

## PERFLUORINATED COMPOUNDS (PFCs)

### WHAT ARE PFOS AND PFOA?

- ◆ Perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) are both perfluorinated compounds (PFCs) and have similar properties
  - ◇ Man-made compounds with multiple carbonfluorine-bonds
  - ◇ Break down slowly, which makes them useful for home and industrial purposes, but long-lasting in the environment
- ◆ Used since the 1950s in many products because of their stain and water repellant properties
  - ◇ Fire-fighting foam
  - ◇ Stains, paints, and grease
  - ◇ Fabric for upholstered furniture
  - ◇ Carpets
  - ◇ Nonstick cookware
  - ◇ Floor wax
  - ◇ Food packaging (e.g., lining of microwave popcorn bags, fast food wrappers)
- ◆ Now widely distributed in the environment and have been detected in the blood of humans, wildlife, and fish
- ◆ US Environmental Protection Agency (EPA) continues to investigate and work to eliminate sources

## WHY IS THE NAVY SAMPLING FOR PFCs?

### NEW NAVY PERFLUORINATED COMPOUNDS (PFC) POLICY

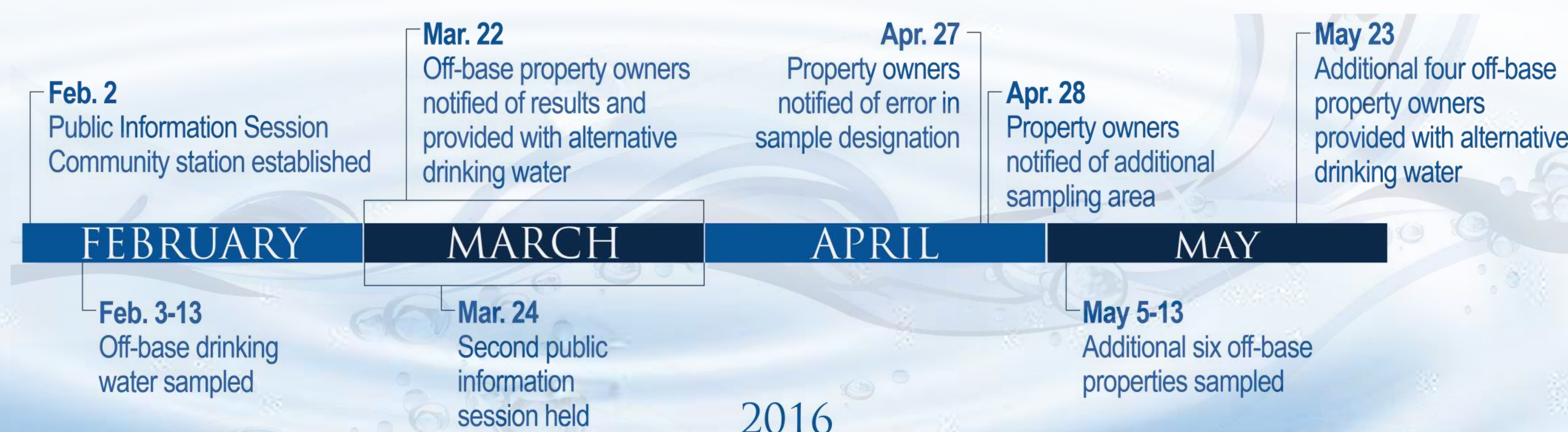
- ◆ September 2015 - Policy required drinking water sampling of PFCs (commonly found in fire-fighting foam) on some Navy bases

### FENTRESS ON-BASE SAMPLING

- ◆ December 2015 - The Navy sampled drinking water and groundwater
- ◆ January 2016 - PFC Results
  - ◇ Drinking water was above the US Environmental Protection Agency (EPA) provisional health advisory levels
  - ◇ Some groundwater monitoring wells were above EPA provisional health advisory levels

### FENTRESS OFF-BASE SAMPLING

- ◆ February & March 2016—Navy requests to sample off-base drinking water in designated area
  - ◇ 0.5 mile radius of groundwater concentrations greater than 25% of EPA provisional health advisory levels
  - ◇ Navy sampled for PFCs at 53 wells on 50 properties
- ◆ April & May 2016—a mis-designated sample resulted in the sampling of 6 additional parcels.
- ◆ May 19, 2016—EPA updated (lowered) the Health Advisory (HA) levels for PFOS and PFOA. These more conservative values required that 4 previously tested homes would now be placed on bottled water.
- ◆ The new HAs did not result in any additional homes to be tested.



For more Information:

[www.cnmc.navy.mil/FentressInfo](http://www.cnmc.navy.mil/FentressInfo)

If you have specific questions contact  
[fentressinfo@navy.mil](mailto:fentressinfo@navy.mil) or (757) 433-3132





## RECENT AND UPCOMING PRIVATE WELL SAMPLING

- ◆ In late April, one private well sample was identified as having been mis-designated as requiring no further action although the result for Perfluorooctane Sulfonate (PFOS) of 0.086 µg/L exceeded 25% of the Provisional Health Advisory (0.2 ug/L), which was the screening value for triggering additional sampling
- ◆ The resident of this property was notified that additional quarterly monitoring would be required and an additional sampling area was identified to ensure all properties within a 1/2 mile radius of this property were offered sampling
  - ◆ Additional samples from the revised sampling boundary were collected at six homes in early May 2016
- ◆ On May 19, 2016, EPA updated the previous Provisional Health Advisory (PHA) Levels and released a new cumulative health advisory level of 0.07 µg/L for total PFOA and PFOS
- ◆ Existing results were immediately screened against the Health Advisory
  - ◆ Four additional private wells which did not exceed the Provisional Health Advisory were determined to exceed the revised Health Advisory
  - ◆ Homes with exceedances were supplied with bottled water within 24 hours of release of the revised Health Advisory

- ◆ In June 2016, analytical results were received for the step-out locations identified as requiring sampling in May 2016
  - ◆ No additional exceedances of the current Health Advisory were identified
  - ◆ No need to revise the sampling boundary and no need to provide additional bottled water was identified

## TREATMENT EFFECTIVENESS TESTING

- ◆ The Navy is currently evaluating various treatments for filtering out perfluorinated compounds (PFCs) from drinking and wastewater
- ◆ Field-scale treatment in homes and at NALF is planned for late 2016
  - ◆ Installation of granular activated carbon (GAC) filters
  - ◆ Monitoring treatment effectiveness and determination of long-term solutions

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## GROUNDWATER PLUME DELINEATION

- ◆ There is potential for PFCs to continue to move off the NALF Fentress property in groundwater and impact nearby residents who are not currently already impacted.
- ◆ The Navy, EPA, and VDEQ have proposed a monitoring well network to:
  - ◆ Define the lateral and vertical boundaries of the groundwater plume
  - ◆ Allow for continued monitoring of migration potential
- ◆ New monitoring wells will be installed in June 2016 and new and existing monitoring wells will be sampled in June and July 2016
- ◆ Results will be received in July and August 2016
- ◆ Monitoring wells will be sampled periodically until a remedial action is completed to address contamination
- ◆ If at any time, monitoring well data indicate additional well installation or drinking water sampling is necessary, the public will be notified.

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## MONITORING WELL INSTALLATION

- ◆ Monitoring wells are installed using a truck-mounted drilling rig.
- ◆ Because wells will be installed along roadways in city rights way, traffic management methods will be used to ensure the safety of residents during installation
- ◆ Residents should stay clear of installation activities as drilling equipment poses hazards associated with noise and heavy machinery .







## PFC HEALTH ADVISORIES

WHAT IS THE CURRENT EPA HEALTH ADVISORY LEVEL FOR PFCs?

- ◆ In 2016, the EPA developed a Lifetime Health Advisory of 0.07 micrograms per liter ( $\mu\text{g/L}$ ) for drinking water
  - ◇ Combined levels of PFOA and PFOS should be compared to this level
- ◆ This level replaces the 2009 provisional advisory levels of 0.4  $\mu\text{g/L}$  for PFOA and 0.2  $\mu\text{g/L}$  for PFOS

Chemicals	2009 Health Advisory Levels ( $\mu\text{g/L}$ )	2016 Lifetime Health Advisory Levels ( $\mu\text{g/L}$ )
Perfluorooctanoic Acid (PFOA)	0.4	0.07
Perfluorooctane Sulfonate (PFOS)	0.2	

- ◆ These levels are only intended to provide information to states, agencies, and public health officials on potential health effects and are non-enforceable

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HOW ARE HEALTH ADVISORIES CALCULATED?

- ◆ Using results from the best available peer-reviewed studies of effects of PFCs on laboratory animals and human populations that have been exposed
- ◆ Based on the most sensitive populations to provide Americans with protection from a lifetime of exposure to PFCs in drinking water
  - ◇ Fetuses during pregnancy and breastfed infants
- ◆ Calculated based on:
  - ◇ Fetuses during pregnancy and breastfed infants
- ◆ Toxicity of PFCs in laboratory animals
- ◆ Drinking water intake of lactating women, who drink more water than other people and can pass these chemicals along to nursing infants through breastmilk
- ◆ Other sources of exposure (e.g., air, food, soil)

For more Information on EPA's Drinking Water Health Advisories for PFCs, please see:

<https://www.epa.gov/ground-water-and-drinking-water/drinking-water-health-advisories-pfoa-and-pfos>





## HEALTH EFFECTS

### WHAT WE KNOW

- ◆ Exposure to perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA) appears to be widespread globally
  - ◇ Studies found PFOS and PFOA in the blood samples of the general human population and wildlife nationwide (ATSDR 2009; EPA 2006a)
  - ◇ + 98% or more of the general US population has perfluorinated compounds (PFCs) in their blood
  - ◇ Exposure through ingestion is the primary concern
  - ◇ US Environmental Protection Agency (EPA) currently believes that skin contact while bathing and inhalation while showering is not a significant exposure
- ◆ Studies on exposed human populations indicate PFOS and/or PFOA may cause elevated cholesterol levels and possibly low infant birth weight
- ◆ When animals are given large doses, they exhibit developmental, reproductive, and liver effects. Other studies suggest a link with cancer.

### WHAT WE DON'T KNOW

- ◆ Health effects from exposure to low levels of PFOS and PFOA are not well known and studies are continuing
- ◆ It is not possible to definitively link exposures to PFOS and PFOA in water to a person's individual health issues
- ◆ Blood tests are not routinely done. The results can be inconclusive, do not allow for a determination of the source of the exposure, and do not predict health effects
- ◆ Long term exposure effects are still being investigated by the EPA

**AVAILABLE NOW!**  
**Free Water Fill Station**  
**1564 Mount Pleasant Road**  
*across the street from Butts Road Intermediate School*

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## Private Well Water Information

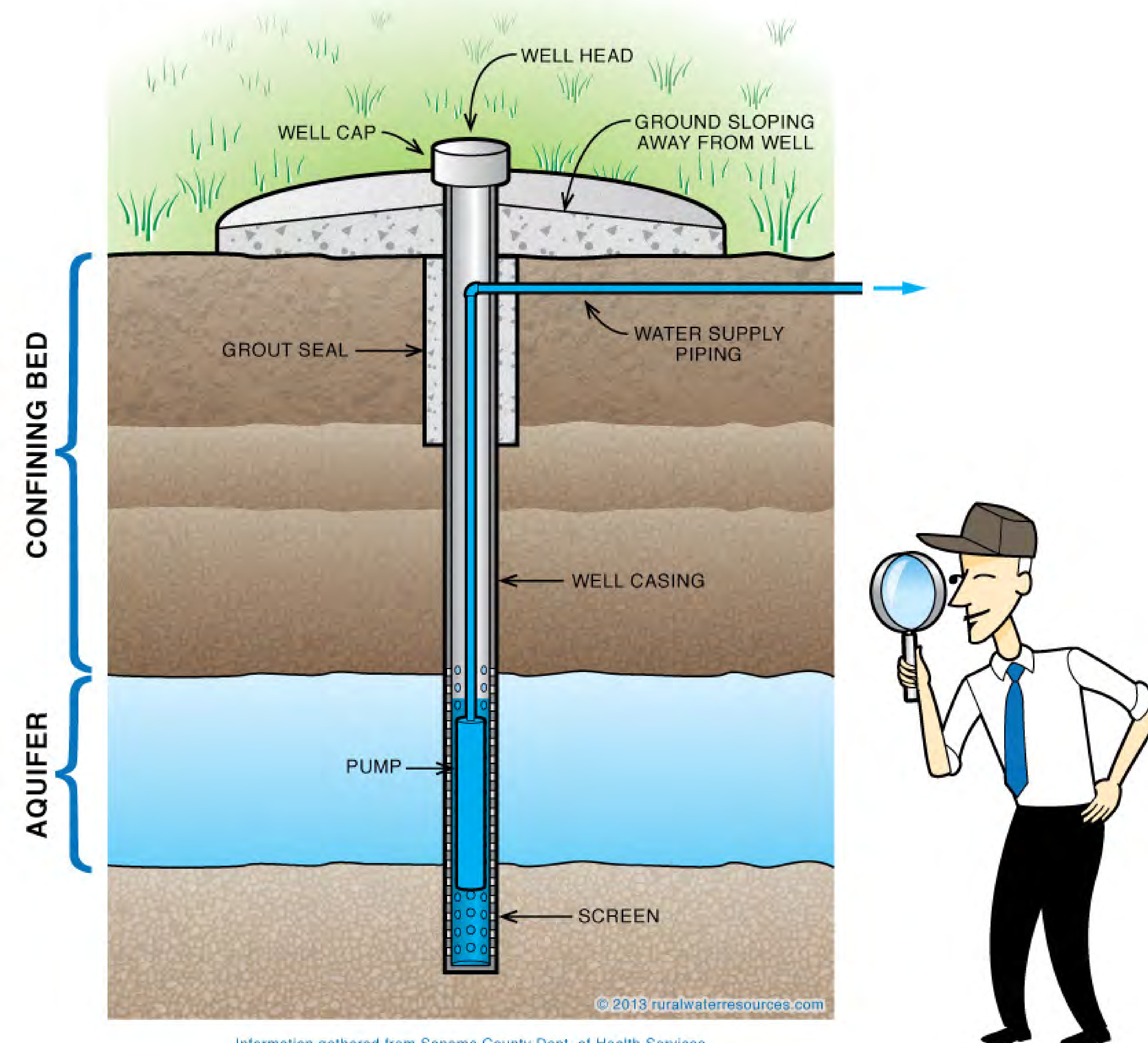
### Virginia Department of Health Division of Onsite Sewage and Water Services

**MISSION:** PROTECT PUBLIC HEALTH AND GROUND WATER QUALITY. ACHIEVED BY IMPLEMENTING PROGRAMS BASED ON SOUND SCIENTIFIC, ENGINEERING, AND PUBLIC HEALTH PRINCIPLES.

#### MANAGING THE RISKS

- ◆ Under current *Code of Virginia* and the *Private Well Regulations* **owners are responsible** for the ongoing quality, quantity and remediation of private wells
- ◆ There are no specific testing requirements mandated by law other than the bacteriological test for fecal coliform at the time the well is drilled and/or prior to the well being put into service
- ◆ Testing once a year is a good idea. Regular testing can tell you the quality of the water
- ◆ More frequent testing is recommended if you have a change in taste, odor, appearance, recurrent incidences of gastrointestinal illness, infants living in the home, or a failing septic system
- ◆ The National Groundwater Association recommends you test for bacteria, nitrates/nitrites and any other contaminants of local concern.
- ◆ Never connect a well to a public water supply
- ◆ If using water conditioner (aka, "water softener") equipment, it should be maintained and kept in working order
- ◆ Do not dispose hazardous materials or chemicals on your property or near your well
- ◆ A permit from the Chesapeake Health Department is required

#### Typical Well Design



Information gathered from Sonoma County Dept. of Health Services

For more Information about wells or our environmental programs,  
please visit the website below:  
[www.vdh.virginia.gov](http://www.vdh.virginia.gov)

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