

# Chatham County Well Program

Carl Kivett, REHS, LSS  
Well Program Specialist

**Leading the Charge to a Healthier Chatham**

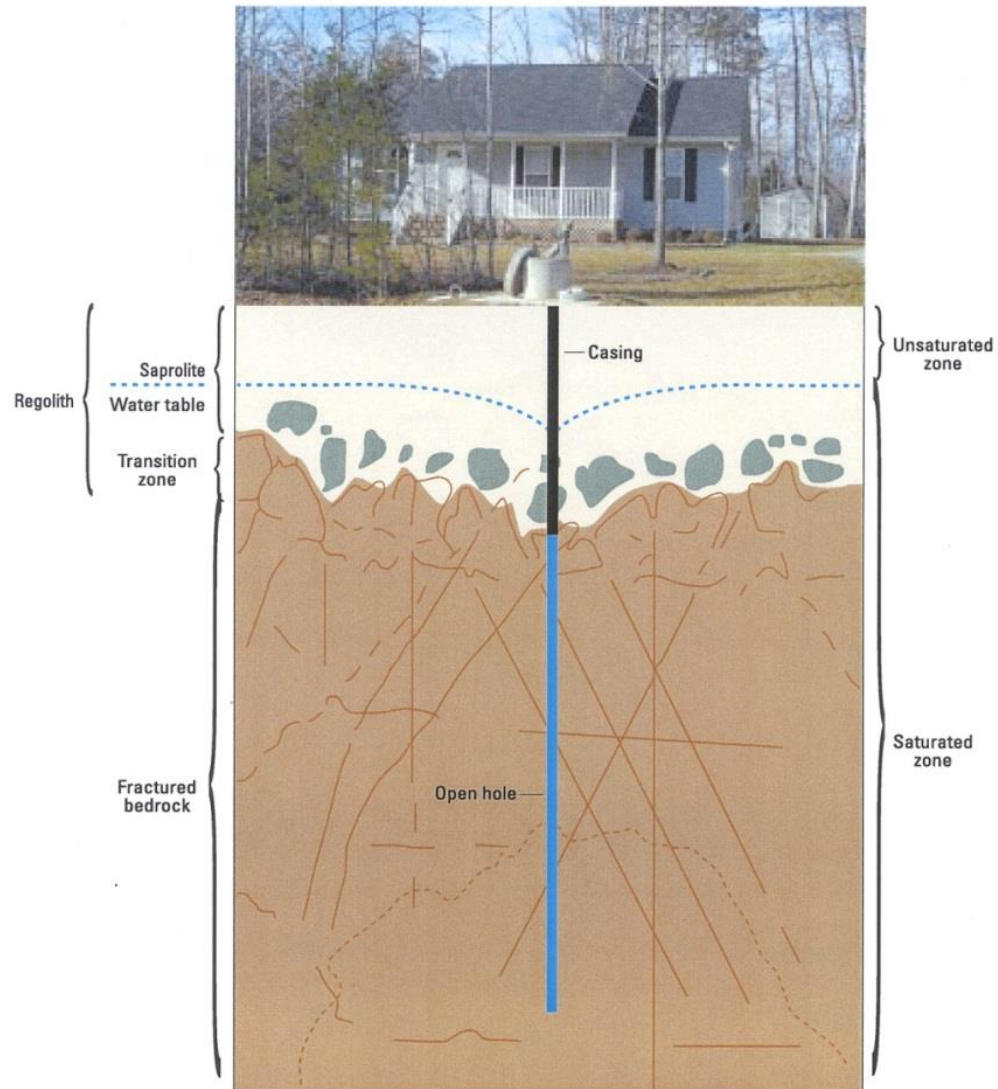
Chatham County Public Health Department • L. Layton Long, Health Director • [www.chathamnc.org/publichealth](http://www.chathamnc.org/publichealth)

# Private Wells

- Siting & Installing New Wells
- Inspections
- Repairing
- Abandonment
- Water Sampling
- Contaminants




# Installing a New Well



# Well Permit Application

- Obtain a permit from the Chatham County Environmental Health Division
- Fee (currently \$340)

Print Form



**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.**

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

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. I 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

Revised 4/10

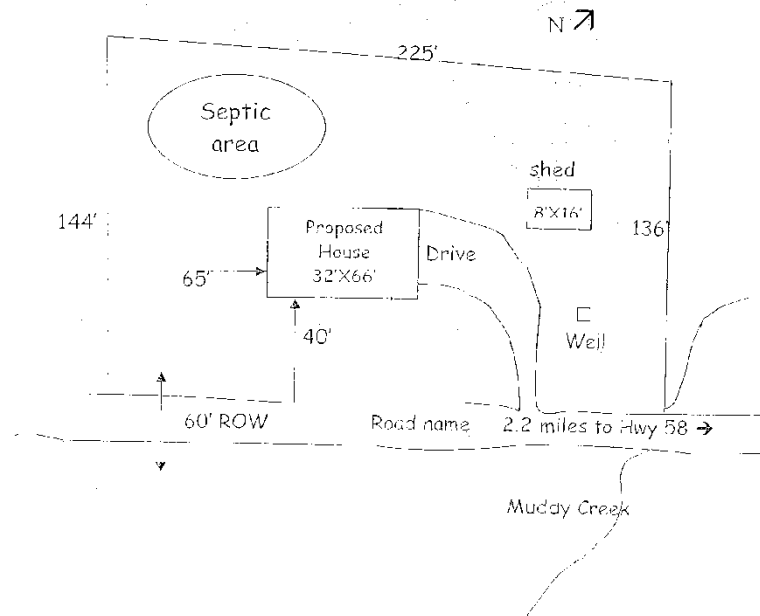
# Site Plan

## 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:

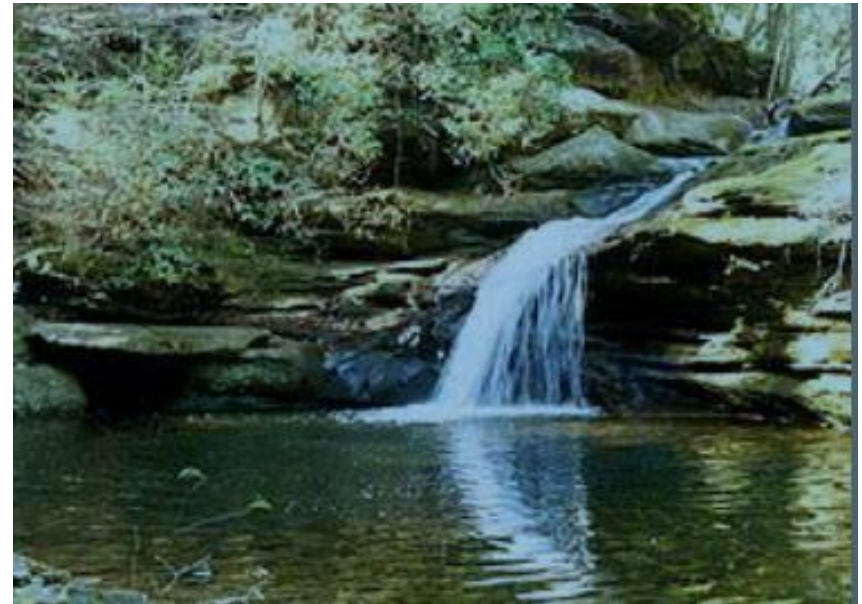
- a. The dimensions of the property.
- b. The proposed location of all existing and proposed structures (e.g., facility, wells, water lines, outbuildings, workshops, garages, pools). Show the distances from the road and the side property line to all structures. Indicate the dimensions for all the structures. 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.
- c. The site you would prefer your septic system to go in.
- d. The preferred driveway location and any parking areas.
- e. The proposed well location.
- f. A north arrow or other sufficient directional indicator.
- g. The location of any existing septic tank systems and wells on your property and on the adjoining property within 100' of your property line.
- h. The location of any easements or rights of way on the property.
- i. The location of any designated wetlands on the property.

Example of a properly prepared site plan:



# Well Site Minimum Setbacks

- **\*50 feet** from any septic system, including the septic tank and repair area
- Session Law 2018-65 (HB573)
  - Wells serving single-family dwellings can be permitted less than 100 feet from a septic system but shall be at least 50 feet.
  - Shared wells are still required to be 100 feet from a septic system and repair area.
  - Wells must still be a min. of 100 feet from a septic system installed in decayed rock material (saprolite).

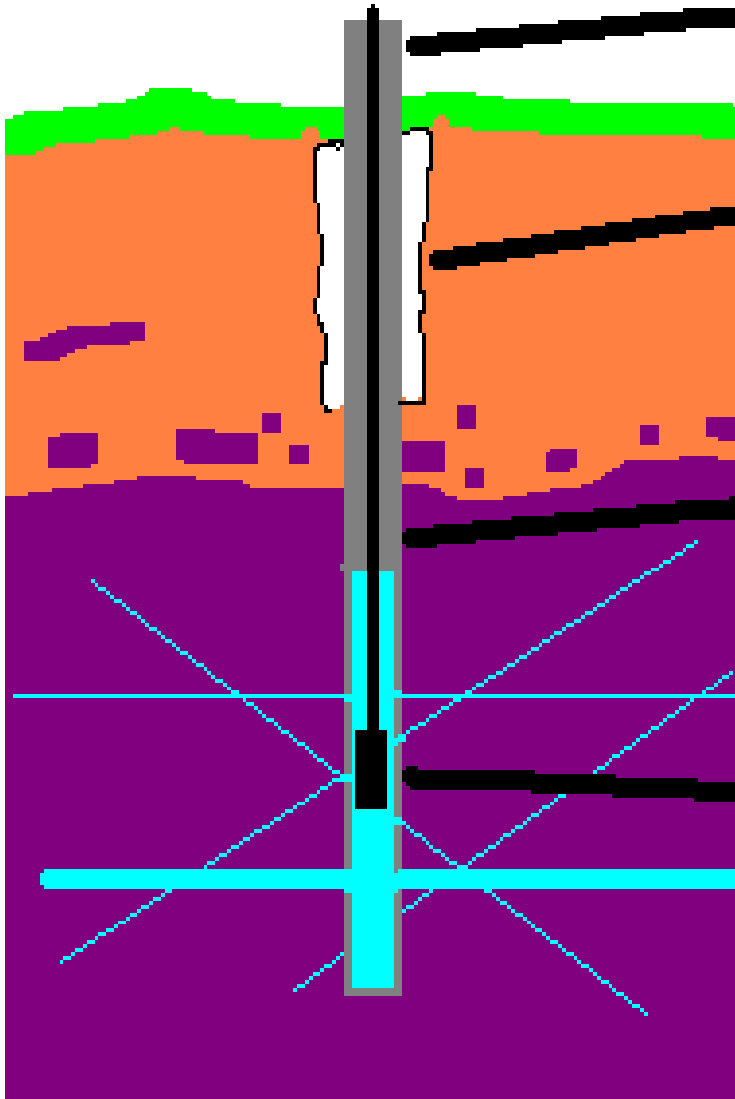


# Minimum Setbacks

- 25 feet from any building foundation or structure subject to termite treatment
- 50 feet from any watertight sewer line
- 100 feet from any source of potential groundwater contamination
- 50 feet from lakes, ponds or reservoirs
- 25 feet from all other surface waters
  
- **Permit is valid for 5 Years.**



# Drilled Well Components



- ❑ Casing extends one foot above grade
- ❑ Grout extends to minimum depth (over 20 feet)
- ❑ Bottom of casing seated and sealed in consolidated rock
- ❑ Submersible pump moves the water out of the well



# Inspections

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- **Grout Material & Placement**
- **Well Head Completions**
- **Repairs**
- **Abandonments**



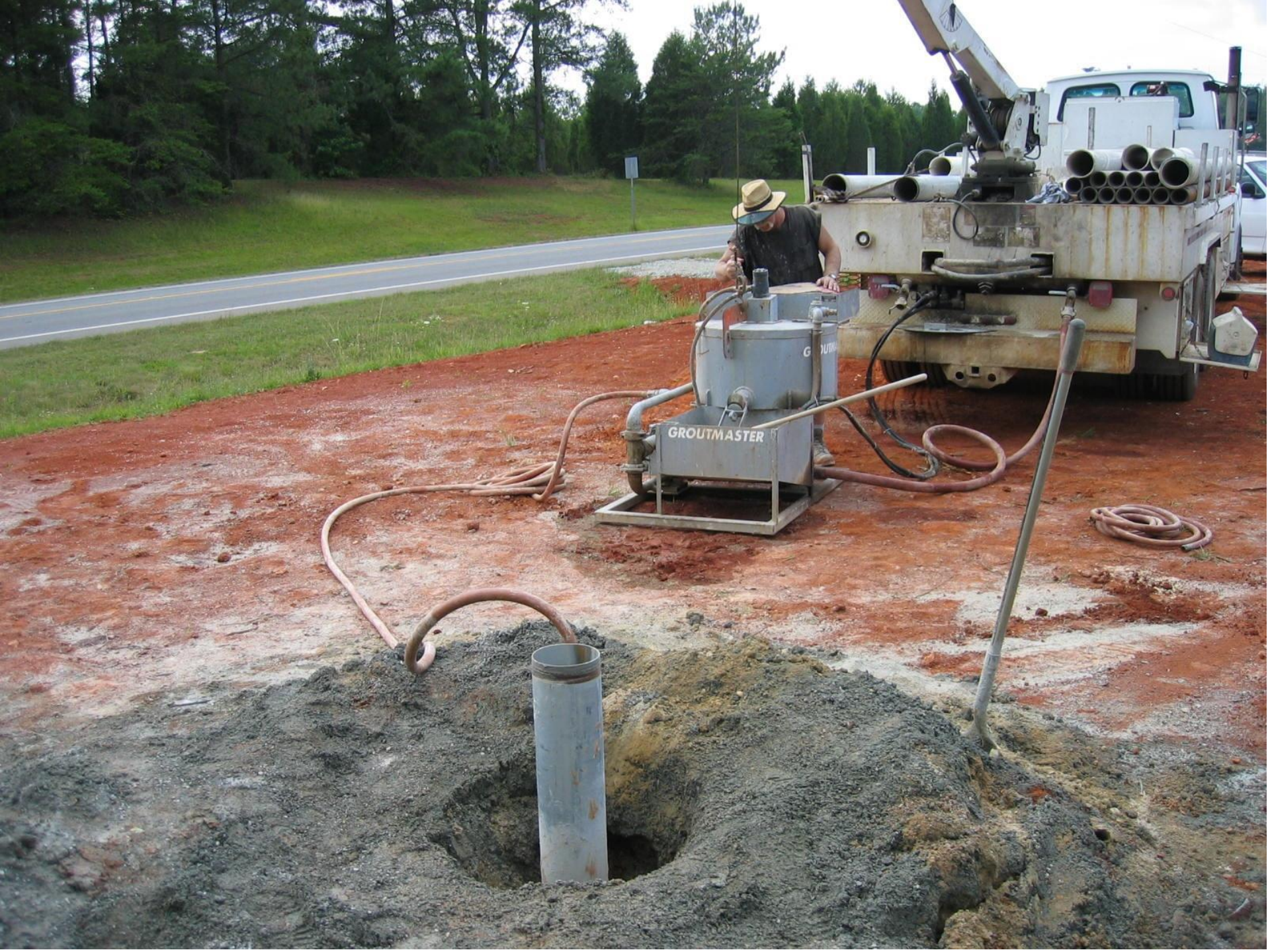
# Types of Grout

- **Neat cement grout**
- **Sand cement grout**
- **Concrete grout**
- **Bentonite Slurry**
- **Bentonite Chips or Pellets**

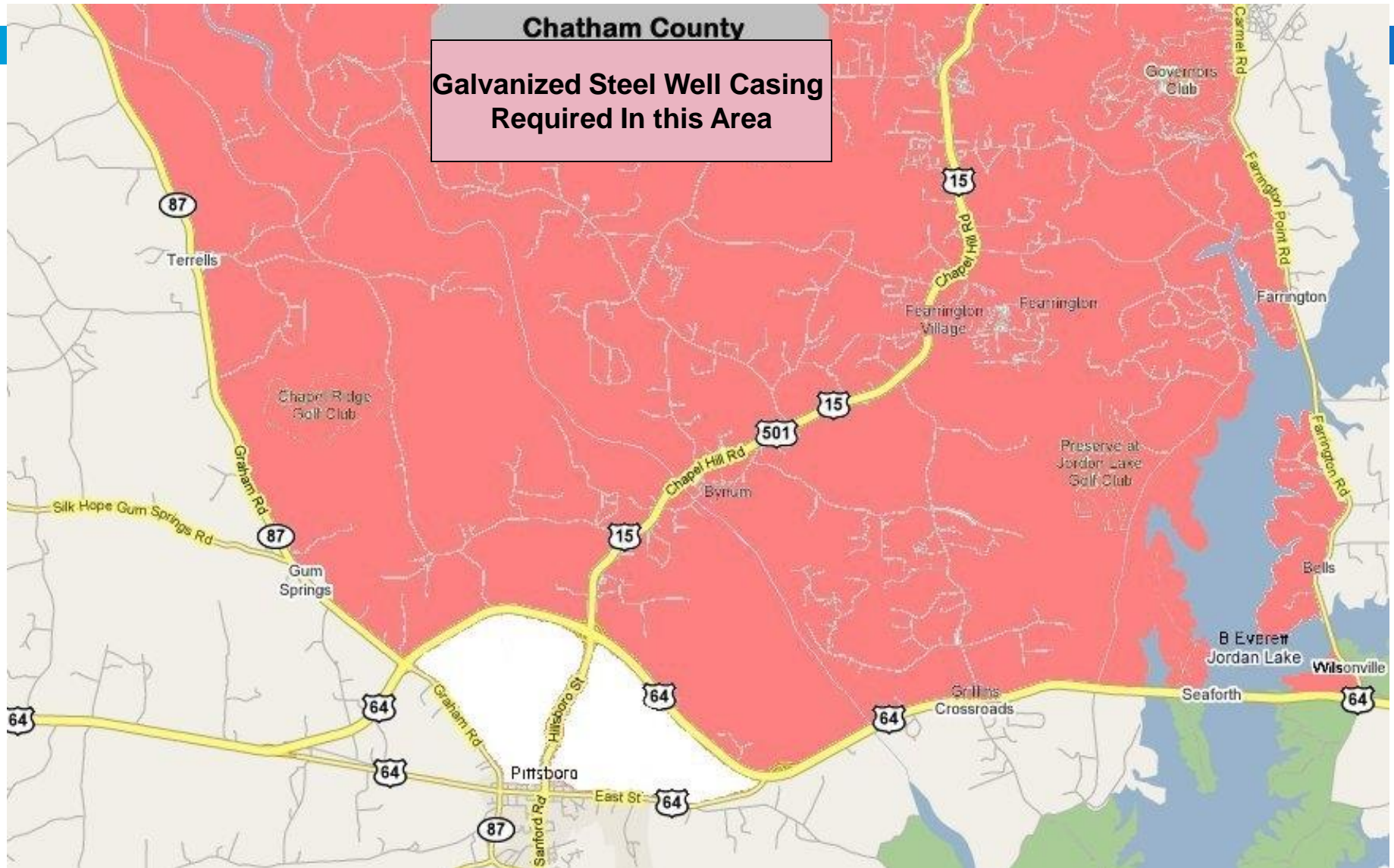








# Geology Determines Well Casing

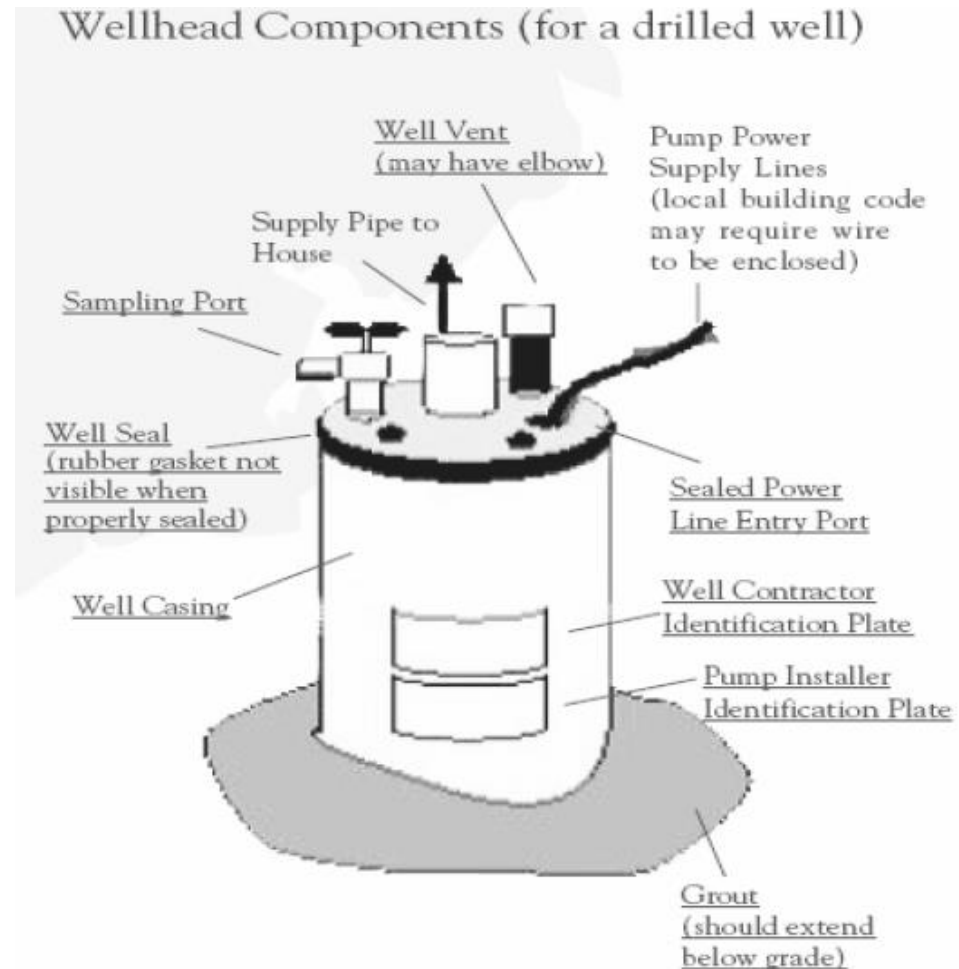






# Well Head Inspections

- ❑ Adequately Sealed
- ❑ All openings for piping, wiring and vents shall be at least 12 inches above land surface.
- ❑ Sampling Tap
- ❑ Well shall be properly vented



The well casing or visible portion of the well should extend a minimum of 12 inches above the land surface.

# Well Head Inspections

- Well Contractor identification plate
- Installer identification plate





# Well Repairs

- Well repairs may be necessary if your well has muddy or discolored water or is found to have bacteria present.
- Well has low yield. (Drill the well deeper)
- Permit is required from the dept.
- Well Liners most common

# Liners

- Well Camera
- Always Look Before You Line!



# Pulling a Pump



# Liner with Packer





# Packer





# Well Abandonments

- ❑ **Permanently Abandoned Well:** Well that has been filled in using approved materials and by approved means.
- ❑ Health/Safety Hazards. Low Yield or do not meet minimum setbacks
- ❑ 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.









# Water Sampling & Common Contaminants





# Water Sampling

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



# 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
- ❑ Any residual chlorine must be flushed prior to sampling
- ❑ owner responsible for providing access and a source of power



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WATER SAMPLE REQUEST

OFFICE USE ONLY  
Receipt # \_\_\_\_\_  
Initials \_\_\_\_\_ / \_\_\_\_\_  
Date Rec'd: \_\_\_\_\_  
Ck# \_\_\_\_\_ Cash \_\_\_\_\_ CC \_\_\_\_\_  
Amt. Rec'd \_\_\_\_\_  
R.E.H.S. \_\_\_\_\_  
Cityview \_\_\_\_\_

- BACTERIA (COLIFORM)  \$70.00
- IRON BACTERIA  \$70.00
- INORGANIC (MINERAL)  \$110.00
- SULFUR BACTERIA  \$70.00
- NITRATE  \$70.00
- FULL PANEL: Bacteria (Coliform only), Nitrate, & Inorganic  \$150.00
- PESTICIDE\*\*  \$150.00
- FULL PANEL KIT  \$150 (EXISTING WELL)
- PETROLEUM\*\*  \$150.00
- FULL PANEL KIT  \$0 (New Well-Initial Sample)

\*\*Requires prior health department authorization

++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. \_\_\_\_\_

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PRIVATE WATER SUPPLY  COMMUNITY WATER  SHARED WELL  LIVESTOCK  IRRIGATION WELL   
WELL DRILLER'S NAME \_\_\_\_\_

DRILLED WELL  BORED WELL  DUG WELL  SPRING  OTHER

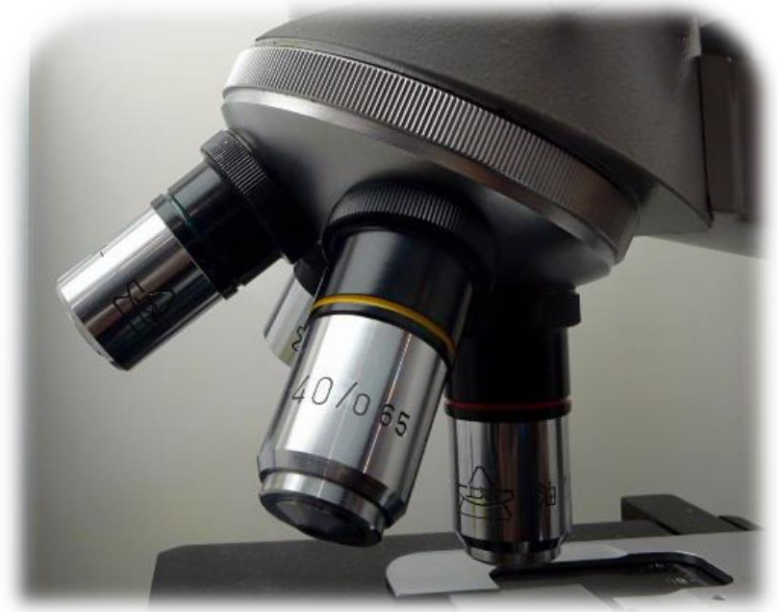
- Before your scheduled appointment with the Environmental Health Specialist, make sure:**
- Your well casing is uncovered (for inspection) and properly sealed (no openings in well seal).
  - The water spigot is accessible (sample bottle must "fit" under spigot in sanitary manner).
  - There is no chlorine 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)

# Tests Offered By Environmental Health

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



# Common Contaminants

- Total & Fecal Coliform Bacteria



# Coliform Bacteria

- ❑ **Total Coliform**

- ❑ 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

# Coliform Bacteria

- ❑ **Indicator organism**
  - ❑ If present, may indicate that other potential disease causing organisms are present
  - ❑ Relatively easy & inexpensive test



# 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**



# Treating Coliform Bacteria

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- Well disinfection**
- Ultraviolet light or continuous chlorination**
- Ozonation**
  
- Well Repair (Liner)**

# Sulfur Bacteria

- ❑ This test is recommended if:
  - Your water has a “rotten eggs” or sulfur odor\
  - Your water has a bitter taste
  - Your plumbing has pipe corrosion problems and yellow or black stains on fixtures





# Treatment of Iron Bacteria

## **Destroy Bacteria:**

- ❑ Chlorine Shock treatment of well
- ❑ Check for iron after two week period
- ❑ If reoccurrence, continuous disinfection be needed
- ❑ Well Repair (Liner)

# Well Disinfection

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



# 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

# Lead

- ❑ **May occur where piping material or pipe joint compound contains lead.**
- ❑ **Corrosion of household plumbing systems**
- ❑ **Naturally Occurring (rare)**



# Treating Lead

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- Reverse osmosis**
- Ion exchange**
- Distillation**
- Replace Plumbing**



# Iron

- ❑ **Ferrous Iron: soluble – a dissolved solid (clear).**
- ❑ **Ferric Iron: Insoluble – a suspended solid (solid particle)**
- ❑ **Iron Bacteria: Living non-pathogenic organism**



# Treatment of Iron

- ❑ Oxidation
- ❑ Ion Exchange
- ❑ Reverse Osmosis
- ❑ Well Repair (Liner)



# Manganese

- Adverse health effects from long term exposure

Treatment includes Oxidation, Ion Exchange

- Well Repair



# Nitrate/Nitrites

- ❑ Nitrogen-oxygen chemical units which combine with various organic and inorganic compounds
- ❑ Can cause “Blue Baby Syndrome”
- ❑ Boiling the water can increase concentration



# Nitrate/Nitrites

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



# Treating Nitrates/Nitrites

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- ❑ Anion exchange (water softener), distillation, or reverse osmosis
- ❑ Do NOT heat/boil the water
- ❑ Mechanical filters or chemical disinfection DO NOT remove nitrate from water.

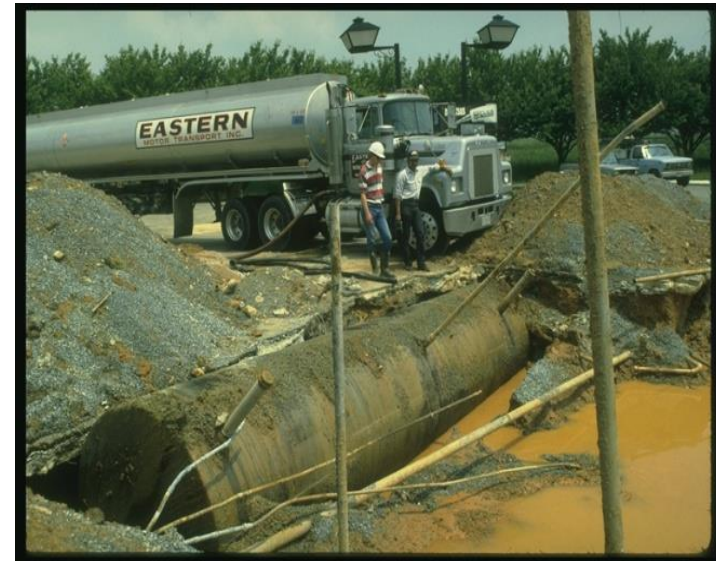
# Pesticides

- ❑ 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



# 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





# Water Treatment

- Do your Homework!
- [www.nsf.org](http://www.nsf.org)
- Test and certify drinking water treatment equipment

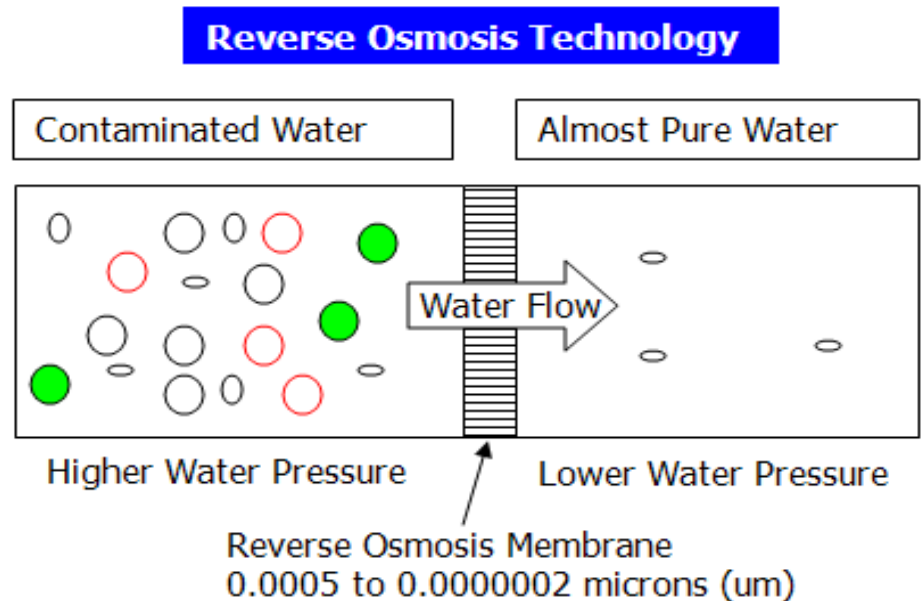
# Ion Exchange:

- ❑ Resins replace contaminants with ions such as sodium and potassium.
- ❑ Cost \$600- \$2,000+
- ❑ Treats Hard Water
- ❑ Removes: Dissolved Iron & Manganese.  
Some bad colors/tastes



# Reverse Osmosis

- Microscopic openings in a membrane
- Cost: \$200 for under sink system \$ 1000+ for whole house



# Distillation

- Boil water into steam which is condensed back into water and collected in a purer form.
- \$250-\$1,200+
- Removes Lead, Nitrate, Pesticides, other organic compounds





# Questions?

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