

St. Juliens Creek Annex Restoration Advisory Board Meeting Summary: November 13, 2019 Meeting

Meeting Attendees

Robert Bray	NAVFAC Mid-Atlantic	Kathryn Smith	CH2M
Jennifer Corack	NAVFAC Atlantic	Tracy Hughes	CH2M
Robert Stroud	EPA Region 3	Christian Conover	CH2M
Weel Lindsay	VDEQ	Pam Boatwright	Elizabeth River Project
James McGrath	NAVFAC Environmental	Robert Mann	RAB Community Member
Madison Witte	APTIM	Barbara Brumbaugh	RAB Community Member
Megghan Smith	APTIM	Dennis Long	RAB Community Member
Jason Scarborough	Norfolk Naval Shipyard		
Hayley Becker	Norfolk Naval Shipyard		

Location: Major Hillard Library, Chesapeake, Virginia

Meeting Date: November 13, 2019

From: Tracy Hughes/CH2M

Minutes Date: April 9, 2020

Restoration Advisory Board Welcome and Introductions

At 5:05 p.m., Mr. Bray presented opening remarks and introductions to the Restoration Advisory Board (RAB). Mr. Bray thanked everyone for coming and explained that he is the Naval Facilities Engineering Command (NAVFAC) Mid-Atlantic Remedial Project Manager for St. Juliens Creek Annex (SJCA). The other RAB members and guests introduced themselves. All presentation handouts were distributed.

St. Juliens Creek Annex Fiscal Year 2020 Environmental Restoration Program Goals and Schedule

Mr. Robert Bray led the topic and projected a presentation. The objectives of the presentation were to provide an overview of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process, provide an update on the SJCA Environmental Restoration Program (ERP) sites and fiscal year (FY) 2020 goals, highlight FY 2019 successes, and solicit questions and comments from the RAB.

Mr. Bray provided a brief overview of the CERCLA process. Mr. Bray explained that ERP goals are established on a yearly basis by fiscal years, which begin on October 1 and end on September 30 of the following year. The goals serve as a budgeting tool for allocating funding and prioritizing sites to be investigated and remediated based on potential risk to human health and the environment. In addition, the goals help keep projects in the remediation process on schedule and drive the program.

Figures were presented that depicted the 56 no further action ERP sites and the three currently active ERP sites (Sites 2, 4, and 21) at SJCA.

An update on Site 2 was provided. Site 2 (Disposal Area B) is an unlined waste disposal area that operated from 1921 to 1942. Investigations conducted at the site identified concerns from waste; chlorinated solvents, one polycyclic aromatic hydrocarbon (PAH), and one pesticide in the shallow aquifer groundwater; chlorinated solvents and metals in the surface water; and PAHs, pesticides, polychlorinated biphenyls, and metals in the sediment and soil.

Site 2 is currently in the remedial action-operation phase. The remedial action-operation activities currently consist of bi-annual groundwater monitoring, additional as-needed emulsified vegetable oil injections, land use controls (LUCs) maintenance, and compensatory mitigation wetland monitoring. The first Five-Year Review (FYR) was completed for the site in May 2015, and the second review will be completed in May 2020. The first FYR concluded that the remedy is protective in the short term, but identified the following three issues that needed to be addressed to ensure long-term protectiveness:

- The cleanup level of naphthalene in groundwater was not protective of potential future use. The cleanup level was revised in FY 2017.
- The emerging contaminants perchlorate and 1,4-dioxane were potentially present in groundwater but had not been evaluated. The issue was addressed in FY 2017, when the emerging contaminants investigation was completed.
- Groundwater data was not available during the FYR to determine if the remedy was properly functioning. The issue has since been addressed, as several rounds of groundwater data have been collected.

The FY 2020 goals for Site 2 are to:

- Conduct annual LUC inspections and reporting
- Finalize the Remedial Action-Operation Groundwater Monitoring Event 8 Report
- Finalize the Soil Cover Maintenance Report

An update on Site 4 was provided. Site 4 is a sanitary landfill that operated from 1970 to 1981. Soil and sediment contaminated with PAHs, polychlorinated biphenyls, and metals were identified at the site. The remedial action to address the contamination, consisting of a soil cover, excavation of drainage ditch sediment, and LUCs, was completed in 2005. Site 4 is currently in the response complete phase with ongoing LUCs maintenance and FYRs. The second FYR for Site 4 was completed in May 2015 and concluded that the remedy is protective. The third FYR will be completed in May 2020.

The FY 2020 goal for Site 4 is to:

- Conduct annual LUC inspections and reporting

An update on Site 21 was provided. Site 21 is the primary industrial area of the facility, where buildings were historically used for maintenance, electrical shops, and munitions loading, and outdoor areas were used for equipment and chemical storage. The environmental concern at Site 21 is chlorinated volatile organic compounds in the shallow aquifer groundwater. In situ chemical reduction, Enhanced Reductive Dechlorination (ERD), and LUCs was the selected remedy to address the contamination at the site. The site is currently in the remedial action-operation phase. The remedial action-operation activities consist of bi-annual groundwater, storm water, and vapor intrusion monitoring, EVO injections, and LUCs maintenance. Mr. Bray explained that vapor intrusion is when vapors in the subsurface migrate inside a building. Figures presented show the concentrations of constituents of concern in the groundwater over time is ultimately decreasing. The first FYR for Site 21 was completed in May 2015 and concluded that the remedy is protective in the short term and identified one issue that needed to be addressed to ensure long-term protectiveness: emerging contaminants perchlorate and 1,4-dioxane were potentially present in groundwater but had not been evaluated. The issue was addressed in FY 2017, when the emerging contaminants investigation was completed. The second FYR will be completed in May 2020.

The FY 2020 goals for Site 21 are to:

- Conduct annual LUC inspections and reporting
- Finalize the Remedial Action-Operation Groundwater and Storm Water Monitoring Event 16 Report
- Finalize the Remedial Action-Operation Vapor Intrusion Monitoring Event 14 Report

The facility-wide goals for SJCA for FY 2020 are to:

- Complete the FY 2021 through 2025 Site Management Plan update

- Prepare a Per-and Polyfluoroalkyl Substances (PFAS) Preliminary Assessment Report
- Update the Community Involvement Plan
- Finalize the Five-Year Review
- Prepare a PFAS Site Investigation Sampling and Analysis Plan

Mr. Lindsey asked what the purpose of the FYR is. Mr. Bray replied that it is part of the CERCLA process, and the objective is to evaluate the performance of implemented remedies to assess whether the remedies remain protective of human health and the environment. Ms. Corack added that FYRs are used to evaluate if anything has changed at the site or from a regulatory standpoint and ensure that the remedies selected at the site are still protective of human health and the environment.

Mr. Bray reviewed the FY 2019 SJCA ERP successes. The Site 2 Injections Work Plan was finalized, and the Round 3 injections were completed. The Site 2 compensatory mitigation wetland monitoring was conducted, and the monitoring indicated the wetland was healthy and functioning as intended. Annual LUC inspections and maintenance were completed at Sites 2, 4, and 21; the soil cover repairs were completed at Site 2; and the LUC signs were repaired and updated at Sites 2, 4, and 21. Two RAB meetings were held, and interviews were conducted with community members in association with the Community Involvement Plan.

Mr. Bray asked if there were any additional questions or comments. No additional questions or comments were received.

Per-and Polyfluoroalkyl Substances Overview

Ms. Jennifer Corack introduced herself as a human health risk assessor at NAVFAC Atlantic and led the presentation. Ms. Corack presented the topics to be discussed. Ms. Corack explained that PFAS knowledge is still emerging, and we are discovering more about them every day. Preliminary Assessments (PAs) were conducted in the past for other contaminants at Navy bases, but those PAs did not include PFAS. The bases are now conducting basewide PAs for PFAS.

Ms. Corack discussed that PFAS are man-made compounds that have been used in products since the 1950s. They do not know how many PFAS there are, but they have identified over 1,000 different chemicals so far that fall into the PFAS category. PFAS can be found in stain-resistant carpets, nonstick cookware, water-repelling fabrics, food packaging, firefighting foam, and plating shop mist suppression systems. The useful properties of PFAS results in their persistence in the environment. They are heat-resistant/flame-retardant, oil-resistant, and water-resistant. PFAS are found in the blood of people, wildlife, and fish worldwide.

Ms. Corack described the chemistry and properties of PFAS. PFAS are composed of carbon chains of different lengths. Per-FAS means all carbons are bonded with fluorine, and poly-FAS means some carbons are bonded with fluorine. The hydrophobic and hydrophilic properties of PFAS make it useful as a firefighting compound. The carbon fluorine bond is extremely strong and hard to break, which is why they are very persistent in the environment and last a long time. PFAS are water soluble and partition to interfaces (air-water, soil-water, product-water).

Ms. Corack explained the timeline of when PFAS began showing up in products beginning with the invention of PFAS in the 1930s. At Navy facilities, the most common source of PFAS to the environment is the use of aqueous film forming foam (AFFF) in past firefighting training activities and emergency response. The Navy's use of AFFF started in the late 1960s and early 1970s following issuance of the military specification (MILSPEC) for a fluorocarbon-based AFFF in 1969. MILSPEC are performance-based, and there are different formulations. The MILSPEC is not a recipe, but it must meet certain criteria.

Ms. Corack explained how the PFAS timeline began in 2006 when the United States Environmental Protection Agency (USEPA) worked with a PFOA Stewardship Program, which called for the reduction by 95 percent of PFOA and PFOS in material by 2020. Ms. Corack noted that PFAS are not regulated yet. However, in 2009, the USEPA issued provisional health advisories for PFOA (400 parts per trillion [ppt]) and PFOS (200 ppt) in drinking water. The provisional health advisories were not enforceable and were based on short-term exposure. In May 2012 the Third Unregulated Contaminant Monitoring Rule (UCMR3) issued testing for 30 unregulated substances between

2013 and 2015 which included six PFAS, including PFOA and PFOS. Water systems were required to sample for these compounds. In December 2016, UCMR4 was released and did not include PFAS; however, in 2016, the USEPA issued the lifetime health advisory for PFOA and PFOS in drinking water. The lifetime health advisory is 70 ppt in drinking water. When both PFOA and PFOS are present, the total amount should be compared to 70 ppt. The lifetime health advisory is not enforceable. It provides a margin of protection for Americans, including the most sensitive populations. In February 2019, the USEPA created the PFAS Action Plan, which outlines the USEPA's plan to address PFAS in the environment and to protect public health.

A meeting attendee asked what the human health and ecological risks are associated with PFAS. Ms. Corack responded that PFAS is an emerging contaminant and very new; there are many ongoing studies. The critical endpoint of the drinking water study focused on developmental impacts. One of the studies indicated a decreased birthweight, and another study indicated delayed ossification in the phalanges (bones in fingertip did not harden). Mr. Bray noted that there were fact sheets available and handed out the USEPA and ASTDR PFAS fact sheets to meeting attendees. Several states have standards/values for PFAS that include different media (groundwater, drinking water), different PFAS, and some are promulgated (law) and some are guidance. There is not a current "standard" for PFAS in Virginia. Mr. Lindsey stated that Virginia Department of Environmental Quality (VDEQ) is following the USEPA's lead regarding the development of standards for PFAS.

Ms. Corack shared the Navy's PFAS timeline starting with October 2014 when the Navy policy required on-base drinking water sampling at bases where groundwater was used for drinking water, and PFAS could have been released nearby in the past. All bases using groundwater for drinking were required to sample their finished drinking water by December 2015. In June 2016, The Navy issued three policies:

- June 14, 2016 – Required all Navy bases not previously tested under UCMR3 or as part of the 2014 policy to test their finished drinking water, regardless of water source or potential for PFAS release
- June 17, 2016 – Provided AFFF control, removal, and disposal requirements
- June 20, 2016 – Provided the process to efficiently identify, validate, and prioritize the inventory of sites and areas of concern with known or potential PFAS releases.

Ms. Corack reviewed the summary of actions the Navy has taken to address PFAS. Many bases identified drinking water sources that may be impacted by PFOA and PFOS from Navy releases and eliminated the exposure to PFOA and PFOS in drinking water at concentrations greater than the lifetime health advisory by providing bottled water. The Navy has prevented AFFF from being released to the environment during firefighting training, supported research for new AFFF formulations that do not contain PFOA and PFOS (in the short term) and do not contain fluorine (in the long term), and identified and investigated locations with the potential for releases of PFAS during Navy operations.

Ms. Corack provided a list of Potential Source Areas, which include AFFF releases (firefighting training areas; crash sites; crash truck testing, cleaning, or refilling areas; hangars, buildings, or bulk fuel storage with fire suppression systems; and areas used for fire truck and fueler maintenance), and other sources, including plating shops with certain mist suppression systems, wastewater spray fields, and wastewater sludge disposal areas.

The PA for PFAS at SJCA is currently being conducted and is the first investigation step in CERCLA. The PA will evaluate and document Potential Source Areas that will move forward to the Site Inspection (SI) phase. Following the PA, an SI will be conducted to confirm environmental releases or propose no further investigation. As part of the CERCLA process, public input is welcome and is formally solicited during the process.

Ms. Corack posted the following resources that provide information for PFAS.

- Secretary of the Navy
 - <https://www.secnav.navy.mil/eie/Pages/pfc-pfas.aspx>
- Virginia Department of Environmental Quality (VDEQ)
 - <https://www.deq.virginia.gov/ConnectWithDEQ/EnvironmentalInformation/PFAS.aspx>
- Agency for Toxic Substances and Disease Registry (Division of the Centers for Disease Control)

- <https://www.atsdr.cdc.gov/pfas/index.html>
- United States Environmental Protection Agency (USEPA)
 - <https://www.epa.gov/pfas>
- Interstate Technology Regulatory Council (ITRC)
 - <https://pfas-1.itrcweb.org/fact-sheets/>

A meeting attendee asked if the threat to human health is from ingestion, physical contact, or both. Ms. Corack replied that so far, they have only quantified ingestion and there are toxicity values for ingestion; there are not currently any toxicity values for dermal contact. Ms. Corack noted that the answer to that question and the values being used may change as more information is available.

Site 2 and 21 Injections Update

Ms. Megghan Smith led the topic and projected a presentation. The background for Site 2 and 21 was provided. Site 2 was historically used to openly burn refuse and is currently maintained as a closed landfill with a vegetated soil cover. Site 21 was historically utilized as an industrial area with maintenance and electrical shops, munitions loading facilities, and a filling station with former petroleum USTs. Site 21 is currently used for storage and maintenance activities.

Ms. Smith detailed the chemicals of concern at Site 2 and 21, which include the chlorinated volatile organic compound (CVOCs) trichloroethene (TCE), dichloroethane (DCE), and vinyl chloride. Ms. Smith summarized the remedial actions that have been completed to date at Site 2. A cover system was installed in 2014 with follow up improvements in grading and drainage to minimize transport of constituents of concern (COCs) to other site media. The shallow groundwater was treated through injections from 2014 through 2019. The remedial action at Site 21 was to perform treatment through injections into the shallow groundwater from 2010 through the present.

Ms. Smith discussed the ERD injections, including biostimulation injections that provide the food and energy for the dehalococoides (DHC) and bioaugmentation injections of DHC. DHC strips chlorine atoms from chlorinated solvents and replaces them with a hydrogen atom, speeding up the natural breakdown of the chemical. Ms. Smith projected an image that showed the injection process, including injection of the material into the injection wells, location of monitoring wells downgradient of the injection wells, and the flow of groundwater.

Ms. Smith summarized the injections at Site 2. The Round 1 injections were started in Spring 2014 and included ERD injections into 44 wells. Round 2 injections were conducted in Spring 2017 and included the installation and injection into nine additional injection wells. During the Round 3 injections nine additional wells were installed, and EVO was injected into 39 wells in January 2019 and into 41 wells in July/August 2019. Free product at the site was not observed during the Round 3 injections. A drum mixer was used to mix the sodium bicarbonate, and the EVO was diluted with water and mixed in a separate container.

A meeting attendee asked what “free product was not observed” meant. Ms. Witte responded that it means that that the contaminant product, referred to as free product, was not observed in the well cuttings during installation.

Ms. Smith summarized the injections at Site 21. Round 1 injections were conducted from 2010 to 2012 and consisted of injection EVO and zero valent iron. Mr. Bray noted that zerovalent iron is molecule of iron that is injected and can bind to chloride molecules. The Round 2 and Round 3 ERD injections were performed in 2014 and 2019-2020, respectively. Due to decreased COC concentrations, additional zerovalent iron injections were not required. Semi-annual groundwater sampling from December 2011 to the present indicate that TCE and DCE have decreased in size and concentration. Ms. Smith showed the plume maps, which show the TCE and Cis-1,2-DCE plumes have been greatly reduced. The vinyl chloride plume has not been reduced as much, but that is to be expected since it is the breakdown product of the CVOCs.

The Round 3 injections at Site 21 were initiated October 28, 2019, and focused on the vinyl chloride plume, and are currently ongoing. The plan is to inject EVO at 41 temporary injection wells and two permanent injection wells

at depths of 13 to 17 ft below ground surface (bgs), 9 to 13 ft bgs, and 5 to 9 ft bgs. The injection areas were cleared for utilities by Miss Utility and ground-penetrating radar. Groundwater parameters were collected before injections to determine the pH and evaluate the groundwater conditions. The geoprobe sampler rods and screens that are used for the injections are initially installed at the 13- to 17 feet-interval and then reset to the next interval as needed.

Ms. Smith asked if there were any additional questions or comments. No additional questions or comments were received.

Roundtable/Question and Answer

Mr. Bray asked if there were any additional question or comments, or if there were any potential future agenda topics the RAB was interested in hearing about. No additional questions or comments were received.

Next Meeting

Mr. Bray indicated the next RAB meeting is scheduled for May 2020.

Meeting Adjourned