

NAVY PFC SAMPLING AT NALF FENTRESS

SEPTEMBER 2015

Navy policy required drinking water sampling of perfluorinated compounds (PFCs) (commonly found in firefighting foam) on some Navy Bases

DECEMBER 2015

The Navy sampled drinking water and groundwater on-base

JANUARY 2016

On-base results received

- ◇ 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

FEBRUARY 2016

Public information session held, community water station established, and off-base drinking water sampled

MARCH 2016

Off-base property owners notified of results and provided with bottled water if necessary. Public information session held

APRIL 2016

Sampling area expanded to encompass twelve additional properties

MAY 2016

Six properties in expanded area sampled at owner's request.

New health advisory issued by EPA resulted in the Navy providing bottled water to four additional properties. The new HAs did not result in any additional homes to be tested

JUNE 2016

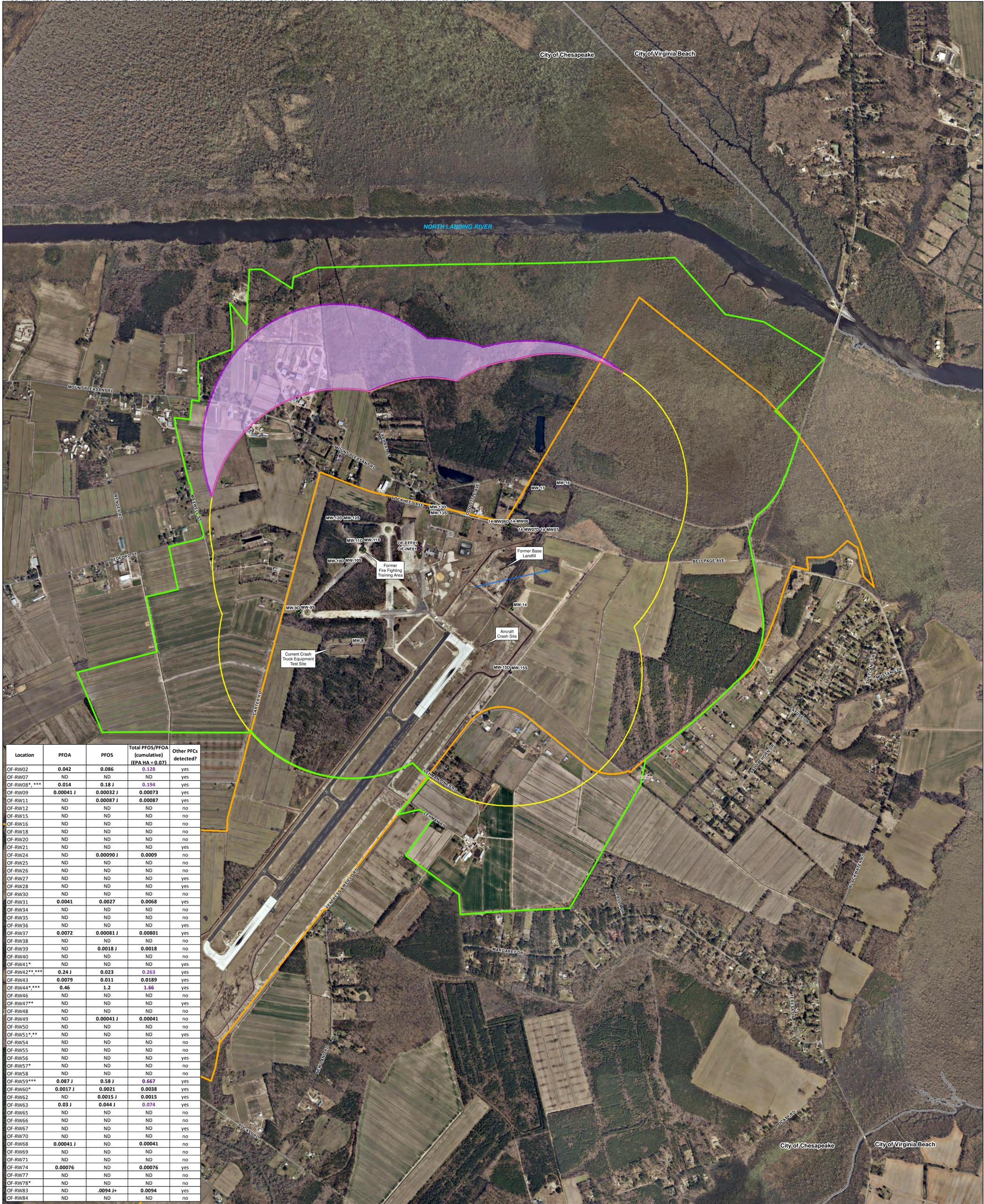
Results of sampling received and no additional actions required



For more Information:

www.cnic.navy.mil/FentressInfo

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

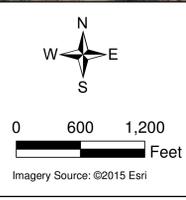


Location	PFOA	PFOS	Total PFOS/PFOA (cumulative) (EPA HA = 0.07)	Other PFCs detected?
OF-RW02	0.042	0.086	0.128	yes
OF-RW07	ND	ND	ND	yes
OF-RW08*, ***	0.014	0.18 J	0.194	yes
OF-RW09	0.00041 J	0.00032 J	0.00073	yes
OF-RW11	ND	0.00087 J	0.00087	yes
OF-RW12	ND	ND	ND	no
OF-RW15	ND	ND	ND	no
OF-RW16	ND	ND	ND	no
OF-RW18	ND	ND	ND	no
OF-RW20	ND	ND	ND	no
OF-RW21	ND	ND	ND	yes
OF-RW24	ND	0.00090 J	0.0009	no
OF-RW25	ND	ND	ND	no
OF-RW26	ND	ND	ND	no
OF-RW27	ND	ND	ND	yes
OF-RW28	ND	ND	ND	yes
OF-RW30	ND	ND	ND	no
OF-RW31	0.0041	0.0027	0.0068	yes
OF-RW34	ND	ND	ND	no
OF-RW35	ND	ND	ND	no
OF-RW36	ND	ND	ND	yes
OF-RW37	0.0072	0.00081 J	0.00801	yes
OF-RW38	ND	ND	ND	no
OF-RW39	ND	0.0018 J	0.0018	no
OF-RW40	ND	ND	ND	no
OF-RW41*	ND	ND	ND	yes
OF-RW42***	0.24 J	0.023	0.263	yes
OF-RW43	0.0079	0.011	0.0189	yes
OF-RW44***	0.46	1.2	1.66	yes
OF-RW46	ND	ND	ND	no
OF-RW47**	ND	ND	ND	yes
OF-RW48	ND	ND	ND	no
OF-RW49	ND	0.00041 J	0.00041	no
OF-RW50	ND	ND	ND	no
OF-RW51**, **	ND	ND	ND	yes
OF-RW54	ND	ND	ND	no
OF-RW55	ND	ND	ND	no
OF-RW56	ND	ND	ND	yes
OF-RW57*	ND	ND	ND	no
OF-RW58	ND	ND	ND	no
OF-RW59***	0.087 J	0.58 J	0.667	yes
OF-RW60*	0.0017 J	0.0021	0.0038	yes
OF-RW62	ND	0.0015 J	0.0015	yes
OF-RW63	0.03 J	0.044 J	0.074	yes
OF-RW65	ND	ND	ND	no
OF-RW66	ND	ND	ND	no
OF-RW67	ND	ND	ND	yes
OF-RW70	ND	ND	ND	no
OF-RW68	0.00041 J	ND	0.00041	no
OF-RW69	ND	ND	ND	no
OF-RW71	ND	ND	ND	no
OF-RW74	0.00076	ND	0.00076	yes
OF-RW77	ND	ND	ND	no
OF-RW78*	ND	ND	ND	no
OF-RW83	ND	.0094 J+	0.0094	yes
OF-RW84	ND	ND	ND	no

Legend

- Groundwater Flow Direction
- Fentress Boundary
- Extent of Property Boundary within the Designated Sample Area
- Boundary - 0.5 mile of Fentress
- Extent of Additional 0.5 mile Boundary
- City Boundary
- Location with No HA Exceedance
- Location with HA Exceedance

Notes:
 All concentrations in ppb
 *Field duplicate collected at this location; the greater result is shown
 **Multiple wells sampled at this location; the greater result is shown
 ***Wells sampled in February and May; the greater result is shown
Bold text indicates detections
Purple text indicates exceedance of the EPA HA
 ND - Not detected
 J - Analyte present. Value may or may not be accurate or precise.
 J+ - Analyte present. Reported value may be biased high. Actual value is expected to be lower.
 PFOS - Perfluorooctanesulfonic acid
 PFOA - Perfluorooctanoic acid
 HA - EPA Lifetime Health Advisory



Current Sampling Area
 June 2016
 NALF Fentress, Chesapeake, Virginia





INVESTIGATING PFCs IN GROUNDWATER

- ◆ There is potential for PFCs to continue to move off the NALF Fentress property in groundwater
- ◆ The Navy, EPA, and VDEQ have proposed a monitoring well network to:
 - ◇ Define the horizontal and vertical boundaries of the groundwater plume
 - ◇ Allow for continued monitoring of the PFC movement in groundwater
- ◆ 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 continue to be sampled as needed until the remedial action is implemented to address contamination
- ◆ If monitoring well data indicates additional well installation or drinking water sampling is necessary, the public will be notified

DRINKING WATER NEXT STEPS

- ◆ The Navy is evaluating methods for filtering PFCs from drinking water with concentrations greater than the health advisory
- ◆ Treatment systems are planned in late 2016
 - ◇ Installation of granular activated carbon (GAC) filters
 - ◇ Monitoring treatment effectiveness
- ◆ Long-term solutions are still being evaluated

MONITORING WELL INSTALLATION AND SAMPLING

- ◆ Monitoring wells are installed using a truck-mounted drilling rig
- ◆ Drilling will occur during daylight hours
- ◆ Installation time varies from one to several days per well; once wells are installed, personnel will be onsite periodically for sampling
- ◆ Because wells will be installed along roadways in city rights of way, traffic management methods will be used to ensure the safety of residents during installation
 - ◇ Work will be coordinated with the City of Chesapeake
- ◆ Residents should stay clear of installation activities because of hazards associated with heavy machinery
- ◆ 55-gallon drums containing soil and water will be temporarily located in the vicinity of well locations

For more Information:

www.cnmc.navy.mil/FentressInfo

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



Legend

- Fentress Boundary
- Existing Monitoring Well Location
- Proposed Monitoring Wells**
 - Deep Only
 - Shallow Only
 - Shallow/Deep

0 650 1,300 Feet

Imagery Source: ©2015 Esri

Monitoring Well Network
NALF Fentress, Chesapeake, Virginia



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
 - ◇ PFCs are a subset of a group of fluorinated chemicals known as polyfluorinated alkyl substances (PFASs)
- ◆ Used since the 1950s in many products because of their stain and water repellent 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
- ◆ PFCs are unregulated contaminants that were not required to be sampled for in public water systems prior to 2013
- ◆ EPA uses the Unregulated Contaminant Monitoring Rule (UCMR) program to collect data for contaminants suspected to be present in drinking water
 - Data collection for PFCs in public water systems was conducted from 2013 to 2015
- ◆ EPA continues to investigate and work to eliminate sources

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>

FORMER AND CURRENT PFC HEALTH ADVISORIES

WHAT IS THE CURRENT EPA HEALTH ADVISORY LEVEL FOR PFCs?

Chemicals	Former (2009) Provisional Health Advisory Levels (µg/L)	Current (2016) Lifetime Health Advisory Levels (µg/L)
Perfluorooctanoic Acid (PFOA)	0.4	0.07
Perfluorooctane Sulfonate (PFOS)	0.2	

Micrograms per liter (µg/l) = parts per billion (ppb)

HOW WAS THE 2016 LIFETIME HEALTH ADVISORY CALCULATED?

- ◆ The best available peer-reviewed studies on the effects of PFCs on laboratory animals and human populations were used
- ◆ The value was set to be protective of the most sensitive populations (fetuses during pregnancy and breast-fed infants), which therefore protects all people from a lifetime exposure to PFCs in drinking water
- ◆ The value was calculated based on 20% exposure from drinking water and 80% from other sources of ingestion (e.g., food, soil)



HEALTH EFFECTS

WHAT WE KNOW

- ◆ Exposure to PFOS and 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% of the 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 laboratory animals (rats and mice) are given large doses, they exhibit developmental, reproductive, and liver effects. Other studies suggest a link with cancer
- ◆ Limited studies have been completed to date on food-crops and livestock

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

For more Information:
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PRIVATE WELL WATER INFORMATION

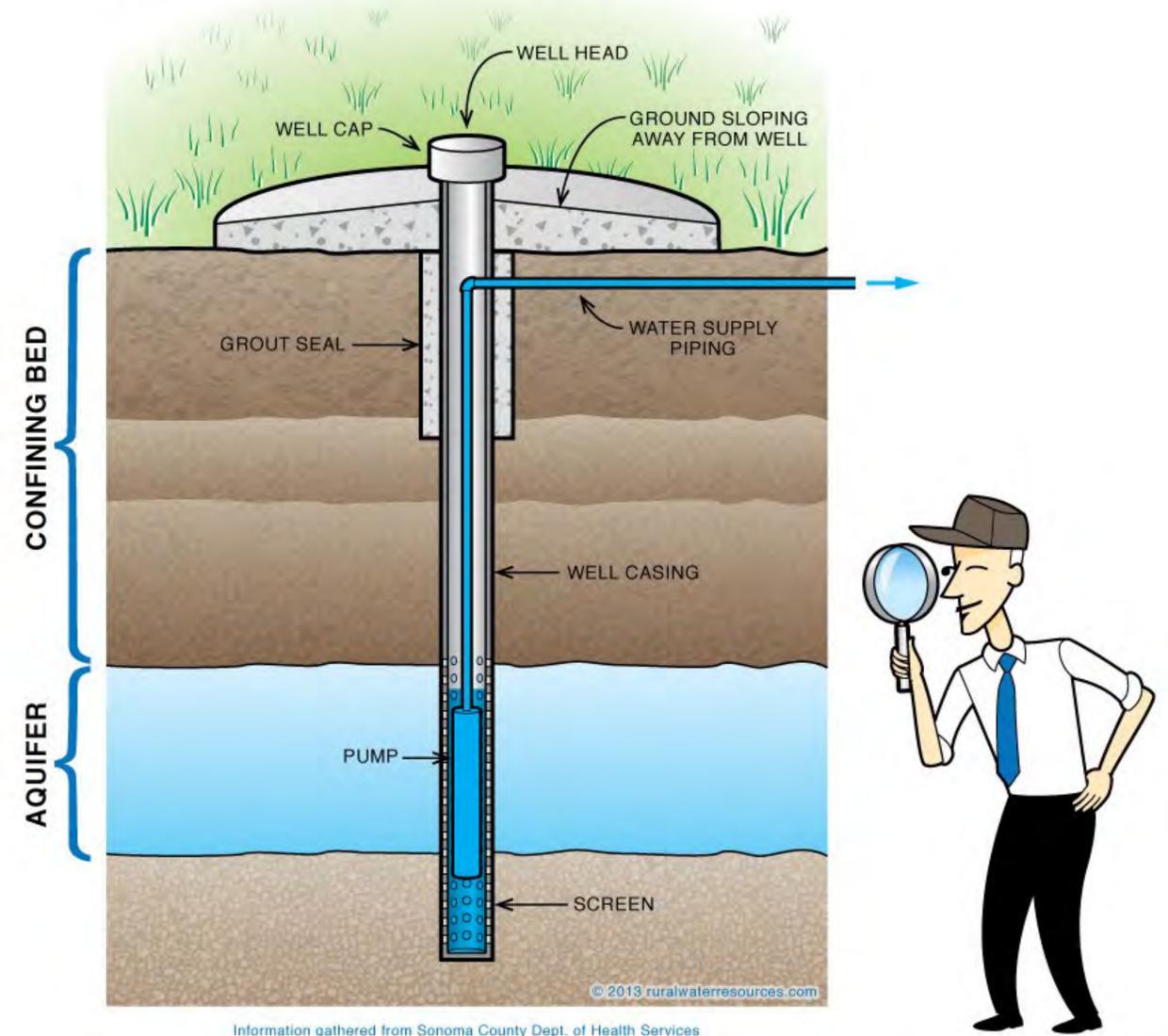
Virginia Department of Health Division of Onsite Sewage and Water Services

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



For more Information about wells or our environmental programs, please visit the website below:
www.vdh.virginia.gov

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