

CHATHAM COUNTY WELL PROGRAM



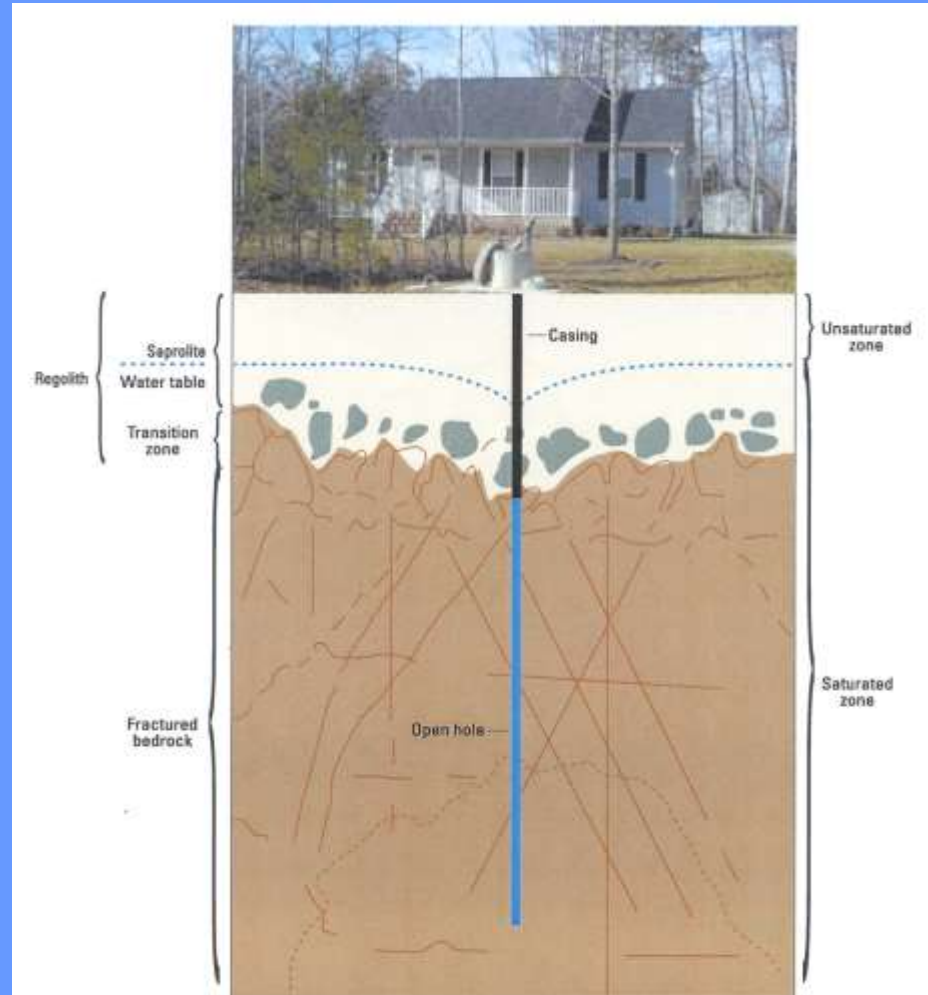
Carl Kivett, REHS, LSS
Well Program Specialist





Private Wells

- Installing new wells
- Inspections
- Protecting wells
- Water Sampling



Principal components of the ground-water system in the Piedmont physiographic province of North Carolina (Cunningham and Daniel, 2001).

Installing a New Well

- Obtain a permit from the Chatham County Environmental Health Division
- Hire a “competent”, certified well-driller
 - Consult with neighbors
 - Consult with professionals
 - Ask for two or three references

Well Permits

- The property owner must submit:
 - a completed application
 - the fee (currently \$340)
 - a site plan
- A representative of the owner can submit these items as long as a Legal Representation Document is completed and submitted.
- A site visit will be scheduled.



PERMIT APPLICATION FORM

CHATHAM COUNTY PUBLIC HEALTH DEPARTMENT
DIVISION OF ENVIRONMENTAL HEALTH
80 EAST ST, P.O. BOX 130 • PITTSBORO, NC 27312-0130
PHONE 919-542-8208 • FAX 919-542-8288
www.chathamnc.org/environmentalhealth

OFFICE USE ONLY
Receipt #: _____
Initials _____ / _____
Date Rec'd: _____
Ck# _____ Cash _____ CC _____
Amt. Rec'd: _____
R E H S _____ C V

NOTE: Do not fill in amounts, just check type of permit.

- Improvement Permit \$ _____ Valid for 60 months from date of issue
Well Permit \$ _____ Valid for 60 months from date issued
Improvement Permit \$ _____ Perpetual plat 1" - 60" required within 30 days of site approval
Well Re-Site Permit \$ _____
OP Revision \$ _____
Well Repair/Abandonment \$ _____
Construction Authorization \$ _____
Septic Repair Permit \$ _____

Applicant: _____ Owner: _____
Mailing Address: _____ Mailing Address: _____
City: _____ State: _____ Zip: _____ City: _____ State: _____ Zip: _____
Cell Phone: _____ Home Phone: _____ Cell Phone: _____ Home Phone: _____
E-Mail Address: _____ E-Mail Address: _____
Property Address: _____ City: _____ State: NC Zip: _____
Tax Parcel#: _____ Acres(Existing): _____ Acres(Proposed): _____ Subdivision: _____ Lot#: _____
Directions to Property: _____

Residential
New Single Family Residence
Expand or Alter Existing Septic System
Repair to Existing Septic System
Maximum number of bedrooms _____
Basement with plumbing fixtures? Yes No
Other structures with plumbing fixtures? Yes No
Garage Shop Barn Other _____
List fixtures in basement & other structures: _____
Non-Residential
Please describe the business, its plumbing fixtures, number of employees, square footage, number of seats etc. Use attachment if needed.

WATER SUPPLY: New Well Existing Well Community Well Public Water
For New Construction: If served by Chatham County Water, that department requires connection to the County Water System

Construction Authorization
Type of septic system requested: Type listed on IP Other _____

The Applicant shall notify the local health department upon submittal of this application if any of the following apply to the property in question.
If the answer to any question is "yes" applicant must attach supporting documentation
Are there any easements or right of ways on this property? Yes No
Is the site located in any designated wetlands? Yes No
Is any wastewater going to be generated on the site other than domestic sewage? Yes No
Is the site subject to approval by any other public agency? Yes No

I have read the application and certify that the information provided therein is true, complete and correct. I authorize county and state officials right of entry to conduct necessary inspections to determine compliance with applicable laws and rules. If the information in the application is falsified, changed or the site is altered then the Permit shall be invalid. Understand that I am solely responsible for the proper identification and labeling of all property lines and corners and making the site accessible so that a complete site evaluation can be performed. The issuance of a permit in no way guarantees the approval of other permits (i.e. Building Permits, etc.)

SIGNATURE: _____ DATE: _____

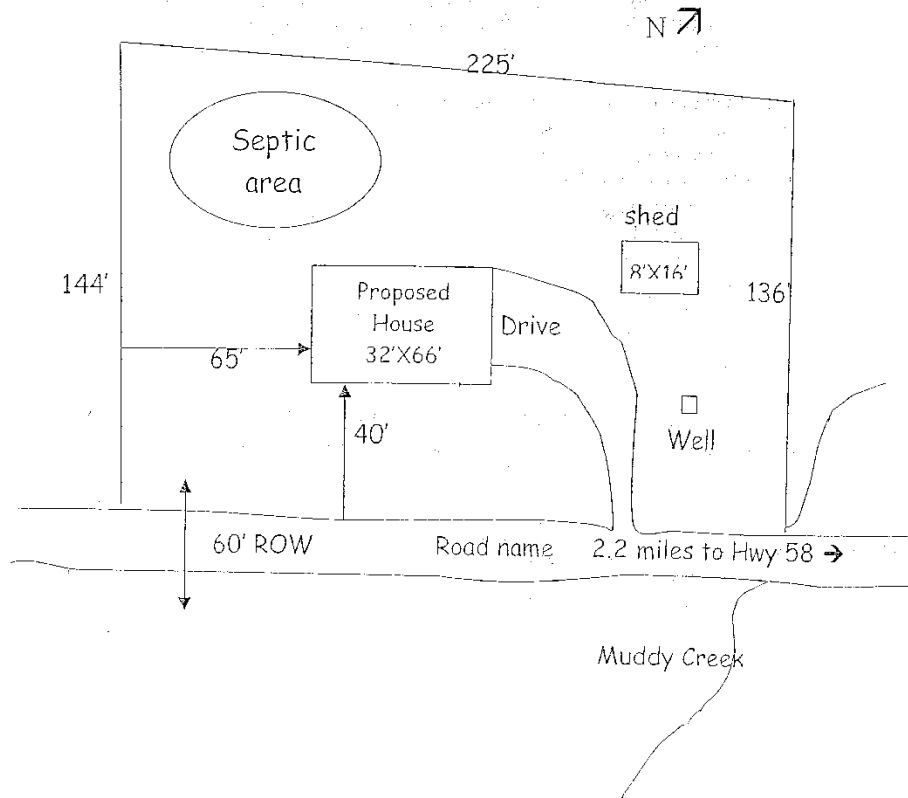
Property owner's or owner's legal representative** signature (Required)
** Must provide documentation to support claim as owner's legal representative

SITE PLAN WORKSHEET

Incomplete site plans will be returned to you for completion. Remember: Your property will not be scheduled for an evaluation until we have received a completed application, site plan, and all proposed items are marked on the property. Submit a site plan on a copy of the surveyed and/or recorded plat showing:

- The dimensions of the property.
 - The proposed location of all existing and proposed structures (e.g.: facility, wells, water lines, outbuildings, workshops, garages, pools). Show the distances from the road and the side property line to all structures. Indicate the dimensions for all the structures. If you are unsure as to the structure size, please show the dimensions of the MAXIMUM area of the lot that you anticipate the structure will cover.
 - The site you would prefer your septic system to go in.
 - The preferred driveway location and any parking areas.
 - The proposed well location.
-
- A north arrow or other sufficient directional indicator.
 - The location of any existing septic tank systems and wells on your property and on the adjoining property within 100' of your property line.
 - The location of any easements or rights of way on the property.
 - The location of any designated wetlands on the property.

Example of a properly prepared site plan:



Site Visit

- An Environmental Health Specialist will come to the site to approve the well area based on the required setbacks.
- Once the site is approved, the permit will be issued.
- The permit is good for 5 years.

Locate wells in areas not subject to flooding and at least:

- 100 feet from any septic system, including those on adjacent property
- 50 feet from any watertight sewer line
- 100 feet from any source of potential groundwater contamination, including animal feedlots or barns, fertilizer or other chemical storage areas, etc.
- 25 feet from any building foundation or structure subject to termite treatment
- 10 feet from all property lines
- 50 feet from lakes, ponds or reservoirs
- 25 feet from all other surface waters, such as brooks, creeks, streams, and rivers

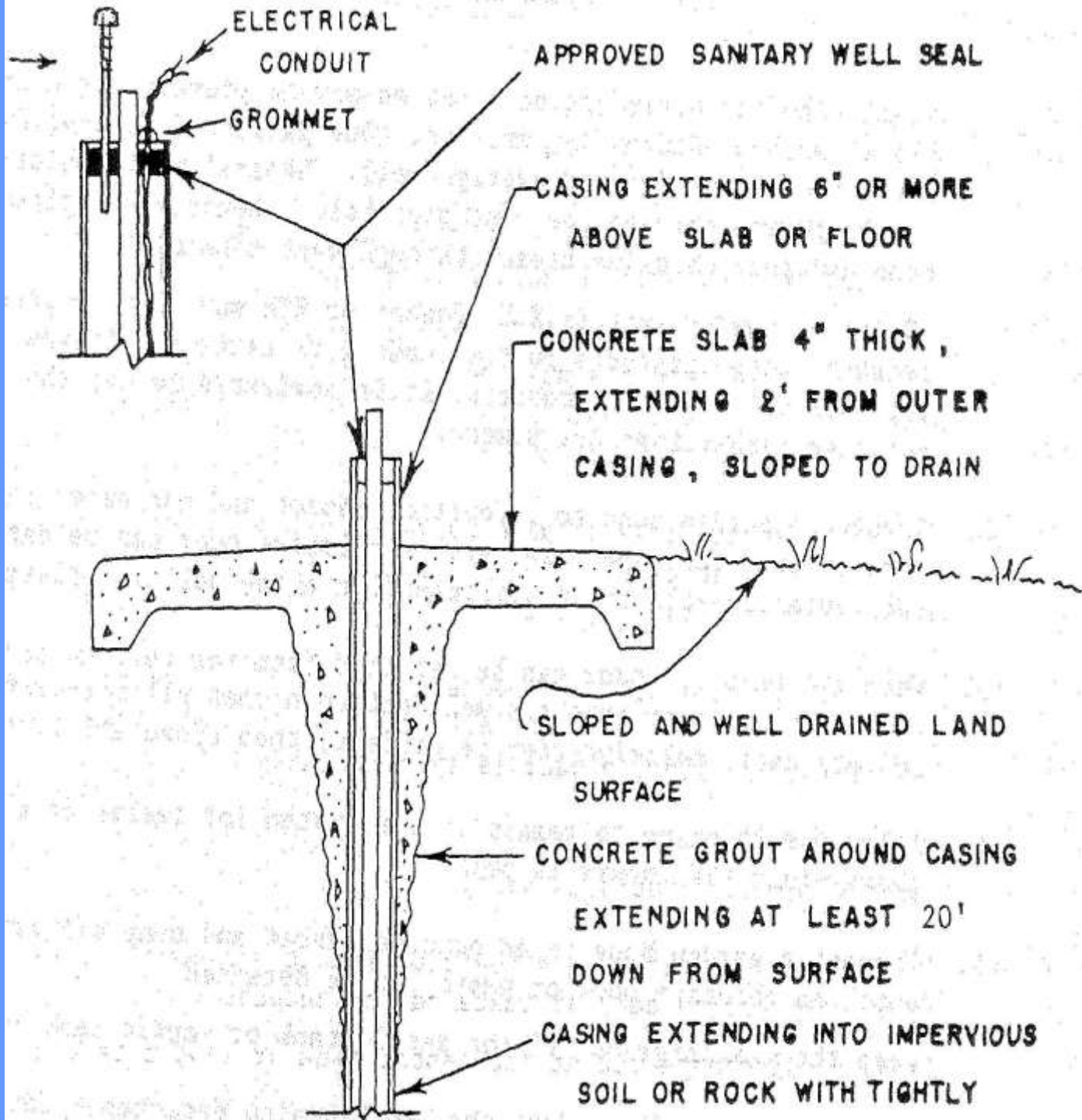
Inspections

- Grout placement
- Well head
- Repairs
- Abandonments

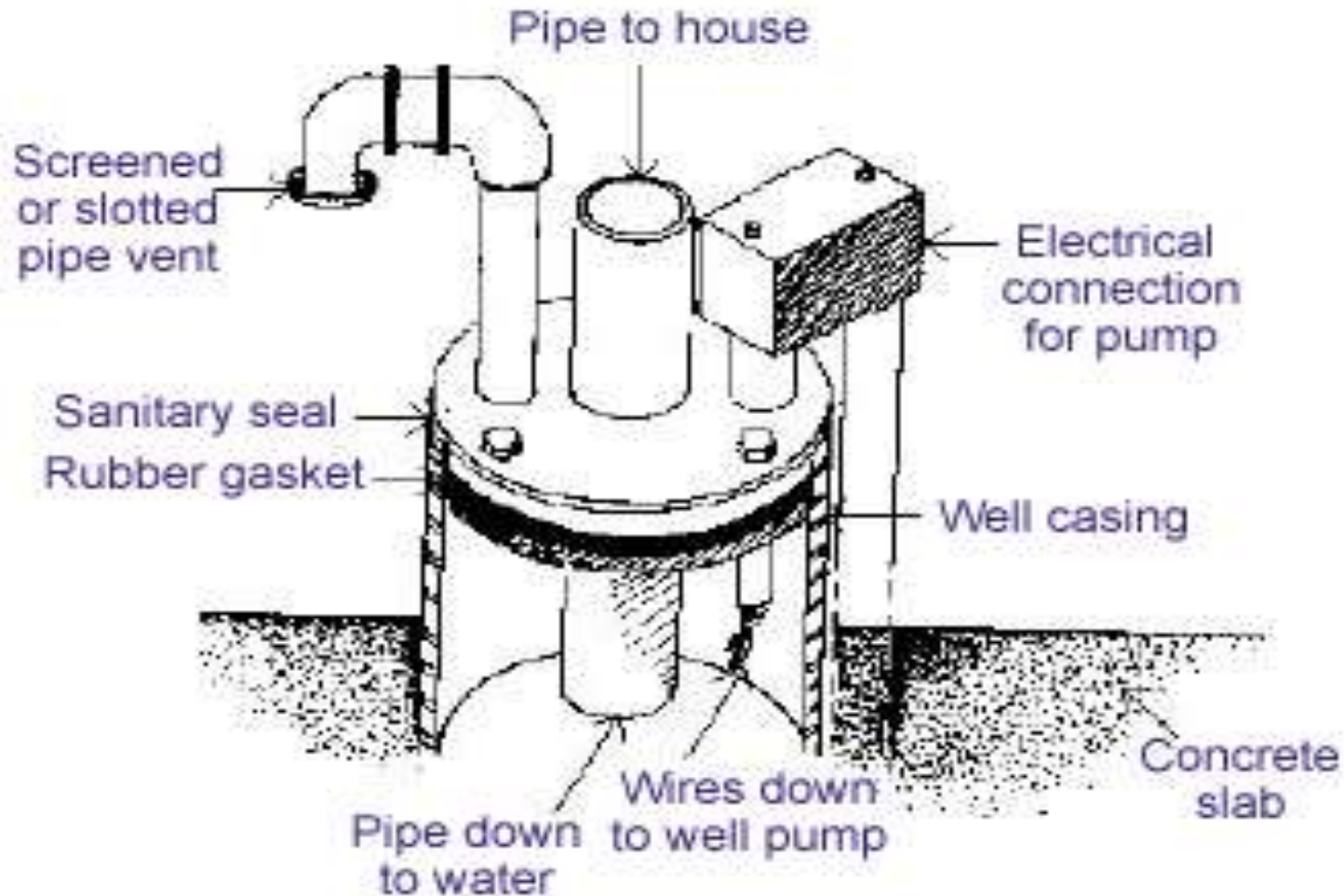


Well Grouting Inspection





Well Head







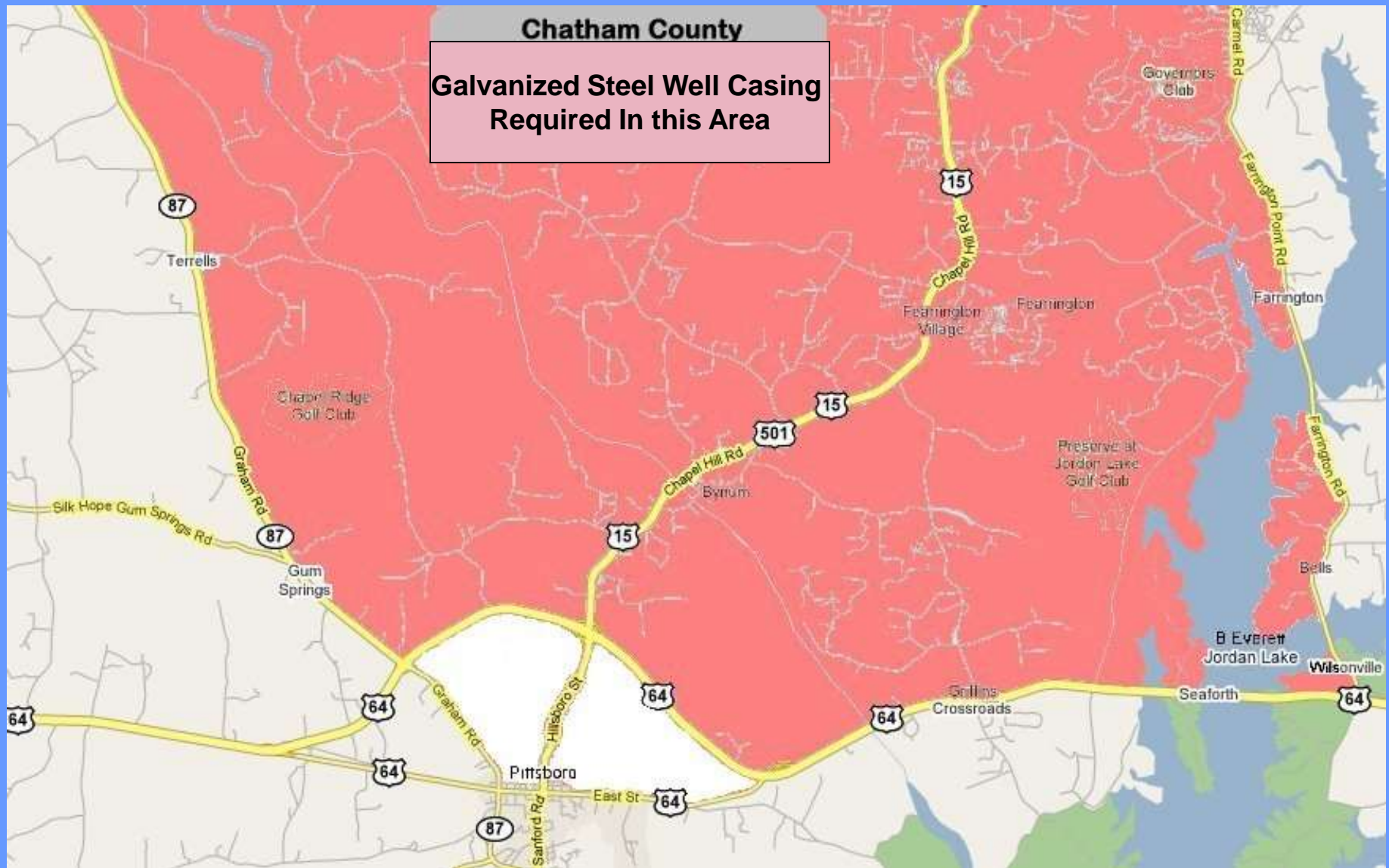
CB12

WAGNER & SONS WELL DRILLING, INC.
CERTIFICATION NO. 28271
AS COMPLETED BY: [Signature]
DATE: 10/15/03
WELL NO.: [Blank]
WELL DEPTH: [Blank]
WELL TYPE: [Blank]
WELL DIRECTION: [Blank]
WELL LOCATION: [Blank]
WELL STATUS: [Blank]
WELL OWNER: [Blank]
WELL USER: [Blank]
WELL PURPOSE: [Blank]
WELL DATE: [Blank]

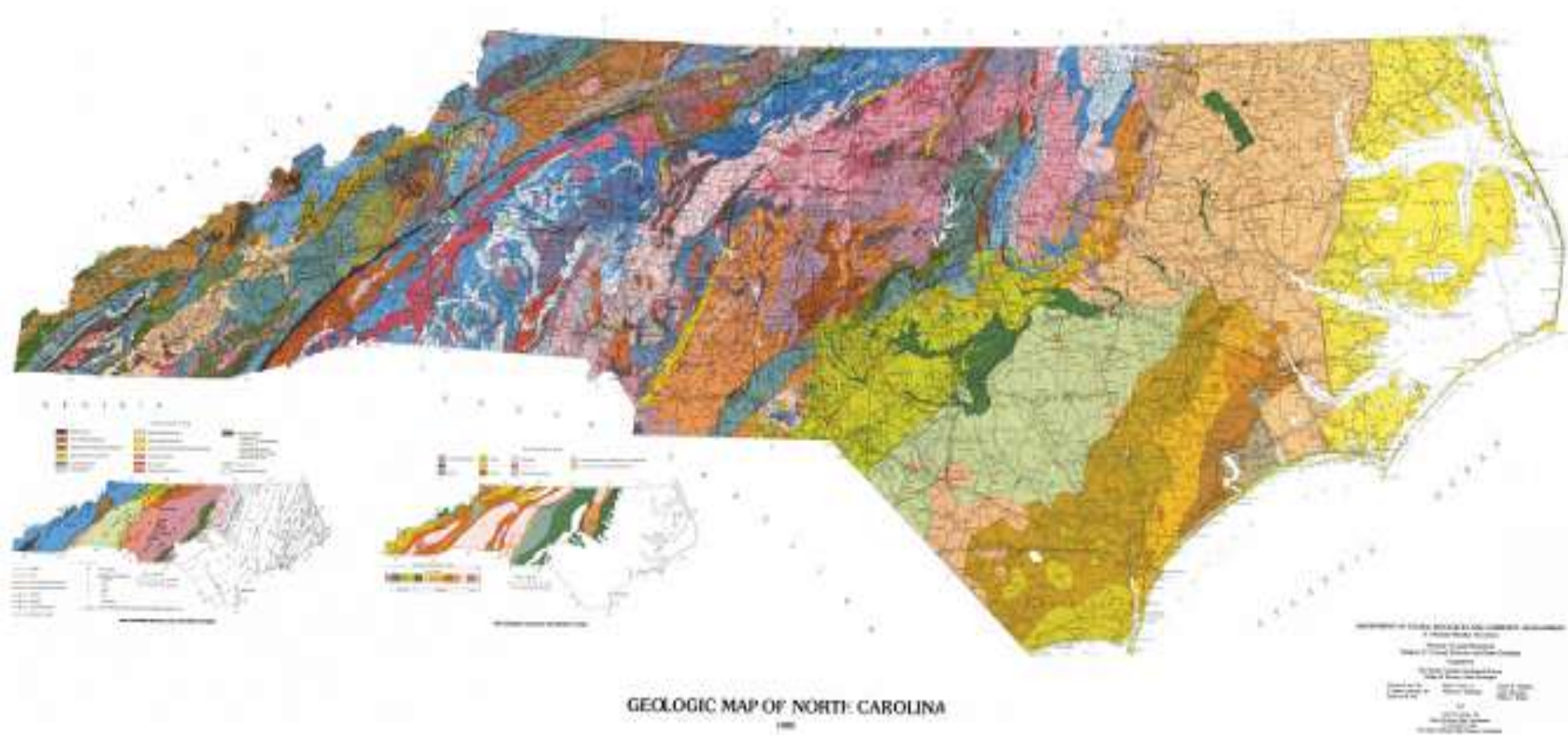
MADE IN USA 654930

PUMP IDENTIFICATION
PUMP INSTALLER'S NAME PLATE
MFG. [Blank]
PUMP MODEL [Blank]
SERIAL NO. [Blank]
DATE [Blank]

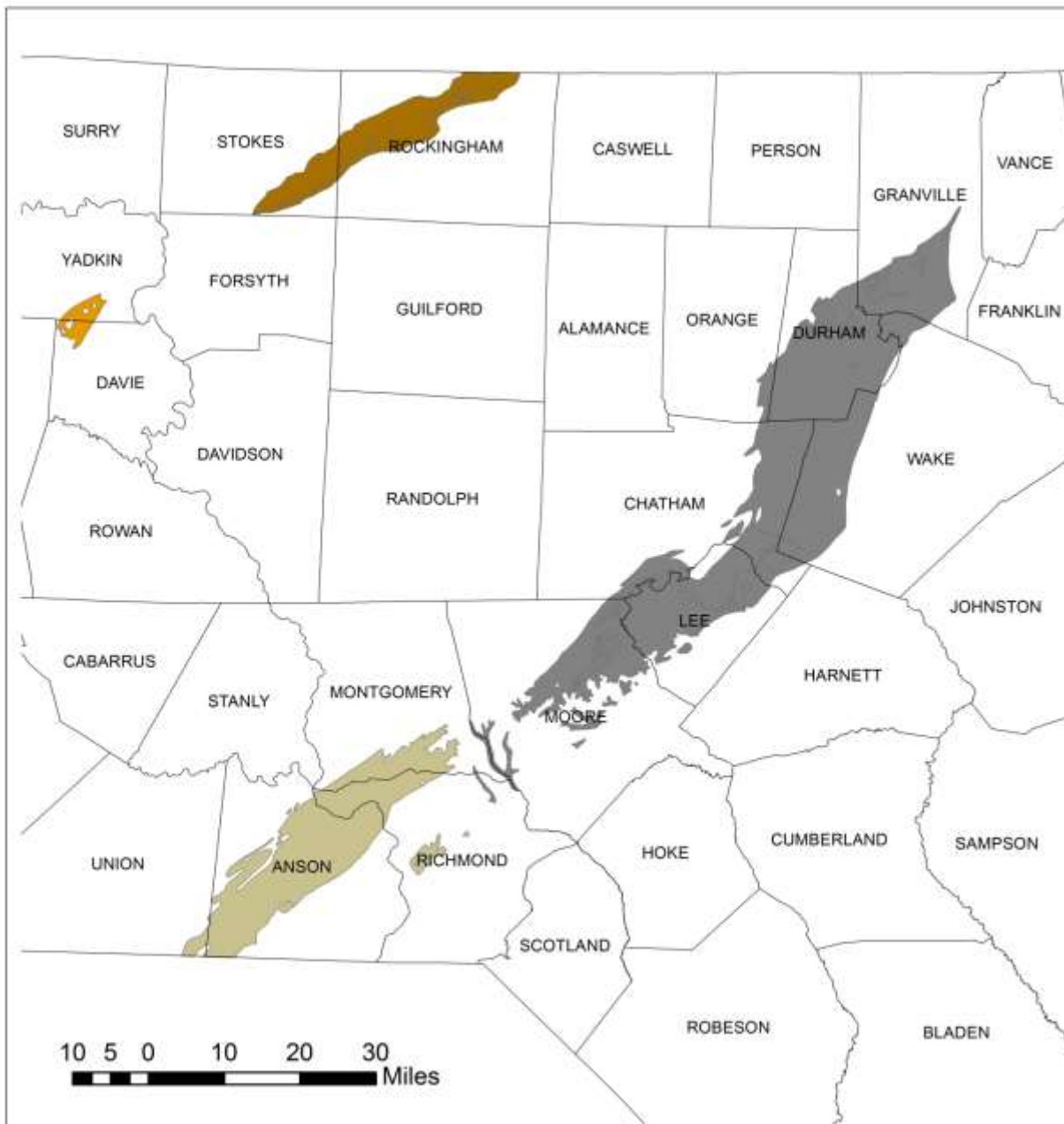
Geology Determines Well Casing



Geologic Map of North Carolina



- Represent rock unit at or near land surface. Actual contact may be covered by soil.
- Chatham County is composed of several different geologic units.
- Provides insight into subsurface geologic structures and units.
- Can be used to determine needed drilling equipment.



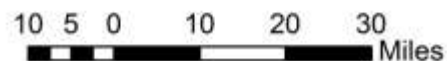
North Carolina Triassic Basins

Major Geologic Belt

- Dan River Basin
- Davie Basin
- Durham-Sanford Subbasins
- Wadesboro Subbasin

For more information contact:
 Clean Water for NC
 Ph: 919-401-9600
www.cwfnc.org

Source: North Carolina Geology, 2007
 North Carolina Geological Survey



Well Repairs

- Well repairs may be necessary if your well yields muddy or discolored water or is found to have bacteria present.
- Well repairs require a permit from the local Health Department and must be done by a certified well contractor.
- An EHS will inspect the well repair to verify that the materials and methods used by the contractor meet state and county rules.

Down-hole Well Camera



Pulling a Pump



Pulling a Pump



Well Repair: Liner with Packer



Well Repair: Liner with Packer



Well Repairs



Well Abandonments - Definitions

- **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 ground water or other useful purpose is impracticable.
- **Permanently Abandoned Well** is a well that has been filled in using approved materials and by approved means.

Well Abandonments

- Any well that is a source or channel of contamination shall be repaired or permanently abandoned within 30 days of receipt of an order from the Health Director.
- The local Health Department must issue a permit for any well abandonment.
- An EHS will inspect the well abandonment in order to verify the materials and methods used.













Protecting Wells

- Store and mix chemicals safely
- Store fuel safely
- Keep out animal or human waste
- Eliminate other potential sources of contamination
- Check well seal
- Disinfect well as needed

Your well head should not be in a hole!



Look out for critters when checking your well head!





Well Disinfection & Water Sampling



Well Disinfection

- New well
- Repaired well
- Repaired/replaced well pump
- Well tests positive for bacteria
- Well seal is opened for any reason



Water Testing: Who?

➤ Health Department

- Environmental Health Division
- Well owner, or their legal representative, needs to complete & submit an application

➤ Certified Laboratory

- Can search list of state certified labs at
<http://slphreporting.ncpublichealth.com/EnvironmentalSciences/Certification/CertifiedLaboratory.asp>



Tests Offered By Environmental Health:

- Bacteriologic (Coliform)
- Inorganic (Mineral)
- Nitrate/Nitrite
- Sulfur Bacteria
- Iron Bacteria
- Pesticide
- Petroleum



What Tests Should You Request?



Bacteriologic

- Tests for Total & Fecal Coliform Bacteria



Bacteriologic

➤ Total Coliform

- Large group of several different gram-negative facultative bacteria
- Ubiquitous - found in air, soil, vegetation, decaying matter, sewage, etc.

➤ Fecal Coliform

- Subgroup of Total Coliform bacteria
- Found in intestines and feces of warm-blooded animals, including humans
- If total coliform result is positive, the lab tests further to see if fecal coliform is positive

Bacteriologic

- Indicator organism
 - If present, may indicate that other potential disease causing organisms are present (e.g., Giardia, Cryptosporidium, Hepatitis, Vibrio cholerae, Salmonella Typhi, etc.)
 - Relatively easy & inexpensive test
 - Complex, expensive, time-consuming to test for all possible pathogens
- If present, water should not be used for drinking or cooking

Bacteriologic

- Bacteriologic testing should be done if:
 - Your well is newly drilled
 - Your well has been repaired or pump replaced
 - A flood has occurred near or around your well
 - Any household member suffers from recurring bouts of gastrointestinal illness
 - An infant lives in the home
 - A person with a chronic illness that compromises the immune system lives in the home
 - Your well has never been tested
- Recommended to test for once a year

Inorganic

➤ Parameters included in Inorganic testing:

- Arsenic
- Barium
- Cadmium
- Calcium
- Chloride
- Chromium
- Copper
- Fluoride
- Iron
- Lead
- Magnesium
- Manganese
- Mercury
- pH
- Selenium
- Silver
- Sodium
- Sulfate
- Alkalinity
- Hardness
- Zinc

Inorganic

- Inorganic testing should be done if:
 - Your well is newly drilled
 - Your water has an objectionable or metallic taste
 - Your water is cloudy or discolored
 - Your plumbing fixtures or pipes have a scaly residue or corrosion
 - You notice stained plumbing fixtures or laundry

Nitrate/nitrites

- Nitrogen-oxygen chemical units which combine with various organic and inorganic compounds
- Once taken into the body, nitrates are converted into nitrites.
- Can be very dangerous
- Can cause methemoglobinemia (“Blue Baby Syndrome”)
- Boiling the water can increase concentration

Nitrate/nitrites

- Possible sources of nitrates are fertilizer, sewage, and animal waste



Nitrate/nitrites

- Nitrate/Nitrite testing should be done if:
 - A household member is pregnant
 - An infant lives in or spends time in the household
 - A household member suffers from severe heart or lung disease
 - Your well is located near a farm field, animal barn (including chicken house) or feed lot
 - Your well is located within 100 feet of a septic system, particularly an old system or one that has failed

Sulfur Bacteria

- This test is recommended if:
 - Your water has a “rotten eggs” or sulfur odor
 - However, if this odor is present, the test is probably not necessary because the odor indicates that treatment (e.g., super chlorination) is needed
 - Your water has a bitter taste
 - Your plumbing has pipe corrosion problems and yellow or black stains on fixtures

Iron Bacteria

- This test is recommended if:
 - You notice a slimy build-up in the toilet tank
 - Your water has a reddish-brown tinge or an oil-like sheen on the surface
 - Your water has a musty, oily, or “cucumber” odor



Pesticide



➤ This test is recommended if:

- Your well is near areas of intensive agriculture
- Your well is located within 25 feet of a termite-treated building foundation

❖ Requires prior authorization from the EH Director



Petroleum

- This test is recommended if:
 - Your well is located near an underground storage tank (UST)
 - Your well is located near a business that has an UST or is industrial in nature
 - Your well is located near a landfill

- ❖ Requires prior authorization from the EH Director



Sampling Requirements for New Wells as of July 1, 2008

- 15A NCAC 18A .3802 – Samples shall be obtained by the LHD within 30 days after issuance of a well certificate of completion
- Well needs to be chlorinated and chlorine flushed out prior to sampling
- Well owner is responsible for providing access and a source of power
- Need adequate tap to collect sample

Sampling Requirements (cont'd)

- Samples shall be collected from sample tap at, or as close as possible to, the well (i.e., before any treatment devices)

- Sample tests required:
 - Total Coliform/ Fecal Coliform
 - Arsenic, Barium, Cadmium, Calcium, Chloride, Chromium, Copper, Fluoride, Lead, Iron, Magnesium, Manganese, Mercury, Nitrate, Nitrite, Selenium, Silver, Sodium, Sulfate, Zinc, Total Alkalinity, Total Hardness and pH



WATER SAMPLE REQUEST

OFFICE USE ONLY

Receipt # _____

Initials _____ / _____

Date Rec'd: _____

Clk _____ Cash _____ CC _____

Am't Rec'd _____

R.E.H.S. _____

Cityview _____

BACTERIA (COLIFORM) \$60.00

IRON BACTERIA \$60.00

INORGANIC (MERCURY) \$100.00

SULFUR BACTERIA \$70.00

NITRATE \$60.00

Full Panel: Bacteria (Coliform only), Nitrate, & Inorganic

**Requires prior health department authorization

FULL PANEL KIT \$100 (EXISTING WELL)

PESTICIDE** \$150.00

FULL PANEL KIT \$0 (New Well-Initial Sample)

PETROLEUM** \$150.00

++Existing Wells-Please indicate if you would like to have sample taken from outside or inside .

If sample is taken inside owner must be present. We will call daytime phone number to schedule appointment.

⊖ A Bacteriological Analysis, Inorganic Analysis and Nitrate Analysis are **required per State Law for all newly constructed wells** within 30 days of the certificate of completion. The owner or owner's legal representative must submit a water sample application prior to the collection of the water sample by the Environmental Health Specialist.

IMPORTANT: Prior to requesting an appointment for new well sampling, the well head must be completed, the pump installed and provided with electricity. All chlorine disinfectant must be fully removed from the well.

Your water sample results will be sent by e-mail unless you request otherwise.

You may also check them on our webpage: <http://www.chathamnc.org/index.aspx?page=650>

Does home have a water treatment system? Yes No Which type of system: _____

Property Owner* _____

Property Owner's Mailing Address _____

City _____ State _____ Zip _____

Property Owner's Daytime Telephone _____ Cell Phone Number _____

Property Owner's Email Address _____

Street Address of Well Location _____ City _____ State _____ Zip _____

Subdivision or Mobile Home Park Name and Lot Number _____

Parcel Number _____

Person Requesting Sample _____

Daytime Phone Number _____ Cell Phone number _____

Applicant's Email Address _____

* If applicant for service is not the property owner, a signed Legal Representation Document is required to be submitted with this form.

Directions to property where well is located.

Well location on property. BE SPECIFIC.

Empty box for directions and well location details.

PRIVATE WATER SUPPLY COMMUNITY WATER SHARED WELL LIVESTOCK IRRIGATION WELL

WELL DRILLER'S NAME _____

DRILLED WELL BORED WELL DUG WELL SPRING OTHER

Before your scheduled appointment with the Environmental Health Specialist, make sure:

- Your well casing is uncovered (for inspection) and properly sealed (no openings in well seal).
- The water spigot is accessible (sample bottle must "fit" under spigot in sanitary manner).
- There is no chlorine residue in water (use pool sample kit if necessary).
- The well pump is operating properly (electricity provided).

Notify the Environmental Health Specialist before 9:00am on the scheduled appointment day if you are not ready for the sample collection. FAILURE TO COMPLY WITH THE ABOVE WILL RESULT IN FORFEITURE OF FEE PAID. A NEW FEE MUST BE PAID FOR THE ENVIRONMENTAL HEALTH SPECIALIST TO RETURN TO THE PROPERTY. I authorize county and state officials right of entry to conduct necessary inspections to determine compliance with applicable laws and rules to include mandated and requested water sampling.

SIGNATURE _____ DATE _____

(Well Owner or Legal Representative)

Home Water Treatment

- ✓ Carefully select treatment systems
 - Understand options
 - Match equipment to treatment needs
- ✓ Operate and maintain equipment properly
- ✓ Protect from consumer fraud



Home Water Treatment

➤ Helpful Websites:

- NC Cooperative Extension

- <http://www.bae.ncsu.edu/programs/extension/publicat/wqwm/drwtr.html>

- NSF.org (National Sanitation Foundation)

- www.nsf.org/consumer/drinking_water/dw_treatment.asp?program=Water_Tre

- EPA.gov

- http://water.epa.gov/drink/info/upload/2005_11_17_faq_fs_healthseries_filtration.pdf

Want to know more?

- North Carolina Division of Water Resources:
<http://www.ncwaterquality.org/>
- National Ground Water Association Well Owner Information: <http://www.wellowner.org/>
- EPA Ground Water and Drinking Water:
<http://www.epa.gov/safewater/index.html>
- North Carolina Groundwater Association:
<http://www.ncgwa.org>
- Water Systems Council:
<http://www.watersystemscouncil.org>
- NC Private Well Water and your Health
<http://epi.publichealth.nc.gov/oeep/programs/wellwater.html>

Contact Information

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