

Edgecombe County

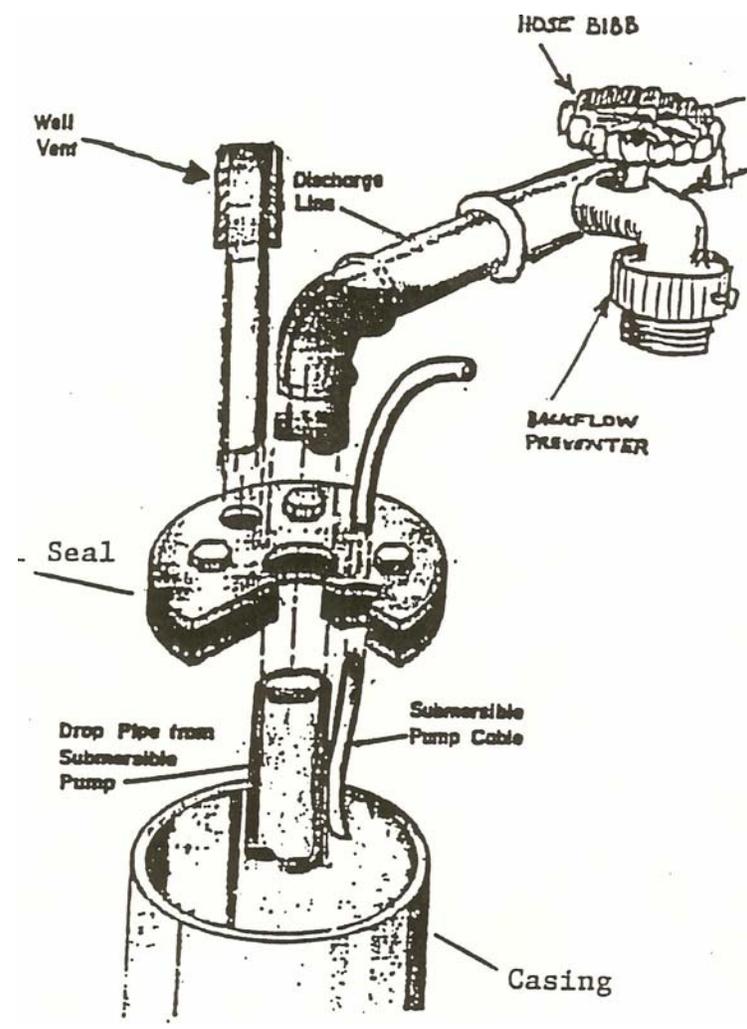
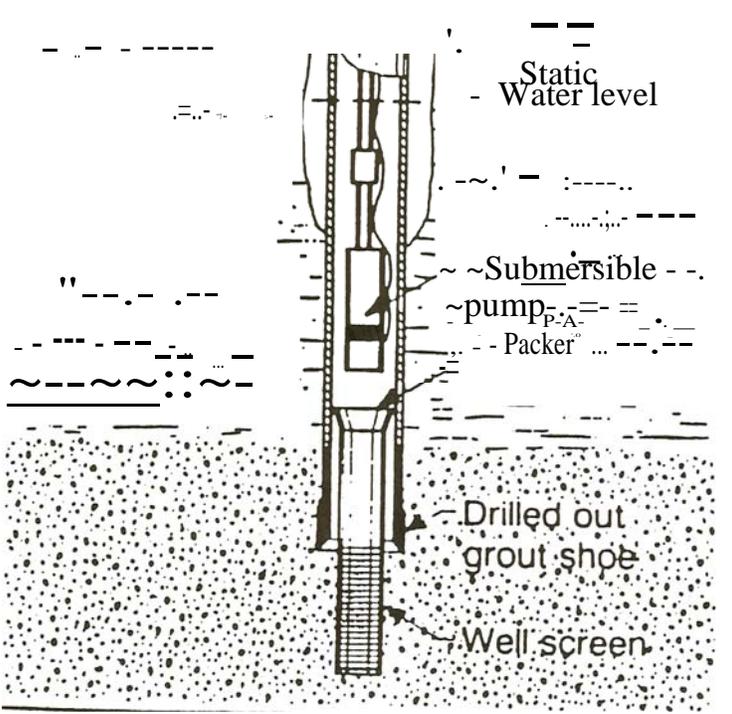
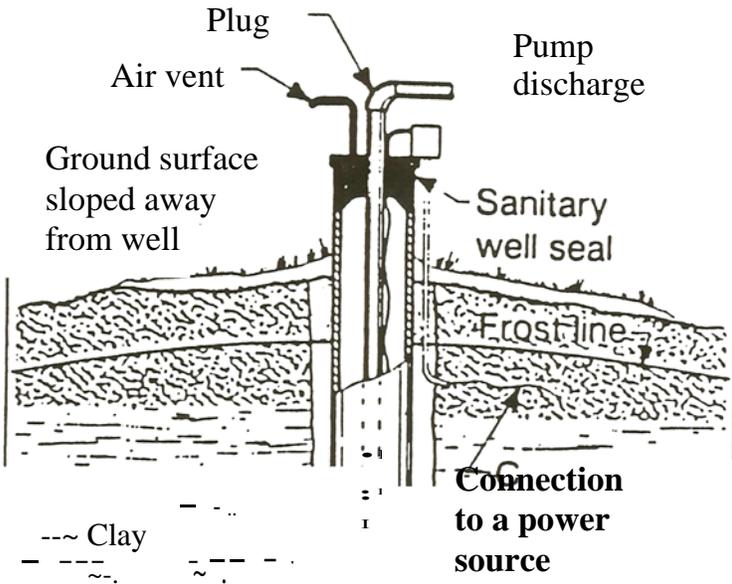
Well

Ordinance

Adopted September 16, 1996

Edgecombe County Board of Health

WELL CONSTRUCTION STANDARDS



This well has been vented and sealed properly. The groundwater surface around the top of the casing has been graded to slope away in all directions. (After U.S. Environmental Protection Agency, 1973)

WELL CONSTRUCTION STANDARDS

SECTION I. GENERAL PROVISIONS

(a) **Authorization** - The Edgecombe County Board of Health is authorized under the provisions of Chapter 130A-39 of the General Statutes of North Carolina to adopt appropriate rules for the protection of the public health.

(b) **Purpose** - Consistent with the responsibility to protect and advance the public health, it is declared to be the policy of the Edgecombe County Board of Health to require that the location, construction, repair and abandonment of water supply wells conform to such reasonable standards and requirements as may be necessary to protect the public health and groundwater resources.

(c) **Scope** - No person shall construct, or abandon, or cause to be constructed, or abandoned any well contrary to the provisions of these regulations and standards.

(d) **Conflict with Other Laws and Regulations** - The provisions of any federal, state, or municipal law or regulation establishing standards affording greater protection to the public welfare, safety, health and groundwater resources shall prevail within the jurisdiction of such agency or municipality over standards established by these regulations.

(e) **Penalties** - Any person who willfully violates any provision of these regulations, or any order issued pursuant thereto, shall be guilty of a misdemeanor. As provided by G.S. 130A18, the health director may also institute an action in the Edgecombe County Superior Court for injunctive relief. All other remedies provided by state law shall be available to the health director.

(f) **Inspection** - Before being used to supply water for human consumption, all newly constructed wells shall be inspected and found to comply with the provisions of these regulations.

(g) **Appeals** - Any person aggrieved by any action of the health department representative with regard to wells shall first confer with the local health director who may affirm or reverse the original decision of the representative. If the person is dissatisfied with the health director's decision, he shall give written notice of appeal to the health director within thirty (30) days after the person's grievances. Upon receiving this notice the health director shall, within five (5) working days, transmit to the chairman of the board of health the notice and all other pertinent papers. The board shall hold a hearing within fifteen (15) days after it receives the notice of appeal. The board shall give the appellant no less than ten (10) days notice of the date, time and place of the hearing. Any party may appear in person or by agent or attorney. No person shall take any action prohibited by the health department until there is a final resolution of the grievance. On appeal the board shall have the authority to affirm, modify or reverse the challenged action. The board shall issue a concise written decision setting forth its reasons with all deliberate speed after the hearing.

SECTION II. DEFINITIONS

(a) **Abandon** means to discontinue the use of and to seal the well according to the requirements of Rule .0113, 15-NCAC, Subchapter 2C, North Carolina Division of Environmental Management.

(b) **Abandoned Well** means a well whose use or construction has been discontinued, or which is in such a state of disrepair that continued use for obtaining groundwater or other useful purpose is impracticable.

1) **Temporarily abandoned well** means any usable well whose use has been temporarily discontinued because of well or pump maintenance problems, and newly constructed wells not yet put into service.

2) **Permanently abandoned well** means any well removed from or not yet put into service; or whose use is impractical because of faulty construction, location, water quality, insufficient yield, unserviceable casing and screen; or which has been removed from service because it is no longer serves its intended use.

(c) **Access Port** means an opening in the well casing or well-head installed for the primary purpose of determine water level in the well.

(d) **Agent** means any person who by mutual and legal agreement with a well owner has authority to act in the owner's behalf in executing applications for permits.

(e) **ASTM** means the American Society for Testing and Materials.

(f) **Aquifer** means a geological formation, group of formations, or part of a formation that will yield usable quantities of water to wells.

(g) **Board of Health** means the Edgecombe County Board of Health or its official representatives.

(h) **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 the well, to prevent formation material from entering the well, to prevent the loss of drilling fluids into permeable formations, and to prevent entry of undesirable water.

(i) **Consolidated Rock** means rock that is firm and coherent, solidified or cemented and that has not been decomposed by weathering. Examples include but are not limited to granite, gneiss, limestone, slate or sandstone.

G) **Construction of Wells** includes all acts necessary to construct wells for any intended use, including the location and excavation of the well, placement of casings, grouting, screens,

and fittings development and testing.

(k) **Contamination** means the presence of any foreign substance (organic, inorganic, radiological or biological) in water which tends to degrade its quality so as to constitute a hazard or impair the usefulness of the water.

(l) **Domestic Use** means use of water for drinking, bathing, household purposes, livestock or gardens.

(m) **Grout** shall mean and include the following:

1) **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.

2) **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.

3) **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.

4) **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.

(n) **Health Department** means the Edgecombe County Health Department, Environmental Health Section.

(o) **Health Director** means the Director of the Edgecombe County Health Department or his authorized representative.

(p) **Health Department Representative** means an authorized agent of the Edgecombe County Health Department, Environmental Health Section.

(q) **Installing Pumps and Pumping Equipment** means placing and preparing pumps and pumping equipment for operation, including all construction involved in making entrances to the well and establishing seals.

(r) **Liner Pipe** means pipe that is installed inside a completed and cased well for the purpose of sealing off undesirable water or for repairing ruptured or punctured casing or screens.

(s) **Non-potable Mineralized Water** means brackish, saline, or other water containing minerals of such quantity or type as to render the water unsafe, harmful, or generally unsuitable

for domestic use.

(t) Owner means any person who holds all or any of the ownership or property rights in the well being constructed. For purposes of these regulations, a well's construction on a parcel of land creates a presumption that the owner of the land also owns the well, in absence of contrary agreement in writing.

(u) Permit means a written permit issued by the health director authorizing or allowing the construction or repair of any well as defined in this ordinance.

(v) Person means any individual, firm, partnership, association, public or private institution, municipality or political subdivision, governmental agency, or private or public corporation organized or existing under the laws of this state or of any other state or country, or any group or combination of the above.

(w) Polluted water means water containing organic or other contaminants of such type and quantity as to render it unsafe, harmful or suitable for human consumption.

(x) Private Well Water Supply means any well water supply furnishing water for up to fourteen (14) connections or up to twenty-four individuals and is not a public water supply.

(y) Public Water System means a water system as defined in 15A NCAC 18C (Rules Governing Public Water Supplies).

(z) Pumps and Pumping Equipment means the well seal and any other equipment or materials used or intended to be used for withdrawing or obtaining groundwater.

(aa) Repair means work involved in deepening or changing depths, reaming, sealing, installing, perforating, screening or cleaning, acidizing or redeveloping a well, excavation, or any work which results in breaking or opening the well seal.

(bb) Site means the place where any facility, activity, or situation is physically located, including adjacent or nearby land used in connection with the facility, activity, or situation.

(cc) Specific Capacity means the yield of the well expressed in gallons per minute per foot of draw-down of the water level.

(dd) 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.

(ee) Unconsolidated Rock Formation means those rock formations that are not solid, e.g., sand, clay, shell, saprolite or decaying rock.

(ff) Water Supply means any source of groundwater.

(gg) Water Supply System means pump and pipe used in connection with or pertaining to the operation of a water well including pumps, distribution service piping, pressure tanks and fittings.

(hh) 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.

(ii) Well capacity means the maximum quantity of water that a well will yield continuously.

(JJ) Well Driller, Driller, or Water-Well Contractor means any person, firm or corporation engaged in the business of constructing a well.

(kk) Well-Head means the upper terminal of the well including adaptors, ports, valves, seals, and other attachments.

(11) 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.

SECTION III. **WELL DRILLER REGISTRATION**

(a) Every person, firm or corporation engaged in the business of using power machinery to drill, bore, core or construct wells in Edgecombe County shall register annually with the health department.

(b) Registration shall be accomplished during the period from January 1 to January 31 of each year, or other such time the health department may determine.

(c) Registration shall be accomplished by completing and submitting to the health department a registration application form provided by the health department for this purpose.

(d) Upon submitting a properly completed application form, the applicant will be issued a certificate of registration.

SECTION IV. **PERMITS**

(a) It shall be unlawful for any person to construct a well in Edgecombe County without first obtaining a permit from the health director. The permit shall be obtained by the well owner or his authorized agent.

(b) The location of any private well water supply in Edgecombe County shall be approved by the health director before any construction activity on the lot is begun. Any site for a public well water supply shall be approved by an authorized representative of the Division of Environmental Health, Public Water Section.

(c) The well contractor shall not commence any drilling activity until the well permit has been obtained. The driller shall maintain a copy of the permit on the job at all times during the construction of the well. The driller shall be responsible for assuring all required setbacks and separations are met. If the driller has any questions concerning the siting of the well, he shall call the health department prior to beginning construction.

(d) The health director is authorized to revoke any permits issued pursuant to these regulations upon the determination that these regulations are not being fully complied with.

(e) Unless otherwise specified in writing by the Edgecombe County Health Department, permits shall become invalid after sixty (60) months from the date of issuance if the construction has not been completed during that time period. When a permit has become invalid, the installation shall not be commenced or completed until a new permit has been obtained.

(f) The fee for a new well permit shall be established by the board of health and approved by the board of county commissioners and is payable to the Edgecombe County Health Department at the time the permit application is submitted.

SECTION V. STANDARDS OF CONSTRUCTION

(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. The site shall be graded and sloped so that surface water is diverted away from the well.

(2) The well shall be located at a site that permits access for maintenance, repair, treatment, testing and such other attention as may be necessary.

(3) The minimum horizontal separation between a well and potential sources of groundwater contamination 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.
1. Non-hazardous waste storage treatment or disposal lagoons	100 ft.
J. Sanitary landfills	500 ft.
k. Other non-hazardous solid waste landfills	100 ft.
1. Animal barns	100 ft.
m. Building foundation	50 ft.
n.Surface water bodies	50 ft.
o. Chemical or petroleum fuel underground storage tanks regulated under 15A NCAC 2N:	
(i) with secondary containment	50 ft.
(ii) with out secondary containment	100 ft.
p.Property boundaries	10 ft.
q. All other potential sources of Ground water contamination	100 ft.

(4) For a well serving a single family dwelling where lot size or other fixed conditions preclude the separation distances specified in subparagraph (a) (3) of this section, the required separation distances shall be the maximum possible but shall in no case be less than the following:

a.Septic tank and drain field	50 ft.
b. Water-tight sewage or liquid-waste collection or transfer facility	50 ft.
c.Building foundations	25 ft.
d.Cesspools and privies	50 ft.

(5) Actual separation distances must conform with the most stringent of applicable federal, state or local requirements.

(b) **Source of water**

(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 or that contains unpotable mineralized water.

(2) 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 and may be comprised only of the formational material encountered during drilling, or materials manufactured specifically for the purpose of borehole conditioning or water well construction.

(d) **Casing**

Casing materials and construction shall be in accordance with Rule .0107 (d) 15-NCAC Subchapter 2C of the North Carolina Division of Environmental Management.

(e) **Grouting**

1. Casing shall be grouted to a minimum depth of twenty feet below land surface.
2. For large diameter wells, commonly referred to as "bored" wells, cased with concrete pipe or ceramic tile, the following shall apply:
 - a. If the casing joints are not sealed, the construction shall be as follows:
 1. The diameter of the bore hole shall be at least six (6) inches larger than the outside diameter of the casing;
 2. The annular space around the casing shall be filled with a cement-type grout to a depth of at least 20 feet.
 3. The annular space around the casing below the grout shall be filled with sand or gravel.
 4. The gravel-pack material shall be composed of quartz, granite, or similar rock material and shall be clean, rounded, uniform, water-washed and free from clay, silt, or other deleterious material.
 5. The gravel shall be adequately disinfected.
 - b. If the casing joints are sealed, the construction shall be as follows:
 1. The bore hole shall have a minimum diameter of six inches larger than the outside diameter of the casing to a depth of at least 20 feet below the land surface.
 2. The annular space around the casing shall be filled with approved grout to a depth of 20 feet below the land surface.
 3. Bentonite grout may only be used in that portion of the borehole that is below the water table throughout the year.
 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.
 - 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 should remain submerged in grout during the entire operation.
 - 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 minimum 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. All grout mixtures shall be prepared prior to emplacement.
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 (1/3) of the diameter of the outside dimension of the casing or two (2) inches, whichever is greater; excepting, however, that large diameter bored wells shall meet the requirements of Subparagraph (e) (2) of this rule.

(f) **WELL DEVELOPMENT**

All water supply wells shall be properly developed by the well driller. Development shall include the removal of formation materials, mud, drilling fluids and additives.

(g) **WELL-HEAD COMPLETION**

1. Well Contractor Identification Plate.

- a. An identification plate, showing the drilling contractor and registration number and the information specified in Part (g) (1) (e) of this section 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.
- c. The identification plate shall be permanently attached to the well casing or enclosure floor around the casing where it is readily visible.
- d. The identification plate shall not be removed from the well casing or enclosure floor by any person.
- e. The identification plate shall be stamped with a permanent marking to show the: (i) total depth of well; (ii) casing depth (ft.) and inside diameter (in.); (iii) yield in gallons per minute; (iv) static water level and date measured; (v) date well completed.

2. Pump Installer Identification Plate.

- a. An identification plate, displaying the name and registration number of the pump installation contractor, shall be permanently attached to either the above ground portion of the well casing, 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.
- c. The identification plate shall not be removed from the well casing or enclosure

floor by any person.

- d. The identification plate shall be stamped with a permanent marking to show the:
 - (i) date the pump was installed;
 - (ii) the depth of the pump intake; and
 - (iii) the horsepower rating of the pump.

(h) Pumping and Pumping Equipment

1. The pumping capacity of the pump shall be consistent with the intended use and yield characteristics of the well.
2. The pump and related equipment for the well should be conveniently located to permit easy access and removal for repair and maintenance.
3. 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.
4. 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.
5. 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.
6. 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. A backflow prevention device shall be installed on the hose bibb.
7. A priming tee shall be installed at the well head in conjunction with offset jet pump installations.
8. Joints of any suction line installed underground between the well and pump shall be tight under pressure.
9. The drop piping and electrical wiring used in connection with the pump shall meet all applicable underwriters specifications.
10. Contaminated water shall not be used for priming the pump.

SECTION VI. WELL TESTS FOR YIELD AND CAPACITY

- (a) Every new well constructed for use as a private water supply shall be tested for capacity by a method outlined in Rule .0110, 15-NCAC, Subchapter 2C, North Carolina Division of Environmental Management.
- (b) Yield test results must be submitted to the Edgecombe County Health Department within five (5) days after completion of the test/so

SECTION VII. WELL DISINFECTION

(a) Chlorination

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

1. Chlorine shall be placed in the well in sufficient quantities to produce a chlorine residual of at least 100 mg/l in the well. A chlorine solution may be prepared by dissolving high test calcium hypochlorite (trade names include HTH, Chlortabs, etc.) in water. About 0.12 lbs. or two ounces of hypochlorite containing 70 percent available chlorine is needed per 100 gallons of water for a 100 mg/l chlorine residual. As an example, a well having a diameter of six (6) 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 0.36 lbs. (1.5 x 200 feet = 300 gallons, 0.12 lbs. per 100 gallons, 0.12 x 3 = 0.36 lbs.).
 2. The chlorine shall be placed in the well by one of the following methods or its equivalent:
 - a. Chlorine tablets may be dropped in the top of the well and allowed to settle to the bottom.
 - b. 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.
 3. Agitate the water in the well to insure thorough dispersion of the chlorine.
 4. 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.
 5. The chlorine shall be dispersed throughout the water supply by running each tap or other fixture until a chlorine odor is evident.
 6. The chlorine shall stand in the well and water supply system for a period of at least 24 hours.
 7. The well shall be pumped until the system is clear of the chlorine before the system is sampled or placed in use.
- (b) Other materials and methods of disinfection may be used upon prior approval by the health director.

SECTION VIII. WELL MAINTENANCE AND REPAIR

(a) Every well shall be maintained so that it will not be a source or channel of contamination or pollution to the water supply or any aquifer.

(b) When repairs are made to a well, the well-head and well seal shall be made to conform to existing standards. All materials used in the maintenance, replacement, or repair of any well shall meet the requirements for new installation.

(c) Broken, punctured or otherwise defective or unserviceable casings, screens, fixtures, seals, or any other parts of the well-head shall be repaired or replaced as soon as possible unless the well is permanently abandoned.

(d) Repairs to wells completed with a buried seal (the well-head terminating below ground) shall include extending the well casing above land surface. The extension shall be made as follows:

1. A tapered sleeve shall be inserted inside of the casing and shall extend at least six inches down into the existing casing. The extension casing shall be welded or

- bonded to the existing casing around the outside of the joint; or
2. A sleeve shall be heated and wedged over the existing casing with at least six inches of overlap.
 3. Cement grout shall be placed around the casing, extending from land surface to depth of at least one foot below the joint formed by the casings. The grout shall have a minimum thickness of one and five-tenths inches.

(e) National Sanitation Foundation (NSF) approved PVC pipe rated at 160 PSI should be used for liner casing. The liner casing shall be installed with centering guides to insure proper centering in the well. The annular space around the liner casing shall be at least five-eighths inches and shall be completely filled with neat-cement grout.

SECTION IX. ABANDONMENT OF WELLS

(a) Any well which has been abandoned, either temporarily or permanently, shall be abandoned in accordance with Rule .0113 15-NCAC Subchapter 2C North Carolina Division of Environmental Management.

(b) The well driller shall complete the construction or abandonment of the well within thirty (30) days of commencement of the construction.

SECTION X. ~~RECORDS REQUIRED~~ RECORDS REQUIRED

(a) Any person completing or abandoning any well in Edgecombe County shall submit to the Edgecombe County Health Department and to the well owner a record of the construction or abandonment which includes the owner's name, the well's location, diameter and depth, casing depth, the method of finishing or abandoning, static water level, pumping water level, yield, pump type, capacity and setting and date of completion or abandonment.

(b) Any person repairing a well shall submit to the Edgecombe County Health Department and the well owner a record of the repair to include the owner's name, location of the well, change in construction and materials replaced, and date of repair.

(c) The reports required in Sections A and B above shall be submitted to the Edgecombe County Health Department within fifteen (15) days after completing construction, abandonment or repair.

(d) Reports shall be certified by the contractor or other person completing the construction, abandonment or repair.

SECTION XI. VARIANCES

The health director or health department representative may grant a variance upon a finding that compliance with the provisions of these regulations is impractical because of conditions beyond the control of the well owner, or because compliance would result in unreasonable or unnecessary hardship to the well owner. Requests for variances must be in writing and addressed to the health director. A variance may be issued by the health director or health department representative and may be conditioned on the submission of periodic progress reports. Any variance herein shall be contingent upon the granting of a variance of Rule .0100 15 NCAC Subchapter 2C North Carolina Division of Environmental Management when applicable. It may be revoked or modified

after thirty (30) days notice to the persons affected by the revocation or modification, and it may be extended from one date certain to another if circumstances warrant such extension.

SECTION XII. SEVERABILITY

If any provision or clause of these regulations or the application thereof shall be declared invalid by a court of competent jurisdiction, such declaration shall not invalidate any other provision, clause, or application of these regulations.

SECTION XIII IMPLIED GUARANTEE

These rules, or adherence to these rules shall not be taken as a guarantee of producing a safe, potable water supply.

SECTION XIV. EFFECTIVE DATE

These rules adopted by the Edgecombe County Board of Health on September 16, 1996 shall be in full force and effect from and after January 1, 1997.