



# Restoration Advisory Board Meeting Minutes Naval Research Laboratory – Chesapeake Bay Detachment

MEETING DATE: May 18, 2021

LOCATION: Virtual meeting conducted via Cisco WebEx platform

*Note: This meeting summary is based on informal notes taken at the meeting. It is not intended as a verbatim transcript. Rather, it is intended to summarize the overall discussions.*

*Notations marked (“\_\_\_\_\_”) were added to the meeting minutes for additional clarification, and/or correction.*

## Welcome and Introductions

Ryan Mayer from Naval Facilities Engineering Systems Command (NAVFAC) – Washington introduced himself as the Department of the Navy’s (Navy’s) Remedial Project Manager for Naval Research Laboratory – Chesapeake Bay Detachment (NRL-CBD). He welcomed the Restoration Advisory Board (RAB) members and the public to the RAB meeting for NRL-CBD. Ryan opened the meeting with introductions of the presenters and regulators, which comprises members from the Navy, Maryland Department of the Environment (MDE), and Navy support contractors.

Ryan informed the attendees that the RAB meeting presentation was forwarded to the RAB members, and were posted to the NRL-CBD website (under the Community Outreach tab at [https://www.navfac.navy.mil/products\\_and\\_services/ev/products\\_and\\_services/env\\_restoration/installation\\_map/navfac\\_atlantic/washington/nrl\\_cbd/outreach.html](https://www.navfac.navy.mil/products_and_services/ev/products_and_services/env_restoration/installation_map/navfac_atlantic/washington/nrl_cbd/outreach.html)) in advance of the meeting.

Following the welcome and introductions, Ryan reviewed the meeting agenda (**Attachment 1**).

Ryan then introduced the RAB Community Co-Chair, Mr. Kevin Britt, and stated that Kevin was elected Co-Chair by the RAB members during the RAB training session in December 2020. Kevin informed the attendees that he lives in Chesapeake Beach, MD, near NRL-CBD and that the RAB meeting is a forum for the Navy to provide community members with updates on their environmental restoration projects, as well as giving community members the opportunity to provide input and ask questions.

Following introductions, the meeting proceeded following the agenda and the PowerPoint presentation (**Attachment 2**).

## Virtual Meeting Logistics

Amy Brand, a senior community involvement specialist from CH2M HILL, Inc. (CH2M) (Navy support contractor), reviewed the WebEx meeting technology basics with the attendees, informing them that comments could be typed into the chat box, and asked RAB members to click on the “hand mark” if they would like to be called on to speak. Amy stated that for any issues encountered during the presentation, Leticia Solaun from CH2M would be available for assistance.

## Review and Approve the December 2020 RAB Training Meeting Minutes

The December 2020 RAB training session meeting minutes were distributed to the RAB members via email in May 2021. Amy Brand stated that the meeting was held to provide RAB members with an overview of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, approve the RAB charter, and to elect the RAB Co-Chair (Kevin Britt). The few action items identified during the meeting were addressed and Amy asked if any of the RAB members had any comments on the minutes; no comments were noted. Amy informed the RAB members that if for any reason they could not submit their comments during the meeting, they could follow-up with Ryan Mayer and Kevin Britt, whose email addresses were provided at the end of the meeting presentation slides.

## Community Involvement Update

Amy Brand described the Community Involvement Plan (CIP) that was recently prepared for NRL-CBD. The CIP is a document that describes how the Navy will communicate with the public during the environmental restoration process and how community members can be involved in that process. The basis for the CIP is community input, that was gathered via questionnaires and interviews that focused on what people know about environmental restoration at the Base; what people want to know; and how they want to obtain this information and be involved.

The CIP includes an overview of the plan, a description of and history of the Base, an overview of the Chesapeake Beach community, and communication methods that will be used. When gathering the community input, questionnaires were distributed and some interviews were conducted between August and September 2019 and 9 persons chose to be interviewed. Most of the participants were already aware of environmental investigations at NRL-CBD, but some of them did not know about the off-base drinking water sampling that had been conducted in 2018. Specific interests that people listed included protecting the Chesapeake Bay; addressing shallow groundwater wells; protecting people; starting the RAB; and ensuring that the Navy implements a thorough and sound process for environmental restoration.

Community involvement activities are spelled out in the CIP and there are a number of public outreach activities that are required by CERCLA. However, the Navy went beyond those requirements, and established: the NRL-CBD RAB, a mailing list for notifications, and an updated website that includes information about the environmental cleanup program and links to the administrative record documents. In addition, the Navy will distribute fact sheets, as needed, as the environmental restoration program (ERP) moves forward.

The CIP was reviewed by the MDE, who provided comments to the Navy. Upon addressing these comments, the document was released in March 2021. The CIP has been posted to the NRL-CBD website and its posting to the Administrative Record is in progress.

## Technical Assistance for RAB Support

Ryan Mayer provided a summary of the Technical Assistance for Public Participation (TAPP) program, which provides funding for RABs for independent technical assistance to assist in understanding or evaluating technical documents, concepts, or other information related to environmental restoration activities. When considering whether to apply for TAPP funding, the first step is to define the project; with the two most common types of projects being training education on a particular technical issue or

interpretation of technical documents. Ryan then turned the presentation over to Kevin Britt, the RAB Community Co-Chair.

Kevin informed the attendees that TAPP is a resource available to benefit communities, and that the Navy may fund TAPP projects with grants of up to a total of \$100,000. Kevin noted that he would be interested in defining a technical project that focuses on Base contamination and the potential concerns that may not currently be addressed through State and Federal regulation. He'd like to hear from RAB and community members regarding their thoughts and suggestions on the TAPP program and encouraged them to contact him to discuss this further.

Ryan then stated that once Kevin received input regarding potential TAPP projects, and a majority of the RAB members agree on the project(s), both Ryan and Kevin would fill out and submit the application(s) for review and approval. Each RAB is eligible for TAPP funding up to a total ("lifetime maximum") of \$100,000, or 1% of the installation's estimated environmental restoration costs, with a maximum of \$25,000 allowed per year. Ref: Federal Register (<https://www.govinfo.gov/content/pkg/FR-1998-02-02/pdf/98-2394.pdf#page=7>).

## Questions & Comments from RAB Members

Following the presentations on the December 2020 RAB Training Meeting Minutes, the CIP, and the TAPP program, Amy Brand asked the RAB members for questions and comments on these presentations. Michael Rooney stated that he had not had the opportunity to review the December 2020 meeting minutes and asked if the documents are made available at the local library. Ryan Mayer replied that all documents that are made final are available in the Administrative Record and the NRL-CBD website. In the past, they have also been placed in the public library at Chesapeake Beach, MD; however, the pandemic has made placing documents in the library logistically challenging. Going forward, the Navy will regroup on placing documents in the library.

Kevin Britt stated there is no deadline for submitting input on the TAPP program and asked if there was a deadline for commenting on the CIP. Ryan replied no; the CIP has been posted to the NRL-CBD website and Administrative Record; however, the CIP is a living document and will be updated when necessary.

Another RAB member asked if the presentation printouts were available and Ryan replied that they can be emailed to members, as well as sent via U.S. mail; the member replied that submittal via U.S. mail would be preferred.

## Status Update: Planned, Ongoing, and Completed Activities

Ryan Mayer provided a brief summary of the status of environmental activities at NRL-CBD, that included the completion of the following three major activities by the end of 2020:

- Site 10 – Fire Testing Area: The sampling and analysis plan (SAP), corresponding field sampling, and laboratory analysis and data validation. The field sampling included installation of five additional surficial aquifer monitoring wells, and collection of groundwater, soil, sediment, and surface water samples for PFAS compounds.
- Building 76 – Disposal Area: This is a relatively new area (not an official site at this time), and soil samples were collected, analyzed, and validated. Evaluation of this data is in progress.
- CIP – This document was finalized.

Ryan then reviewed the current, ongoing activities at NRL-CBD, that include:

- Sites 3, 4, and 5 – Landfills No. 1, 2, and 3 (“respectively”): these are three small landfill areas that have been moved forward to the Remedial Investigation phase of the CERCLA process; review of the Draft SAP for these sites is in progress with MDE.
- Building 76 – Disposal Area: A site assessment report for this site is in progress.
- Site 10 – Fire Testing Area: The Site Inspection (SI) Report for this site is in progress, and the Final SI Report is anticipated in fall 2021. PFAS compounds were sampled in the media at this site.

Ryan then reviewed the planned activities at NRL-CBD, that include:

- MRS 001 - Hypervelocity Low Pressure Gun: Additional soil sampling in summer 2021 associated with the Pre-Feasibility Study.
- Sites 3, 4, and 5 – Landfills No. 1, 2, and 3: Remedial Investigation fieldwork anticipated in Summer 2021
- Site 9 – Photo Processing and Discharge: Preparation of the Expanded SI SAP Addendum; additional sampling is anticipated in late-summer/early-fall 2021.

## Site 10 Site Inspection Update

Following the status update, Ryan Mayer and Andy Bogdanski provided a review of the recent sampling conducted at the Site 10 – Fire Testing Area and the PFAS analytical results.

Per- and polyfluoroalkyl Substances (PFAS) are a group of thousands of compounds which are chemicals of emerging concern and found in a variety of products from aqueous film-forming foam (AFFF) to household products such as nonstick cookware, cleaning products, cosmetics, paints and varnishes, water resistant clothing, etc. PFAS are environmentally persistent and bioaccumulate in the environment. Releases of PFAS to the environment due to DoD activities have occurred in association with firefighter training, fire suppression systems, and emergency incident response. Current Navy guidance for analyzing PFAS includes use of the approved USEPA analytical Method 537.1 that can detect 18 PFAS compounds, and United States Environmental Protection Agency (USEPA) human health screening levels are available for three PFAS compounds (perfluorooctane sulfonate [PFOS], perfluorooctanoic acid [PFOA], and perfluorobutanesulfonic acid [PFBS]).

In 2014, the Navy issued a policy to identify all known and suspected sites for PFOS and/or PFOA that may have been released on active and Base Realignment and Closure (BRAC) installations. It also required on-Base drinking water sampling for PFAS for bases where groundwater was used as drinking water and PFAS could have been released nearby.

In June 2016, the Navy issued another policy to identify and prioritize sites for investigation of drinking water resources for on- and off-Base that are thought to be vulnerable to PFAS contamination from past Navy releases of PFAS, with a focus on releases of AFFF.

Prior to conducting the Site Inspection (SI) at Site 10, the Navy’s focus was on drinking water; sampling on- and off-Base to determine if PFAS were present and if so, whether levels were below the USEPA lifetime health advisory (LHA) levels (“of 70 ppt”). The Navy held two open house, public meetings in July 2018 and October 2018. The first meeting was to inform the public of the Navy’s interest to sample off-site drinking water wells, and the second meeting was to explain the overall findings. After the first public meeting, drinking water sampling was conducted for residents in the immediately downgradient areas of the Base; to the north and the southeast. Of the 42 private well sampled, PFAS was detected in three drinking water wells, all below the LHA levels; the remaining 37 (“39”) wells were all non-detect.

Ryan provided an overview of the CERCLA process and noted that Site 10 is currently in the Site Inspection stage. Ryan then reviewed the Site 10 history and background. Site 10 has been used since the late-1960s to test extinguishing agents used on fires started with various fuel sources. Specifically, the tests were conducted by creating a fire on the concrete testing pad by the open burning of petroleum products and then using fire suppressants, that included AFFF, PKP (potassium bicarbonate) halons, and protein foam, to extinguish the fire. Historically, wastewater containing these solutions were drained into a holding pit and allowed to absorb slowly into the soil. In the mid-to-late-1980s the Fire Testing Area infrastructure received an upgrade which provided containment for the effluent from the fire testing operations. The environmental restoration program is investigating releases from this site that occurred over an approximately 20 year timeframe, from the late-1960s to the late-1980s. Current operations include an outdoor fire testing pad and indoor fire testing building where fire suppressants are tested, that include AFFF. Wastewater drains into sumps, which are emptied via a vacuum pump truck and transported off-site for proper disposal.

The Site Inspection at Site 10 is being conducted to answer the question “Are PFAS present in environmental media associated with Site 10” and focuses on the media most likely affected by migration pathways. Media sampled on Base during the investigation included soil, groundwater (surficial and deep aquifers), surface water, and sediment. The fieldwork was completed in October 2020 and the Navy began receiving validated analytical data in January 2021. Overall, with the exception of sediment, all media sampled had PFAS concentrations above applicable screening levels; however, the PFAS concentrations in the deep aquifer were below the drinking water LHAs for PFOA and PFOS.

Andy Bogdanski then reviewed the Site 10 SI results. Surface soil samples were collected from 29 boring locations from a sample depth of zero to six inches below ground surface (bgs). PFAS concentrations are relatively low on the periphery of Site 10. However, in the interior of the site near the old fire testing pad, higher concentrations of PFAS concentrations in surface soil were detected, with the highest concentration of PFOS (4,660 ng/g) (“equivalent to ppb- parts per billion”) at sample location SS17. There were no PFAS detected in surface soil in samples collected south of Navy Court Road.

Subsurface soil samples were also collected from the same soil boring locations which surface soil samples were collected; subsurface soil samples were collected from depths of six to 16 feet bgs. In general, PFAS concentrations in the subsurface soil samples were higher than those detected in the surface soil samples, suggesting downward migration of PFAS consistent with the conceptual site model where there were releases from the testing pads. The highest PFAS concentrations were detected in subsurface soil sample SB09 at one to three feet bgs (PFOS at 7,150 ng/g) and six to eight feet bgs (PFOS at 7,950 ng/g), in the vicinity of the old testing pad. There were no PFAS detected in subsurface soil in samples collected south of Navy Court Road.

Regarding surficial groundwater, there were 23 monitoring wells sampled, that were generally screened between 20 to 30 feet bgs. The highest concentration of PFAS was detected in monitoring well MW02 (PFOS at 171,000 ng/L), (“equivalent to ppt – parts per trillion”) and the pattern of PFAS detected in groundwater indicates it’s migrating along the direction of groundwater flow to the northeast, as well as to the southeast. For the deep aquifer (Piney Point aquifer), there are four deep monitoring wells on base, generally screened between 200 to 300 feet bgs. Detections of PFAS in these deeper monitoring wells were fairly low, suggesting minimal transmission from the sources coming from the old fire test pad. The highest concentration of PFAS in the deeper aquifer was detected at MW13 (PFOS at 17.9 ng/L).

Surface water and sediment samples were collected from two streams – one stream north of the site and the other stream south of the site. Five surface water samples were collected from the northern

stream, and six surface water samples were collected from the southern stream. Additional, two sediment samples were collected from both the northern and southern streams. Based on the results, groundwater is flowing toward the streams and appears to be discharging to surface water. In the north stream, PFOS concentrations in surface water ranged from 2,990 ng/L at the upgradient edge to 4,960 ng/L downstream. In the south stream, PFOS concentrations in surface water ranged from 12.8 ng/L at the upgradient edge to 1,230 ng/L downstream. PFAS in sediment was primarily non-detect, with the exception of PFOS, which ranged from 1.63 ng/g to 34.9 ng/g.

Ryan then stated that at this time, the draft Site 10 SI Report is anticipated to be completed in the summer of 2021, with the final SI Report projected for fall 2021. Since PFAS have been detected in environmental media above the applicable screening levels at Site 10, the site will move to the Remedial Investigation phase which is the next step in the CERCLA process. The Remedial Investigation phase will focus on the nature and extent of PFAS impact, fate and transport through the environmental media, and human health and ecological risk assessments.

## Questions & Comments

Amy Brand then led a review of the questions submitted by RAB members and the public in advance of the meeting. The questions submitted in advance, and corresponding responses, are as follows:

### Questions from Kevin Britt (Community Co-Chair)

#### ***What activities are planned as part of the Remedial Investigation fieldwork (planned for Summer 2021) at Sites 3, 4, 5?***

Response: The planned RI field activities will include field preparation such as site mark-out, and utility locating. The primary tasks will be test pitting, soil sampling via a drill rig, surveying, and investigative derived waste management.

#### ***Thousands of PFAS compounds exist and the Navy is using USEPA analytical Method 537.1 which can detect 18 compounds. Does NRL CBD have records of which PFAS compounds have been used or tested at the facility? I would like to know how many PFAS compounds could be present at NRL CBD and how many of those PFAS compounds would not be detected by USEPA analytical Method 537.1.***

Response: There are thousands of possible PFAS chemicals, but only reliable analytical methods for less than 30 PFAS, and screening and advisory levels exist for very few of the chemicals. The Navy tests for 18 compounds as specified in EPA Analytical Method 537.1. As EPA methods are revised and finalized, the Navy updates its policy, as necessary for using these additional methods.

NRL would typically maintain records for the fire extinguishing agents that were tested. However, the specific fluorinated compounds contained within the AFFF were proprietary information of the specific manufacture. There's no one analytical method capable of identifying all PFAS, however, Method 537.1 was developed in part because it is capable of identifying PFAS associated with AFFF.

#### ***Are PFAS compounds still being released to the environment through activities at NRL CBD?***

Response: No, PFAS compounds are contained and not being released to the environment. Current modernized facilities have stopped these releases. These operations are conducted in very controlled settings. After tests are conducted, residual AFFF product is containerized, and removed from the area for proper disposal. The environmental restoration program samples for historical use of PFAS compounds which includes historical use of AFFF operations within the Site 10 area.

***The highest PFAS concentrations at NRL CBD have been detected in AOA Monitoring Well 2. In 2017, shallow groundwater samples contained PFAS compounds as high as 234,000 parts per trillion. Then in 2020, shallow groundwater concentrations were as high as 171,000 ppt in the same well. How do you explain the differences?***

Response: Fluctuations in groundwater concentrations are normal for groundwater sample results, it is a dynamic system, and it can be expected to see some changes. Concentrations can fluctuate in environmental media based on a variety of factors (dispersion, dilution, absorption). Some groundwater wells had increases, followed by other wells where decreases were observed. While these two results differ from each other, they are both in the same relative order of magnitude. From that perspective these two results are relatively consistent.

***In 2020, surface water samples collected at NRL CBD contained PFAS compounds at concentrations as high as 4,960 ppt. Is it safe for humans to fish and swim in surface waters with PFAS concentrations that exceed the human health screening levels for PFOA and PFOS?***

***Similarly, based on concerns about potential exposure to PFAS near Webster Field Annex, Maryland Department of the Environment has recently completed a pilot study to assess whether surface water and potentially oysters in that area have elevated levels of PFAS. Will MDE conduct a similar study in the Chesapeake Bay near NRL CBD?***

Response: Yes, the PFAS concentrations in surface water are above the screening levels which is the first step in understanding if a release has occurred and requires further evaluation in the RI. The human health risk associated with PFAS in environmental media including surface water is a key concept that DoD and the regulatory bodies are working though to understand as PFAS sites move into the RI phase. One important step moving forward into the RI will be to refine the conceptual site model to evaluate whether the streams on-site have the exposure pathways (fishing, swimming) mentioned in the comment.

The Navy is not aware of any advisory's in the area of Chesapeake Beach for PFAS chemicals. MDE recently conducted and published a Pilot Study of PFAS Occurrence in Surface Water and Oysters in the St. Mary's River of the lower Potomac River in September 2020. This report is available online for the public to review. This MDE study was conducted to address concerns of PFAS sources from potential Navy operation use in upstream areas. The study area was fairly broad and included many reaches of the St. Mary's River, St. Inigoes Creek, Smith Creek, and the Patuxent River. Fishing Bay – on Maryland's eastern shore, was used as a reference station. Although low levels of PFAS were detected in surface waters, MDE did not consider these concentrations a human health risk. Additionally, oyster tissue concentrations were non-detect for PFAS throughout the study area, and considered protective of human health from consumption of oysters within the study area.

Understanding and managing risk associated with PFAS is a high priority for MDE and MDE is working with other programs to implement a science-based strategy to evaluate risks posed by PFAS in various environmental media. Specifically, MDE is looking at all media that could be impacted, as well as potential routes of exposure such as consumption of oysters. MDE's strategy focused initially on drinking water and public water systems, and then the pilot study on the occurrence of PFAS in oysters and surface water at St. Mary's River. MDE has recently expanded efforts to include collecting data on the occurrence of PFAS in fish and also directing impacted water supplies to take action to reduce PFAS risk. Additionally, MDE is working at military installations with PFAS contamination to ensure actions are taken to protect public health and the environment. MDE reviewed the latest data at NRL-CBD and found no impacts to offsite drinking water above health advisory levels. MDE will have the Navy continue to conduct additional characterization and assessments to determine the extent of PFAS to surface water

and aquatic organisms and ensure the necessary follow-up occurs to keep Marylanders informed and protected.

With regard to the question “Is it safe for humans to fish and swim in surface waters with PFAS concentrations that exceed the human health screening levels for PFOA and PFOS?”, as far as the human health screening levels, the referenced human health screening levels are for drinking water and are based on exposure to PFOA and PFAS presence in primary drinking water sources. The reported elevated concentrations are not from a drinking water source, but from a stream at the facility. Concentrations are below recreational swimming screening values, as presented in the St. Mary’s pilot study of PFAS. Based on these reported concentrations, additional characterization and assessment is warranted within the stream and potentially other downstream areas within the discharge basin.

Regarding the fish, MDE is not aware of any large-scale studies of fish tissue conducted in the vicinity of these bases, specifically. However, MDE did start last fall to include PFAS analytes in its fish tissue sampling program and is working to modify existing sampling programs to make sure popular fish species are collected from locations where high levels of recreational fishing occur. MDE expects to post the results of the fish tissue sampling on their website when the data are available; possibly as soon as July 2021. Risk assessment work will be conducted to provide PFAS-related fish consumption guidance to the public, if necessary. As part of the RI process, MDE will require the Navy to conduct both human health and ecological risk assessments that should include the collection of organisms for PFAS analysis.

***When will the Site 10 Site Inspection Report be provided to MDE for comments? Will there be a public review and comment period for the Site 10 Site Inspection Report before it is finalized?***

Response: The Navy expects the Site 10 Site Inspection Report to be available this summer for MDE review, most likely within the next couple of months. Reports are reviewed by the Navy and MDE regulators prior to finalization. Once they are final, they are available for public review and placed in the Administrative Record and is available online at the NRL-CBD website.

***Will the Remedial Investigation for Site 10 include surface water and or shallow groundwater sampling off site?***

Response: The Navy’s environmental restoration program allows for off-site sampling if the data shows that contamination originating from an on-site source has migrated off-base. The RI sampling activities haven’t been planned at this point but off-base sampling will be assessed as the RI is planned.

Question from John Bacon, Chairman Chesapeake Beach Oyster Cultivation Society (CBOCS)

***Did the Navy test oyster samples on their Reef in Chesapeake Bay?***

Response: Our Natural Resource program works with the Chesapeake Beach Oyster Cultivation Society. The Navy has not done any testing of oysters as part our investigation and is usually not included in the Site Inspection phase. However, as the investigation moves into the Remedial Investigation phase, the Navy will look at human health and ecological risk more in depth. One of the challenges, at this time, for testing tissue is the lack of published or approved EPA analytical methods.

Amy then opened the meeting to answer questions by RAB members. Larry Jaworski, a member of the Chesapeake Beach Town Council, informed attendees that the town has also conducted independent testing of its water supply well and that PFAS was non-detect. In addition, the town is also planning to conduct testing of the water reclamation treatment plant effluent for PFAS since the town is concerned about the impacts of these discharges on the quality of the Bay and the fact that there is a large charter



boat business in town and oyster populations. The town is concerned about the surface runoff into the Bay from NRL-CBD. While discharges have stopped at the facility, aggressive offsite testing is strongly encouraged. Ryan thanked Larry for the comment and stated that surface water is one item the Navy will be looking very carefully during the next investigation phase. Ryan also stated that the Navy understands that shellfish, fish, and community is a big concern to the town.

Question: David Harris requested that the charts (figures/tables) show the equivalence of nanograms/liter in parts per trillion (ppt). In addition, as a property owner to the south, he has sent several emails inquiring about testing streams and asked if livestock can drink from the streams. He was informed that the Navy does not have any plans for offsite testing yet and is alarmed to see the PFAS concentrations in surface water exiting the Navy's property to the south. In addition, the PFAS concentrations leaving the Navy's property to north are even higher and it's troublesome that nothing is being done about the constant waterflow going out. He felt it was a challenge to try and have the Navy test the one shallow well on his farm to the south. He stated that the watershed at the head of the stream which emanates off the Navy property clearly shows that the source of the water contamination comes from the Navy property. He asked when will there be a faster plan on how to resolve these issues regarding the stream runoff and water discharges that currently exceed safe levels?

Response: Ryan acknowledged that the PFAS levels in the stream are high, likely due to surficial groundwater discharging into the pond and tributaries. The Navy plans to conduct additional sampling around the tributaries, ponds, and downstream to evaluate these concentrations. With regard to the CERCLA process, it is a deliberate and thorough process and not fast. However, the Navy is moving forward into the next phase of investigation and will be conducting additional sampling.

Peggy Williams then reiterated that the 70 ppt health advisory is for drinking water and cannot be compared directly to surface water. David replied that there is one problem – growing up, as a boy scout, we were permitted to camp out near the old Landfill Number 3 site and would occasionally drink out of the streams. In addition, the shallow well on the farm tested in the 30 to 50 ppt is in the drinking table; it's just not in the aquifer that most wells are drilled down to nowadays. People do drink from these streams and boiling water does not remove the PFAS. There are things that need to be taken a look at.

Ryan thanked David and stated that these are some of the comments and feedback that the Navy is looking for. When the Navy goes through the RI for Site 10, the pathways where people could be exposed (e.g., drinking and fishing out of the streams) will be evaluated.

Question: Michael Rooney asked are the sampling plans submitted to MDE for review made available for public and RAB member reviews before finalization.

Response: Ryan responded that the Navy reviews sampling plans and reports before they are submitted for regulatory review or other stakeholder review (if applicable). Once regulatory comments are addressed the plans and reports are finalized. Once placed in the Administrative Record, the plans and reports are available for public review.

Question: Greg Morris is concerned about CERCLA process schedule, given that we are less than a fifth of the way through the CERCLA process for Site 10 and two years into the formation of the RAB.

Response: Ryan replied that the schedule depends on the site; some sites at NRL-CBD have already been cleaned up and some are just entering the CERCLA process. Investigations at some of these sites began before my involvement at NRL-CBD.

Mark Mank, with MDE, then provided additional comments. The PFAS concentrations on Base are significantly elevated, and there were questions in the chat about how high these concentrations are relative to other things. The State does not specifically track which is the highest concentration, or things like that; but, unequivocally, the concentrations are significantly elevated. NRL-CBD had an intensive use of PFAS in a very discrete area. However, one benefit to note is that this area is specific and not a sprawling/gigantic area. With regard to the drinking water number, it is just for that. That is, a lifetime exposure of drinking and can't be compared to exposure during swimming. With regard to the elevated PFAS concentrations in soil on Base- they are significant. MDE will work with the Navy to get the questions answered, which include: Is it getting to the Bay? And how much mass is getting to the Bay? Perhaps not directly applicable to NRL-CBD; however, MDE is looking at PFAS in fish in the State of Maryland, and will continue to do so. Perhaps the area of NRL-CBD would become a prioritized area. Mark encouraged the community to continue asking Peggy questions as necessary.

Question: Has the Navy ever performed any testing on local shellfish here in the Bay in the vicinity of the subject facility?

Response: Ryan responded not at this time. Sampling shellfish is something the Navy will consider during the next phase of investigation. However, there are challenges to this since there aren't finalized PFAS analytical methods for analyzing fish or shellfish tissue, nor screening levels.

Question: Michael Rooney asked what was the methodology used for the drinking water samples collected by the town of Chesapeake Beach? What was the detection limit? Who completed the chain-of-custody?

Response: Greg Morris replied that he will look into this and for Michael to feel free to email him. Larry Jaworski added the testing was conducted by an independent lab that followed EPA protocols, to which Michael asked whether the laboratory information is available or do we need to submit to request it? Larry replied that he would check to see if the town can release the laboratory information publicly. Larry also noted that USEPA is currently updating its requirements for PFAS testing and that hopefully, we'll continue to follow the EPA updates.

Amy then proceeded with opening the meeting to answer questions submitted by the public via chat.

Question: Pat Elder mentioned you found three wells with PFAS. How can you argue that cannot reach the lower aquifer? Doesn't that say that the clay layer may not be completely confining?

Response: Peggy Williams, with MDE, replied that there are several variables that can affect movement from a shallow aquifer to a deeper aquifer, and having seen that Calvert formation in the field during well installation, there are more plausible ways PFAS could be detected, given it is a fairly thick and dense formation. Generally speaking, migration of groundwater downward through that formation is highly unlikely. While it is possible that that could happen, it's highly unlikely having seen that formation. Ryan added that all PFAS detections to date in the Piney Point aquifer have been well below the LHAs; if there was more intrusion there, it's likely there would have been more detections and at higher concentrations given the higher concentrations in the surficial aquifer. However, the data currently doesn't support vertical migration into the deep aquifer. However, the Navy will continue to test groundwater and will look at the well network to ensure it is adequate for investigation purposes.

Question: Pat Elder stated 7,950 ng/g equals 7,950,000 ppt- we are in trouble. Is there anywhere else on earth with higher levels?

Response: Ryan responded that this is something the Navy will continue to look at this. The Navy is using the State's (Maryland) and USEPA's PFAS screening values and our policy is to look at USEPA's values first, and of course the State's values.

Mark Mank of MDE then pointed out that this site is not at the stage where remedial measures are being contemplated. However, things cannot leave a facility, impact the waters of the State, whatever those waters may be. So those elevated concentrations, and being in the investigation phase, perhaps there are some interim measures that could be considered. MDE is in communication with the Navy, and when we get to that step, which hopefully will occur quickly, there may be remedies that will need to be implemented to solve these problems. However, it would be premature at this stage to say what those would be. In addition, with regard to bioaccumulation as mentioned in the chat, MDE is looking at fish tissue across the state, other aquifers, different environmental media – it is an evolving process. The Navy spoke with regard to methods- there are a host of methods that may not be approved. The State utilizes those, and MDE will encourage the Navy and other parties to avail themselves of those methods and come to logical decisions using the best technology and science available at that point in time, and MDE may have to modify their procedures in the future. That is the case with the number of PFAS chemicals as well as when additional toxicity information becomes available; the State will modify, as will the Navy, and take appropriate action. The methodology issues are complicated, and the toxicity values have evolved lower and lower over time, making this a greater environmental concern that it was 5 or 10 years ago. That's unfortunate for this community, obviously given the location and the contamination. But things are heading in the right direction. MDE would like to keep up the momentum and if you've got questions, please send them to Peggy. MDE approves plans and takes those questions into consideration on sampling.

Peggy added that MDE, via the water management program, is testing fish throughout the state. Before last fall, they added PFAS to their regular recreational fish monitoring program and fish tissue sampling for PFAS will continue at 10 to 12 locations per year in different locations, for a total of 5 years to eventually cover the various regions of the state. Since they started sampling for PFAS in the fall, they sampled Piscataway Creek, Wicomico River, Corisca River, Chesapeake Bay at the mouth of Fairlee, Chester River, Choptank River, Elk River, C&D Canal and the Savage River; those data may be available by July 2021 and I believe they'll post it on their website. As far as fish tissue samples collected near NRL-CBD, there are plans to collect fish near NRL-CBD in the fall of 2021.

Question: What about contamination from animals to humans? For example, there's a high deer population around that are drinking the streams with these excessive levels.

Response: Peggy replied that this site is still in the SI phase; typically sampling for deer would be planned for the next phase of investigation, the RI phase. Ryan added that the Navy will be looking at these populations, whether deer or other animals. However, there are no approved USEPA methods for sampling animal tissue for PFAS. Peggy noted, looking at the deer studies in Michigan, that the PFAS was concentrated primarily in the organ meat. Pertaining to crabs, she said this may be similar, in that contaminants tend to accumulate in crab mustard as opposed to the meat.

Question: Where online can we see the water management program fish sampling mentioned?

Response: Peggy replied that a link to MDE's PFAS landing page will be provided in the meeting minutes, which should have the water management's links to the PFAS studies they are currently conducting. Ryan then confirmed that the last slide in the RAB meeting presentation,

which will be included as an attachment to the meeting minutes, lists these links. MDE Fish sampling information is also provided below in the link below:

[https://mde.maryland.gov/programs/Water/water\\_supply/Documents/PFAS-Roundtable2020-10-05.pdf](https://mde.maryland.gov/programs/Water/water_supply/Documents/PFAS-Roundtable2020-10-05.pdf)

Question: How do the USEPA advisory levels compare to levels set in other countries?

Response: Ryan responded that that is a good question and that he did not have the information on that. The Navy looks at USEPA to set these levels, but he does not have the information on the other countries' advisory levels.

## Future Meeting Planning

Ryan Mayer informed the RAB meeting attendees that the next RAB meeting is planned for October 2021, on a Wednesday from 5-7 pm (date to be determined). He requested that attendees submit their input for RAB agenda topics and noted that both his and Kevin Britt's email addresses are provided on slide 41 of the meeting presentation.

Ryan then reviewed the additional RAB, Navy ERP, and PFAS websites available to the attendees (provided on slide 42 of the meeting presentation).

Kevin Britt then thanked everyone who participated in tonight's meeting, as well as MDE and the Navy, and asked attendees to share the meeting information with others in the community and to reach out to him any time. Ryan then thanked Kevin for stepping up as the RAB Community Co-Chair.

Following this, Ryan concluded the RAB meeting at 6:50 p.m.

**RESTORATION ADVISORY BOARD MEETING**  
**NRL-CBD**  
**May 18, 2021**  
**LIST OF ATTENDEES**

<b>Name</b>	<b>Affiliation</b>
Amy Brand	CH2M
Andy Bogdanski	CH2M
Bob Williams	Guest
Cindy Peil	Guest
David Harris, II	RAB member
Greg Morris	RAB member
Ira May	MDE
Justin Barlow	Guest
Kaley Laleker	Guest
Kevin Britt	RAB member – Community Co-Chair
Kevin McAndrews	Guest
Laura Lampshire	CH2M
Lawrence Jaworski	RAB member
Leticia Solaun	CH2M
Mark Mank	MDE
Marty Madden	Guest
Michael Rooney	RAB Member
Pat Elder	Guest
Peggy Williams	MDE
Randall Getman	Guest
Robin Harris	RAB member
Ryan Mayer	RAB member – Navy Co-Chair (NAVFAC Washington)
Scott Lonesome	NRL
Tim Wheeler	Guest
Will Hager	RAB member



Attachment 1  
RAB Agenda, May 18, 2021



## Restoration Advisory Board (RAB) Meeting Naval Research Laboratory – Chesapeake Bay Detachment

May 18, 2021, 5:00-7:00 pm  
Virtual Meeting

Meeting Facilitator: Amy Brand - Jacobs

<b>Meeting Agenda</b>		
<b>Time</b>	<b>Topic</b>	<b>Presenter</b>
5:00-5:10 pm	Welcome and Introductions	Ryan Mayer and Kevin Britt
5:10-5:15 pm	Virtual meeting logistics: review ground rules and meeting logistics	Amy Brand
5:15-5:20 pm	Review and approve Dec. 2020 RAB Training Meeting Minutes	Amy Brand
5:20-5:30 pm	Community Involvement Update: Website/Community Involvement Plan	Amy Brand
5:30-5:40 pm	Technical Assistance for RAB Support	Ryan Mayer and Kevin Britt
5:40-5:50 pm	Questions & Comments from RAB Members	RAB Members
5:50-6:00 pm	Status Update on Planned, Ongoing, Completed Activities	Ryan Mayer
6:00-6:25 pm	Site 10 Site Inspection Update	Ryan Mayer and Andy Bogdanski
6:25-6:50 pm	Questions & Comments	RAB Members Public Meeting Attendees
6:50-7:00 pm	Future Meeting Planning and Adjournment	Ryan Mayer



Attachment 2  
NRL – CBD RAB Meeting Presentation,  
May 18, 2021



# **Naval Research Laboratory – Chesapeake Bay Detachment Restoration Advisory Board Meeting**

**May 18, 2021**

**5:00 - 7:00 p.m.**

# Agenda

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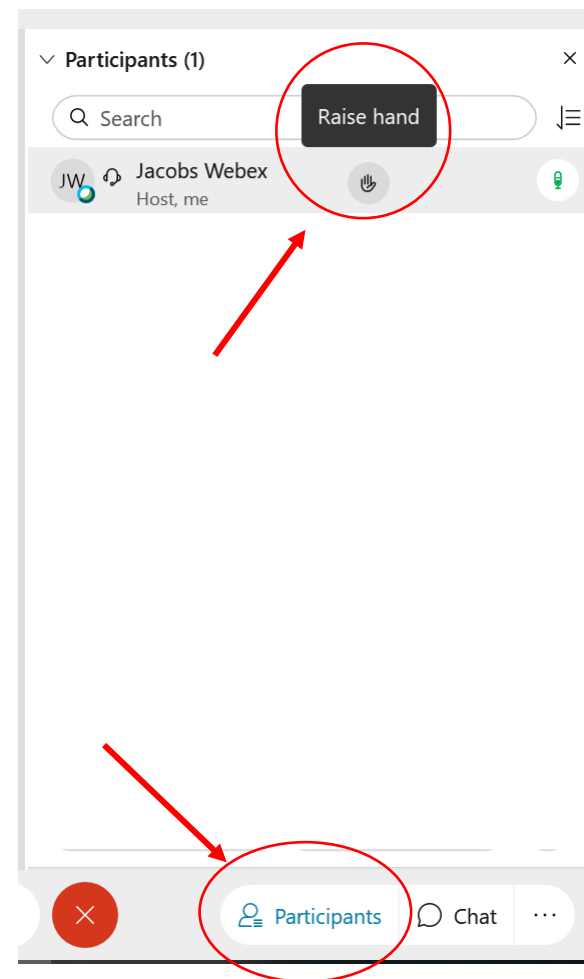
- **Welcome and Introductions**
- **Virtual Meeting Logistics**
- **Review and Approve Dec. 2020 Training Meeting Minutes**
- **Community Involvement Update**
- **Technical Assistance for RAB Support**
- **Questions & Comments from RAB members**
- **Status Update: Planned, On-going, and Completed Activities**
- **Site 10 – Site Inspection Update**
- **Questions & Comments from RAB**
- **Questions & Comments from Public**
- **Future Meeting Planning and Adjournment**

# Virtual Meeting Logistics

**Amy Brand - Jacobs**

# Webex Basics – Computer Access Participants

- Video – Turn OFF except for slide presentation (to preserve bandwidth)
- Participants - On the lower right, click “participants” to open panel
- Chat box – On the lower right, click on Chat and enter questions/comments in chat box
- Raise hand to be called on to speak
  - Scroll over your name in the participant list and click on hand symbol
- Mute/Unmute (all muted to start)
  - Host will unmute individuals
- Trouble? Call or text 352-246-5246



# Webex Basics – Telephone Access Participants

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- Video – Turn OFF except for slide presentation (saves bandwidth)
- Dial \*3 to raise hand to be called on to speak
- Host will unmute individual after seeing raised hand
- You will then receive a prompt to dial \*6 on the phone to unmute yourself
- Trouble? Call or text 352-246-5246

# **Previous RAB Training Meeting Minutes December 2020**

**Amy Brand - Jacobs**

# Previous Meeting Minutes (December 2020)

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- The December 2020 RAB training minutes were distributed to the RAB via email in May 2021.
- Action Items
  - Greg Morris: Re-send written response to comments on 12/2019 minutes to Ryan Mayer
  - Ryan Mayer: Circulate RAB Charter approval signoff sheet
  - Ryan Mayer: Forward CIP to RAB members after regulator review
  - Ryan Mayer: Follow-up on boat site in Chesapeake Beach
- Comments from RAB members?

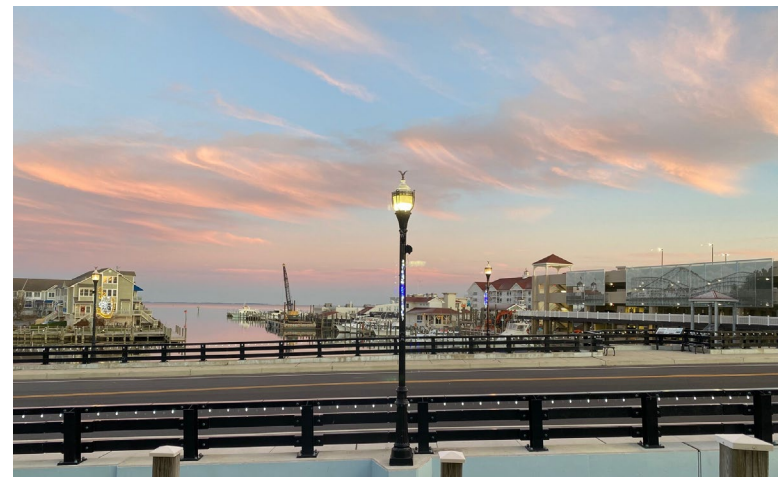


# Community Involvement Update

**Amy Brand - Jacobs**

# Community Involvement Plan (CIP)

- Describes how the Navy will communicate with the public during environmental restoration and how community members can be involved.
- Based on community input – questionnaires and interviews
  - What do people know about environmental restoration at the site? What do they want to know?
  - What are the best ways for people to get that information and be involved?
- Content
  - Overview of the Community Involvement Plan
  - Facility Description and Site History
  - Community Overview
  - Community Involvement Program



# Community Input and Results

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- Community Input

- Questionnaire and interviews in August-September 2019, nine participants

- Summary of Results

- Most aware of environmental investigations but many not aware until off-base groundwater sampling

- Specific interests:

- Protect Chesapeake Bay

- Address shallow wells and protect people

- Start a RAB

- Ensure the Navy implements a thorough and sound process

# Community Involvement Update

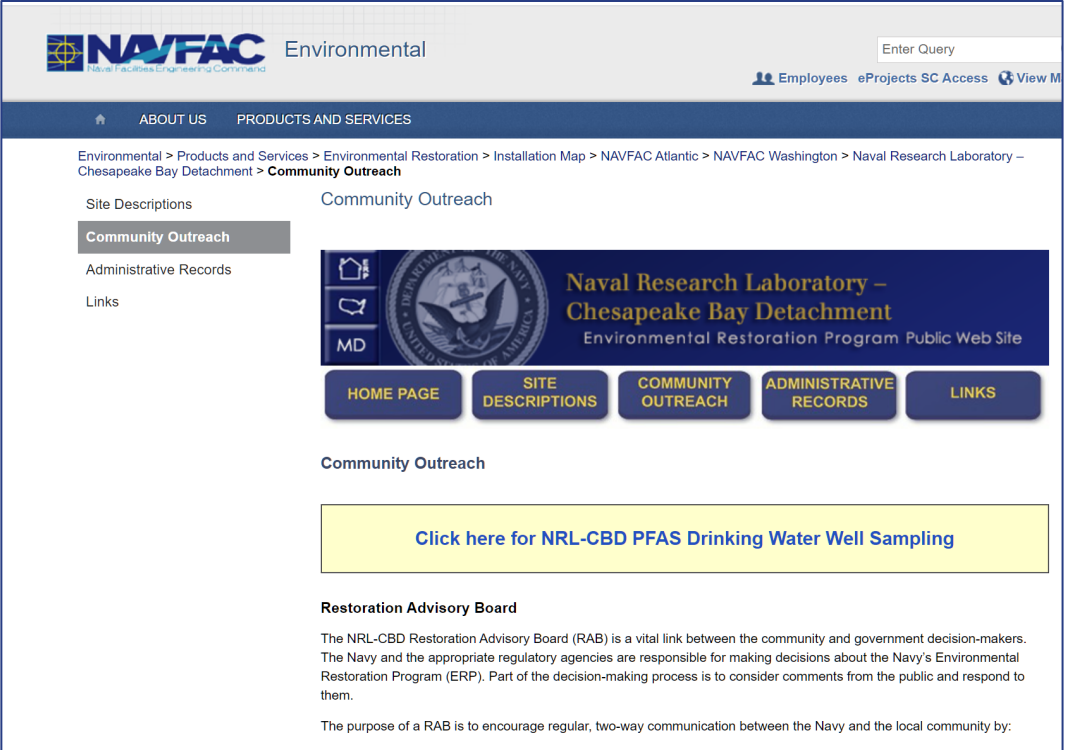
- Community Involvement Activities
  - Many activities required by CERCLA law
  - Establish this RAB
  - Maintain a mailing list for notifications
  - Maintain a website
  - Distribute fact sheets as needed
- CIP Status
  - MDE reviewed the CIP and provided comments
  - Navy addressed MDE comments and CIP released in March 2021
  - CIP posted to the website and in-progress to the Administrative Record



# Website Update

<https://go.usa.gov/xQFuV> (case sensitive)

- Website has been updated with new information on the Site Description and Community Outreach tabs
- RAB information and minutes
- Searchable Administrative Record



The screenshot displays the NAVFAC Environmental website interface. At the top, the NAVFAC logo is visible alongside the text "Environmental". A search bar with the placeholder "Enter Query" is located in the upper right corner. Below the logo, a navigation menu includes "ABOUT US" and "PRODUCTS AND SERVICES". The main content area shows a breadcrumb trail: "Environmental > Products and Services > Environmental Restoration > Installation Map > NAVFAC Atlantic > NAVFAC Washington > Naval Research Laboratory – Chesapeake Bay Detachment > **Community Outreach**". A left-hand sidebar lists "Site Descriptions", "Community Outreach" (which is highlighted), "Administrative Records", and "Links". The main content area features a banner for the "Naval Research Laboratory – Chesapeake Bay Detachment Environmental Restoration Program Public Web Site". Below the banner are five buttons: "HOME PAGE", "SITE DESCRIPTIONS", "COMMUNITY OUTREACH", "ADMINISTRATIVE RECORDS", and "LINKS". A yellow call-to-action box contains the text "Click here for NRL-CBD PFAS Drinking Water Well Sampling". At the bottom, the "Restoration Advisory Board" section is introduced, stating that the NRL-CBD RAB is a vital link between the community and government decision-makers, and that the Navy and regulatory agencies are responsible for making decisions about the Navy's Environmental Restoration Program (ERP). The purpose of a RAB is to encourage regular, two-way communication between the Navy and the local community.

# **Technical Assistance for RAB**

**Ryan Mayer – Navy Co-Chair**

**Kevin Britt – Community Co-Chair**

# Technical Assistance for Public Participation (TAPP)

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- **What is TAPP?**

- TAPP provides RABs with independent technical assistance that contributes to community members' ability to provide advice to decision makers by improving their understanding of cleanup activities at a site.
- Specifically, the TAPP program helps RAB members better understand the scientific and engineering issues underlying environmental cleanup activities.

# 1<sup>st</sup> Step - Define a Project

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- RAB members define a project to better understand the environmental restoration program.

Two most common types:

- Training / Education on a particular technical issue.
  - Interpretation of Technical Documents produced by the installation's restoration contractor.
- For more information contact Community Co-Chair
    - Kevin Britt: [kev3125@yahoo.com](mailto:kev3125@yahoo.com)



# TAPP Funding

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- How do we apply for TAPP funding?
  - The RAB must agree and certify by majority to apply for TAPP.
  - Once the RAB members formally submit an application, DoD reviews the TAPP project to ensure it meets eligibility requirements.
  - RAB members can use TAPP funding for support with activities such as reviewing human health risks, assessing technology, interpreting technical documents, and participating in relative risk evaluations.

# Questions and Comments

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Open to RAB Members

# Status Update on Completed, Ongoing, and Planned Activities

Ryan Mayer – NAVFAC Washington

# Completed Activities

## Completed Activities

- Site 10 PFAS sampling data received and validated
- Bldg. 76 Disposal Area Site Assessment sampling data received and validated
- Community Involvement Plan



# Ongoing Activities

## Ongoing Activities

- Sites 3, 4, and 5 Remedial Investigation Uniform Federal Policy-Sampling and Analysis Plan (UFP-SAP)
- Draft Bldg. 76 Site Assessment Report
- Site 10 PFAS Site Inspection (SI) Report





# Planned Activities

## Planned Activities

- MRS 001 Pre-Feasibility Study UFP-SAP
- Sites 3, 4, 5 Remedial Investigation fieldwork (planned for summer 2021)
- Site 9 Expanded Site Inspection SAP Addendum



# **Site 10 (Fire Testing Area) Site Inspection Update**

**Ryan Mayer – NAVFAC Washington**

**Andy Bogdanski - Jacobs**

# Presentation Overview

---

- What are PFAS and sources of PFAS
- CERCLA and Navy PFAS Policy
- Site 10 Site Inspection Results
- Future phases of investigation



# Per- and Polyfluoroalkyl Substances (PFAS)

- Chemicals of emerging concern
- Widely found in the environment
  - Aqueous film-forming foam (AFFF)
  - Nonstick cookware
  - Cleaning products
  - Cosmetics
  - Paints and varnishes
  - Water resistant clothing



# Sources of PFAS at Military Installations



Firefighter Training



Fire Suppression Systems



Incident Response

- At military installations, historic firefighter training and fire suppression using AFFF are primary sources of PFAS in the environment.

# What are PFAS?

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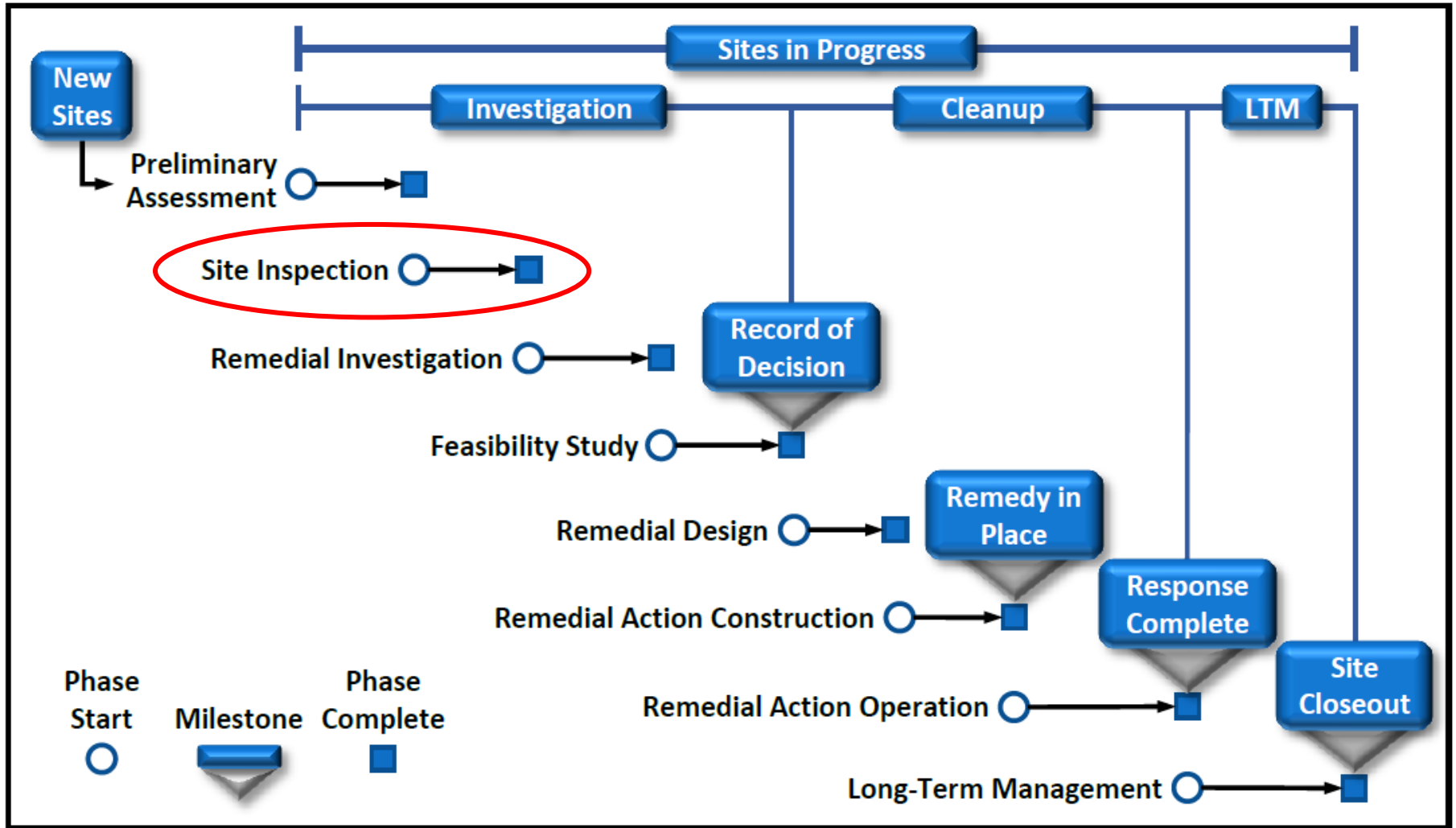
- Environmentally persistent and bioaccumulate
- Includes thousands of compounds
- Navy guidance to use the approved USEPA analytical Method 537.1 which can detect 18 compounds
- USEPA human health screening levels are available for 3 compounds
  - Perfluorooctane sulfonate (PFOS)
  - Perfluorooctanoic acid (PFOA)
  - Perfluorobutanesulfonic acid (PFBS)
- Research continues and will likely result in an increase of:
  - PFAS with analytical methods
  - Analytical methods for environmental media
  - PFAS with screening levels

# CERCLA and Navy PFAS Policy

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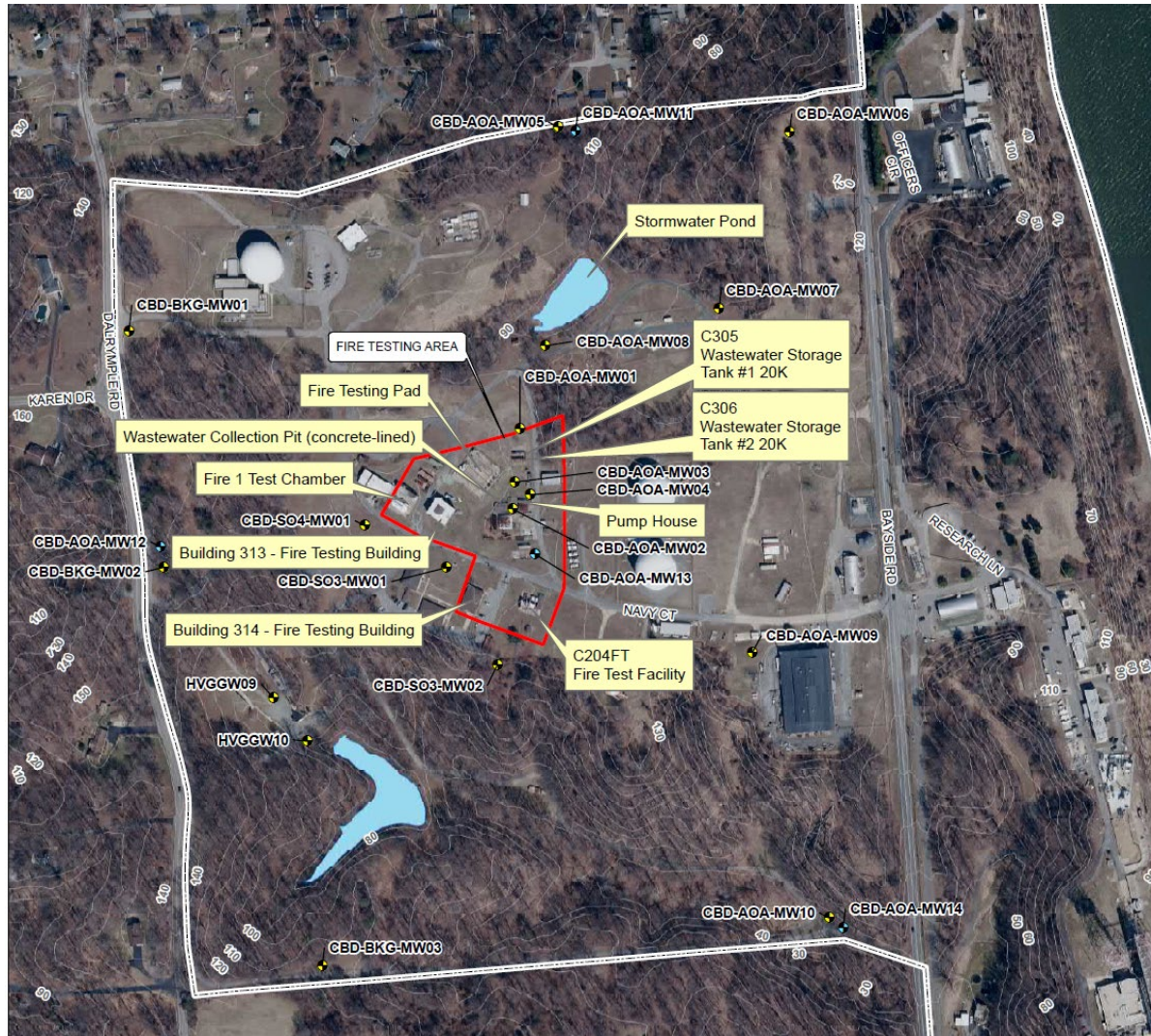
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
  - Legislation that guides the process used by the Environmental Restoration Program (ERP)
  - October 2014 DASN(E) Memo
    - “...identify all known and suspected sites where PFOS and/or PFOA may have been released on active and BRAC installations.”
    - Brought potential PFAS sites into the ERP

# Overview of the CERCLA Process





# Site 10 – Location and Layout



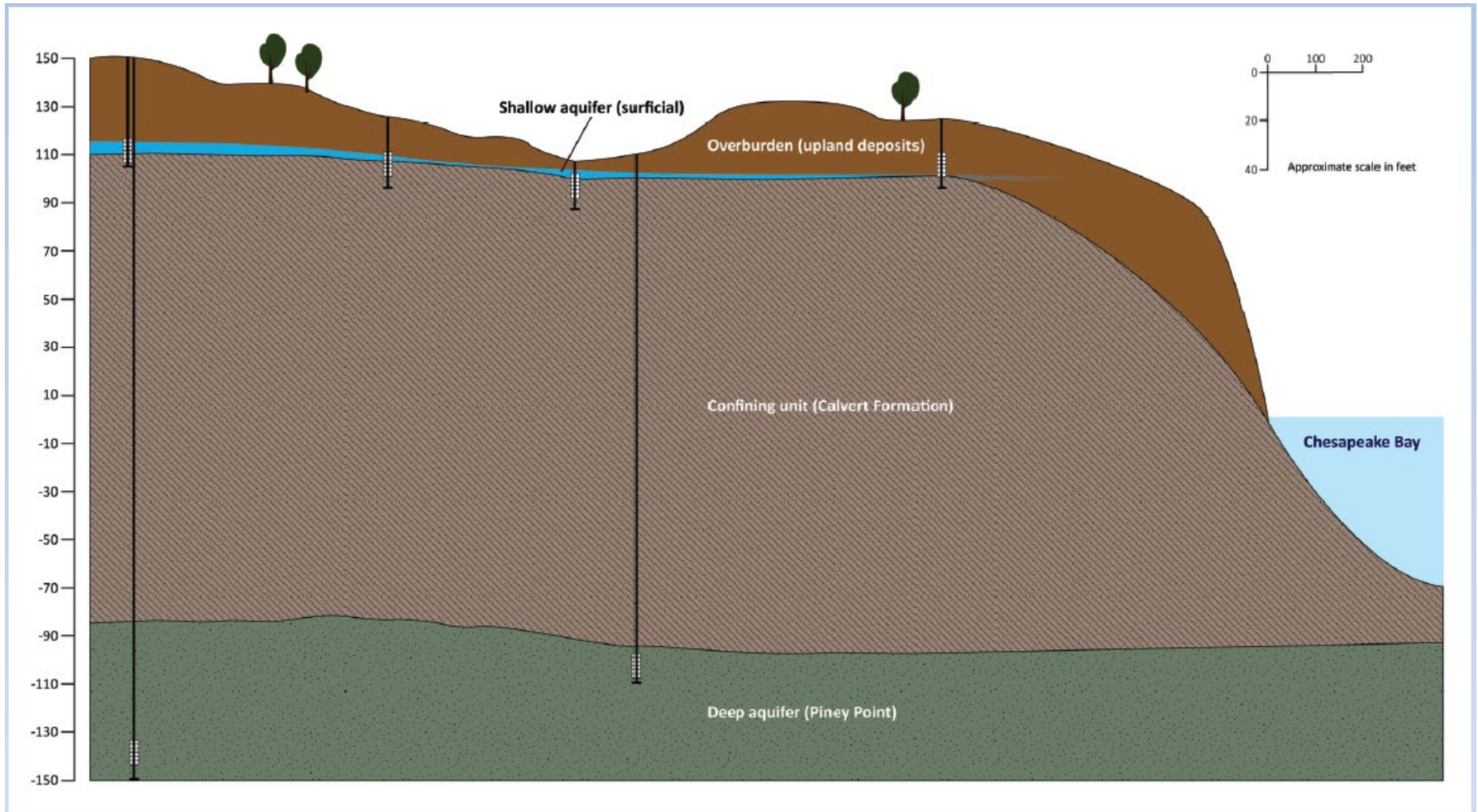
# Site 10 – Site Inspection

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- Answers the question “Are PFAS present in environmental media associated with Site 10?”
- Focuses on media most likely affected by migration pathways
- Collected samples on base from:
  - Soil (surface and subsurface) samples
  - Groundwater samples (surficial aquifer and Piney Point aquifer)
  - Surface water, and
  - Sediment samples



# Conceptual Site Model



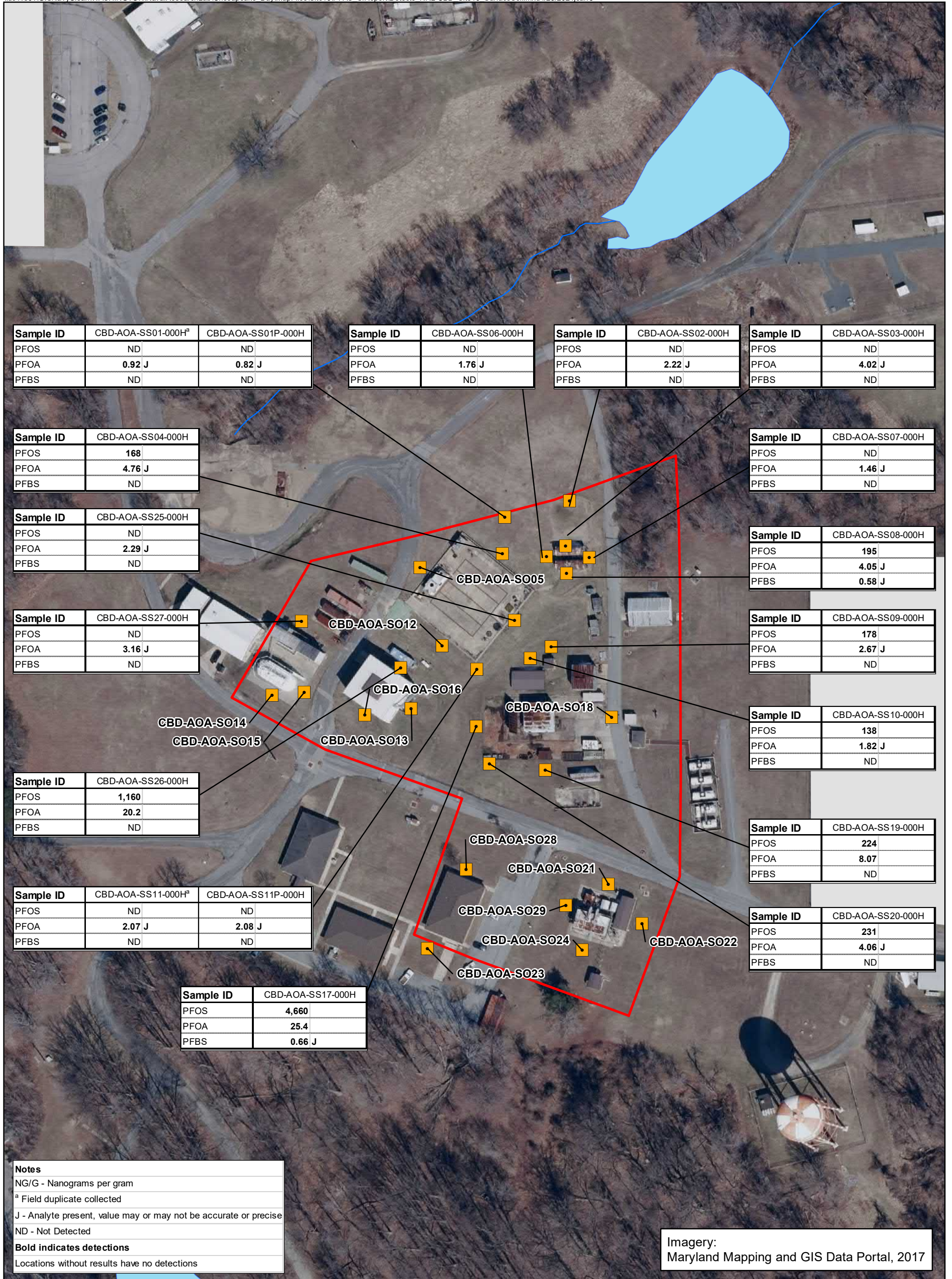


# Site 10 Site Inspection Results

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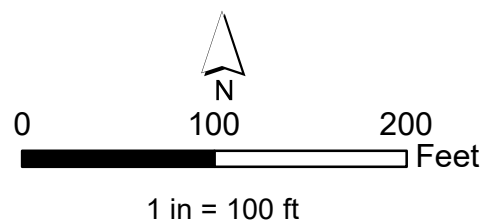
- Fieldwork completed in October 2020
- Final validated data received January 2021
- Detections of PFOS, PFOA, and/or PFBS in surface and subsurface soil, groundwater, surface water, and sediment
- All media except sediment had concentrations above applicable screening levels





- Legend**
- Surface/Subsurface Soil Location
  - Fire Testing Area Boundary
  - Surface Water

**Surface Soil Sample Locations**  
 Site 10 PFAS SI  
 NRL-CBD  
 Chesapeake Beach, Maryland



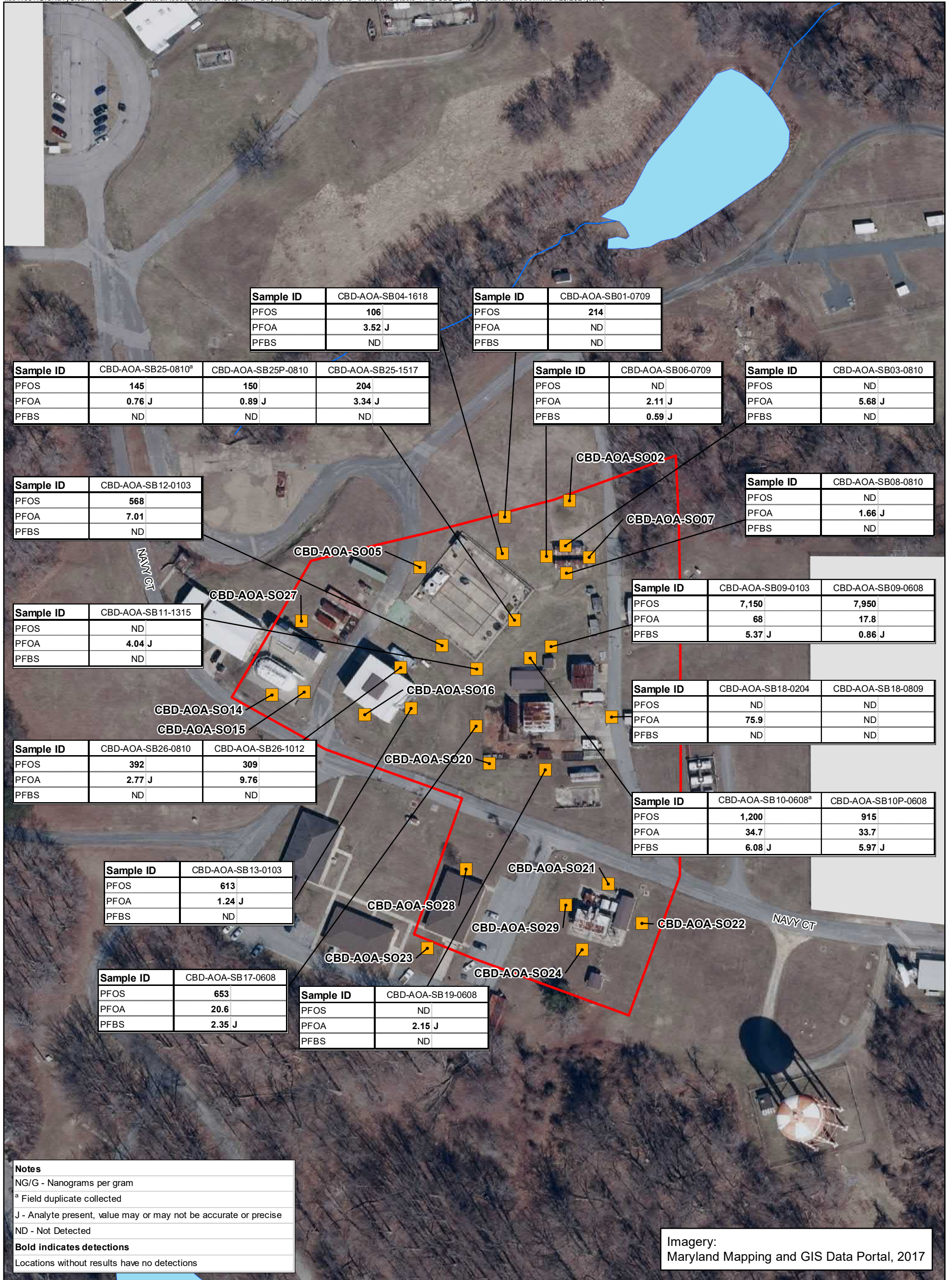


# Surface Soil Results

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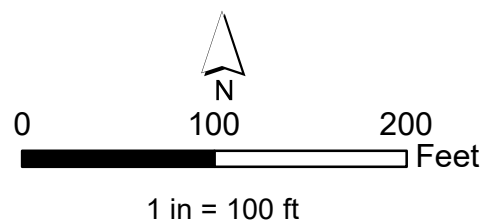
- Surface soil was collected from 0-6 inches in areas around fire testing structures that could represent an area of release.
- Generally, PFAS concentrations were low-level detections however, higher concentrations were found in the area of the old burn pad which is the primary source area based on the historical use of the site.





- Legend**
- Surface/Subsurface Soil Location
  - ▬ Fire Testing Area Boundary
  - ▬ Surface Water

**Subsurface Soil Boring Locations**  
 Site 10 PFAS SI  
 NRL-CBD  
 Chesapeake Beach, Maryland





# Subsurface Soil Results

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- Subsurface soil was generally collected between 6 and 16 ft below ground surface in areas around fire testing structures that could represent an area of release.
- Generally, PFAS concentrations were higher in subsurface soil than surface soil suggesting downward migration through soil
- Highest concentrations were found in the area of the old burn pad which is the primary source area based on the historical use of the site.



CHESAPEAKE BAY

Sample ID	CBD-AOA-MW01-1020 <sup>a</sup>	CBD-AOA-MW01P-1020
PFOS	<b>23,700</b>	<b>21,600</b>
PFOA	<b>1,970</b>	<b>2,330</b>
PFBS	<b>167</b>	<b>171</b>

Sample ID	CBD-AOA-MW08-1020
PFOS	<b>13,300</b>
PFOA	<b>4,630</b>
PFBS	<b>501</b>

Sample ID	CBD-AOA-MW05-1020
PFOS	ND
PFOA	ND
PFBS	ND

Sample ID	CBD-AOA-MW06-1020
PFOS	<b>5.96</b>
PFOA	<b>55</b>
PFBS	<b>1.04 J</b>

Sample ID	CBD-AOA-MW17-1020
PFOS	<b>9.67</b>
PFOA	<b>2.56 J</b>
PFBS	<b>1.72 J</b>

Sample ID	CBD-AOA-MW18-1020
PFOS	<b>12,700</b>
PFOA	<b>1,030</b>
PFBS	<b>62</b>

Sample ID	CBD-AOA-MW07-1020
PFOS	ND
PFOA	ND
PFBS	<b>2.45 J</b>

Sample ID	CBD-BKG-MW01-1020
PFOS	<b>10.8</b>
PFOA	<b>1.4 J</b>
PFBS	ND

Sample ID	CBD-AOA-MW03-1020
PFOS	<b>112,000</b>
PFOA	<b>6,800</b>
PFBS	<b>574</b>

Sample ID	CBD-BKG-MW02-1020
PFOS	ND
PFOA	<b>0.98 J</b>
PFBS	ND

Sample ID	CBD-AOA-MW04-1020
PFOS	<b>10,800</b>
PFOA	<b>1,090</b>
PFBS	<b>88.8</b>

Sample ID	CBD-HVGGW09-1020
PFOS	<b>3.17 J</b>
PFOA	ND
PFBS	<b>2.7 J</b>

Sample ID	CBD-AOA-MW19-1020
PFOS	<b>21.1</b>
PFOA	<b>23.7</b>
PFBS	<b>1.81 J</b>

Sample ID	CBD-HVGGW10-1020
PFOS	<b>3.27 J</b>
PFOA	<b>1.47 J</b>
PFBS	<b>2.82 J</b>

Sample ID	CBD-AOA-MW02-1020
PFOS	<b>171,000</b>
PFOA	<b>3,870</b>
PFBS	<b>261</b>

Sample ID	CBD-S04-MW01-1020 <sup>a</sup>	CBD-S04-MW01P-1020
PFOS	<b>1,850</b>	<b>1,900</b>
PFOA	<b>12.1</b>	<b>12.9</b>
PFBS	<b>168</b>	<b>154</b>

Sample ID	CBD-S03-MW01-1020
PFOS	<b>1,090</b>
PFOA	<b>59.6</b>
PFBS	<b>7.5</b>

Sample ID	CBD-S03-MW02-1020
PFOS	<b>323</b>
PFOA	<b>94.2</b>
PFBS	<b>10.1</b>

Sample ID	CBD-AOA-MW09-1020
PFOS	<b>15.6</b>
PFOA	<b>9.05</b>
PFBS	<b>1.88 J</b>

Sample ID	CBD-BKG-MW03-1020
PFOS	<b>10.6</b>
PFOA	<b>2.89 J</b>
PFBS	<b>1.11 J</b>

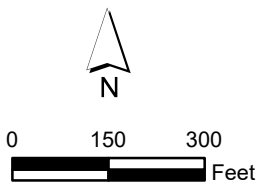
Sample ID	CBD-AOA-MW15-1020
PFOS	<b>34.5</b>
PFOA	<b>431</b>
PFBS	<b>30.2</b>

Sample ID	CBD-AOA-MW10-1020
PFOS	<b>325</b>
PFOA	<b>248</b>
PFBS	<b>33.3</b>

Sample ID	CBD-AOA-MW16-1020
PFOS	<b>92 J</b>
PFOA	<b>22</b>
PFBS	<b>9.89</b>

**Notes**  
<sup>a</sup> Field duplicate collected  
 NG/L - Nanograms per liter  
 J - Analyte present, value may or may not be accurate or precise  
 ND - Not Detected  
**Bold indicates detections**  
 Locations without results have no detections

- Legend**
- Shallow Monitoring Well Location
  - Deep Monitoring Well Location
  - Groundwater Flow Direction
  - Surface Water Centerline
  - ▭ Fire Testing Area Boundary
  - ▭ NRL-CBD Base Boundary
  - ▭ Surface Water



1 inch equals 300 feet  
 Basemap Data: Esri

**Shallow Monitoring Well Locations**  
 Site 10 PFAS SI  
 NRL-CBD  
 Chesapeake Beach, Maryland



# Shallow Groundwater Results

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- Shallow groundwater was collected from wells screened generally between 20-30 ft below ground surface
- Highest concentrations were found in the area of the old burn pad which is the primary source area based on the historical use of the site.
- PFAS detection pattern indicates that PFAS are migrating along groundwater flow direction to the northeast and southeast in shallow groundwater



CHESAPEAKE BAY

Sample ID	CBD-AOA-MW11-1020 <sup>a</sup>	CBD-AOA-MW11P-1020
PFOS	ND	ND
PFOA	<b>0.68 J</b>	<b>0.76 J</b>
PFBS	ND	ND

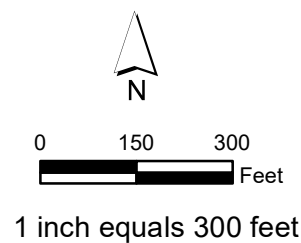
Sample ID	CBD-AOA-MW12-1020
PFOS	ND
PFOA	<b>0.68 J</b>
PFBS	ND

Sample ID	CBD-AOA-MW13-1020
PFOS	<b>17.9</b>
PFOA	<b>10</b>
PFBS	ND

Sample ID	CBD-AOA-MW14-1020
PFOS	ND
PFOA	<b>5.99</b>
PFBS	<b>0.75 J</b>

**Notes**  
<sup>a</sup> Field duplicate collected  
 NG/L - Nanograms per liter  
 J - Analyte present, value may or may not be accurate or precise  
 ND - Not Detected  
**Bold indicates detections**  
 Locations without results have no detections

- Legend**
- Shallow Monitoring Well Location
  - Deep Monitoring Well Location
  - ➔ Groundwater Flow Direction
  - Surface Water Centerline
  - ▭ Fire Testing Area Boundary
  - ▭ NRL-CBD Base Boundary
  - ▭ Surface Water



**Deep Monitoring Well Locations**  
 Site 10 PFAS SI  
 NRL-CBD  
 Chesapeake Beach, Maryland



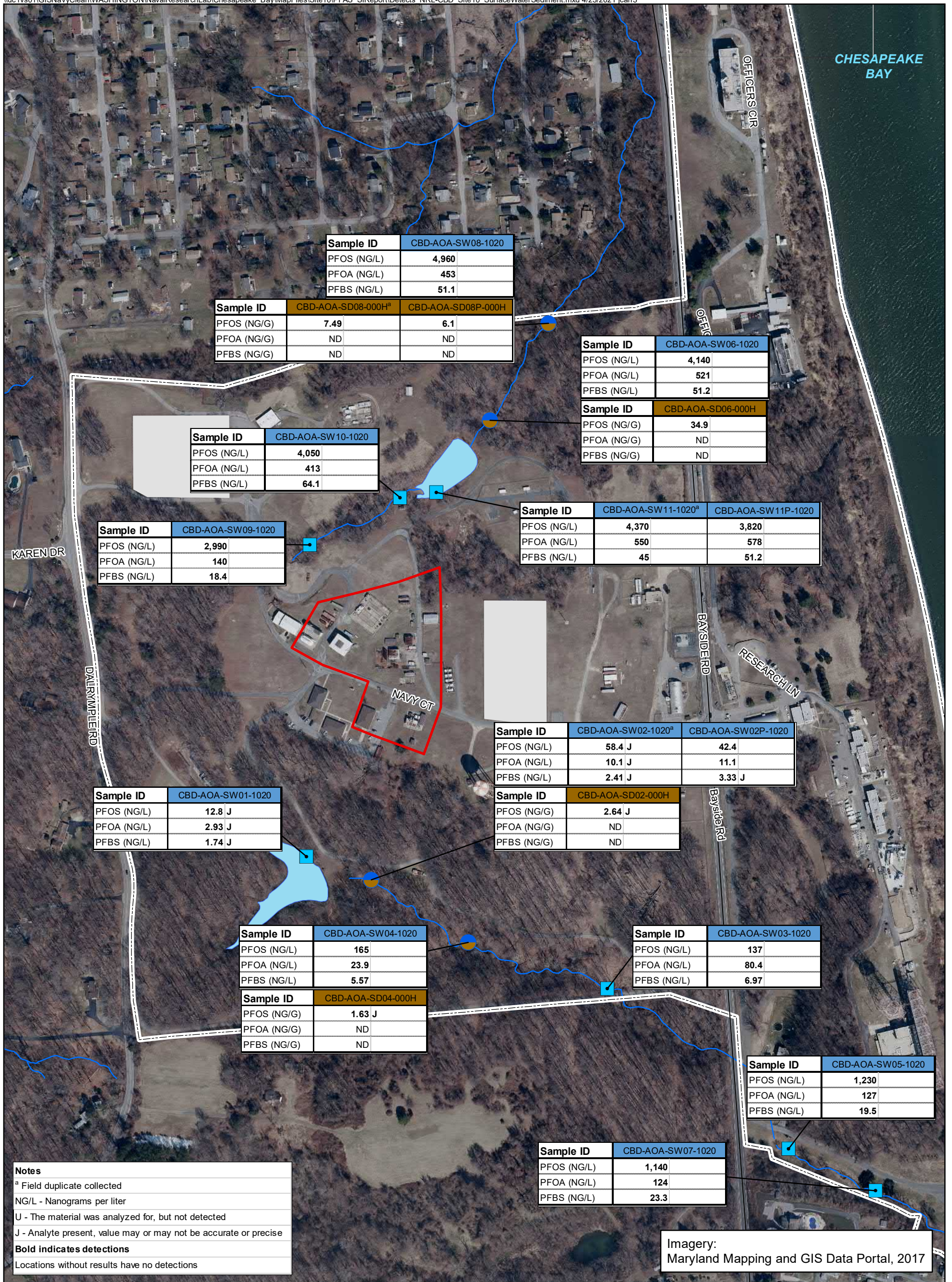


# Deep Groundwater Results

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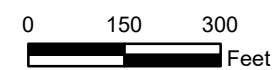
- Deep groundwater was collected from wells screened generally between 200-300 ft below ground surface
- PFAS concentrations were low level suggesting minimal migration through soil
- Highest concentrations were found in the area of the old burn pad which is the primary source area based on the historical use of the site.
- Detections in base perimeter wells were generally either non-detect or low-level estimated “J-flag” values





**Legend**

- Surface Water Location
- Co-located Surface Water/Sediment Location
- Fire Testing Area Boundary
- Surface Water
- Surface Water Centerline
- NRL-CBD Base Boundary



1 inch equals 300 feet



**Surface Water and Sediment Locations**  
Site 10 PFAS SI  
NRL-CBD  
Chesapeake Beach, Maryland

<b>Sample ID</b>	<b>CBD-AOA-SW08-1020</b>
PFOS (NG/L)	<b>4,960</b>
PFOA (NG/L)	<b>453</b>
PFBS (NG/L)	<b>51.1</b>

<b>Sample ID</b>	<b>CBD-AOA-SD08-000H<sup>a</sup></b>	<b>CBD-AOA-SD08P-000H</b>
PFOS (NG/G)	<b>7.49</b>	<b>6.1</b>
PFOA (NG/G)	ND	ND
PFBS (NG/G)	ND	ND

<b>Sample ID</b>	<b>CBD-AOA-SW06-1020</b>
PFOS (NG/L)	<b>4,140</b>
PFOA (NG/L)	<b>521</b>
PFBS (NG/L)	<b>51.2</b>

<b>Sample ID</b>	<b>CBD-AOA-SD06-000H</b>
PFOS (NG/G)	<b>34.9</b>
PFOA (NG/G)	ND
PFBS (NG/G)	ND

<b>Sample ID</b>	<b>CBD-AOA-SW10-1020</b>
PFOS (NG/L)	<b>4,050</b>
PFOA (NG/L)	<b>413</b>
PFBS (NG/L)	<b>64.1</b>

<b>Sample ID</b>	<b>CBD-AOA-SW11-1020<sup>a</sup></b>	<b>CBD-AOA-SW11P-1020</b>
PFOS (NG/L)	<b>4,370</b>	<b>3,820</b>
PFOA (NG/L)	<b>550</b>	<b>578</b>
PFBS (NG/L)	<b>45</b>	<b>51.2</b>

<b>Sample ID</b>	<b>CBD-AOA-SW09-1020</b>
PFOS (NG/L)	<b>2,990</b>
PFOA (NG/L)	<b>140</b>
PFBS (NG/L)	<b>18.4</b>

<b>Sample ID</b>	<b>CBD-AOA-SW02-1020<sup>a</sup></b>	<b>CBD-AOA-SW02P-1020</b>
PFOS (NG/L)	<b>58.4 J</b>	<b>42.4</b>
PFOA (NG/L)	<b>10.1 J</b>	<b>11.1</b>
PFBS (NG/L)	<b>2.41 J</b>	<b>3.33 J</b>

<b>Sample ID</b>	<b>CBD-AOA-SD02-000H</b>
PFOS (NG/G)	<b>2.64 J</b>
PFOA (NG/G)	ND
PFBS (NG/G)	ND

<b>Sample ID</b>	<b>CBD-AOA-SW01-1020</b>
PFOS (NG/L)	<b>12.8 J</b>
PFOA (NG/L)	<b>2.93 J</b>
PFBS (NG/L)	<b>1.74 J</b>

<b>Sample ID</b>	<b>CBD-AOA-SW04-1020</b>
PFOS (NG/L)	<b>165</b>
PFOA (NG/L)	<b>23.9</b>
PFBS (NG/L)	<b>5.57</b>

<b>Sample ID</b>	<b>CBD-AOA-SD04-000H</b>
PFOS (NG/G)	<b>1.63 J</b>
PFOA (NG/G)	ND
PFBS (NG/G)	ND

<b>Sample ID</b>	<b>CBD-AOA-SW03-1020</b>
PFOS (NG/L)	<b>137</b>
PFOA (NG/L)	<b>80.4</b>
PFBS (NG/L)	<b>6.97</b>

<b>Sample ID</b>	<b>CBD-AOA-SW05-1020</b>
PFOS (NG/L)	<b>1,230</b>
PFOA (NG/L)	<b>127</b>
PFBS (NG/L)	<b>19.5</b>

<b>Sample ID</b>	<b>CBD-AOA-SW07-1020</b>
PFOS (NG/L)	<b>1,140</b>
PFOA (NG/L)	<b>124</b>
PFBS (NG/L)	<b>23.3</b>



# Site 10 – Surface Water and Sediment Results

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- Surface water samples collected from streams located north and south of the site
- Groundwater flow direction indicates that groundwater discharges to surface water
- PFAS detections in surface water are likely attributable to groundwater to surface water discharge
- PFAS detections in sediment were all low-level below applicable screening levels

# Next Steps

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- **Prepare Site Inspection Report and coordinate with MDE for regulatory comments and approval**

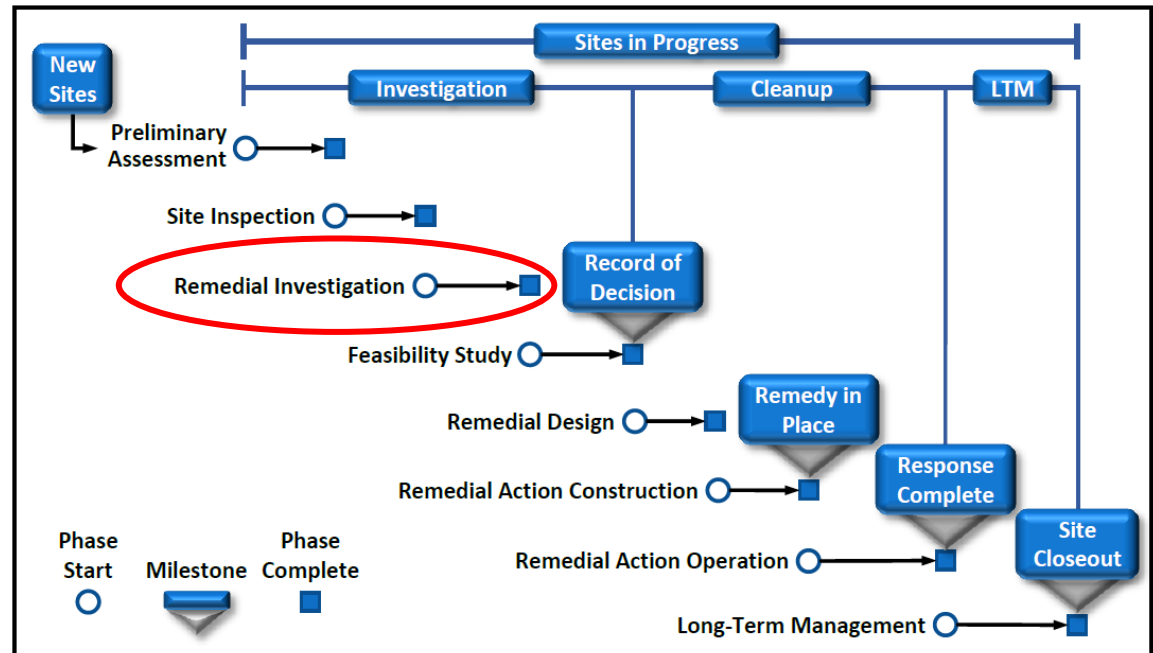
- **Contents**

- Introduction
- Discussion of Site (site description and history, environmental setting, sampling results and comparison to applicable screening levels)
- Summary and Conclusions
- Figures
- Tables
- Appendices

# Next Steps

- PFAS were detected in environmental media, and above applicable screening levels, which will move the site to the next step of the CERCLA process
- Remedial Investigation

- Nature and extent of PFAS impacts
- Fate and transport of PFAS in environmental media
- Human health and ecological risk assessments



# Questions and Comments

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**Submitted Questions,  
RAB Members, and the Public**

# Future Meeting Planning

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- As per charter, plan to meet 2 times per year
  - Navy proposes the next meeting for October 2021
  - Wednesday evenings, 5:00-7:00 p.m.
- RAB agenda topics
  - If there are topics you'd like us to discuss, please communicate them to the RAB Co-Chairs
    - Navy Co-Chair – Ryan Mayer: [ryan.mayer@navy.mil](mailto:ryan.mayer@navy.mil)
    - Community Co-Chair – Kevin Britt: [kev3125@yahoo.com](mailto:kev3125@yahoo.com)

# Websites for More Information

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- **About RABs, including the RAB Rule Handbook:**

<http://www.denix.osd.mil/rab/home/>

- **About the Navy's Environmental Restoration Program:**

<http://www.navfac.navy.mil/go/erb/>

- **About the Environmental Restoration Program at NRL-CBD:**

<https://go.usa.gov/xQFuV> (note: case-sensitive)

- **More about PFAS**

<https://mde.maryland.gov/PublicHealth/Pages/PFAS-Landing-Page.aspx>

- **RAB Co-chair Contact Information**

– Navy Co-Chair – Ryan Mayer: [ryan.mayer@navy.mil](mailto:ryan.mayer@navy.mil)

– Community Co-Chair – Kevin Britt: [kev3125@yahoo.com](mailto:kev3125@yahoo.com)