



Why Is the Navy Sampling for PFAS?

Additional information can be found online at
www.secnav.navy.mil/eie/pages/pfc-pfas.aspx

For updates as more information becomes available, visit (case sensitive)
<https://go.usa.gov/xQFuw/>

If you have specific questions, please contact
NRLCBDWATER@navy.mil or 1-855-NRLCBD1 (1-855-675-2231)

The Navy is protecting our neighbors by identifying potential exposure to unregulated compounds (PFAS) in drinking water.

The Navy has a protective policy that goes beyond the requirements of the Safe Drinking Water Act.

- The EPA established a drinking water lifetime health advisory of 70 ppt for two PFAS compounds, PFOS and PFOA.
- The Navy is taking action to:
 - Identify and prioritize locations with the potential for exposure to PFOS and/or PFOA.
 - Protect our neighbors who may be exposed to drinking water that has PFOS and/or PFOA above the EPA lifetime health advisory.



AFFF aqueous film forming foam
EPA U.S. Environmental Protection Agency

LHA lifetime health advisory
NRL-CBD Naval Research Laboratory – Chesapeake Bay Detachment

PFAS per- and polyfluoroalkyl substances
PFOA perfluorooctanoic acid

PFOS perfluorooctane sulfonate
ppt parts per trillion

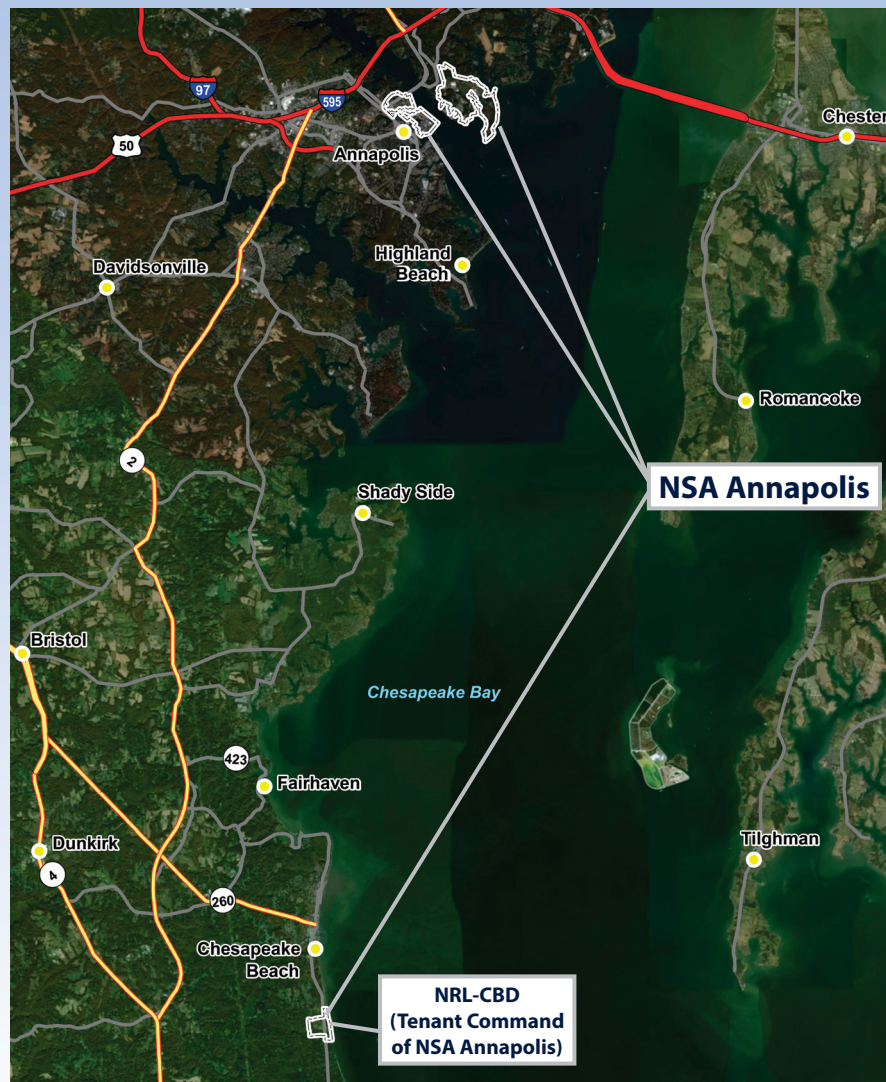


Naval Support Activity Annapolis

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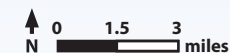
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- Naval Support Activity (NSA) Annapolis is a Commander, Navy Installations Command (CNIC) activity.
 - Naval Research Laboratory – Chesapeake Bay Detachment (NRL-CBD), located near Chesapeake Beach, Maryland, is a tenant command on the footprint of NSA Annapolis.
- NSA Annapolis delivers base operations support and municipal services to NRL-CBD, including:
 - Security and emergency services
 - Public works and environmental services through Naval Facilities Engineering Command (NAVFAC)
- NSA Annapolis provides the primary point of contact:
 - Commandant Naval District Washington N00P
Washington Navy Yard
1411 Parsons Ave SE
Washington, DC 20374

LEGEND

□ NSA Annapolis





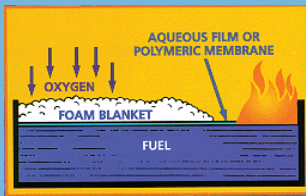
U.S. NAVAL RESEARCH LABORATORY



CHESAPEAKE BAY DETACHMENT

NRL-CBD Fire and Combustion Research

AFFF REFORMULATION AND REPLACEMENT TESTING



AFFF Fire Suppression Process

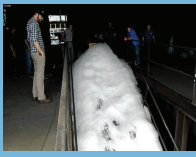


28 ft² MILSPEC Test

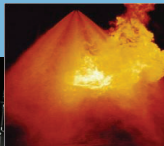
FIRE TESTING AREA

- indoor/outdoor testing areas
- concrete lined since the late 1980s
- all above-ground transfer process

FIRE SUPPRESSION ANALYSIS AND DOCTRINE DEVELOPMENT



HiEx Foam Suppression Analysis

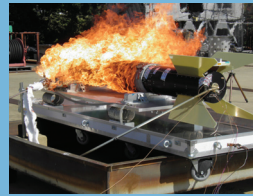


Water Mist Suppression Analysis



Self-Contained Aerosol Generators Testing

LITHIUM BATTERY CASUALTY MITIGATION



CARINA and MK18 Mod 2 UAV Testing



OIL SPILL REMEDIATION SCIENCE AND TECHNOLOGY



CFD Validation for In Situ Wellhead Burning Efficiency



In Situ Burn Ignition



25% Seawater Burn Test

PROPULSION COMBUSTION SCIENCE RESEARCH



Gas Turbine Combustion



Multi-pass Raman Scattering Experiment



Off-Base Investigation – Drinking Water Well Sampling

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www.secnave.navy.mil/eie/pages/pfc-pfas.aspx

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- The Navy is investigating the release of AFFF (firefighting foam) from research and testing activities on the base.
- The Navy is also investigating off-base locations while continuing to evaluate the extent of PFAS contamination on base.
- The Navy is requesting permission to sample drinking water wells within the designated areas due to their location relative to the NRL-CBD Fire Testing Area.
- Based on the results of off-base drinking water well sampling, the Navy may expand the sampling area.

LEGEND

- Proposed sampling area (parcels)
- Fire Testing Area (suspected source)
- ⊗ Shallow monitoring well
- ➡ Direction of shallow groundwater flow
- Surface water
- ▭ Base boundary

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LEGEND

- | | | |
|--------------------------------------|---------------------------------------|---------------|
| Proposed sampling area (parcels) | Shallow monitoring well | Surface water |
| Fire Testing Area (suspected source) | Direction of shallow groundwater flow | Base boundary |

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What Are PFAS, PFOS, and PFOA?

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Where Do PFAS Come From?

- Are man-made compounds; no natural occurrence.
- Have been used since 1950s in many products.
- Last a long time in the environment.
- Are found in people, animals, and fish around the world.



firefighting foam



paints and stains



stain-resistant carpets



water-repelling fabrics



nonstick cookware



food packaging

What Is the EPA LHA for PFOS and PFOA?

- Sets a concentration of 70 ppt in drinking water.
- Protects against harmful health effects to sensitive populations and the general public, even for lifetime exposure.
- Compares the total concentration of both PFOS and PFOA found to the 70 ppt advisory.
- Provides information to state agencies and public health officials on health effects and water treatment so they can take steps to reduce exposures.
- Is non-enforceable.

How Is the EPA LHA Calculated?

- Is based on studies of health effects with PFOS and PFOA in laboratory animals.
- Considers information regarding health effects of people exposed to PFOS and PFOA.
- Protects sensitive populations, including the fetuses or nursing infants of mothers who are exposed.
- Assumes 20 percent of overall exposure is from drinking water, 80 percent of exposure is from other sources.

AFFF aqueous film forming foam
ATSDR Agency for Toxic Substances and Disease Registry
CDC Centers for Disease Control and Prevention
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Exposure and Health Effects

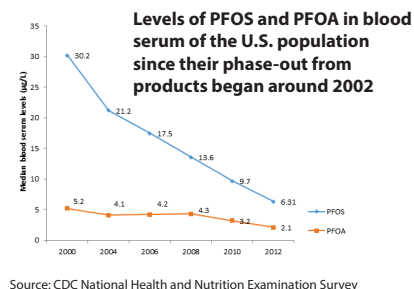
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PFAS in People

- CDC monitoring estimates that most people in the U.S. have PFAS in their bodies.
- Levels of PFOS and PFOA are going down over time following their phase-out from use.
- Some PFAS stay in the body a long time – there is no recommended medical treatment to reduce PFAS in the body.



Exposures to PFAS

- Appear to be widespread around the world.
- Are primarily through:
 - Ingesting contaminated food, water, or soil
 - Breathing air that contains contaminated dust from carpets, upholstery, clothing, etc.
- Will build up in the body until exposure stops.
- Reach the fetuses or nursing infants of mothers who are exposed.
- Are not significant through skin contact when bathing or showering.

How to Reduce Exposure

- If water contains PFOS and PFOA above the health advisory level, you can reduce exposure by using a different water source for drinking, cooking, and brushing teeth.
- Filter PFOS and PFOA from water using certified granular activated carbon or high-pressure membrane systems, such as reverse osmosis. These systems require ongoing maintenance.

Potential Health Effects

- More research is needed to confirm or rule out possible links between exposure and health effects.
- Animals exposed to high levels of PFAS had changes in liver, thyroid, and pancreas function; altered hormone levels; and increased rates of certain cancers.
- Based on limited evidence from studies with people, potential health effects can include:
 - Increased cholesterol levels
 - Changes in growth, learning, and behavior of the developing fetus and child
 - Immune system changes
 - Decreased fertility
 - Altered hormone function
 - Increased risk of certain types of cancer
- The levels of PFOS or PFOA in drinking water do not predict what, if any, health impact might occur as a result of exposure.

Should I Have My Blood Tested?

ATSDR and CDC understand and acknowledge that you may want to know the level of PFAS in your body. However, there are some limitations with blood tests to consider:

- Test results will not provide clear answers for existing or possible health effects or patient care.
- Blood testing for PFAS is not a routine test that health care providers offer.

Consult with your doctor for more information.

AFFF
ATSDR
CDC
EPA
LHA

aqueous film forming foam
Agency for Toxic Substances
and Disease Registry
Centers for Disease Control and Prevention
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lifetime health advisory

NRL-CBD
PFAS
PFOA
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Naval Research Laboratory –
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Next Steps

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After Your Water Is Sampled...What's Next?

- The Navy will notify residents of preliminary results in August 2018.
- If the PFOS/PFOA test results are **above** the health advisory level...
...the Navy will provide bottled water for drinking and cooking, tailored to each household's needs.
- If the PFOS/PFOA test results are **at or below** the health advisory level...
...no immediate action is needed.



Ongoing Actions

The Navy is committed to you. We will:

- Continue to keep the community informed.
- Monitor and expand the sampling area if needed.
- Stay involved until a long-term solution is in place.

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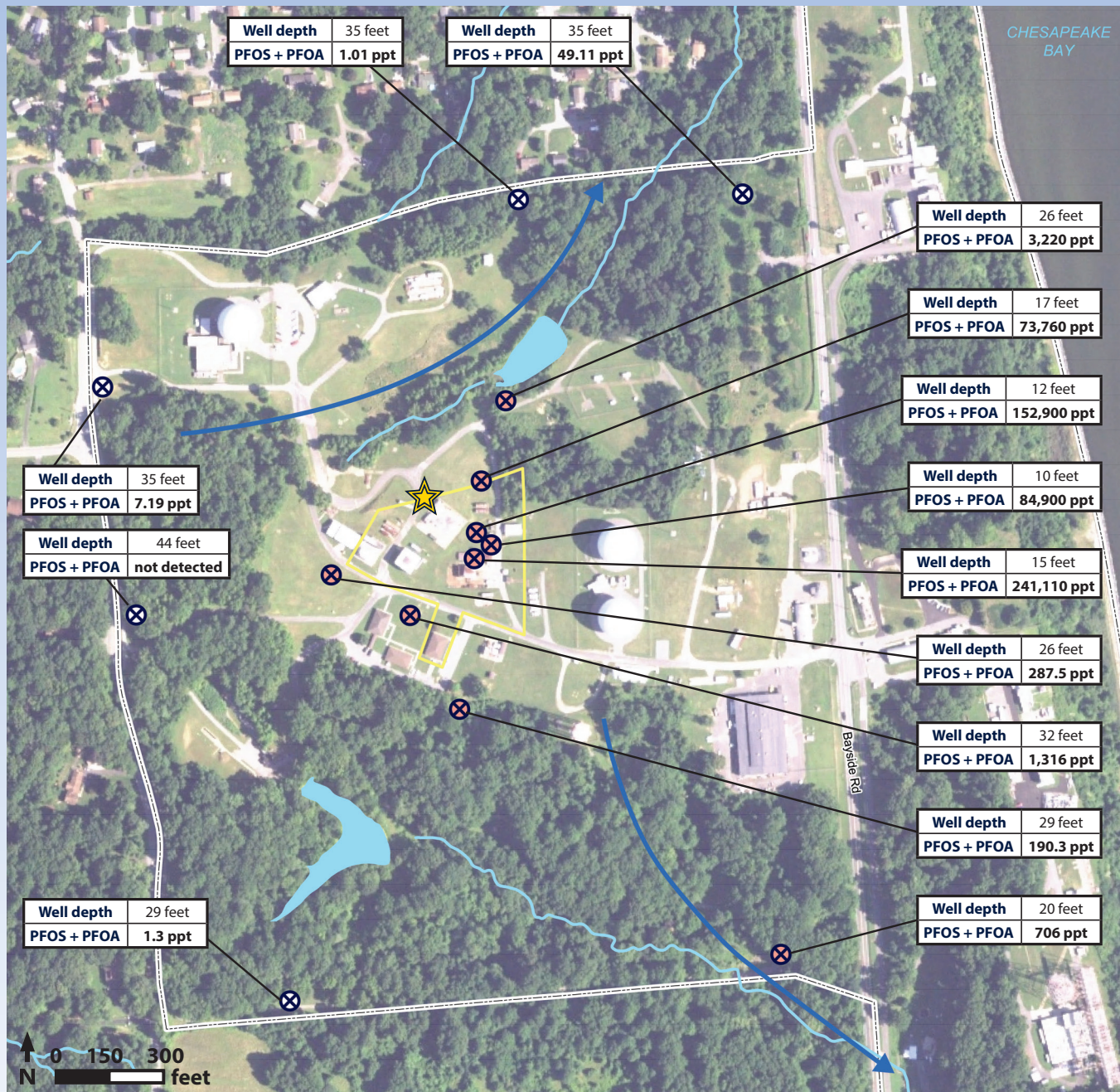


On-Base Investigation – Shallow Groundwater

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LEGEND

- ⊗ Shallow monitoring well
- ⊗ PFOS and/or PFOA detection greater than EPA LHA (70 ppt)
- ➔ Direction of shallow groundwater flow
- Surface water
- Fire Testing Area (suspected source)
- Base boundary

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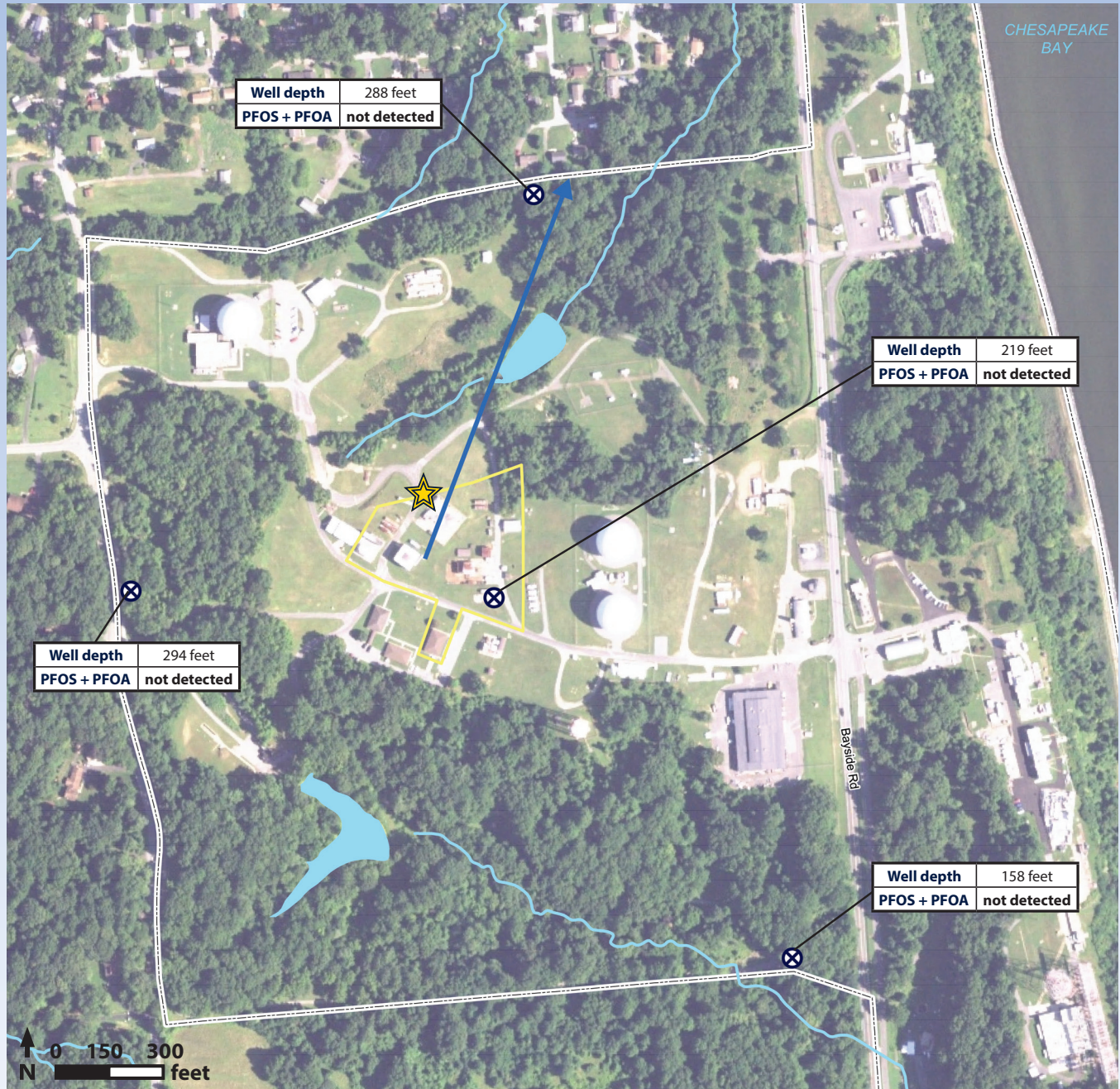


On-Base Investigation – Deep Groundwater

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LEGEND

- ⊗ Deep monitoring well
- Direction of deep groundwater flow
- Surface water
- Fire Testing Area (suspected source)
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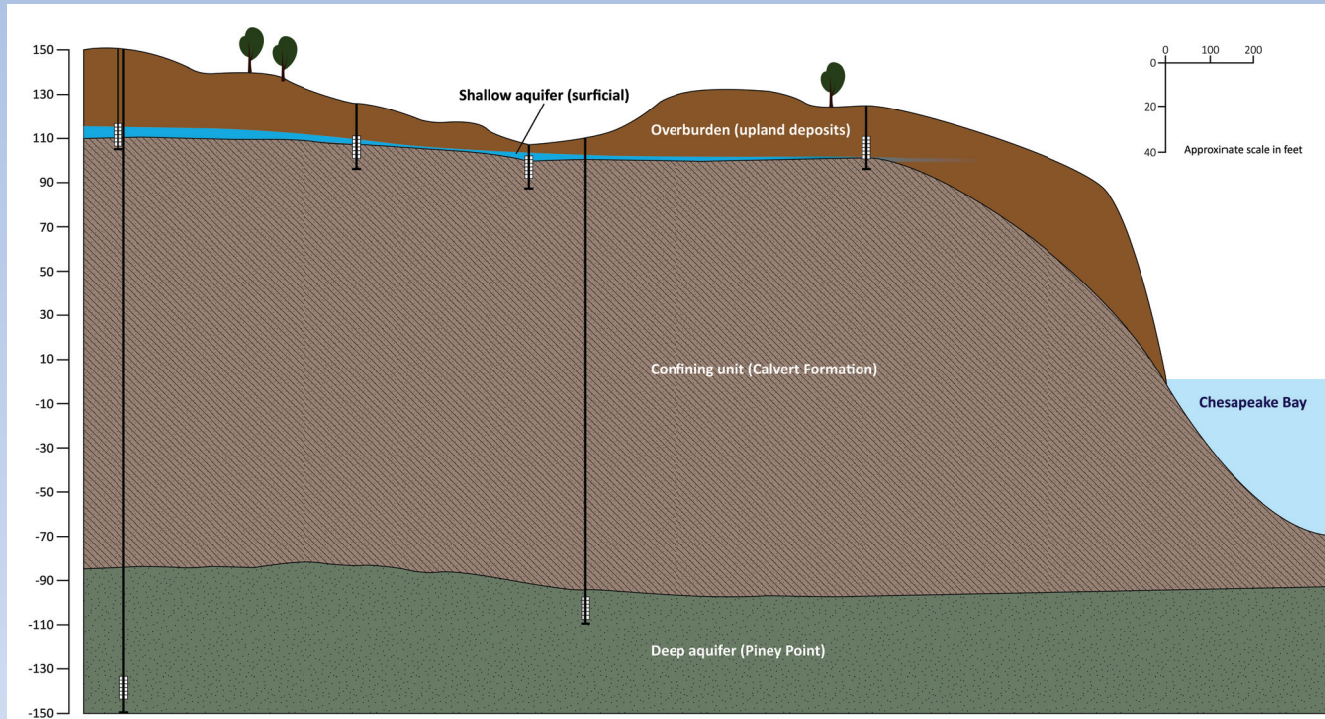


NRL-CBD Conceptual Cross Section

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- Review of drinking water well records available through the County indicated that all private water supply wells are screened in the Piney Point aquifer.
- There were no detections of PFAS in the Piney Point aquifer on base.
- The Navy is sampling to determine whether PFAS have impacted private drinking water wells off base.

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Federal Environmental Investigation Process

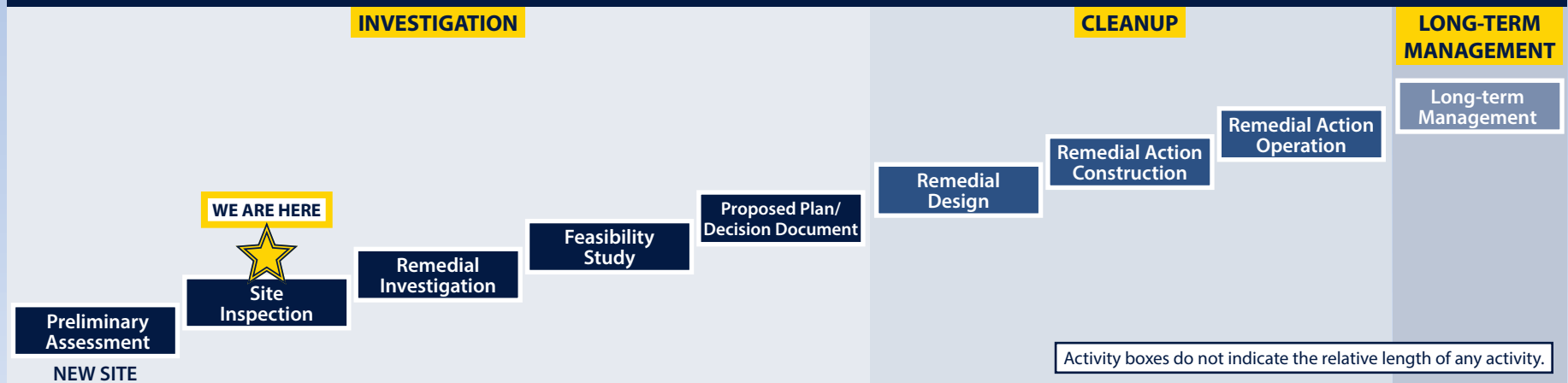
Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)

For more information on NRL-CBD environmental activities, visit (case sensitive)
<https://go.usa.gov/xQFuV>

For more information on EPA processes, visit
<https://www.epa.gov/superfund>

For more information on Maryland processes, visit
www.mde.maryland.gov

Implementation Process



NRL-CBD Community Involvement

- Community involvement is the process of engaging and collaborating with community members.
- The goal of community involvement is to advocate community participation throughout the NRL-CBD environmental restoration program by:
 - Providing an avenue for discussion and information exchange for the environmental cleanup program
 - Helping to address concerns of the public and NRL-CBD neighbors



The on-base PFAS investigation is in the early stages. A preliminary groundwater investigation was conducted to determine if contaminants were released. The goal of the Site Inspection is to determine the magnitude and extent of the release.



NRL-CBD Environmental Restoration Program Sites

Additional information can be found online at (case sensitive)
<https://go.usa.gov/xQFuV/>

Munitions Response Sites

MRS 001 – Hypervelocity Low Pressure Gun

- Test facility used 1967–1995
- Remedial Investigation Phase

MRS 002 – Randle Cliffs, Zuni Launch Site, and Gun Mounts

- Zuni Launch Site – Used 1960s–1992; site activities limited to quality control testing and research
- Gun Mounts – Used for a short period 1944–1948; site activities likely involved gun sighting
- Proposed Plan Phase

MRS 003 – Small Arms Range

- Small arms range used 1960s–early 1990s for recreation and small arms qualification
- Decision Document Phase

LEGEND

- Munitions Response Site boundary
- Environmental Response Site or Area of Concern boundary
- NRL-CBD boundary

0 500 1,000 feet
↑ N

AOC Area of Concern
MRS Munitions Response Site
NRL-CBD Naval Research Laboratory –
Chesapeake Bay Detachment

The Navy is committed to environmental protection.

In addition to the PFAS investigation, the Navy is investigating three munitions sites and seven environmental sites at NRL-CBD.



Environmental Response Sites

Site 3 – Landfill No. 1

- Base municipal landfill 1942–1950
- Site Inspection Phase

Site 4 – Landfill No. 2

- Base municipal landfill 1950–1958
- Site Inspection Phase

Site 5 – Landfill No. 3

- Base municipal landfill 1958–1968
- Site Inspection Phase

Site 7 – Road Oil Application

- Historical dirt roads reportedly sprayed with waste oils as dust control 1940–1952
- Site Inspection Phase

Site 9 – Photo-Processing Waste

- Discharge from photo-processing lab released to the ground during 1950s and 1960s
- Site Inspection Phase

★ Site 10 – Fire Testing Area

- Site in use since 1968 to test fire extinguishing agents
- Site Inspection Phase

AOC D – Water Tower

- Base water tower in use since 1950s; soils beneath water tower impacted by lead from lead-based paint used on the water tower
- Site Inspection Phase

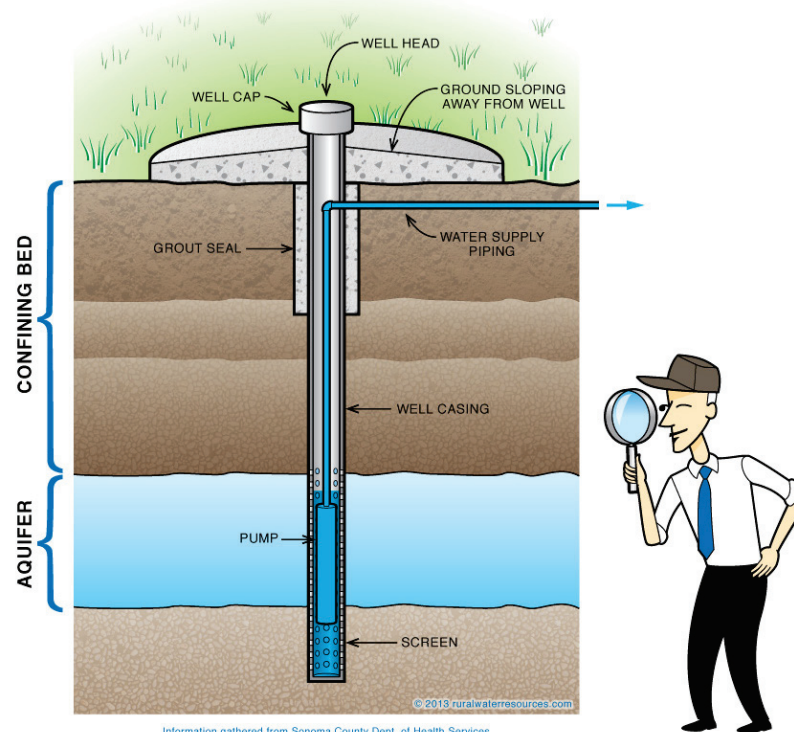
Managing Your Private Well

If you have specific questions, please contact Calvert County Health Department
410-535-5400 | calvert.admin@maryland.gov | www.calverthealth.org

Managing the Risks

- Testing of private wells is recommended to ensure water quality.
- Bacteriological testing once a year is a good idea. Regular testing can tell you the quality of the water.
- More frequent testing is recommended if your water changes in taste, odor, or appearance or if you have recurrent incidences of gastrointestinal illness.
- The National Ground Water Association recommends you test for bacteria, nitrates/nitrites, and any other contaminants of local concern.
- If using water conditioner (aka, "water softener") equipment, it should be maintained and kept in working order.
- Do not dispose of or store hazardous materials or chemicals on your property or near your well.

Typical Well Design





We Need Your Cooperation – Drinking Water Sampling Process

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Sampling Process

- We need your cooperation to:
 - Make your appointment (sampling will take less than an hour).
 - Review and fill out the questionnaire.
- A team of qualified professionals will:
 - Collect water from the sample point (water will run for 3–5 minutes).
 - Analyze the sample according to EPA guidelines for a sampling and analysis process that follows strict quality control and quality assurance protocols.

Other Ways to Schedule an Appointment

To schedule an appointment for sampling a drinking water well in the designated area, please contact:
NRLCBDWATER@navy.mil or
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Sign Up for Your Sampling Appointment Here

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Off-Base Drinking Water Well Sampling

- The Navy is currently sampling drinking water wells in designated areas only.
- Drinking water samples will be collected **Friday, July 13, through Sunday, July 22.**
- Sampling appointments are available **Monday–Friday 9 a.m.–6 p.m., Saturdays 9 a.m.–1 p.m., and Sundays noon–4 p.m.**
- The property owner must give permission for sampling.
- Sampling takes less than an hour.
- An adult resident (18 years of age or older) must be present during sampling.

Drinking Water Sampling Activity Timeline

