designated area shall be cased to the same minimum depth as those within the described area.

History Note: Authority G.S. 87-87;
Eff. April 20, 1978;
Amended Eff. April 1, 2001.

15A NCAC 02C .0118 VARIANCE

(a) The Director may grant a variance from any construction standard under the rules of this Section. Any variance will be in writing, and may be granted upon oral or written application to the Director, by the person responsible for the construction of the well for which the variance is sought, if the Director finds facts to support the following conclusions:

- (1) that the use of the well will not endanger human health and welfare or the groundwater;
- (2) that construction in accordance with the standards was not technically feasible in such a manner as to afford a reasonable water supply at a reasonable cost.

(b) The Director may require the variance applicant to submit such information as he deems necessary to make a decision to grant or deny the variance. The Director may impose such conditions on a variance or the use of a well for which a variance is granted as he deems necessary to protect human health and welfare and the groundwater resources. The findings of fact supporting any variance under this Rule shall be in writing and made part of the variance.

(c) The Director shall respond in writing to a request for a variance within 30 days from the receipt of the variance request.

(d) A variance applicant who is dissatisfied with the decision of the Director may commence a contested case by filing a petition under G.S. 150B-23 within 60 days after receipt of the decision.

History Note: Authority G.S. 87-87; 87-88; 150B-23;
Eff. April 20, 1978;
Amended Eff. April 1, 2001; December 1, 1992; September 1, 1988; September 1, 1984.

15A NCAC 02C .0119 DELEGATION

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- (a) The Director is delegated the authority to grant permission for well construction under G.S. 87-87.
- (b) The Director is delegated the authority to give notices and sign orders for violations under G.S. 87-91.
- (c) The Director is delegated the authority to request the Attorney General to institute civil actions under G.S. 87-95.
- (d) The Director is authorized to subdelegate, to an official of the Division, the granting of a variance from any construction standard, or the approval of alternate construction methods or materials, specified under the Rules of this Section.

History Note: Authority G.S. 143-215.3(a)(1);
Eff. March 1, 1985;
Amended Eff. December 1, 1992.

15A NCAC 02C .0301 SCOPE AND PURPOSE

- (a) The purpose of the rules of this Section is to set out standards for permitting and inspection of private drinking water wells as defined in G.S. 87-85 by local health departments pursuant to G.S. 87-97.
- (b) The rules of 15A NCAC 02C .0100 are applicable to private drinking water wells. In addition to the provisions in 15A NCAC 02C .0100, the following shall apply:
 - (1) The well owner shall not place potential sources of groundwater contamination closer to the well than the separation distances specified in 15A NCAC 02C .0107(a)(2) or .0107(a)(3), as applicable
 - (2) In addition to the provisions in 15A NCAC 02C .0109 PUMPS AND PUMPING EQUIPMENT, the builder, well contractor, pump installer, or homeowner, as applicable, shall provide assistance when necessary to gain access for inspection of the well, pumps, and pumping equipment; and
 - (3) In addition to the requirements of 15A NCAC 02C .0113 ABANDONMENT OF WELLS, any well which acts as a source or channel of contamination shall be repaired or permanently abandoned within 30 days of receipt of notice from the local health department. The person abandoning the well shall provide a minimum 24-hour notice to the local health department prior to commencement of permanent abandonment procedures.

History Note: Authority G.S. 87-87; 87-97;
July 1, 2008.

15A NCAC 02C .0302 DEFINITIONS

The definitions in G.S. 87-85 and 15A NCAC 02C .0102 apply throughout this Section. In addition, the following definitions apply throughout this Section:

- (1) "Addition" means any structure that is constructed, altered or placed on property that contains one or more wells. This would not include replacement of existing equipment

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within the existing footprint of a structure and addresses only those situations for which a building permit is required.

- (2) "Board of Health" means the County Board of Health or successor entity.
- (3) "Certificate of Completion" means a certification by the Department that a private drinking water well has been constructed or repaired in compliance with the construction permit or repair permit.
- (4) "Construction of wells" means all acts necessary to construct wells for any intended purpose or use, including the location and excavation of the well, placement of casings, screens and fittings, development and testing.
- (5) "Construction permit" means a well construction permit issued by the Department authorizing or allowing the construction of any private drinking water well as defined in the rules of this Section.
- (6) "Department of Environment and Natural Resources" or "Department" means the North Carolina Department of Environment and Natural Resources. The term also means the authorized representative of the Department. For the purposes of any notices required pursuant to the rules of this Section, notice shall be mailed to "Division of Environmental Health, On-Site Water Protection Section, North Carolina Department of Environment and Natural Resources," 1642 Mail Service Center, Raleigh, NC 27699-1642.
- (7) "Local Health Department" means the county or district health department or its successor.
- (8) "Person" means all persons, including individuals, firms, partnerships, associations, public or private institutions, municipalities or political subdivisions, governmental agencies, or private or public corporations organized or existing under the laws of this State or any other state or country.
- (9) "Plat" means a property survey prepared by a registered land surveyor, drawn to a scale of one inch equals no more than 60 feet, that includes: the specific location of all structures and proposed structures and appurtenances, including but not limited to decks, porches, pools, driveways, out buildings, existing and proposed wastewater systems, existing and proposed wells, springs, water lines, surface waters or designated wetlands, easements, including utility easements, and existing or proposed chemical or petroleum storage tanks above or below ground. "Plat" also means, for subdivision lots approved by the local planning authority and recorded with the county register of deeds, a copy of the recorded subdivisions plat that is accompanied by a site plan that is drawn to scale.
- (10) "Pumps" and "pumping equipment" means any equipment or materials utilized or intended for use in withdrawing or obtaining ground-water including well seals.

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- (11) "Repair" means work involved in deepening, reaming, sealing, installing or changing casing depths, perforating, screening, or cleaning, acidizing or redevelopment of a well excavation, or any other work which results in breaking or opening the well seal.
- (12) "Repair permit" means a well repair permit issued by the Department authorizing or allowing the repair of any private drinking water well as defined in the rules of this Section.
- (13) "Site plan" means a drawing not necessarily drawn to scale that shows the existing and proposed property lines with dimensions, and the specific location of all structures and proposed structures and appurtenances, including decks, porches, pools, driveways, out buildings, existing and proposed wastewater systems, existing and proposed wells, springs, water lines, surface waters or designated wetlands, easements, including utility easements, and existing or proposed chemical or petroleum storage tanks above or below ground.
- (14) "Water supply system" means pump and pipe used in connection with or pertaining to the operation of a private drinking water well including pumps, distribution service piping, pressure tanks and fittings.
- (15) "Well contractor activity" means the construction, installation, repair, alteration or abandonment of any well.
- (16) "Well Contractor" means any person in trade or business who undertakes to perform a well contractor activity or who undertakes to personally supervise or personally manage the performance of a well contractor activity on the person's own behalf or for any person, firm, or corporation in accordance with the well contractor certification requirements of 15A NCAC 27.
- (17) "Well seal" means an approved arrangement or device used to cap a well or to establish and maintain a junction between the casing or curbing of a well and the piping or equipment installed therein, the purpose or function of which is to prevent pollutants from entering the well at the upper terminal.

History Note: Authority G.S. 87-87; 87-97;
July 1, 2008.

15A NCAC 02C .0303 APPLICATION FOR CONSTRUCTION PERMIT

An application for a permit to construct, repair, or abandon a private drinking water well shall be submitted to the local health department for the county where the well is to be located by a property owner or the property owner's agent. The application shall include:

- (1) Name, address and phone number of the proposed well property owner or owner's agent;
- (2) Signature of owner or agent;

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- (3) Address and parcel identification number of the property where the proposed well is to be located;
- (4) A plat or site plan as defined in the rules of this Section;
- (5) Intended use(s) of the property;
- (6) Other information deemed necessary by the Department to determine the location of the property and any site characteristics such as existing or permitted sewage disposal systems, easements or rights of way, existing wells or springs, surface water or designated wetlands, chemical or petroleum storage tanks, landfills, waste storage, known underground contamination and any other characteristics or activities on the property or adjacent properties that could impact groundwater quality or suitability of the site for well construction;
- (7) Any current or pending restrictions regarding groundwater use as specified in G.S. 87-88(a); and
- (8) Any variances regarding well construction or location issued under 15A NCAC 02C .0118.

History Note: Authority G.S. 87-87; 87-97;
July 1, 2008.

15A NCAC 02C .0304 PERMITTING

(a) Before issuing a well construction permit, the Department shall conduct a field investigation to evaluate the topography, landscape position, available space and potential sources of groundwater contamination on or around the site on which a private drinking water well is to be located. The Department shall issue a private water well construction permit after determining the site can be permitted for a well meeting the rules of this Section. Notwithstanding the above, the Department shall not issue a construction permit for a well in violation of restrictions regarding groundwater use established pursuant to G.S. 87-88(a). The construction permit shall include a site plan showing the location of potential sources of contamination and area(s) suitable for well construction. The Department shall issue a written notice of denial of a construction permit if it determines a private drinking water well cannot be constructed in compliance with the rules of this Section. The notice of denial shall include reference to specific laws or rules that cannot be met and shall be provided to the applicant.

(b) No person shall construct a private drinking water well without first obtaining a well construction permit from the Department. No person shall repair a private drinking water well without first obtaining a well repair permit except a well repair permit is not required for maintenance or pump repair or replacement. Disinfection in accordance with Rule 15A NCAC 02C .0113 is a maintenance activity that does not require a repair permit.

(c) A well construction permit is valid for a period of five years except that the Department may revoke a permit at any time if it determines that there has been a material change in any fact or circumstance upon

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which the permit is issued. The validity of a construction permit or a repair permit is not affected by a change in ownership of the site on which a private drinking water well is proposed to be located. Well construction permits issued under local well ordinances prior to the effective date of these Rules remain valid for the term of those permits unless those permits are suspended or revoked. The Department may suspend or revoke any permits issued upon a determination that the rules of this Section have been violated.

(d) If there is an improperly abandoned well(s) on the site, the construction permit shall be conditioned upon repair or abandonment of any improperly abandoned well(s) in accordance with the rules of 15A NCAC 02C, Section .0100.

History Note: Authority G.S. 87-87; 87-97;
July 1, 2008.

15A NCAC 02C .0305 GROUT INSPECTION: CERTIFICATION

(a) The well contractor shall contact the local health department to schedule a grout inspection before grouting a private drinking water well. Contact shall include the location, permit number and anticipated time for grouting each private drinking water well and the appointment shall be scheduled by the end of the business day before the grouting is to occur except where the local health department has made provisions for scheduling inspections at night or on the same day of the inspection.

(b) Upon completion of a grout inspection, the Department shall provide a written certification on the well permit that a grout inspection was completed and that the grouting is in compliance with the rules of 15A NCAC 02C .0100. When a local health department is unable to conduct a grout inspection within one hour of the scheduled time, the well contractor may grout a well without a grout inspection by the Department. The well contractor shall provide a written certification to the local health department that the well has been grouted in compliance with the rules of 15A NCAC 02C .0100. A completed Well Construction Record form GW-1 indicating the well was grouted in compliance with the rules of this Section shall serve as the well contractor's grout certification. For purposes of issuing a certificate of completion, the well contractor's grout certification shall be accepted by the Department as evidence the grout complies with the rules of this Section if the local health department:

- (1) was contacted by the well contractor to schedule a grout inspection;
- (2) was unable to inspect the grouting of the well within one hour following the scheduled time; and
- (3) upon final inspection, finds no evidence to indicate the well grout does not comply with the rules of this Section.

History Note: Authority G.S. 87-87; 87-97;
July 1, 2008.

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15A NCAC 02C .0306 WELL COMPLETION AND CERTIFICATION

(a) After receiving a permit to construct a private drinking water well, the property owner or his agent shall notify the health department prior to well construction if any of the following occur:

- (1) The separation criteria specified in 15A NCAC 02C .0107 cannot be met;
- (2) The residence or other structure is located other than; indicated on the permit;
- (3) The use of the structure is changed from the use; specified on the permit;
- (4) The septic system needs to be changed from the location indicated on the permit;
- (5) Landscaping changes have been made that may affect the integrity of the well;
- (6) There are current or pending restrictions regarding groundwater use as specified in G.S. 87-88(a);
- (7) The water source for any well intended for domestic use is adjacent to any water-bearing zone suspected or known to be contaminated; or
- (8) Any other changes occur in the information provided in the application for the well permit.

(b) The well contractor shall maintain a copy of the well construction permit or repair permit on the job site at all times during the construction, repair or abandonment of the well. The well contractor shall meet all the conditions of the permit.

(c) Upon completion of construction of a private drinking water well, the Department shall complete an "as built" drawing of the well location. The well contractor shall submit a copy of Residential Well Construction Record to the local health department. Upon completion of construction or repair of a private drinking water well for which a permit is required, the Department shall inspect the well and issue a Certificate of Completion. Prior to the issuance of a Certificate of Completion, the Department shall: verify that the well was constructed in the designated area and according to the well construction, ~~permit~~ and the rules of this Subchapter. The Department shall inspect the grout around the casing, inspect the well head after the well seal is in place and obtain a well construction record from the Certified Well Contractor. No person shall place a private drinking water well into service without first having obtained a Certificate of Completion.

History Note: Authority G.S. 87-87; 87-97;
July 1, 2008.

15A NCAC 02C .0307 WELL DATA AND RECORDS

(a) Any person completing, abandoning or repairing any well shall submit a record of the construction, abandonment or repair to the local health department and the Division of Water Quality within 30 days of completion of construction, abandonment or repair. The record shall be on a form provided by the Department.

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(b) The local health department shall maintain a registry of all permitted private drinking water wells, specifying the well location and the water quality test: results until the well is permanently abandoned in accordance with this Subchapter.

History Note: Authority G.S. 87-87; 87-97;
July 1, 2008.

15A NCAC 02C .0308 APPEAL PROCEDURE

Appeals concerning permit decisions or actions by the Department to enforce the rules of this Section shall be conducted according to the procedures established in G.S. 150B, the Administrative Procedures Act.

History Note: Authority G.S. 87-87;
July 1, 2008.

15A NCAC 27 .0110 DUTIES OF A CERTIFIED WELL CONTRACTOR

(a) A Certified well contractor must be present at all times when well contractor activities are being conducted.

(b) A person who has satisfactorily met the requirements of the Commission relating to well contractor activities is entitled to recognition as a Certified Well Contractor certified to practice as a well contractor in the State of North Carolina.

- (1) Each certified well contractor shall be assigned a permanent certification number and shall be issued a certificate with that certification number. Certification numbers are not transferable and shall not be used by another well contractor.
- (2) The certification number shall be carried by the well contractor on a card issued by the Commission at all times when performing well contractor activities.

History Note: Authority G.S. 87-98.2; 87-98.4; 87-98.12; 143B-301.11;
Temporary Adoption Eff. December 15, 1998;
Eff. August 1, 2000.

15A NCAC 27 .0301 APPLICATION REQUIREMENTS FOR CERTIFICATION

(a) The Commission shall accept applications and renewal requests for certification as a well contractor from any person who is at least 18 years of age and whose application meets all the following conditions:

- (1) Each application shall be submitted on forms provided by the Commission, which are designed for requesting certification as a well contractor by way of examination, reexamination, or temporary certification and must be properly and accurately completed and submitted with an appropriate fee to the office of the chairman of the Commission.
- (2) Each application has been determined to be complete by the Commission. Incomplete applications and applications not accompanied by an appropriate fee and attachments shall not be processed and shall be returned to the applicant.
- (3) Each application shall contain proof of experience as provided in Paragraph (f) of this Rule.
- (4) Except for those applications where renewal of certification is requested, each application shall include a request for the well contractor examination.

(b) Applicants who have intentionally supplied false information must wait 12 months before resubmitting an application for certification.

(c) The Commission shall not schedule an applicant to take the required examination until his application has been reviewed and the applicant has met all other conditions for certification. The applicant must pass

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the examination within three consecutive attempts or within a one year period of time after application submittal, whichever expires first, or a new application shall be required. An applicant who has failed the examination after three consecutive attempts shall be required to obtain eight PDH units prior to resubmittal of an application for certification.

(d) A certification shall not be issued until the applicant passes the required examination and pays the appropriate fee.

(e) A certification issued by the Commission shall be valid in every county in the state.

(f) Proof of 18 months of full-time experience in well construction activities shall be demonstrated by providing one of the following:

(1) An affidavit from at least one currently certified well contractor, who has not committed any violation of 15A NCAC 02C or 15A NCAC 27 within the past two years, attesting that the applicant has been working in well contractor activities under the supervision of a certified well contractor for the equivalent of a minimum of 18 months full-time and submits appropriate payroll records as proof.

(2) Any other proof of working in well contractor activities for a minimum of 18 months. At a minimum, the proof submitted shall demonstrate that the applicant has received a level of instruction in well construction techniques and practices found in publications used as the basis for a course of study or apprenticeship program, as shown in Paragraph (h)(1-4) of this Rule. Proof submitted must also show that the applicant has a working knowledge of the 15A NCAC 02C .0100 (Well Construction Rules), the 15A NCAC 27 (Well Contractor Certification Rules) and applicable statutes.

(g) An affidavit from at least one currently certified well contractor, who has not committed any 15A NCAC 02C or 15A NCAC 27 violations within the past two years, attesting that the applicant has been working in well contractor activities under the supervision of a certified well contractor for an equivalent of six months full-time and supplies appropriate payroll records, shall be accepted in lieu of meeting the requirements of Paragraph (f) of this Rule, if the applicant also furnishes proof of completion of one of the following:

(1) Completion of a course of study in well construction techniques approved by the Well Contractor's Certification Commission and offered by a community college within the N.C. Department of Community Colleges with a passing grade; or

(2) Completion of an apprenticeship program approved by the Well Contractor's Certification Commission and approved by the N.C. Department of Labor in well construction; or

(3) Completion of a similar course of study or apprenticeship program as approved by the Well Contractor's Certification Commission.

(h) The WCCC shall approve a course of study or apprenticeship program whose educational materials or program meets technical aspects of well construction. The course of study or apprenticeship program shall provide the level of instruction in well construction techniques and practices found in publications recognized by the National Ground Water Association (NGWA) or other publications determined by the Commission to be equivalent to those recognized by NGWA. Examples of equivalent publications include the following:

(1) "Manual of Water Well Construction Practices";

(2) "Well Drilling Manual";

(3) "Ground Water Handbook"; or

(4) Any other peer-reviewed published document on well construction activities.

*History Note: Authority G.S. 87-98.6; 87-98.9; 143B-301.11; S.L. 2001-440;
Temporary Adoption Eff. December 15, 1998;
Eff. August 1, 2000;
Codifier determined that findings did not meet criteria for temporary rule on July 12, 2002;
Temporary Adoption Eff. September 12, 2002;
Amended Eff. August 1, 2004.*

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15A NCAC 18A SECTION .1700 - PROTECTION OF WATER SUPPLIES

Rules .1701 - .1719 of Title 15A Subchapter 18A of the North Carolina Administrative Code (T15A.18A .1701 - .1719); has been transferred and recodified from Rules .1701 - .1719 of Title 10 Subchapter 10A of the North Carolina Administrative Code (T10.10A .1701 - .1719), effective April 4, 1990.

15A NCAC 18A .1701	PURPOSE
15A NCAC 18A .1702	DESIGN AND CONSTRUCTION
15A NCAC 18A .1703	SITE SELECTION
15A NCAC 18A .1704	WELL CONSTRUCTION
15A NCAC 18A .1705	PROTECTION
15A NCAC 18A .1706	WATER SUPPLY NEEDED
15A NCAC 18A .1707	DISINFECTION
15A NCAC 18A .1708	TEST WATER QUALITY
15A NCAC 18A .1709	TYPES OF WELLS
15A NCAC 18A .1710	CONTAMINATION
15A NCAC 18A .1711	PROTECTION OF SPRINGS
15A NCAC 18A .1712	CISTERNS
15A NCAC 18A .1713	HORIZONTAL SUCTION LINES
15A NCAC 18A .1714	PITLESS ADAPTER
15A NCAC 18A .1715	DISINFECTION PROCEDURES
15A NCAC 18A .1716	DISINFECTION OF WELLS
15A NCAC 18A .1717	DISINFECTION OF SPRINGS
15A NCAC 18A .1718	DISINFECTION OF DISTRIBUTION SYSTEM
15A NCAC 18A .1719	AVAILABILITY OF BULLETIN

History Note: Authority G.S. 130A-5(3); 130A-120; 130A-228; 130A-230; 130A-235; 130A-236; 130A-239; 130A-248; 130A-257; Eff. February 1, 1976; Readopted Eff. December 5, 1977; Amended Eff. June 10, 1978; Repealed Eff. September 1, 1990.

15A NCAC 18A .1720 WATER SUPPLIES

(a) A water supply for which requirements are established in this Subchapter, shall be from a community water supply regulated pursuant to 15A NCAC 18C or from a supply located, constructed, maintained, and operated in accordance with this Section.

(b) The requirements found in Rules .1720(c) through .1728 of this Section shall not apply to community water supplies.

(c) The following setback requirements shall apply:

- (1) A well shall not be located in an area propensity for flooding. Areas which have a propensity for flooding include those with concave slope, alluvial or colluvial soils, gullies, depressions or drainage ways.
- (2) A well constructed on or after July 1, 1993 shall be located at a minimum horizontal distance from:
 - (A) Septic tank or nitrification field;
100 ft.
 - (B) Other subsurface ground absorption waste disposal;
100 ft.
 - (C) Industrial or municipal sludge spreading or wastewater irrigation site;
100 ft.

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- (D) Watertight sewage or liquid-waste collection or transfer facility;
50 ft.
 - (E) Other sewage or liquid-waste collection or transfer facility;
100 ft.
 - (F) Animal feedlot or manure pile;
100 ft.
 - (G) Fertilizer, pesticide, herbicide or other chemical storage area;
100 ft.
 - (H) Non-hazardous waste storage, treatment or disposal lagoon;
100 ft.
 - (I) Sanitary landfill;
500 ft.
 - (J) Other non-hazardous solid waste landfill;
100 ft.
 - (K) Animal barn;
100 ft.
 - (L) Building foundation;
50 ft.
 - (M) Surface water body;
50 ft.
 - (N) Chemical or petroleum fuel underground storage tank regulated under 15A NCAC 2N:
 - (i) with secondary containment;
50 ft.
 - (ii) without secondary containment;
100 ft.
 - (O) Any other source of groundwater contamination.
100 ft.
- (3) For a well constructed prior to July 1, 1993, the minimum horizontal distances specified in Parts (C)(2)(A), (B), (D), and (L) of this Rule shall be reduced to no less than the following:
- (A) Septic tank or nitrification field;
50 ft.
 - (B) Other subsurface ground absorption waste disposal system;
50 ft.
 - (C) Water-tight sewage or liquid-waste collection or transfer facility;
25 ft.
 - (D) Building foundation.
25 ft.
- (4) A well constructed prior to July 1, 1993 serving an establishment regulated under 15A NCAC 18A in operation prior to July 1, 1993 shall be required to meet only the following minimum horizontal distance requirements:
- (A) Septic tank or nitrification field;
50 ft.
 - (B) Other subsurface ground absorption waste disposal system.
50 ft.
- (5) An owner, licensee or permittee shall not place or have placed a new source of contamination within the minimum horizontal distances in Subparagraphs (c)(1)-(4) of this Rule.
- (6) If different minimum horizontal distances requirements are set by the Division of Environmental Management pursuant to 15A NCAC 2C .0118 and .0119, those minimum horizontal distance requirements shall be used. The owner, licensee or permittees shall provide a written copy of the adjusted minimum horizontal distance requirements from the Division of Environmental Management to the local health department.

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History Note: Authority G.S. 95-225; 130A-5(3); 130A-230; 130A-235; 130A-236; 130A-248; 130A-257;
Eff. September 1, 1990;
Amended Eff. May 1, 1996; July 1, 1993;
Temporary Amendment Eff. May 25, 1998; May 5, 1998; March 1, 1998;
Temporary Amendment (March 1, 1998) Expired December 11, 1998;
Temporary Amendment (May 5, 1998) Expired January 26, 1999;
Temporary Amendment (May 25, 1998) Expired March 12, 1999.

15A NCAC 18A .1721 WELL CASING

- (a) For a well constructed after July 1, 1993, the well casing shall be terminated at least 12 inches above the land surface.
- (b) For a well constructed prior to July 1, 1993, the well casing shall be terminated at least six inches above the land surface.

History Note: Authority G.S. 95-225; 130A-5(3); 130A-228; 130A-230; 130A-235; 130A-236; 130A-248; 130A-257;
Eff. July 1, 1993.

15A NCAC 18A .1722 WELL HEAD PROTECTION

- (a) The base plate of a pump placed directly over the well shall be designed to form a watertight seal with the well casing or pump foundation.
- (b) In an installation where the pump is not located directly over the well, the annular space between the casing and pump intake or discharge piping shall be closed with a watertight seal designed specifically for this purpose.
- (c) The well shall be vented at the well head to allow for pressure changes within the well except when a suction lift type pump is used. Any vent pipe or tube shall be screened or otherwise designed to prevent the entrance of insects or other foreign materials.
- (d) For a well constructed after July 1, 1993, a hose bib shall be installed at the well head for obtaining samples. In the case of offset jet pump installations, the hose bib shall be installed directed downward on the pressure side of the jet pump piping. A vacuum breaker or backflow prevention device shall be installed on the hose bib.
- (e) For a well constructed after July 1, 1993, a continuous bond concrete slab or well house concrete floor extending at least three feet horizontally around the outside of the well casing shall be provided. The minimum thickness for the concrete slab or floor shall be four inches. The slab or floor shall slope to drain away from the well casing.
- (f) Any establishments permitted or licensed after July 1, 1993 shall have a continuous bond concrete slab or well house concrete floor extending at least three feet horizontally around the outside of the well casing. The minimum thickness for the concrete slab or floor shall be four inches. The slab or floor shall slope to drain away from the well casing.

History Note: Authority G.S. 95-225; 130A-5(3); 130A-230; 130A-235; 130A-236; 130A-248; 130A-257;
Eff. July 1, 1993;
Amended Eff. May 1, 1996.

15A NCAC 18A .1723 SPRINGS

- (a) If a spring is serving an establishment regulated under 15A NCAC 18A on or before July 1, 1993, the spring shall be approved unless a violation of Rule .1725 of this Section is identified. If Rule .1725 of this Section is violated and violation remains after disinfection in accordance with Rule .1724(b) of this Section, or the removal of chemical constituents, the spring shall comply with all requirements of Paragraph (b) of this Rule. However, a spring which is in violation of Rule .1725(c) of this Section may continue to be used if equipped with a continuous disinfection device in accordance with Rule .1727 of this Section.

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(b) Any establishment permitted or licensed under 15A NCAC 18A after July 1, 1993, and any establishment developing a new spring shall meet the requirements of 2 NCAC 9C .0703, except Paragraphs (a), (b) and (f) shall not apply. 2 NCAC 9C .0703, except Paragraphs (a), (b) and (f) are hereby incorporated by reference including any subsequent amendments and editions. This material is available for inspection at the NC Department of Environment, Health, and Natural Resources, Environmental Health Services Section, 2728 Capital Blvd., Raleigh, North Carolina. Copies may be obtained from the Environmental Health Services Section at no cost.

(c) Springs approved pursuant to Paragraph (b) of this Rule shall not be connected to the establishment until compliance with this Section has been completed and the Department receives written certification from the owner of the establishment or a registered engineer, that the spring has been constructed in accordance with the approved plans and specifications.

History Note: Authority G.S. 95-225; 130A-5(3); 130A-230; 130A-235; 130A-236; 130A-248; 130A-257; Eff. July 1, 1993; Amended Eff. May 1, 1996.

15A NCAC 18A .1724 DISINFECTION OF WATER SUPPLIES

(a) A water supply serving an establishment regulated under this Subchapter shall be disinfected upon completion of construction, maintenance, repairs, pump installation, or a report of a positive coliform sample as follows:

- (1) chlorine in sufficient quantities to produce a chlorine residual of at least 100 milligrams per liter (mg/l) shall be placed in the supply;
- (2) a chlorine solution shall be placed in the supply in such a manner as to contact any water-contact parts and materials above the normal water level;
- (3) a chlorine solution shall stand in the supply for a period of at least 24 hours; and,
- (4) the supply shall flow to waste until no disinfectant can be measured with a test kit that measures chlorine levels.

(b) A spring enclosure shall be disinfected upon completion of construction, maintenance, repairs, pump installation, or a report of a positive coliform sample as follows:

- (1) the interior walls of the spring enclosure shall be washed or swabbed with a chlorine solution of at least 100 milligrams per liter (mg/l) or greater of chlorine residual approved by the Department;
- (2) the disinfectant shall be poured into the spring, the service pipe shall be plugged, and water shall be retained in the spring storage for at least 24 hours, or, disinfectant shall be fed into the spring continuously for at least 24 hours; and
- (3) the spring shall flow to waste until no disinfectant can be measured with a test kit that measures chlorine levels.

History Note: Authority G.S. 95-225; 130A-5(3); 130A-228; 130A-230; 130A-235; 130A-236; 130A-248; 130A-257; Eff. July 1, 1993.

15A NCAC 18A .1725 WATER QUALITY

(a) Prior to the initial use of a water supply, or after construction, maintenance, repairs, pump installation, or a report of a positive coliform sample, two consecutive bacteriological water samples taken at least 48 hours apart shall be collected by the Department and submitted to the Division of Laboratory Services of the Department of Environment, Health, and Natural Resources or another laboratory certified pursuant to 15A NCAC 20D for analysis. Prior to collecting the sample, the water shall be tested and shall be negative for chlorine residual. For the purposes of this Rule, confirmation means another positive sample result following the initial positive sample unless the last positive sample was preceded by two consecutive negative samples.

(b) The water supply shall be deemed an imminent hazard under the following circumstances:

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- (1) confirmation of the presence of fecal coliform bacteria.
 - (2) determination by the Environmental Epidemiology Section of the Department that the presence of chemical constituents are present at levels that constitute an imminent hazard as defined in G.S. 130A-2(3).
- (c) The water supply shall be deemed unsafe for use under the following conditions:
- (1) confirmation of the presence of total coliform.
 - (2) determination by the Environmental Epidemiology Section of the Department that the presence of chemical constituents are present at levels in violation of water quality standards found in 15A NCAC 18C .1500 and do not constitute an imminent hazard as defined in G.S. 130A-2(3).
- (d) After a positive sample has been followed by two consecutive negative samples collected at least 48 hours apart, follow-up samples shall be collected by the Department at least once each quarter, while the supply is in use, for one year. There shall be no treatment procedures between the two consecutive negative samples.

History Note: Authority G.S. 95-225; 130A-5(3); 130A-230; 130A-235; 130A-236; 130A-248; 130A-257; Eff. July 1, 1993; Amended Eff. May 1, 1996.

15A NCAC 18A .1726 EMERGENCY SUPPLY SYSTEMS

A water supply serving an establishment regulated under 15A NCAC 18A which is in violation of Rule .1725 of this Section may be replaced by an emergency supply system for a time period not to exceed three months provided the Public Water Supply Section determines that the emergency supply system meets all the following requirements:

- (1) The source of water used by the emergency supply shall meet the requirements of 15A NCAC 18C;
- (2) Containers, hoses, pumps, lines, or other means of conveyance used to transport the water is disinfected with a chlorine solution of at least 100 mg/l of chlorine prior to being placed into use and after each transfer of water;
- (3) A chlorine residual of no less than 0.2 mg/l of free chlorine is maintained at all times and the owner, licensee, or permittee shall maintain a log to record the level of free chlorine residual at least twice a day while the facility is in operation; and
- (4) The emergency supply system is sampled for bacteriological analysis at least every other week by the Department and at least weekly by the owner, permittee, or licensee. All samples shall be submitted to the laboratory section of the Department or another laboratory certified by the Department for the analysis. A copy of all sample reports collected by the owner, permittee, or licensee shall be submitted to the local health department having jurisdiction within three days of receipt of the report.

History Note: Authority G.S. 95-225; 130A-5(3); 130A-230; 130A-235; 130A-236; 130A-248; 130A-257; Eff. July 1, 1993; Amended Eff. May 1, 1996.

15A NCAC 18A .1727 CONTINUOUS DISINFECTION

(a) A supply which is in violation of Rule .1725(c)(1) of this Section may be used provided that the supply shall be continuously disinfected and a chlorine residual is maintained of at least 0.2 mg/l by use of equipment designed for this purpose. An operator shall be required for a water supply using continuous disinfection. The operator shall hold a valid certificate issued by the N.C. Water Treatment Facility Operators Certification Board.

(b) The owner, operator, or permittee shall provide to the Department a statement from the operator that a supply using continuous disinfection has a minimum chlorine residual of 0.2 mg/l and a chlorine contact time of at least 20 minutes.

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(c) A disinfection device shall not be used to comply with a violation of Rule .1725 (b)(1) of this Section.

History Note: Authority G.S. 95-225; 130A-5(3); 130A-228; 130A-230; 130A-235; 130A-236; 130A-248; 130A-257; Eff. July 1, 1993.

15A NCAC 18A .1728 PROHIBITED SUPPLIES

(a) A supply in violation of Rule .1725(b)(1) of this Section shall be prohibited.

(b) Cisterns shall be prohibited.

History Note: Authority G.S. 95-225; 130A-5(3); 130A-228; 130A-230; 130A-235; 130A-236; 130A-248; 130A-257; Eff. July 1, 1993.

15A NCAC SECTION.3800 - PRIVATE DRINKING WATER WELL SAMPLING (DRAFT)

15A NCAC 18A .3801 DEFINITIONS

The following definitions shall apply throughout this Section:

- (1) "Certified laboratory" means the North Carolina State Laboratory of Public Health certified by the US Environmental Protection Agency or a laboratory certified by the Certification Section of the North Carolina Public Health Laboratory pursuant to 10A NCAC 42D to perform tests to determine the presence of coliform bacteria or the chemical constituents to be tested.
- (2) "Coliform bacteria" or "total coliform" means aerobic or facultative anaerobic, gram-negative, non-spore forming, rod shaped bacteria included in the genera Klebsiella, Enterobacter, Escherichia and Citrobacteria. Coliform bacteria originate in soil, vegetation or the intestinal tract of warm-blooded animals. The presence of coliform bacteria in a water sample indicate the presence of a pathway for bacteria and possibly pathogens to gain entry into a water supply system.
- (3) "Department of Environment and Natural Resources" or "Department" means the North Carolina Department of Environment and Natural Resources. The term also means the authorized representative of the Department.
- (4) "Fecal coliform bacteria" or "fecal coliform" means a sub-group of coliform bacteria that are present in the intestinal tract and feces of warm-blooded animals. The presence of fecal coliform bacteria in a water sample indicate fecal contamination and the presumed presence of pathogens in the water supply
- (5) "Local Health Department" means the county or district health department or its successor.
- (6) "Private drinking water well" means a private drinking water well as defined in G.S. 87-85 (10a).

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History Note: Authority G.S. 87-97;

Eff. July 1, 2008.

15A NCAC 18A .3802 SAMPLE COLLECTION

(a) Within 30 days after it issues a certificate of completion for a newly constructed private drinking water well, the local health department shall obtain water samples and submit them to a certified laboratory for analyses or ensure that the water obtained from the well has been sampled and tested by a certified laboratory, in accordance with the rules of this Section.

(b) Samples collected from private drinking water wells pursuant to the rules of this Section shall be collected by employee of a local health department, or a certified laboratory. The sample collector shall use aseptic sampling techniques for collection of coliform bacteria and sampling techniques and containers for chemical constituents following methods described in 40 Code of Federal Regulations 141.23 Inorganic Chemical Sampling and Analytical Requirements and 40 Code of Federal Regulations 143.4 Monitoring, which are incorporated by reference including any subsequent amendments, additions or editions. A copy may be obtained from the National Archives and Records Administration through their website at <http://www.gpoaccess.gov/cfr/index.html>.

(c) Sample collectors shall be trained in accordance with guidance developed by the Department.

(d) Water samples shall be collected from the sample tap at the well or the closest accessible collection point to the water source with a tap capable of being disinfected, provided the sampling point shall precede any water treatment devices.

(e) It is the responsibility of the well owner to provide access and a source of power for the purpose of collecting the required water sample.

(f) For all new private drinking water wells, samples for total coliform and fecal coliform bacteria shall be collected after the disinfectant agent has been flushed from the well and water supply system. The water shall be determined to be free of disinfectant before collection of samples for bacteria. Required water samples shall not be collected: from wells that are not constructed and located in accordance with the rules of 15A NCAC 02C .0100 and .0300.

(g) Samples shall be transported to the laboratory following the procedures for sample preservation and within holding times required in 40 Code of Federal Regulations 141.21(f) Analytical Methodology, 141.23 Inorganic Chemical Sampling and Analytical Requirements, and 143.4 Monitoring, which are hereby incorporated by reference including any subsequent amendments, additions or editions. Copies may be obtained from the National Archives and Records Administration through their website at <http://www.gpoaccess.gov/cfr/index.html>.

(h) Additional or retest samples may be collected if:

- (1) during the permitting, construction and sampling process, information indicates the potential for other contaminants to be present in the groundwater source; or
- (2) if necessary to confirm initial testing results.

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History Note: Authority G.S. 87-97;
Eff. July 1, 2008.

15A NCAC 18A .3803 SAMPLE ANALYSIS

(a) Water samples shall be analyzed in the North Carolina State Laboratory of Public Health or a certified laboratory.

(b) A water sample shall be tested for total coliform bacteria and if present, further analyzed for the presence of fecal coliform bacteria or *E. coli*.

(c) A water sample shall be analyzed for Arsenic, Barium, Cadmium, Chromium, Copper, Fluoride, Lead, Iron, Magnesium, Manganese, Mercury, Nitrate, Nitrite, Selenium, Silver, Sodium, Zinc and pH.

(d) Testing protocols shall follow EPA methods as published in the applicable sections of the most recent 40 CFR 141 and 143, Federal Register updates and the North Carolina Drinking Water Laboratory Certification rules of Section 10A NCAC 42D. Copies may be obtained from the National Archives and Records Administration through their website at <http://www.gpoaccess.gov/cfr/index.html>.

History Note: Authority G.S. 87-97;
Eff. July 1, 2008.

15A NCAC 18A .3804 REPORTING

(a) Laboratories shall report results of chemical and bacteriological water sample analyses for each new private drinking water well to:

- (1) the local health department;
- (2) the DENR Private Water Supply Protection Branch; and
- (3) the DHHS Division of Public Health, Epidemiology Section, Occupational and Environmental Epidemiology Branch.

(b) Certified laboratories reporting results of sampling required by the rules of this Section shall use the reporting format developed by the North Carolina State Laboratory of Public Health for reporting private well-water sample results and shall include well identification information and a guide for interpreting sample results.

(c) For the purposes of any notices required pursuant to the rules of this Section, notice shall be mailed to "Division of Environmental Health, On-Site Water Protection Section, North Carolina Department of Environment and Natural Resources," 1642 Mail Service Center, Raleigh, NC 27699-1642.

History Note: Authority G.S. 87-97;
Eff. July 1, 2008.

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15A NCAC 18A .3805 DATA REVIEW

For all private well sampling data where chemical or biological contaminants are detected exceeding the Maximum Contaminant Levels (MCLs) for public drinking water, as defined in 15A NCAC 18C, the North Carolina Occupational and Environmental Epidemiology Branch (OEEB) shall provide the following to the local health department from which the sample was collected:

- (1) information about the contaminant(s); exceeding public drinking water MCLs;
- (2) recommendations for; water use limitations or treatment options to reduce exposure to a level comparable to meeting public drinking water MCLs; and
- (3) recommendations about the need for and the frequency of repeat sampling.

The local health department shall provide information to the well owner or respective lease holder concerning chemical and biological contaminants exceeding public drinking water MCLs and the need for exposure limitation, remediation, and/or future sampling.

History Note: Authority G.S. 87-97;

Eff. July 1, 2008.

§ 87-97. Permitting, inspection, and testing of private drinking water wells.

(a) Mandatory Local Well Programs. – Each county, through the local health department that serves the county, shall implement a private drinking water well permitting, inspection, and testing program. Local health departments shall administer the program and enforce the minimum well construction, permitting, inspection, repair, and testing requirements set out in this Article and rules adopted pursuant to this Article.(b) Permit Required. – Except for those wells required to be permitted by the Environmental Management Commission pursuant to G.S. 87-88, no person shall:

(1) Construct or assist in the construction of a private drinking water well unless a construction permit has been obtained from the local health department.

(2) Repair or assist in the repair of a private drinking water well unless a repair permit has been obtained from the local health department, except that a permit shall not be required for the repair or replacement of a pump or tank.

(c) Permit Not Required for Maintenance or Pump Repair or Replacement. – A repair permit shall not be required for any private drinking water well maintenance work that does not involve breaking or opening the well seal. A repair permit shall not be required for any private drinking water well repair work that involves only the repair or replacement of a pump or tank.

(d) Well Site Evaluation. – The local health department shall conduct a field investigation to evaluate the site on which a private drinking water well is proposed to be located before issuing a permit pursuant to this section. The field investigation shall determine whether there is any abandoned well located on the site, and if so, the construction permit shall be conditioned upon the proper closure of all abandoned wells located on the site in accordance with the requirements of this Article and rules adopted pursuant to this Article. If a private drinking water well is proposed to be located on a site on which a wastewater system subject to the requirements of Article 11 of Chapter 130A of the General Statutes is located or proposed to be located, the application for a construction permit shall be accompanied by a plat, as defined in G.S. 130A-334.

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- (e) Issuance of Permit. – The local health department shall issue a construction permit or repair permit if it determines that a private drinking water well can be constructed or repaired and operated in compliance with this Article and rules adopted pursuant to this Article. The local health department may impose any conditions on the issuance of a construction permit or repair permit that it determines to be necessary to ensure compliance with this Article and rules adopted pursuant to this Article.
- (f) Expiration and Revocation. – A construction permit or repair permit shall be valid for a period of five years except that the local health department may revoke a permit at any time if it determines that there has been a material change in any fact or circumstance upon which the permit is issued. The foregoing shall be prominently stated on the face of the permit. The validity of a construction permit or a repair permit shall not be affected by a change in ownership of the site on which a private drinking water well is proposed to be located or is located if the location of the well is unchanged and the well and the facility served by the well remain under common ownership.
- (g) Certificate of Completion. – Upon completion of construction of a private drinking water well or repair of a private drinking water well for which a permit is required under this section, the local health department shall inspect the well to determine whether it was constructed or repaired in compliance with the construction permit or repair permit. If the local health department determines that the private drinking water well has been constructed or repaired in accordance with the requirements of the construction permit or repair permit, this Article, and rules adopted pursuant to this Article, the local health department shall issue a certificate of completion. No person shall place a private drinking water well into service without first having obtained a certificate of completion. No person shall return a private drinking water well that has undergone repair to service without first having obtained a certificate of completion.
- (h) Drinking Water Testing. – Within 30 days after it issues a certificate of completion for a newly constructed private drinking water well, the local health department shall test the water obtained from the well for the following parameters: arsenic, barium, cadmium, chromium, copper, fluoride, lead, iron, magnesium, manganese, mercury, nitrates, nitrites, selenium, silver, sodium, zinc, pH, and bacterial indicators.
- (i) Commission for Health Services to Adopt Drinking Water Testing Rules. – The Commission for Health Services shall adopt rules governing the sampling and testing of well water and the reporting of test results. The rules shall allow local health departments to designate third parties to collect and test samples and report test results. The rules shall also provide for corrective action and retesting where appropriate. The Commission for Health Services may by rule require testing for additional parameters if the Commission makes a specific finding that testing for the additional parameters is necessary to protect public health.
- (j) Test Results. – The local health department shall provide test results to the owner of the newly constructed private drinking water well and, to the extent practicable, to any leaseholder of a dwelling unit or other facility served by the well at the time the water is sampled.
- (k) Registry of Permits and Test Results. – Each local health department shall maintain a registry of all private drinking water wells for which a construction permit or repair permit is issued. The registry shall specify the physical location of each private drinking water well and shall include the results of all tests of water from each well. The local health department shall retain a record of the results of all tests of water from a private drinking water well until the well is properly closed in accordance with the requirements of this Article and rules adopted pursuant to this Article.
- (l) Authority Not Limited. – This section shall not be construed to limit any authority of local boards of health, local health departments, the Department of Health and Human Services, or the Commission for Health Services to protect public health."

Well Contractors Certification. (GS 87-98 .1-.4)

87-98.3 Purpose.

It is the purpose of this Article to protect the public health and safety by ensuring the integrity and competence of well contractors, to protect and beneficially develop the groundwater resources of the State, to require the examination of well contractors and the certification of their competency to supervise or conduct well contractor activity, and to establish procedures for the examination and certification of well contractors. (1997-358, s. 2.)

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87-98.4. Well contractor certification required; exemptions.

(a) Certification Required. – No person shall perform, manage, or supervise any well contractor activity without being certified under this Article. A person who is not a certified well contractor or who is not employed by a certified well contractor shall not offer to perform any well contractor activity unless the person utilizes a certified well contractor to perform the well contractor activity and, prior to the performance of the well contractor activity, the person discloses to the landowner in writing the name of the certified well contractor who will perform the well contractor activity, the certification number of the well contractor, and the name of the company that employs the certified well contractor.

(b) Exempt persons and activities. – This Article does not apply to any of the following persons or activities:

(1) A person who is employed by, or performs labor or services for, a certified well contractor in connection with well contractor activity performed under the personal supervision of the certified well contractor.

(2) A person who constructs, repairs, or abandons a well that is located on land owned or leased by that person.

(3) A person who is employed by a government agency and who performs well contractor activity solely within the scope of the person's government employment.

(4) A person who is licensed as a professional engineer under Chapter 89C of the General Statutes, a geologist under Chapter 89E of the General Statutes, or a soil scientist under Chapter 89F of the General Statutes who uses a hand auger to collect soil or water samples or to measure water levels. This exemption does not include the construction of a monitoring well.

(5) Construction, repair, or abandonment of a well used for a temporary dewatering activity that is associated with, and necessary to complete construction of, a utility distribution or collection system, a building or other structure, or a transportation system, if all of the following conditions are met:

a. The dewatering well is constructed solely for the purpose of removing water from or lowering the water table in the immediate area of the construction activity.

b. The dewatering well is located within 25 feet of the excavation and is not greater than 25 feet deeper than the excavation.

c. The dewatering well is abandoned in accordance with rules governing the abandonment of wells adopted by the Environmental Management Commission pursuant to G.S. 87-87 within 30 days of installation of the well or within 10 days of completion of the project, whichever is later.

(6) Construction, repair, or abandonment of a well used for a temporary dewatering activity that is associated with the construction of a borrow pit if the dewatering activity is located within 15 feet of the proposed perimeter of the borrow pit.

(7) Exploratory drilling for mining-related investigations.

(8) Installation of a water level observation well on property for which a mining permit has been issued under the Mining Act of 1971, Article 7 of Chapter 74 of the General Statutes.

(9) Drilling of a blast hole.

(10) Installation of a cathodic protection anode.

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(11) Installation of a wetland monitoring gauge at a depth of eight feet or less for the purpose of monitoring fluctuations in the water table.

(12) Installation of a caisson, piling, or structural pier.

(c) Additional Exemptions. – In addition to the exemptions set out in subsection (b) of this section, the Commission may exempt by rule a geophysical activity, construction activity, or other well contractor activity from the requirements of this Article if the Commission finds that the activity has a negligible impact on the environment; public health, safety, and welfare; and the groundwater resources of the State. (1997-358, s. 2; 1998-129, s. 1; 2001-440, s. 1.1; 2005-386, s. 9.)

15A NCAC 18C .0100 (Water Systems) – Selected Definitions

Community Water System means a public water system which serves at least 15 service connections used by year-round residents or regularly serves at least 25 year-round residents.

Non-Community Water System means a public water system that is not a community water system. A non-community water system is either a “transient non-community water system (TWS)” or a “non-transient non-community water system (NTNCWS).”

Non-transient non-community water system or NTNCWS means a public water system that is not a community water system and that regularly serves at least 25 of the same persons over 6 months per year.

Public water system means a system for the provision to the public of water for human consumption through pipes or, after August 5, 1998, other constructed conveyances, if such system has at least 15 service connections or regularly serves an average of at least 25 individuals daily at least 60 days out of the year.

Transient non-community water system or TWS means a non-community water system that does not regularly serve at least 25 of the same persons over six months per year.

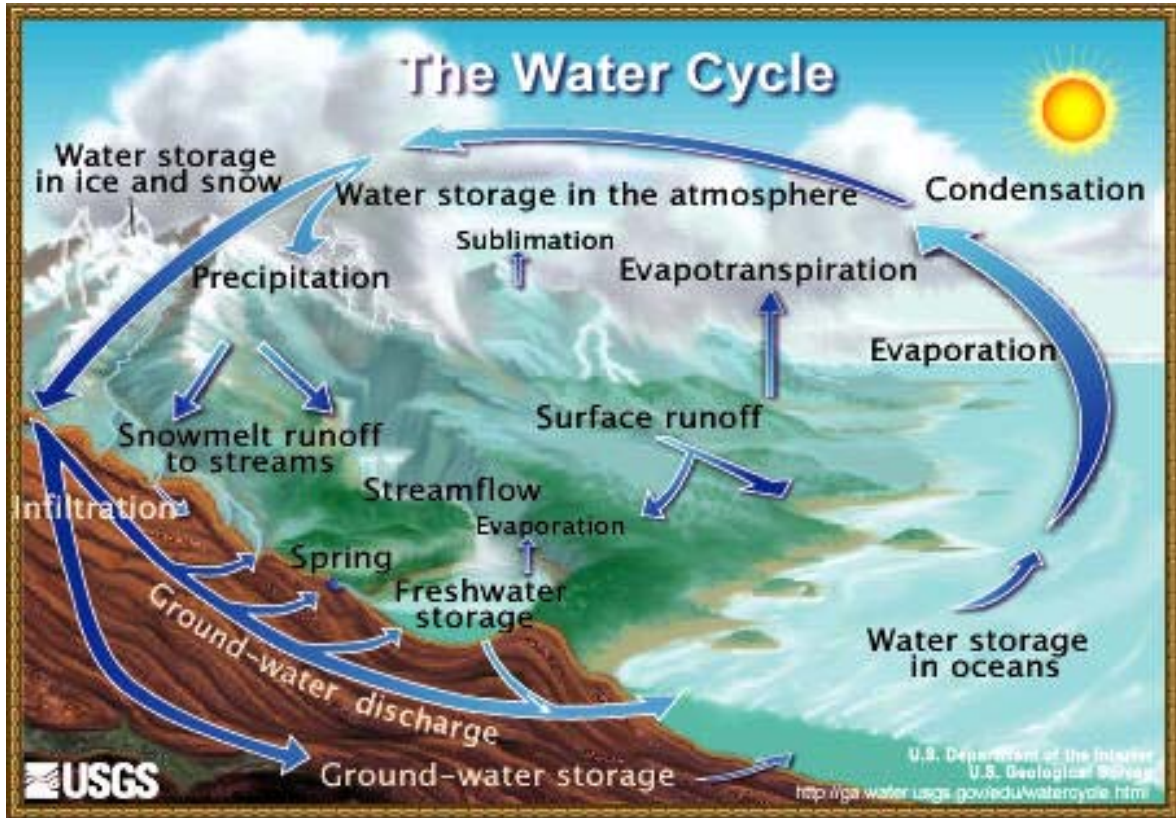
General Knowledge – Groundwater Flow

Water occurs and moves within the “Hydrologic Cycle.” Water evaporates and then forms clouds through a process called condensation. Precipitation returns this water to the ground surface in the form of rain, snow, sleet, etc. After falling back to the Earth’s surface, liquid water continues within the Hydrologic Cycle through one or more of these pathways:

1. **Direct evaporation back into the atmosphere** – this water again forms clouds and is eventually precipitated again back to the Earth’s surface.
2. **Run off flow into surface water bodies.** This water flows on the land surface into ponds, lakes, streams, or oceans. Water from these bodies may again be evaporated back into the atmosphere, or in the case of streams, may continue flowing toward the ocean.
3. **Soaking into the ground.** This water may be taken up by vegetation and then returned to the atmosphere as water vapor through plant transpiration. However, water not used by plants seeps deeper into the ground and saturates rock and soil, and is called

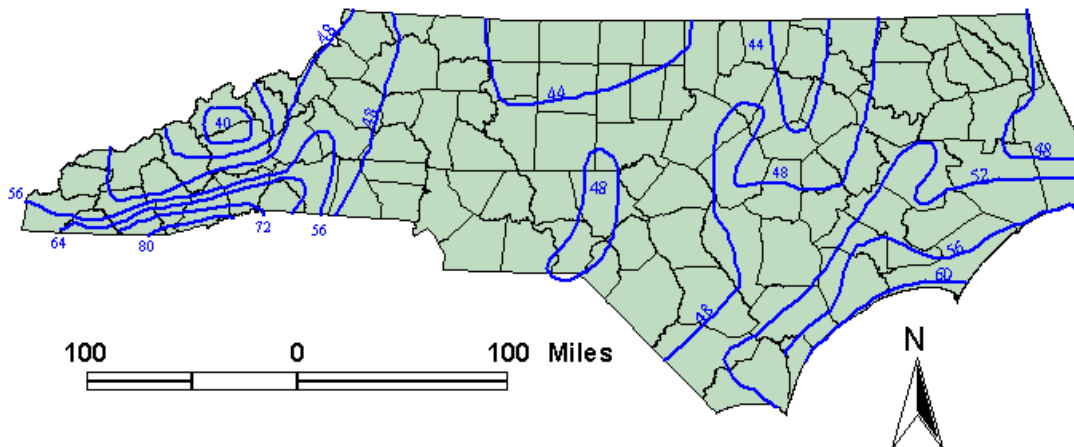
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groundwater. In North Carolina, groundwater typically flows into surface water bodies, where this water may again be evaporated into the atmosphere.



(Image courtesy of the U.S. Geological Survey)

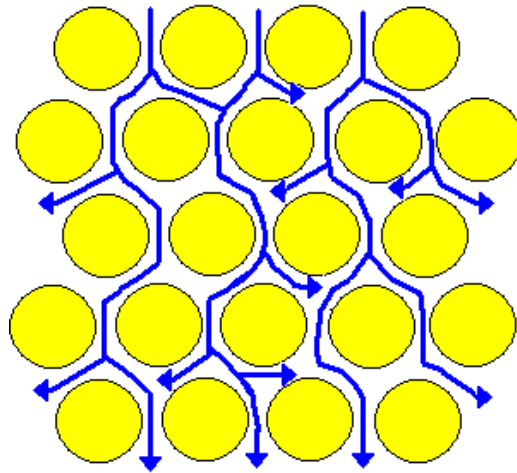
Precipitation recharges groundwater. Typical precipitation rates across North Carolina are heaviest in the mountains and along the coast.



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(Image from Hirth and Haven, 2001. Units are in inches.)

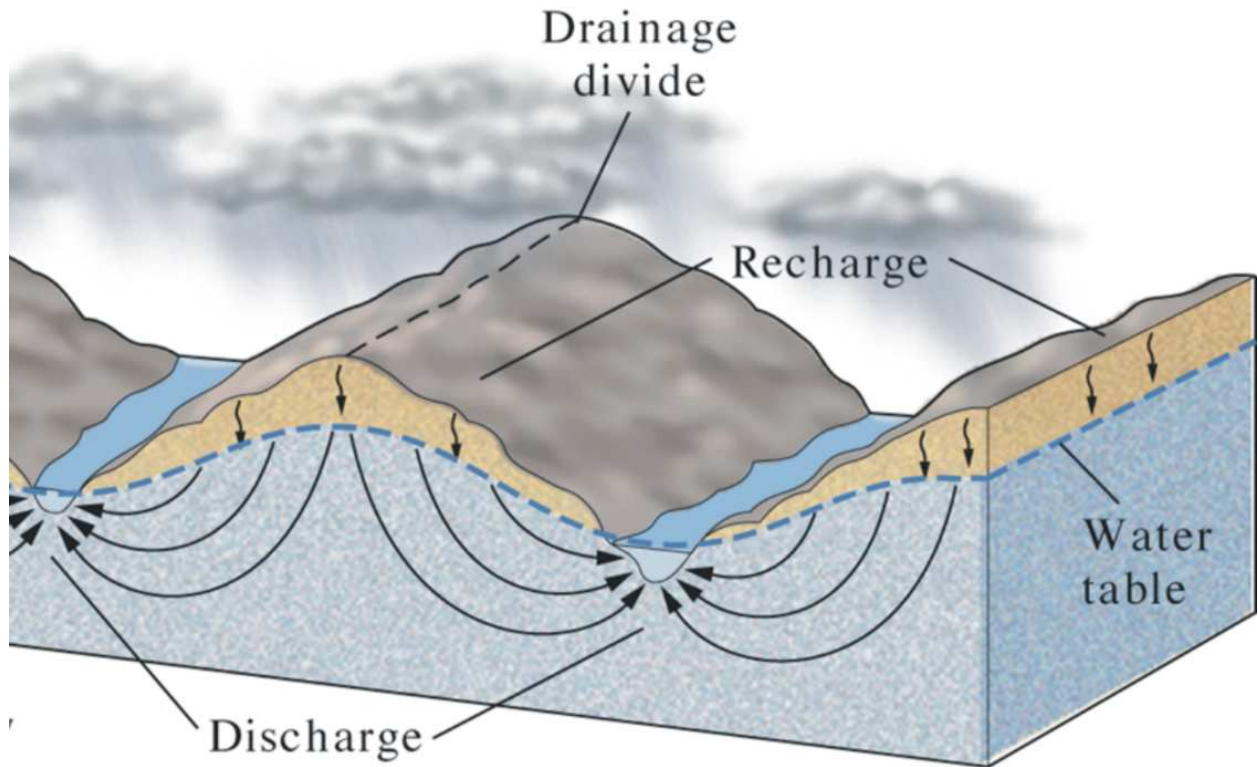
In North Carolina, groundwater does not typically occur in vast underground lakes, pools, or rivers. Groundwater actually occurs and flows through empty spaces between soil grains and rock fractures.



The image above represents soil particles (yellow circles) and flowing groundwater (blue arrows). It is through this manner that groundwater saturates, is stored in, and flows through soil and fractured rock. The top of the saturated soil and/or rock is called the **water table**. The water table may be most easily seen by digging a hole in your yard or at the beach. If you continue digging, you will eventually find standing water in your hole. The surface of this standing water is the water table.

Contrary to popular belief, the water table is not a consistent, flat surface. Actually, the water table typically mimics the overlying land topography. Notice also how the water table not only marks the top of the saturated sand, soil and rock (blue colored zone), but it also marks the surface of the streams.

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(Image courtesy of Eudy, 2007)

In this diagram, “recharge” events occur as rainfall, which allows water to soak into the ground. This saturates much of the underlying soil and rock. Notice how groundwater flows from higher elevations, beneath the hill tops, toward the lower elevations, and discharges into streams. Additionally, groundwater on the right side of the drainage divide (hilltop) does not naturally flow to the left side of the drainage divide, and vice versa.