RESTORATION ADVISORY BOARD MEETING NAVAL WEAPONS INDUSTRIAL RESERVE PLANT (NWIRP), CALVERTON MANORVILLE FIRE DEPARTMENT, MANORVILLE NEW YORK WEDNESDAY, JANUARY 29, 2020

The fifty-first (51st) meeting of the Restoration Advisory Board (RAB) was held at the Manorville Fire Department. Meeting attendees included representatives from the New York State Department of Environmental Conservation (NYSDEC) (Karen Gomez and Henry Wilkie), Suffolk County Department of Health Services (SCDHS) (Andrew Rapiejko and Jonathan Wanlass), Town of Riverhead (Yvette Aguiar, Drew Dillingham, Chris Kempner, Frank Mancini, Denise Civiletti, and Dawn Thomas), Suffolk County Legislature (Al Krupski), Suffolk County Wading River Civic Representative (Steve Shapiro), Suffolk County Department of Environment and Energy (Amy Juchatz), Suffolk County Water Authority (Paul Kuzman), RAB Community Members (Adrienne Esposito, Lou Cork and Vincent Racaniello), Resolution Consultants (Robert Forstner), Tetra Tech (Dave Brayack, Kristi Francisco, Melissa Cushing, Vin Varricchio), and a Congressional Representative (Mark Woolley). The list of attendees is included as Attachment 1.

WELCOME AND AGENDA REVIEW

The Navy representative, Ms. Lora Fly, welcomed everyone to the RAB meeting and introduced the meeting agenda. The agenda for the meeting is included as Attachment 2. RAB Co-Chair Vincent Racaniello introduced the RAB members. Mr. Racaniello and Ms. Adrienne Esposito discussed the upcoming meeting on the Per- and Polyfluoroalkyl Substance (PFAS) state regulation that will be held on Tuesday February 4, 2020 in Albany, New York.

Ms. Fly introduced the technical portion of the meeting, which consisted of presentations on the status of remedial action at the Site 7 – Former Fuel Depot, a summary of the Five Year Review, summary of the Site 6A - Southern Area fence line treatment evaluation and 2019 field activities update, a summary of the volatile organic compound (VOC) groundwater investigations at Site 2 – Former Fire Training Area and a summary of the Site 2 - Former Fire Training Area and facility wide PFAS Site Inspection (SI). The Navy presentations are included in Attachment 3.

DISTRIBUTION AND APPROVAL OF MINUTES

RAB members Adrienne Esposito, Lou Cork, and Vincent Racaniello were present. The April 2018 and April 2019 minutes were approved.

TECHNICAL PROGRESS – SITE 7 FORMER FUEL DEPOT UPDATE

Mr. Forstner (Resolution Consultants) provided an update on the status of Site 7 -Former Fuel Depot. The presentation is included in Attachment 3. A summary of remedial history, system performance, post shutdown activities, design, and path forward were provided.

The Site 7 air sparge soil vapor extraction system (AS\SVE) system operated from 2005 to 2013 and was demolished in 2015. Post shutdown sampling results showed a rebound in VOCs. In addition, non-aqueous phase liquid (NAPL) was observed at the site in October 2016. The NAPL was removed with a bailer and was no longer observed after March 2017. This NAPL was associated with underground storage tanks, which were anchored to a concrete slab approximately 17 feet below ground surface (bgs).

A design was completed and the excavation of the concrete slab and soil above and beneath the slab was removed in the fall of 2019. A total of 1,090 cubic yards of impacted soil and 206.11 tons of impacted concrete was removed and disposed at an off-property facility. Based on end-point samples collected at the floor of the excavation, soil within the area meets NYSDEC Unrestricted Use Soil Cleanup Objectives (SCOs).

Potential future implementation of targeted Air Sparge system is possible if dissolved VOC concentrations persist. Monitored natural attenuation (MNA) would continue to address the remaining dissolved-phase VOCs outside of the excavation area. If multiple rounds of Long-Term Monitoring (LTM) sampling indicate groundwater meets cleanup goals, Site 7 would move toward closure.

Ms. Esposito wanted to confirm that a benzene, toluene, ethyl benzene, and xylene (BTEX) level of over 100 micrograms per Liter (μ g/L) was recorded prior to excavation and that a BTEX level of under 5 μ g/L was recorded after excavation. Mr. Forstner replied that BTEX was detected over 100 μ g/L before the excavation and long-term groundwater monitoring would continue at Site 7.

Mr. Rapiejko inquired about the excavation depth and the depth of the contaminated soil. Mr. Rapiejko additionally inquired if the contaminated soil reached a depth of 29-30 feet bgs, and if the monitoring well screens were deep enough. Mr. Forstner replied that the contamination was not that deep and that the monitoring well screens were reinstalled to the depth of where contaminated soil had been observed.

A community member inquired if the monitoring wells were deep enough, if there was any residual contamination, and if the pollutants would float on top of the groundwater. Mr. Forstner replied that the Navy collected and analyzed groundwater samples from below the bottom of the excavation and the results were below cleanup levels.

The community member further inquired if all contaminates on the property were removed. Mr. Forstner replied that the soil was stockpiled and transported and disposed at an off-property facility approximately two weeks ago. The community member also inquired about the analytical testing laboratory. Mr. Forstner replied that Resolution collected samples and sent them to Katahdin Analytical Services for analysis.

A community member inquired about the history of the monitoring wells and if further investigation is required at Site 7. Mr. Forstner replied that there is analytical data and water level data for some of the Site 7 monitoring wells as far back as 1988. He further replied that no further investigation is required at deeper depths because the fuels would float on top of the groundwater.

FIVE YEAR REVIEW SITE 6A – SOUTHERN AREA FENCE LINE TREATMENT SYSTEM EVALUATION AND 2019 FIELD ACTIVITIES UPDATE

Mr. Forstner (Resolution Consultants) provided an update on the activities that took place during the Five-Year Review. A Five-Year Review (FYR) is required by statute for sites with remedies implemented under Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). The FYR evaluates if the remedies are functioning as designed, if there are previously unknown issues that require attention, and if there's been a change in status regarding any known conditions. The evaluation included a review of any new site data, interviews with relevant site personnel, and community involvement (implemented via RABs in the case of NWIRP Calverton). The FYR covered sites identified in the operable unit (OU) 2 Record of Decision (ROD) dated January 2003 (Site 7 – Former Fuel Depot and Site 10A – Fuel Systems Lab) and sites identified in the OU3 ROD dated May 2012 (Site 6A – Fuel Calibration Area and Site 10B – Engine Test House Remedial Action).

The known changes to be addressed are: 1) the demolition of the AS/SVE system and subsequent LTM results and a recently completed excavation project for OU2 (Sites 7/10A) and 2) emerging contaminants at OU3 (Site 6A).

SITE 6A – SOUTHERN AREA FENCE LINE TREATMENT SYSTEM EVALUATION AND 2019 FIELD ACTIVITIES UPDATE

Ms. Francisco (Tetra Tech) provided an update on the operation of the Fence Line Treatment System (FLTS), a summary of the FLTS Evaluation, and a summary of the 2019 field activities. The presentation is included in Attachment 3. The FLTS was constructed pursuant to the OU3 ROD that was signed in May 2012. The selected remedy is comprised of land use controls (LUCs) and a system to extract, treat, and infiltrate groundwater within the Site 6A – Southern Area plume. The FLTS system used extraction wells, air stripping equipment, and infiltration galleries, in order to control the VOC plume. Construction started in October 2012 and was completed in October 2013, and system start-up occurred on October 8, 2013.

The 2011 plume was estimated to contain 375 pounds of VOCs. By 2018/2019 the plume had been reduced by 331 pounds through source area removal, the biostudy, the treatment system, and attenuation. Goals have been achieved at the Former Fuel Calibration Area and the FLTS Area. Criteria has been met to permanently shut down the FLTS. The cleanup goals have been met to remove 26 of the 35 on-property monitoring wells from the monitoring program.

Based on 2019 field activities and sampling results the proposed optimization of the LTM program for Site 6A – Southern Area includes the addition of ten monitoring wells, removal of nine monitoring wells, and reduction of the frequency of monitoring at 17 monitoring wells to every two to four years.

A community member inquired about the length of time that they run the extraction wells to monitor for rebound. Ms. Francisco replied that the extraction wells are pumped for one hour and samples are then collected to ensure the cleanup goals are being met.

A community member inquired about how fast the plume was moving and if the plume was moving towards residents that live south of Swan Pond. Ms. Francisco replied that groundwater flows to the southeast and it takes approximately two to three years for the VOCs to migrate from the Fuel Calibration Area to the fence-line area. It takes 10 to 20 years for the plume to migrate from the fence line to the Peconic River area. The plume is not migrating towards the drinking water wells south of Swan Pond.

A community member inquired about what the Navy is doing to cleanup south of the property. Ms. Francisco replied that the Navy is currently monitoring groundwater south of the property but has a contingency plan for air sparging depending on the mass of VOCs moving through the area. She further commented that the Peconic River Area is a sensitive ecological area and the contingency plan would disturb this area.

A community member inquired about the air stripping and how the Navy is measuring the pounds of VOCs. Mr. Brayack replied the pounds of VOCs are calculated using analytical data from the influent groundwater to the FLTS and from groundwater samples collected from monitoring wells. He further commented that the Navy plans to remove some of the monitoring wells from the LTM program based on the sampling results.

A community member inquired about why drinking water samples are not being collected from properties located along Wading River Road and River Road. Ms. Francisco replied that that information will be covered in the next presentation.

A community member explained that their water is contaminated and that they have mercury and arsenic poisoning. Ms. Fly instructed the community member to defer to the health department for medical or biological questions. Ms. Fly added that the Navy is investigating the areas that are known to have some type of activity that would have resulted in a release. She further commented that if there is a source inside of the fence-line that is impacting off property areas, the Navy will take responsibility, but releases must be attributed to the Navy.

A community member inquired if there is testing conducted in the woods where people may have dumped chemicals. Ms. Fly replied that when the facility was closed, a facility-wide inspection was conducted, and as part of the inspection, the Navy conducted interviews to inquire about potential contamination. A list of potential sites was generated as part of the inspection and these areas were investigated for contamination. Ms. Fly added that investigations did not yield any evidence of contaminated groundwater flowing in different directions. Ms. Fly also noted that the Navy does not investigate areas unless there are eye-witnesses or factual information about a potential release.

Ms. Esposito commented that there have been many cases where contaminants have been dumped. Ms. Fly replied that unless there is evidence that contaminants were dumped, they cannot conduct sampling in that location.

A community member inquired if the Navy has consulted with NYSDEC about the aquifers and the direction of groundwater flow, and further inquired if the groundwater flow direction that the Navy is presenting is correct. Ms. Fly replied that they work with NYSDEC and that the Navy collects data from monitoring wells to evaluate the direction of groundwater flow.

A community member inquired how the Navy decides to test for VOCs and if the decisions are only made by the Navy. Ms. Fly replied that the Navy has a permit and gets concurrence from the State.

A community member inquired why the Navy is not doing anything for the plume north of fence-line at Site 6A – Southern Area. Ms. Fly replied that the Navy is in the process of evaluating the next step for the on-property portion of the plume.

2019 VOLATILE ORGANIC COMPOUND GROUNDWATER INVESTIGATION, SITE 2 – FORMER FIRE TRAINING AREA

Ms. Francisco presented 2019 groundwater sampling results for VOCs at Site 2 – Former Fire Training Area. The presentation is included in Attachment 3. Site 2 – Former Fire Training Area was an active fire training area from the 1950's until 1996. As a result of fire training activities, soil and groundwater at the site were impacted by petroleum, chlorinated solvents, and other chemicals. Aqueous Film Forming Foams (AFFF) were used to extinguish fires. The remedy selection for VOCs in groundwater has been delayed while PFAS is investigated. During the fall of 2019, a supplemental groundwater investigation to monitor attenuation and migration of VOCs was performed. VOCs were detected in groundwater from the four monitoring wells. Two monitoring wells results exceeded the New York State Department of Health (NYSDOH) Maximum Contaminant Level (MCL).

A community member inquired why Site 2 has not been included with the Land Use Controls yet. Ms. Francisco replied the Navy does not have a remedy in place yet.

Ms. Esposito inquired about the level of exceedance at the two monitoring wells. Ms. Francisco replied trichloroethene (TCE) was detected at FT-PZ461I at 22.8 μ g/l and at FT-PZ460I at 100 μ g/L and the data is presented on the tag maps in the handouts. She further noted that TCE has been decreasing and degradation products have also been detected in the groundwater sample.

Ms. Esposito inquired about the flow rate and the depth of the monitoring wells. Ms. Francisco replied that the flow rate is approximately 100 feet per year and monitoring wells are set at a depth above the clay layer, which acts as a barrier and stops the VOCs migrating deeper into the aquifer. The shallow monitoring wells are at the water table depth that ranges from 10 to 15 feet bgs and intermediate wells are screened at approximately 30 to 40 feet bgs. Mr. Brayack added that the Navy has been conducting investigating at Calverton since the early 1990s and some wells have been as deep as

300 feet. The 60-foot clay unit thins out and disappears near the Peconic River and deeper wells have been installed in this area.

PER- AND POLYFLUOROALKYL SUBSTANCES, SITE 2 – FORMER FIRE TRAINING AREA AND FACILITY WIDE SITE INSPECTIONS

Ms. Francisco provided an update on the Site 2 and Facility-Wide Site Inspections (SIs). The SIs are used to evaluate the presence of PFAS throughout the facility. The presentation is included in Attachment 3. As part of the CERCLA process, after the Preliminary Assessment (PA), the SI is the next step in the investigative process. The Environmental Protection Agency (EPA) Health Advisories for drinking water are concerned with two long-chains of PFAS: perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA). The EPA Health Advisory for PFOS and PFOA is 70 nanograms per liter (ng/L). If both are present, then PFOS and PFOA should not exceed 70 ng/L. The Department of Defense (October 2018) and EPA's interim recommendations for groundwater (December 2019) Risk Screening Levels (RSL) is 40 ng/L for PFOA and 40 ng/L for PFOS. The New York State Proposed MCL is 10 ng/L for PFOA and 10 ng/L for PFOS. The Department of Defense (October 2018). Residential Screening Level (RSL) for soil are 130 ng/g for PFOA and 130 ng/g for PFOS. The Industrial RSL is 1,600 ng/g for PFOA and 1,600 ng/g for PFOS.

At Site 2 – Former Fire Training Area, PFOA and PFOS detected in 14 of the 80 samples exceed the EPA recommended RSL of 40 ng/L. PFOA and PFOS in 21 of the 80 samples exceed the New York State proposed MCL. The exceedances are located downgradient of the former fire training ring.

Facility Wide SIs covered 12 Areas of Concern (AOCs). At AOC-01 and AOC-02 – Aircraft Paint Hangars and AOC-03 – Paint Stripper Building, a total of 49 groundwater grab samples were collected from nine (9) locations and analyzed for PFOA and PFOS. Five (5) samples exceeded the EPA recommended RSL of 40 ng/L and 44 samples were below the EPA recommended RSL. Sixteen (16) samples were below the State's recommended MCL of 10 ng/L. Twelve (12) soil samples were collected from three (3) locations. PFOA/PFOS ranged from ranged from not detected to 2.4 J ng/g, below the residential RSL of 130 ng/g.

At AOC-04 – Noise Suppression Hush House, a total of 15 groundwater grab samples were collected from three locations and analyzed for PFOA and PFOS. Ten (10) samples exceeded the EPA recommended RSL of 40 ng/L and five samples were below the EPA recommended RSL. Of the five samples, three samples were below the State's recommended MCL.

At AOC-05 – Aircraft Fuel Storage Terminal a total of 30 groundwater grab samples were collected from six (6) locations and analyzed for PFOA and PFOS. Eleven (11) samples exceed the EPA recommended RSL and 19 samples were below the EPA recommended RSL. Of the 19 samples, 18 samples were below the State's recommended MCL. Three (3) soil samples were collected from one location and PFOA and PFOS were not detected.

At AOC06 – Hangars; equipped with fire suppression system containing AFFF, AOC-07 – Fire House; storage of AFFF inside the building and AOC-08 – Equipment Training Area, a total of 50 groundwater grab samples were collected from ten (10) locations and analyzed for PFOA and PFOS. Seven (7) samples exceeded the EPA recommended RSL and 43 samples were below the recommended RSL. Of the 43 samples, 26 samples were below the State's recommended MCL. Fifteen (15) soil samples were collected from five (5) locations, PFOA/PFOS ranged from ranged from not detected to 2.4 J ng/g, below the Residential RSL of 130 ng/g.

At AOC-09 North – Jet Fuels Spill, 20 groundwater grab samples were collected from four (4) locations and analyzed for PFOA and PFOS. Twenty (20) samples were below the EPA recommended RSL and the State's recommended MCL. Nine (9) soil samples were collected from three (3) locations, PFOA and or PFOS ranged from ranged from not detect to 1.49 ng/g, below the Residential RSL of 130 ng/g.

AOC-09 South, a total of 74 groundwater grab samples were collected from ten (10) locations and analyzed for PFOA and PFOS. All samples were below the EPA recommended RSL and the State's recommended MCL. At Site 2 Off Property, a total of 50 groundwater grab samples were collected from ten (10) locations and analyzed for PFOA and PFOS. Four (4) samples exceeded the EPA recommended RSL and 46 samples were below the recommended RSL. Of the 46 samples, 26 samples were below the State's recommended MCL.

At AOC10 – F-111 Aircraft Crash Site and AOC-11 – EF-111 Aircraft Crash Site a total of 68 groundwater grab samples were collected from 15 locations and analyzed for PFOA and PFOS. Two (2) samples exceed the EPA recommended RSL and 66 samples were below the recommended RSL. Of the 66 samples, 61 samples were below the State's recommended MCL. Six (6) soil samples were collected from two (2) locations. PFOA and PFOS ranged from ranged from not detected to 0.91 ng/g, below the Residential RSL of 130 ng/g.

At AOC-12 – Northeast Pond Area a total of 22 groundwater grab samples were collected from three (3) locations and analyzed for PFOA and PFOS. One (1) sample exceeded the EPA recommended RSL and 21 samples were below. Of those 21 samples, 19 samples were below the State's recommended MCL. PFOA was not detected in sediment and surface water samples but PFOS was detected in these samples. Screening criteria for sediment and surface water have not been established for comparison to the results.

The September 2019 drinking water sampling event consisted of contacting owners at the 14 properties with private drinking water wells that were sampled in 2018. In addition, door-to-door handouts were distributed to properties that had not responded to past sampling requests. The results of the 14 resampled private wells were all below the EPA drinking water health advisory and the New York State recommended MCL for PFOA and PFOS.

SI field activities have continued in 2020. In January 2020, SI field activities consist of groundwater sampling and collection of water levels. In Spring/Summer 2020, SI activities will consist of a second round of water level collections and groundwater sampling at the new piezometers. In Summer 2020, SI activities will consist of installation and sampling of additional piezometers.

A community member inquired about the highest detection of PFAS. Ms. Francisco replied that the highest detection was over 1,000 ng/L at AOC-04 and AOC-07.

A community member commented that the groundwater flow arrow on property looks completely different off property. Ms. Francisco replied that the groundwater flow arrow arrows are adjust depending on the groundwater contours. Mr. Brayack added that Swan Pond is a stormwater basin and there is a discharge from McKay Lake to Swan Pond. He further explained that when a rain event (approximately 10-inches) occurs, rainwater funnels into McKay Lake and creates a temporary groundwater mound. When it stops raining, the groundwater reverts back to its natural flow and the groundwater wraps around Swan Pond.

A community member commented that most of the Site 6A – Southern Area plume is located south of the Navy property and inquired whether the Navy is cleaning up the offproperty portion of the plume. Ms. Francisco replied there was a decision document and a Feasibility Study that looked at various options and treatment. The best alternative was to remove the continuing source, so a treatment system was installed to capture and treated VOC-impacted groundwater at the fence line. The Peconic River is an ecologically sensitive area and the preference was to avoid disturbing this area. The Navy monitors the Peconic River and compares analytical results to ecological benchmarks.

A community member commented that groundwater is flowing southeast and then inquired about the PFAS detection of 50 ng/L in Swan Pond. Ms. Francisco replied that the ongoing investigations would evaluate PFAS at Site 2, McKay Lake, and Swan Pond.

Mr. Rapiejko inquired that if PFOA was detected at 105 ng/L in the deepest sample at a vertical profile boring, will the Navy be collecting deeper samples. Ms. Francisco replied that result was collected at a depth on top of the clay layer and there are currently no plans to collect deeper samples, but work plan will be developed for the path forward.

Mr. Rapiejko inquired if the Navy will put treatment on the drinking water wells if PFAS is detected above standards. Ms. Fly replied that if contamination is found in drinking water wells above the EPA Health Advisory, then the Navy would be work with the Town of Riverhead for treatment or connection to the public water supply.

A community member inquired about how many gallons of PFAS were dumped and what kind of damage was done at Site 2. Ms. Fly replied that the quantity is unknown, and that the Navy is in the preliminary stages of the investigation. She further commented that the Navy worked with local municipalities and Grumman to obtain records but information about the quantity of PFAS used was not available.

A community member inquired about the origination of the arsenic at Site 6A – Southern Area. Mr. Brayack replied arsenic is naturally occurring and is naturally present in inorganic compounds. He further commented that some of these natural metals will dissolve and move with the groundwater but will also reattach to the soil.

Ms. Esposito commented that PFAS levels outside the fence are high. She inquired why the Navy is not doing anything outside the fence and asked what the trigger is to remediate because she was concerned about the private drinking water wells in the area. Mr. Brayack replied that the concentrations of PFAS on property are greater than 1,000 ng/L while the off-property concentrations are much lower. Remediation would be conducted on property at the source area. He further commented that the proposed MCL of 10 ng/L is for drinking water, not groundwater.

Mr. Brayack stated that the Navy has been talking to the Town of Riverhead. There are drinking water wells southeast and northwest of the facility that have been sampled for

PFAS and there are no exceedances of the EPA drinking water health advisory. The Superintendent of the Town of Riverhead Water District commented that the Town samples the public water supply wells and have not seen any of these contaminants in the wells. He further commented that there is a new well that was installed within a few miles north west of the facility and the well did not have contaminants.

Mr. Rapiejko inquired if the Navy will be conducting PFAS sampling and if the wells that are used for monitoring VOCs will be sampled for PFAS. Ms. Francisco replied that sampling at the Site 2 wells that are used for VOCs are included in the work plan for the PFAS RI.

A community member inquired if the Navy has been sampling for 1-4 dioxane. Ms. Francisco replied that samples for 1,4-dioxane were collected in 2018 and data for 1,4-dioxane was presented during a past RAB meeting. She further commented that the Navy did not sample for 1-4 dioxane in 2019.

Mr. Woolley, Representative Zeldin's District Director, stated that they want the Navy to continue sampling and want extensive sampling outside the fence because people are concerned about their drinking water. In addition, he would like the Peconic River, Swan Pond, and the west-end sampled and investigated. He added that he appreciates the work that the Navy has done but the pace needs to be picked up and the sampling needs to be extensive. Mr. Woolley further commented that the Navy may be responsible and needs to pick up some of the costs to hookup to public water. He further commented that work needs to be done outside the fence-line as well and that the Navy should continue to be transparent.

Ms. Aguiar, Town of Riverhead Supervisor, also communicated her concerns and added that this problem must be mitigated. She further commented that a risk assessment is needed and will support the plan for further investigation.

A community member inquired about how PFAS ended up in at the two sampling locations on the south side of Swan Pond. Ms. Francisco replied McKay Lake receives water from the facility and drains to Swan Pond. It's currently unknown if PFAS is coming from Site 2 or McKay Lake. As shown on a map from January 2019, groundwater samples were collected from existing monitoring wells and further investigation was conducted along River Road. The Navy is currently drafting work plans for further investigation.

Mr. Rapiejko stated that there was an F-14 crash south of the facility. Mr. Brayack responded that leaflets were left on the doors of residents in the nearby neighborhood

and one resident showed us the general area where the crash occurred, but the exact location is still unknown. Ms. Francisco added that from discussions with the resident, the crash did not occur in a residential neighborhood but instead to the east.

A community member commented that they would like testing to continue all the way to the west at AOC-09. Ms. Fly replied the Navy is only testing where sites have been identified. She added that it is unlikely AFFF would be dumped in the woods as it was not considered a toxic chemical and AFFF was most likely washed off the runway into the grass. The community member added they just want more wells to see where the PFAS is coming from. Ms. Fly responded that more sampling will be conducted south of Swan Pond.

A community member inquired about how many times the wells south of AOC-09 have been tested and if they will be testing them again. Ms. Francisco replied they were sampled once and there are no plans to sample them again. She added the data is used to evaluate if there is evidence of a source.

Ms. Esposito inquired if there could be a trail of AFFF moving through Calverton. Ms. Fly responded that there are a lot of possibilities and that there are industries to the west.

A community member inquired if PFAS floats on top of water. Mr. Brayack replied that in certain conditions, it can, but it mostly dissolves and flows with the water.

A community member inquired if there is a way to continue the line of wells down River Road for sampling and if the Navy would consider testing private drinking water wells to the south. The community member further commented that they are worried about their drinking water every day. Ms. Fly replied that they will talk about continuing sampling along River Road with management. She further commented that if people are witnesses to events that would have led to contamination and show the Navy the locations, the investigations can be conducted at the site. Ms. Fly also responded that the Navy has tested a private drinking water well south of Swan Pond and the results were all non-detect.

A community member inquired if the Navy will test private drinking water wells because the expense is less that the extensive drilling that the Navy is currently funding. Ms. Fly responded that the Navy would still need to drill to get the data required for the investigation. Mr. Brayack added if PFAS is in the drinking water, it does not necessarily mean it came from the Grumman facility and could have come from other sources. Other sources would include potential car fires and only a few ounces of AFFF diluted into millions of gallons could cause the exceedance. Furthermore, if there is Teflon tape or seals, PFAS will be detected in the sample. Field staff is prohibited from using Tyvek or Teflon because PFAS could show up in the samples. He further explained that just because PFAS is detected, it does not mean there was an actual release.

A community member commented that there should be a remedy for the residents and that there should be a collaboration between the County, Town, and Navy to come up with a remedy to help the residents. Mr. Brayack replied that Navy's money is currently being spent on the investigation that will lead to a remedy. In 1991 when the facility closed, there was an investigation conducted by Grumman, the Navy, and other contractors. They looked for areas of disturbance and interviewed Grumman employees to find out where activities were conducted throughout the facility. He concluded with stating that the 6,000 acres of buffer zone were for privacy and there was no evidence of industrial activity.

A community member inquired about investigating the wooded areas. Mr. Brayack responded that sampling locations are planned along the roadway because access is much easier than the wooded areas and that this approach is not unique to this facility. Investigations will continue down River Road in summer 2020.

A community member inquired if there were records of emergency landings. Ms. Fly replied that there are some records about emergency landings.

A community member inquired if Site 6A will be closed when VOCs in groundwater samples have been below the cleanup goal for four consecutive events. Ms. Fly responded that the ROD stated that once the Navy has met that goal, they can petition the state to close the site. If the state concurs, the Navy will close the site out. The Navy is the federal lead agency and NYSDEC is the lead state regulatory agency. She further commented that the Navy has closed out a lot of sites on the property.

A community member inquired about funding and questioned if it is finite. Ms. Fly responded the it was.

A community member inquired if the Navy knew where the dumping sites were located. Mr. Brayack replied that the initial assessment identified these sites. He further commented that it is unlikely that AFFF would just be dumped because the material was expensive.

GENERAL DISCUSSION AND CLOSING REMARKS

At the conclusion of the meeting, an opportunity to ask general questions was provided. No further questions were posed. Ms. Fly thanked the attendees for their participation. The next RAB meeting was planned for Fall 2020 to provide time to submit work plans to conduct field work and obtain data. The final meeting date and location is to be determined. The meeting was then adjourned.

LIST OF ACRONYMS AND ABBREVIATIONS

AFFF	Aqueous Film Forming Foam
AOC	Area of Concern
AS/SVE	Air Sparge/Soil Vapor Extraction
bas	Below ground surface
BTEX	benzene, toluene, ethyl benzene, and xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability
	Act
EPA	Environmental Protection Agency
FLTS	Fence Line Treatment System
FYR	Five-Year Review
LTM	Long Term Monitoring
LUC	Land Use Control
MCL	Maximum Contaminant Level
MEC	Munitions and Explosives of Concern
MNA	Monitored Natural Attenuation
ng/L	Nanograms per Liter
NAPL	Non-aqueous phase liquid
NWIRP	Naval Weapons Industrial Reserve Plant
NYSDEC	New York State Department of Environmental Conservation
NYSDOH	New York State Department of Health
OU	Operable Unit
PA	Preliminary Assessment
PFAS	Per- and Polyfluoroalkyl Substance
PFBS	Perfluorobutane Sulfonic Acid
PFOA	Perfluorooctanoic Acid
PFOS	Perfluorooctane Sulfonate
ppt	parts per trillion
PRSC	Peconic River Sportsman's Club
RAB	Restoration Advisory Board
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
SCDHS	Suffolk County Department of Health Services
SCO	Soil Cleanup Objectives
SI	Site Inspection
TCA	1,1,1-Trichloroethane
TCE	Trichloroethene
µg/L	micrograms per Liter
UST	Underground Storage Tank
VOC	Volatile Organic Compound

ATTACHMENT 1

JANUARY 29, 2020 RAB MEETING ATTENDEES

Attendees for the 51st RAB Meeting for NWIRP Calverton January 29, 2020

r	
1	Aguiar, Yvette
2	Almskog, Kris
3	Bartunek, George
4	Bennett, Clare
5	Brayack, Dave
6	Callaha, John
7	Camberdella, James
8	Civiletti, Denise
9	Cole, Dennis
10	Cork, Lou
11	Cushing, Melissa
12	Dillingham, Drew
13	Drees, Chris
14	Ebert, Elizabeth
15	Ebert, William
16	Egert, Sheri
17	Esposito, Adrienne
18	Fischner, Peter
19	Fly, Lora
20	Francisco, Kristi
21	Gomez, Karen
22	Gorernale, Katherin
23	Govoznae, Robert
24	Houghton, Thomas
25	Indilla, Annelie
26	Johnson, Sherry
27	Jones, Henry
28	Juchatz, Amy
29	Kempner, Chris
30	Kneski, Ken
31	Kreidel, JC
32	Kreiger, Ali
33	Kreiger, Jane

34	Kreiger, Ray
35	Krupski, Al
36	Kuzman, Paul
37	Latvin, Joel
38	Lawton, Hugo
39	Lennon, Kristin
40	Mancini, Frank
41	Martz, Ken
42	Martz, Ronald
43	Masi, Mark
44	McClinchy, Kelly
45	McClinchy, Peter
46	Merttle, Kathy
47	Morrill, Dennis
48	Murphy, Maureen
49	Papone, Frank
50	Pawson, Toni
51	Paquette, Doug
52	Racaniello, Vincent
53	Rapiejko, Andrew
54	Robinson, Bonnie
55	Rojovin, Marc
56	Salamauen, J.P.
57	Scharf, Christine
58	Shapiro, Steve
59	Smith, Cheryl
60	Smith, Daniel
61	Smith, Robert
62	Smith, Rose
63	Sterchun, Toqui
64	Stoddael, John
65	Stoddael, Tammi
66	Thomas, Dawn
67	Trocchio, Joseph
68	Varricchio, Vin

69	Wanlass, Jonathan
70	Wilkie, Henry
71	Woolley, Mark

ATTACHMENT 2

JANUARY 29, 2020 RAB MEETING AGENDA

Agenda

Restoration Advisory Board Naval Weapons Industrial Reserve Plant Calverton

January 29, 2020

Manorville Fire Department, Manorville New York

7:00 p.m.

Welcome and Agenda Review Lora Fly, NAVFAC Mid-Atlantic

> Distribution of Minutes All Members

Community Update Vincent Racaniello, RAB Co-chair

Technical Progress

Site 7 – Fuel Depot Update Robert Forstner PE, Resolution Consultants

Five Year Review Robert Forstner PE, Resolution Consultants

Site 6A – Southern Area Fence Line Treatment System Evaluation and 2019 Field Activities Update

Kristi Francisco, Tetra Tech

2019 Volatile Organic Compound Groundwater Investigation. Site 2 – Former Fire Training Area Kristi Francisco, Tetra Tech

Per- and Polyfluoroalkyl Substances, Site 2 – Former Fire Training Area and Facility Wide Site Inspections Kristi Francisco, Tetra Tech

> Closing Remarks Lora Fly, NAVFAC Mid-Atlantic

Presenters will be available after the program for questions.

ATTACHMENT 3

NAVY PRESENTATIONS - JANUARY 29, 2020 RAB MEETING



SITE 7 – FUEL DEPOT UPDATE

January 2020 Restoration Advisory Board

NWIRP CALVERTON, NEW YORK

January 29, 2020

Introduction







- Underground tanks removed by late '90s
- Air Sparge (AS) and Soil Vapor Extraction (SVE) system started operation in 2005 (pilot)/2006 (full scale)
- Operated seasonally (April to December)
- Three modifications made to the system to improve performance
- System reached end of its functional life November 2013
- Shutdown and monitoring began per the Performance and Shutdown Evaluation document (November 2013)



System Performance



1992/1995, 2009, and 2011 to 2013 Plume Boundaries





- Quarterly and then semiannual sampling
- Rebound and persistent VOC observations led to consideration of supplemental options
 - In-situ chemical oxidation was considered for implementation to address residual VOCs in groundwater
- Observation of NAPL during October 2016 sampling event
 - MW-17S 1.12 ft. observed in October 2016, decreased to 0.14 ft. in February 2017, and 0.21 ft. in March 2017
 - MW-19S 1.05 ft. observed in November 2016, not encountered in February/March 2017
 - MW-16S 0.60 ft. observed in January 2017, not encountered in February/March 2017
 - No NAPL observed in any wells since March 2017



- Fingerprinting identified NAPL as weathered fuel
- Reappearance of NAPL correlated to drop in groundwater table
 - Indicates NAPL was retained in a "smear zone" extending from approximately 16 feet (bottom of the foundation slab) to 23 feet below existing grade (historic low groundwater elevation)

Remedial options reconsidered

- Monitored natural attenuation (MNA)
- Targeted AS or AS/SVE
- Excavation
- Excavation with AS or AS/SVE
- Presence of UST foundation slab at depth limits options
 - Targeted AS or AS/SVE on its' own constrained by buried slab
 - Excavation most reliable option and selected for implementation

NAVIFAC

- Mobilization began on-site July 30
 - Utility clearances, installation of erosion control, mobilization of equipment
- Active remedial work began August 7
 - Removal of surface concrete, excavation and stockpiling of clean overburden (above the old UST foundation slab)





Site Views on August 8



- Temporary Overburden Removal & Stockpiling
 - Mostly fill placed after the tanks were removed in 1995
 - Approximately 3,460 CY removed and stockpiled on-site





Site Views on August 21



- Foundation Slab Exposure
 - Expected dimensions 90 ft. by 25 ft., actual dimensions 81 ft. by 24 ft.
 - Slab western edge elevation ~47.6 ft., eastern edge elevation ~46.3 ft.
 - MW-19S located ~12 ft. east of slab edge; shoring left unchanged despite smaller slab to make sure this area was excavated due to presence of NAPL in 2016



- Shoring Installation
 - Created a 100-ft. by 35-ft. area for excavation of impacted material
 - Shoring with 45-ft. long sheetpiles serves two functions stabilize excavation, and reduce groundwater infiltration





Site Views on August 28



- Dewatering During Excavation
 - Dewatering necessary to control site conditions and prevent contaminant transport
 - Treatment provided by bag filters and granular activated carbon vessels for treatment
 - Discharge of treated water to wooded area east of Site 7
 - System ran at ~300 GPM; effluent samples confirm compliance with discharge limits





Site Views on September 16



- Slab Demolition / Impacted Material Excavation
 - Soil and slab impacted by fuel removed from west to east
 - Target elevation for bottom of excavation 35 ft. (about 12 ft. below top of slab)
 - Final elevations ranged from 32.5 to 34.4 ft. (about 13-14 ft. below top of slab)
 - Impacted material stored in lined and covered stockpile





Site Views on September 12



- Stone Backfill & Oxidant Placement
 - Excavation below slab replaced with #57 stone and treated by oxidant addition
 - Approximately 1,436 tons of stone and 1,700 lbs. of oxidant placed
 - Brought excavation back to approximately match pre-demolition slab elevation





Site Views on September 24



- Overburden Placement and Surface Restoration
 - Excavated overburden placed and compacted in 1-foot lifts
 - Crusher-run stone layer as the new finished surface
 - Final surface matches pre-excavation surface





Site Views on October 2 (left) and October 9 (right)
Construction Progress



- Monitoring Well Reinstallation
 - Four monitoring wells reinstalled for use in Long-Term Monitoring (LTM) Program
 - Replacements for wells demolished by remedial excavation
 - All wells 25-ft. deep, 2-inch diameter, screened from 15 to 25 ft. below ground surface





Site Views on October 15

Construction Summary



- Twelve-week project from start to finish
 - Impacted materials removed:
 - 1,090 CY of soil, 206.11 tons of concrete
 - Based on end-point samples (collected at floor of excavation), while some residual contamination remains (typical), soil within excavated area meets NYSDEC Unrestricted Use Soil Cleanup Objectives (SCOs)
 - Routine LTM Program resumed last fall
 - Residuals may still exist outside of the excavated area, but are likely relatively dilute



Site View on October 15



- Continuation of MNA with long-term monitoring to address remaining dissolved-phase VOCs outside of excavation area
- If needed, Targeted AS or AS/SVE will be considered if dissolved VOC concentrations persists
 - Improved air flow after removal of UST foundation slab would increase effectiveness of AS or AS/SVE
- If multiple rounds of LTM sampling indicate groundwater meets cleanup goals, Site 7 would move toward closure.



FIVE YEAR REVIEW

January 2020 Restoration Advisory Board

NWIRP CALVERTON, NEW YORK

January 29, 2020



- A Five-Year Review (FYR) is required by statute for sites with remedies implemented under CERCLA, NCP or equivalent programs
- A FYR is required when a remedy leaves hazardous substances behind that do not allow for unrestricted site use
- The purpose of an FYR is to evaluate if the remedies are still protective of human health and the environment
- The FYR evaluates:
 - If the remedies function as designed
 - If there are previously unknown issues that require attention
 - If there's been a change in status regarding any known conditions

Five Year Reviews – Content



- The evaluation includes:
 - Review of any new site data
 - Interviews with relevant site personnel
 - Community involvement (implemented via RABs in the case of NWIRP Calverton)
- As part of the FYR, three specific questions must be examined:
 - A. Is the remedy functioning as intended by the decision documents?
 - B. Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy selection still valid?
 - C. Has any other information come to light that could call into question the protectiveness of the remedy?

NWIRP Calverton FYR



- The FYR for NWIRP Calverton covers multiple Operable Units (OUs) and sites with Records of Decision (RODs):
 - OU2 (ROD dated January 2003)
 - Site 7 Former Fuel Depot
 - Site 10A Fuel Systems Lab
 - OU3 (ROD dated May 2012)
 - Site 6A Fuel Calibration Area
 - Site 10B Engine Test House (RACR finalized October 2018)
- Sites not included:
 - Site 1 Northeast Pond (clean closure, part of OU1)
 - Site 9 ECM Area (No-Further Action, part of OU1)
 - Site 2 Fire Training Area (Under investigation)

NWIRP Calverton FYR



- Known changes to be addressed:
 - OU2 (Sites 7/10A)
 - Demolition of AS/SVE system and subsequent LTM results
 - Recently-completed excavation project
 - OU3 (ROD dated May 2012)
 - Site 6A/Southern Area
 - Emerging Contaminants
- Schedule
 - Draft report under Navy review
 - Issuance of final signed document TBD



SITE 6A – SOUTHERN AREA FENCE LINE TREATMENT SYSTEM EVALUATION AND 2019 FIELD ACTIVITIES UPDATE

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT CALVERTON, LONG ISLAND, NEW YORK

01/29/2020

Site Layout Site 6A – Southern Area





Overview Site 6A – Southern Area



History

- 1950's to 1996: Site 6A Former Fuel Calibration Area used for the testing of aircraft fuel and engine systems
- Frequent, small fuel and solvents likely spilled during use at the Site
- Site 6A Southern Area: volatile organic compound (VOC) groundwater plume resulting from activities at the Fuel Calibration Area
- May 2012 Record of Decision (ROD) for Operable Unit (OU) 3 selected remedy: Land Use Controls, construction and operation of the Fence Line Treatment System (FLTS), and groundwater monitoring
- October 2013: System startup
- Removed 54.5 pounds of VOCs via air stripping
- March 2019: FLTS shut down
- Monthly operation of each extraction well and testing for VOCs



FLTS Concentration Trends Site 6A – Southern Area



4

2019 FLTS Evaluation Site 6A – Southern Area



Document Review

• 2012: OU3 ROD

- -Identified selected remedy
- -Identified cleanup goals
- -Identified chemicals of concern (COCs) and cleanup levels

• 2014: Remedial Design

- -Established shutdown criteria for the FLTS
- -Established criteria to remove monitoring wells from the long-term monitoring program
- -Established ecological criteria for the Peconic River Area
- 2015 through 2019 Analytical Data Review
 - -Results for COCs in groundwater grab samples from vertical profile borings
 - -Results for COCs in groundwater samples from monitoring wells
 - -Results for COCs in influent groundwater at the FLTS

2011 and 2018 Plume Site 6A – Southern Area



- Winter 2018/2019: Site 6A Southern Area Investigation
- 2011 Plume (375 pounds)
 - On property: 93 pounds
 - Off property: 282 pounds
- 2018 Plume (44 pounds)
 - On Property: 14 Pounds
 - Off Property: 30 Pounds
- Reduction
 - Reduced by 331 pounds through source area removal, biostudy, the treatment system, and attenuation
 500 µg/L: 11.6 to 0 acres
 - -50 µg/L: 95 to 20 acres
 - $-5\ \mu\text{g/L}$: 121 to 86 acres



Former Fuel Calibration Area FLTS Evaluation



- Goal for Former Fuel Calibration Area
 - Less than 0.36 pounds/year (lbs/yr) of COCs in groundwater migrating from the Fuel Calibration Area (mass flux)
 - Equivalent to an annual average of COC concentrations less than 6 micrograms per liter (µg/L)
- Current conditions at the Former Fuel Calibration Area
 - Residual fuel contamination, chloroethane, and dichlorobenzenes are present in shallow groundwater but are no longer contributing mass to the Southern Area plume
- Goal has been achieved
 - COCs in groundwater are leaving the source area at a rate of 0.21 lbs/year



FLTS and Area Monitoring Wells FLTS Evaluation



- Goal for the FLTS influent and monitoring wells
 - COCs entering the FLTS (mass flux): mass is less than 2.2 lbs/yr and less than 10 µg/L
 - –COCs in groundwater are less than 50 $\mu\text{g/L}$
- Current conditions at the FLTS Area
 - COCs in influent groundwater have been below 10 µg/L since February 2018
 - As of December 2018, all results below 50 ug/L
- Goals have been achieved
 - Mass of COCs decreased from 35 lbs/yr (2014) to 0.16 lbs/yr (2019)
 - Results for COCs in groundwater at individual monitoring wells are below 50 µg/L



FLTS and LTM Optimization Recommendations FLTS Evaluation



- Permanently shut down the FLTS
- · Goal for removing monitoring wells from the network
 - COCs are below cleanup levels for 4 consecutive events
 - Arsenic in groundwater at 3 monitoring wells are less than the New York State Department of Health (NYSDOH) Maximum Contaminant Level (MCL) for 4 consecutive events
- Current conditions (as of September 2018)
 - COCs in 26 of the 35 on-property monitoring wells have met the goal to be removed from the monitoring program
 - Arsenic in 3 of 3 monitoring wells have met the goal to be removed from the monitoring program
- Goals have been achieved at 26 monitoring wells
 - 26 wells have been below the NYSDOH MCL based cleanup level of 5 µg/L (most of the COCs)
 - Concentrations of arsenic range from not detected to 7.21 below the NYSDOH MCL of 10 µg/L



Proposed Optimization of the LTM Program Site 6A – Southern Area





2019 Field Activities Site 6A – Southern Area



- Monitor groundwater, surface water, and porewater quality at the Peconic River Area
 - Groundwater samples collected from 2 monitoring wells
 - -4 surface water samples
 - –4 porewater samples

Summer 2019 – Fence Line Area Groundwater Investigation

- Monitor water quality 3 months after FLTS shutdown
- Groundwater samples collected from 19 monitoring wells

Fall 2019 – Annual LTM Event

- Monitor migration and attenuation of COCs in groundwater a 80 monitoring wells in the Site 6A – Southern Area
- Peconic River Area monitoring





Spring and Fall 2019 Event Site 6A – Southern Area



- Peconic River Sampling
 COCs were below the cleanup levels at the two Peconic River Area monitoring wells
- COCs in pore water and surface water were below the OU3 ecological values



Summer 2019 Event Site 6A - Southern Area



FLTS Area Groundwater Investigation

- July 2019: 3 months after system shutdown
 - -Groundwater sampled from 19 monitoring wells at the area of the FLTS
 - -COCs were not detected



Fall 2019 Event Site 6A - Southern Area



6 Month Rebound and LTM Bidg 168 318 Event FCMW03SR1 W02SR Results at 16 of the 80 wells OCOCs below the Cleanup Level \mathbf{O} COCs above the Cleanup Level exceed ROD Cleanup Goals CMW05 ECMW06S -7 on property wells FCMW09S -9 off property wells ECMW091 P7187 PZ1941 Shallow groundwater at 2 FCMW1 SAMW130I FCMW10S SAPZ15711 Fuel Calibration Area wells SAPZ157I (C)PZ1931 TPZ4545 contain DCA and residual SAPZ139 FTGA 11 SAP714911 SAPZ181 petroleum SAPZ138 Exceedances at 5 of the 8 SAMW128D AMW1271 AMW1295 new piezometers installed on AMW126S $\mathbf{\Theta}$ AMW129 SAMW126D property SAPZ137 Ο SAMW126 SAPZ136 \bigcirc SAPZ145S Exceedances at 5 of the 9 off SAPZ145 APZ163 SAPZ122 SAPZ135 PZ1450 FLTS SAPZ140 property piezometers just PZ1220 SAPZ161 SAPZ182 SAPZ183 APZ131S downgradient of the FLTS AMW131D SAPZ1441 SAPZ1445 0 are trending down SAPZ143 SAPZ123 SAPZ123 SAPZ123S • Exceedances at 4 of the 9 off SAMW1855 PZ166 property wells further SAMW132 \mathbf{O} SAPZ118S SAMW132S downgradient remain SAPZ118 SAMW184S consistent or have slightly SAMW184 SASW20 SAMW186S increased





2019 VOLATILE ORGRANIC COMPOUNDS GROUNDWATER INVESTIGATION SITE 2 – FORMER FIRE TRAINING AREA

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT CALVERTON, LONG ISLAND, NEW YORK

01/29/2020

Site 2 – Former Fire Training Area



- Used as an active Fire Training Area from the 1950's until 1996
- As a result of fire training activities, soil and groundwater at the site have been impacted by petroleum, chlorinated solvents, and other chemicals
- Aqueous Film Forming Foams (AFFF) used to extinguish fires
- Remedy selection for volatile organic compounds (VOCs) in groundwater has been delayed to investigate per- and polyfluoroalkyl substances (PFAS)
- Fall 2019: supplemental groundwater investigation to monitor attenuation and migration of VOCs



Looking west north

Site 2 – Former Fire Training Area 2019 VOC Results



- VOCs detected in groundwater from the four monitoring wells
- For 2 wells, results exceed the New York State Department of Health (NYSDOH) Maximum Contaminant Level (MCL)



Site 2 VOC Trends Off Property





• June 2012: trichloroethene detected at 600 μ g/L at FT-PZ460I and 74 μ g/L at FT-PZ461I.



•Questions?



PER- AND POLYFLUOROALKYL SUBSTANCES SITE 2 – FORMER FIRE TRAINING AREA AND FACILITY WIDE SITE INSPECTIONS

NAVAL WEAPONS INDUSTRIAL RESERVE PLANT CALVERTON, LONG ISLAND, NEW YORK

01/29/2020

Per- and Polyfluoroalkyl Substances (PFAS)



- Man-made compounds, not found in nature
- Useful properties: fire resistance and oil, stain, grease, and water repellency
- Lasts a long time in the environment
- Mobile in groundwater
- Health impacts:
 - –Increased cholesterol levels
 - -Changes in growth, learning, and behavior of the developing fetus and child



aqueous fire fighting foam



electroplating



stain-resistant carpets

nonstick cookware

water-resistant fabrics

food packaging

- -Immune system changes
- -Decreased fertility
- -Altered hormone function
- -Increased risk of cancer

2

PFAS GUIDELINES



Guidelines - Groundwater

• Environmental Protection Agency (EPA) Lifetime Health Advisories for drinking water

- -Concern with two long-chain PFAS: perfluorooctanesulfonic acid (PFOS) and perfluorooctanoic acid (PFOA)
- -PFOS: 70 nanograms per liter (ng/L)

-PFOA: 70 ng/L

- -If both are present: PFOS and PFOA should not exceed 70 ng/L
- Department of Defense (October 2018) and EPA's interim recommendations for groundwater (December 2019)
 - -PFOA Risk Screening Level (RSL): 40 ng/L
 - -PFOS RSL: 40 ng/L

New York State

-Proposed Maximum Contaminant Level (MCL) of 10 ng/L for PFOA and 10 ng/L for PFOS

<u>Guidelines – Soil</u>

- Department of Defense (October 2018) Residential RSL: 130 ng/g for PFOA and 130 ng/g for PFOS
- Industrial RSL: 1,600 ng/g for PFOA and 1,600 ng/g for PFOS

PFAS Site Inspections (SI) Site 2 and Facility Wide

- Site Inspections (SI) field activities began in Spring 2019
- SI: Site 2 Former Fire Training Area and 12 Areas of Concern (AOCs) identified in the Preliminary Assessment for PFAS
- SI components
 - -Soil borings: record soil lithology and confirm depth of the water table and first clay layer
 - -52 piezometers installed: water level collection to better understand groundwater flow throughout the facility and groundwater sampling
 - -390 groundwater grab samples from 83 vertical profile borings: samples collected every ten feet beginning at the water table and ending at the first clay layer
 - -45 soil samples from 15 locations: target three depths (0 to 2 inches, 0 to 2 feet, and 2 to 4 feet below ground surface) at drainage pathways
 - –2 surface water and 2 sediment samples collected at Northeast Pond





Location Map Site 2 and Facility Wide PFAS SI





Groundwater Flow



- Water level elevations are used to determine the direction of groundwater flow
- Groundwater flows from higher to lower elevation
- Groundwater typically flows the same direction that the land surface slopes (down hill)
- Piezometers are used to measure the elevation of groundwater relative to sea level
 - -Groundwater elevation is collected by measuring the depth in feet from the top of the piezometer to the groundwater
 - -The elevation of groundwater is calculated using the depth of the water level and surveyed elevation
- By collecting groundwater elevations from an extensive well network, an experienced hydrogeologist can determine groundwater flow direction with accuracy



Shallow Groundwater Flow





On Property Site 2 PFAS SI



- Site 2 Former Fire Training Area
- Discharged AFFF to extinguish fires during training exercises
- 80 groundwater grab samples were collected from 13 locations
- Results for PFOA or PFOS in:
 - -14 samples exceed the EPA
 recommended RSL
 -66 samples are below the EPA
 recommended RSL
 -59 samples below the New York
 State proposed MCL
- Exceedances are located downgradient of the former fire training ring


AOC-01, 02, and 03 Facility Wide PFAS SI



- AOC-01 and AOC-02 Aircraft Paint Hangars
- AOC-03 Paint Stripper Building
- Equipped with fire suppression systems containing AFFF
- Groundwater Grab Samples
- 49 groundwater grab samples were collected from 9 locations
- Results for total PFOA or PFOS in:
 - 5 samples exceed the EPA recommended RSL
 - 44 samples are below the EPA recommended RSL
 - 16 samples are below the State's recommended MCL
- Exceedances in intermediate (23 to 48 feet below ground surface) and deep (63 to 68 feet below ground surface) depths
 Soil Samples
- 12 soil samples from 3 locations
- PFOA ranged from not detected to 2.4 J ng/g
- PFOS ranged from not detected to 0.3 J ng/g



AOC-04 Facility Wide PFAS SI



- AOC-04 Noise Suppression Hush House
- Equipped with fire suppression systems containing AFFF
- 15 groundwater grab samples were collected from 3 locations
- Results for total PFOA or PFOS in:
 - 10 samples exceed the EPA recommended RSL 5 samples are below the EPA recommended RSL
 - 3 samples are below the State's recommended MCL
- Exceedances from 7 to 52 feet below ground surface



AOC-05 Facility Wide PFAS SI



- AOC-05 Aircraft Fuel Storage Terminal
- Equipped with a fire suppression system containing AFFF
- Groundwater Grab Samples
- 30 groundwater grab samples were collected from 6 locations
- Results for total PFOA and PFOS in:
 - 11 samples exceed the EPA recommended RSL
 - 19 samples are below the EPA recommended RSL
 - 18 samples are below the State's recommended MCL
- Exceedances in at least one sample from each location: 13 to 30 feet below ground surface in the area of the building and 25 to 40 feet below ground surface downgradient of the cesspools

Soil Samples

- 3 soil samples from 1 location
- PFOA and PFOS was not detected



AOC-06, 07, and 08 Facility Wide PFAS SI



- AOC06 Hangars; equipped with fire suppression system containing AFFF
- AOC-07 Fire House; storage of AFFF inside the building
- AOC-08 Equipment Training Area; Discharged AFFF during training of staff on equipment
- Groundwater Grab Samples
- 50 groundwater grab samples were collected from 10 locations
- Results for total PFOA and PFOS in:
 - 7 samples exceed the EPA recommended RSL
 - 43 samples are below the EPA recommended RSL
 - 26 samples are below the State's recommended MCL
- Exceedances from 15 to 42 feet below ground surface
- Soil Samples
- 15 soil samples from 5 locations
- PFOA ranged from not detected to 2.4 ng/g
- PFOS ranged from not detected to 0.3 ng/g



AOC-09 North Facility Wide PFAS SI



- AOC-09 North Jet Fuels Spill
 AFFF released at the spill location; location is uncertain <u>Groundwater Grab Samples</u>
- 20 groundwater grab samples were collected from 4 locations
- Results for total PFOA and PFOS in:
 - 20 samples are below the EPA recommended RSL and the State's recommended MCL
- Soil Samples
- 9 soil samples from 3 locations
- PFOA was not detected
- PFOS ranged from not detected to 1.49 ng/g



AOC-09 South and Site 2 Off Property Facility Wide PFAS SI



AOC-09 South

- 74 groundwater grab samples were collected from 10 locations
- Results for total PFOA and PFOS in:
 - 0 samples exceed the EPA recommended RSL

- 74 samples are below the EPA recommended RSL

- 74 samples are below the State's recommended MCL

Site 2 Off Property

- 50 groundwater grab samples were collected from 10 locations
- Results for total PFOA and PFOS in:
 - 4 samples exceed the EPA recommended RSL
 - 46 samples are below the EPA recommended RSL 26 samples are below the
 - State's recommended MCL
- Exceedances are south of Swan Pond at depths of 26 to 41 feet below ground surface



AOC-10 and 11 Facility Wide PFAS SI





0.91 ng/g

AOC-12 Facility Wide PFAS SI



- AOC-12 Northeast Pond Disposal Area (clean closure)
 Groundwater Grab Samples
- 22 groundwater grab samples were collected from 3 locations
- Results for total PFOA and PFOS in:
 - 1 sample exceed the EPA recommended RSL
 - 21 samples are below the EPA recommended RSL
 - -19 samples are below the State's recommended MCL
- Exceedance is in the upgradient location from 71 to 76 feet below ground surface
- Sediment and Surface Water Samples
- PFOA was not detected in sediment and surface water samples
- Sediment: PFOS ranged from not detected to 0.89 ng/g
- Surface water: PFOS ranged from 2.18 to 7.33 ng/L



Drinking Water Sampling Facility Wide PFAS SI



- September 2019: Drinking Water Sampling
- Contacted owners at the 14 properties with private drinking water wells sampled in 2018
- Door-to-door handouts to properties that have not responded to past sampling requests
- Resampled 14 drinking water wells
- Results are all below the EPA drinking water health advisory and the New York State recommended MCL



What's Next? Site 2 and Facility Wide PFAS SI



- SI field activities continue
 - -January 2020: Groundwater samples and water levels collected from piezometers
 - -Spring / Summer 2020: Second round of water level collection and groundwater sampling at new piezometers
 - -Summer 2020: Installation and sampling of additional piezometers
 - -Reporting



Questions Site 2 and Facility Wide PFAS SIs



•Questions about the Site 2 and Facility Wide PFAS SIs?