

Joint Base McGuire-Dix-Lakehurst (JB MDL)
Restoration Advisory Board (RAB) Final Meeting Minutes
Meeting No. 55 – 8 December 2016

SUBJECT: Restoration Advisory Board (RAB) Meeting No. 55 – Meeting Minutes

- 1) Place: Edward Holloway Senior Citizen Community Center, 5 Cookstown Browns Mills Road, Cookstown, New Jersey
- 2) Date/Time: Thursday, 8 December 2016; 6:30 PM
- 3) Co-Chairs: Col Gregory McClure, 87th Civil Engineer Group Commander, JB MDL
Mr. Michael Tamm, Resident, Southampton Township, New Jersey

4) Attendees:

Mr. Frank Storm	RAB Member
Ms. Theresa Lettman	RAB Member
Mr. Tom Besselman	RAB Member
Ms. Branwen Ellis	RAB Member, Pinelands Commission
Mr. Matt Csik	Ocean County Health Department
Mr. Doug Pocze	US Environmental Protection Agency, Region II (EPA)
Ms. Carla Struble	US Environmental Protection Agency, Region II (EPA)
Ms. Robyn Henderek	US Environmental Protection Agency, Region II (EPA)
Ms. Pat Seppi	US Environmental Protection Agency, Region II (EPA)
Ms. Gwen Zervas	New Jersey Department of Environmental Protection (NJDEP)
Mr. Chris Archer	JB MDL, 87 th CEG, Deputy Base Civil Engineer
Mr. Joseph Rhyner	JB MDL, 787 CES/CEIE, Chief Environmental Element
Mr. Curtis Frye	JB MDL, AFCEC/CZO, Chief, Environmental Restoration Program
Ms. Nicole Brestle	JB MDL, AFCEC/CZO, Environmental Restoration Program
Mr. Michael Figura	JB MDL, AFCEC/CZO, Environmental Restoration Program
Ms. Erin Laux	JB MDL, On-Site Contractor, Environmental Restoration Program
Mr. Jim Richman	JB MDL, On-Site Contractor, Environmental Restoration Program
Mr. Cornell Long	US Air Force, AFCEC
Ms. Cindy Hood	US Air Force, AFCEC
Mr. Chris Baker	87 th AMDS
Mr. John Mahach	87 th AMDS
SSgt Dustin Roberts	87 th ABW/PA
Allivon Kuronya	Resident
Raven Potosky	Resident
O. Samiro	Resident
Ms. Denise Garner	Resident, Jackson Township
Mr. Don Malloy	Resident, Cookstown
Mr. James Johnson	Resident, Cookstown
Mr. Brenton Hutson	Resident, Cookstown
Mr. Paul Paterla	Resident, Cookstown
Mr. Thomas Jackson	Resident, Wrightstown
Mr. Michael Hill	Resident, Cookstown
Ms. Jean Kovalth	Resident, Upper Freehold

Ms. Patricia Caruso	Resident, Upper Freehold
Mr. Pat Miller	Resident
Ms. Jodi Miller	Resident
Mr. Tim Llewellyn	Arcadis
Mr. Bob White	Arcadis
Mr. Doug Sutton	HGL
Ms. Katrina Harris	Bridge Consulting Corp./Arcadis

5) Handouts

- JB MDL Restoration Advisory Board, Meeting No. 55, 8 December 2016, Agenda
- JB MDL Restoration Advisory Board, Meeting No. 55, 8 December 2016, Presentation Slides
- JB MDL, List of Documents Provided to Mr. Tamn as of 8 December 2016
- Acronym List, December 2016
- US EPA Memo Dated 15 November 2016, Clarification About the Appropriate Application of the PFOA and PFOS Drinking Water Health Advisories
- US EPA Fact Sheet, PFOA and PFOS Drinking Water Health Advisories
- ATSDR Fact Sheet, PFAS Frequently Asked Questions

6) Call to Order:

The meeting was called to order by Col. Gregory McClure, 87th Civil Engineer Group Commander, JB MDL. Col. McClure welcomed everyone and thanked everyone for attending. Col. McClure stated the meeting was an opportunity to share current activities and information about the base's environmental program.

7) Minutes of Previous Meeting and Review of Agenda Items:

Mr. Michael Tamn, RAB Community Co-Chair, asked for any comments on the minutes from the 12 May 2016 RAB meeting. A motion was made, seconded, and unanimously passed to approve the minutes.

Mr. Tamn asked for any comments on the 17 August 2016 meeting. A motion was made, seconded, and unanimously passed to approve the minutes.

Mr. Curt Frye reminded all that the meeting was being recorded for purposes of preparing meeting minutes.

Mr. Frye reviewed action items from the last meeting and noted they would be addressed in presentations being given that evening. He stated Mr. Tamn had requested information about surface water concentrations at the BOMARC site, as well as fuel releases in the McGuire airfield areas over the years. Mr. Frye advised Arcadis, a contractor, would address both topics in its presentations.

8) Perfluorinated Compounds Site Inspection Update:

Mr. Frye advised there were several handouts on the back table on the topic including an EPA fact sheet and a fact sheet from ATSDR (a Federal health agency that supports environmental restoration programs).

Mr. Frye stated the focus is primarily on two chemicals: PFOS (perfluorooctanesulfonic acid) and PFOA (perfluorooctanoic acid) which are part of a class of chemicals referred to as PFCs

(perfluorinated compounds). He stated PFCs are associated with Aqueous Film Forming Foam (AFFF) which is a fire fighting foam used by the Air Force and other military agencies, generally a military-spec foam used for fighting petroleum fires and in training exercises. Mr. Frye noted the two chemicals are not regulated, although EPA has issued a health advisory for PFOS and PFOA of 70 parts per trillion (ppt), for either one of the chemicals or the two combined. He advised that although the chemicals are unregulated, the approach being taken by the Air Force is a proactive approach to deal with these two chemicals. He explained the approach focuses on investigating areas where AFFF has been used, determining if it has impacted groundwater, and determining if there are any potential impacts to drinking water systems (either on base or off base). Mr. Frye said the goal is to protect human health and ensure access to safe drinking water for the installation and the surrounding communities.

Mr. Frye said the Air Force's comprehensive approach is to identify (determine where there have been releases), respond (where impacts are found), and prevent (transitioning to new types of firefighting foams that do not contain these compounds).

Mr. Frye displayed a graphic showing the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) process and explained most of the sites in the base's Environmental Restoration Program follow this process. He stated the base has undertaken three PFC studies to date: a limited study in 2014 to collect some data, a Basewide Preliminary Assessment (first step in the CERCLA process and basically a review of records), and the Basewide Site Inspection, the main focus of tonight's presentation.

Mr. Frye stated the goal of the Site Inspection is to take the information gathered during the Preliminary Assessment and determine through sampling the presence or absence of the chemicals, evaluate potential pathways to receptors (in this case, impacts to drinking water above the EPA health advisory level), and determine if the site needs no further action, short term action/remedy (an Expanded Site Inspection), or to advance to a Remedial Investigation. Mr. Frye advised the recommendations would be made to the regulatory agencies for their concurrence.

Mr. Frye stated the Site Inspection (SI) has been going on through 2016. He said 21 areas were identified across JB MDL—eleven (11) at McGuire, four (4) at Dix, and six (6) at Lakehurst. He reviewed the project schedule and noted all the work begins with the development of a work plan which is shared with the regulatory agencies for their comments; the SI work plan was finalized in August. Mr. Frye said sampling occurred in August and September, and validated sample results were received in late October which will be presented tonight. Mr. Frye said a full report will be prepared (March is the targeted date for a draft); however, he would be sharing the results tonight instead of waiting for the report.

Mr. Frye displayed a figure showing the PFC areas at McGuire and Dix and a second figure showing the Lakehurst PFC areas. He noted sampling was conducted at each of the 21 areas; the number of samples collected varied at each of the areas depending on what was needed to provide good coverage as coordinated with the regulators (EPA and NJDEP).

Mr. Frye summarized the Site Inspection results, noting that at each of the 21 areas at least one sample showed an exceedance of the EPA health advisory level for groundwater. He advised there were generally no exceedances in soil or sediment; there were some detections in surface water. He stated the sampling data was reviewed with the regulators, and a decision was made to move forward with an Expanded Site Inspection due to the magnitude of exceedances in groundwater, the distance to off-base areas with shallow drinking water wells, and groundwater flow direction. Mr. Frye explained the Expanded Site Inspection will include initial step-out sampling and off-base sampling in four areas,

and he will be discussing each of the areas.

Mr. Frye reviewed the New Jersey geology and displayed a cross-section showing aquifers (an area where wells are drilled to produce drinking water); he stated there are shallow aquifers which are about 100 feet deep and have confining layers underneath them. Mr. Frye said under the confining layers are intermediate depth aquifers, and then a deep aquifer. He noted a deep aquifer which is used by many of the municipal drinking water systems is about 1,000 feet deep. He explained that an understanding of the geology is important in determining whether there could be a pathway to a drinking water well. He continued explaining that if there is a release of contamination at the base at the surface, there is not a pathway to a well that is drilled 1,000 feet deep into an aquifer as the confining layers have low permeability that prevent the contaminants from moving downward through the layers. Mr. Frye advised there are about 125 sites across the base which are part of the Environmental Restoration Program and contamination has not been found at any of the sites that goes below the surface aquifer.

Mr. Frye stated the Air Force had awarded a rapid response contract to conduct the expanded Site Inspection for the selected areas including the step-out sampling (to determine if the compounds have moved to the boundary of the base), off-base sampling (private wells and municipal wells), and mitigation if needed such as providing bottled water if drinking water has been impacted above the EPA health advisory. He advised the contractor is BERS-Weston. He reiterated that the work is being closely coordinated with EPA and NJDEP.

Mr. Frye explained one of the key steps in determining where it might be necessary to sample off base was to access the well data base maintained by NJDEP. He stated the data base is not completely reliable, especially for older wells, but it provided a good starting point. He advised the next step was to meet with some of the local townships to discuss their municipal water systems and the areas they cover, and by process of elimination, identify the areas where there are private wells. Mr. Frye stated he had met with Jackson Township, Manchester Township, Pemberton Township, and Lakehurst Borough. He noted much useful information had been exchanged in terms of the location of their municipal wells, whether they could be potentially impacted, and their areas of coverage.

Mr. Frye explained there is a rule called the Unregulated Contaminant Monitoring Rule or (UCMR) which is part of a program managed by EPA for a variety of unregulated chemicals. He advised EPA has a process for collecting data for purposes of future regulation of chemicals. He stated many chemicals are regulated under the Safe Water Drinking Act, but there are also many chemicals which are not regulated; periodically, EPA requires municipal water departments to include additional unregulated chemicals as part of their regular sampling programs. He noted the program is done across the nation to assess whether or not there are chemicals being found at a high enough incidence in water systems that require them to be looked at for future regulation. Mr. Frye advised PFCs were a class of chemicals added by EPA to the most recent round of UCMR monitoring called UCMR3; the rule was issued in 2013 and gave townships a three-year period to collect the data. He noted the requirement only needed to be complied with by large water systems which served over 100,000 people; EPA also selected other systems that served populations between 10,000 and 100,000 and required them to perform the sampling as well. Mr. Frye advised that part of the base's water system, the Dix system, was on the list; the Air Force conducted the sampling and did not detect any PFCs.

Mr. Frye stated Manchester Township conducted the sampling for their municipal water and did not detect any PFCs.

Mr. Frye stated Jackson Township also conducted the required sampling of their municipal water and did not detect any PFCs.

Mr. Frye stated Pemberton Township has several water systems; most were sampled under the UCMR3, and no PFCs were detected. He advised there were four wells that were not required to be sampled, and the Air Force will be sampling those wells as part of the Expanded Site Inspection.

Mr. Frye stated Lakehurst Borough was not subject to UCMR3; however, their wells are in the deep aquifer.

Mr. Frye advised the step-out sampling began in the third week of November including on-base monitoring wells near the fence line. He stated earlier in the week canvassing had begun of the four off-base areas for locating private wells and offering to sample those wells. He explained a packet of information was being provided to residents in those four areas including a letter from Col. McClure, a fact sheet with information on PFCs, a sampling permission form, and a flyer about tonight's Restoration Advisory Board meeting.

Mr. Frye discussed the actions that would be taken based on the sampling of private wells. He said if the results are above the EPA health advisory, the Air Force will take immediate steps to ensure clean drinking water is provided. He stated that if the results show detections below the EPA health advisory level, the Air Force may request permission to resample, as needed, to evaluate concentrations. Mr. Frye said if the results show no detections, no further sampling will be required at that well.

Mr. Frye displayed an aerial photograph of the northeast corner of McGuire and the surrounding community. He explained there was a former fire station on McGuire where the highest detection in groundwater was 720 ppt. He explained the groundwater flow directions as mapped by the contour lines shown on the photograph. Mr. Frye noted the area in orange is the area where reconnaissance is being performed to locate private wells.

Mr. Frye displayed an aerial photograph of the northeastern section of JB MDL-Lakehurst and the off base community. He noted the reconnaissance area is in Manchester Township where private wells are being identified for permission to sample. Mr. Frye said there is a former fire training area on post in this area where PFCs were detected up to 1,220 ppt where the fire training was conducted; samples taken closer to the boundary showed detections of 180 ppt and 360 ppt.

Ms. Teresa Lettman asked if the Cedar Glen community is on municipal water. Mr. Jim Richman responded that they have three community supply wells. He stated if there are exceedances of the health advisory level in the area currently targeted for sampling, the sampling will step out until the extent of the plume is determined.

Mr. Frye displayed an aerial photograph of the southeastern section of JB MDL-Lakehurst and the off-base community in Lakehurst Borough and Manchester Township. He noted Lakehurst Borough is on municipal water supplied by two deep wells, except for about three parcels. He noted the area in Manchester Township is not very populated, but canvassing is being done to locate private wells.

Mr. Frye displayed an aerial photograph of Dix and the off-base community of Pemberton Township, on the south side of the Dix cantonment area. He explained the Dix wastewater treatment plant sent effluent to the land application area/ponds in this area, and there have been reported incidents of AFFF making its way to the treatment plant. He stated the maximum detection of PFCs at this site was 1,570 ppt. He noted groundwater flow is generally south so the off-post community to the south was targeted for sampling. He added that four municipal wells in Pemberton Township which are about 300 feet deep will also be sampled.

Mr. Thomas Besselman asked about the impacts to fish. Mr. Frye referred to the EPA fact sheet which states that the health advisory is only for drinking water and is not applied to any other ingestion route such as showering.

Mr. Frye stated the project is an evolving process as data is received, and the areas being targeted for sampling may be adjusted as data is reviewed with the regulators.

Col. McClure added that the Air Force had phased out the use of AFFF in live fire training prior to 2012 and is now phasing out AFFF containing PFOS/PFOA altogether. He explained natural gas is now used instead of jet fuel for fire training to simulate an aircraft fire. He advised the process of phasing out all the fire trucks at the base of the use of AFFF had been completed about three weeks ago. He noted phasing out the hangar fire suppression systems of AFFF is the next step and the speed at which this can be accomplished is dependent on funding and the Federal budget so it could be as quick as two years or more than five years. He said the goal is to ensure that no mission activity has negative impacts on the base's neighbors off base. Col. McClure added that PFCs are also used in many products, such as waterproofing sprays, coating for pans, and carpet stain protection.

Ms. Lettman asked how much of the AFFF is used at the base in a year. Col. McClure said it is no longer on the fire trucks, so if they respond to a fuel fire, the trucks have the more environmentally friendly foam that will be used. He said AFFF is still in the hangars so if there is a fire, or accidental release, it will be used. He noted there is new guidance on containment and cleanup when AFFF is used; the approach is similar to a fuel release with drains being blocked and the release contained with absorbent material. Mr. Christopher Archer added that the new hangers have high-expansion foam, so it is only the older hangers which still have AFFF. In response to a question, Mr. Archer stated there have been no fires at hangars in the past two years.

Mr. Tamn stated the treatment plant at Dix disposed of sludge in Pemberton Township in the early 1990s. He said there are about 25 homes with private wells near Route 206 and North Pemberton Road. He asked if these homes would be offered sampling. Mr. Frye responded that the current sampling effort is focused on releases at the base and potential impacts to the area immediately off base.

Mr. Matt Csik asked if the Air Force would be keeping the private well sampling results confidential. Col. McClure said the results would be discussed in generalities about a neighborhood to respect the privacy of property owners.

The members of the general public attending the meeting asked the following questions:

- How does the base know it identified all the sites?
 - Mr. Frye responded the purpose of the Preliminary Assessment was to identify any potential sites through interviews and researching of records.
- Are any of the sites on landfills?
 - Mr. Frye responded that none of the sites are on the landfills at OU1 and OU3.
- What are the health impacts from PFCs?
 - Mr. Frye said the potential health impacts are discussed in the fact sheets available on the back table.

- Has South Run been sampled?
 - Mr. Frye said South Run has been sampled, and there have been detections in the surface water at about 400 ppt.

- What was the highest detection of PFCs?
 - Mr. Frye said the highest detection was 260,000 ppt in groundwater at an active fire training area in the middle of McGuire airfield triangle area.

- What is the standard for PFCs? Does the Pinelands have a standard?
 - Mr. Frye responded no regulatory agency nor the Pinelands have a standard for PFOS/PFOA. EPA has issued the health advisory of 70 ppt for PFOS and PFOA, individually or combined.

- Was Wrightstown Borough considered in the discussions and sampling program? If not, would the Air Force consider a request to sample if Wrightstown has not already performed the sampling?
 - Mr. Frye responded that the investigation to date has not found any sites that create a potential for a pathway into that area. Mr. Frye said the Air Force would consider any request, but there would need to be data that indicates the potential for a pathway from the base to that area.

Mr. Frye encouraged anyone seeking more information to visit the web site at: www.jointbasemdl.af.mil/PFCs or to email him at curtis.frye@us.af.mil.

Mr. Frye advised that, due to the time taken this evening for the PFC presentation, the co-chairs had decided to reduce the remaining agenda items. Remaining presentations this evening will be an update on OU1 and OU3 Landfill sites and BOMARC surface water issues. Col. McClure noted that any topics not covered would be rolled over to the next meeting.

9) McGuire Operable Units 1 and 3 Landfill Sites Update:

Mr. Bob White of Arcadis, a contractor to the Air Force, reviewed the topics he planned to cover in his abbreviated presentation.

Mr. White advised the Air Force has submitted a draft final Feasibility Study for Operable Unit (OU) 3 about a month ago to the regulators. He stated the Feasibility Study proposes several remedial alternatives to address environmental impacts at OU-3. He noted the Air Force also intends to submit a draft Feasibility Study for OU-1 in early 2017. He explained versions of these Feasibility Studies were submitted in 2014; due to the Pinelands dispute, there has been about a two-year gap during which additional assessments have been conducted and additional data incorporated into the revised Feasibility Studies.

Mr. White displayed an aerial photograph showing the location of OU-1 and the three sites which comprise OU-1: Landfill-03, Landfill-04, and ST-07 (a former Defense Reutilization Marketing Office or DRMO) co-located with Landfill-03.

Mr. White stated landfills at OUs 1 and 3 were generally operated from the 1950s through the 1970s and were closed by the Air Force by adding some type of soil cover. He advised there was a soil removal action at ST-07 in 2011 to remove PCB-contaminated soil.

Mr. White displayed a list of the investigations, assessments, and documents since 2014, including a Baseline Ecological Risk Assessment, surface water sampling, groundwater sampling related to the Pinelands standards, and some geotechnical work related to the sites' topography.

Mr. White discussed current site conditions (open fields and heavy vegetation), the site boundaries, and the general groundwater flow direction. In response to a question about the location of an underground storage tank at OU-1, Mr. White stated the location was not on the graphic he was showing but he would confirm the location and whether there was more than one tank at the site. Mr. White noted groundwater flows towards North Run Creek.

Mr. White next reviewed the surface water sampling results and advised that in the surface and sediment there are no unacceptable risks or hazards identified as part of the Remedial Investigation. He explained the groundwater that goes through the LF-03 Landfill discharges into North Run Creek so even though there is no unacceptable risk or hazard, data will be presented on what impacts the landfill groundwater has to North Run Creek.

Mr. White explained that the screening criteria used are the Pinelands non-degradation standards (maintain a pristine site) which includes the Practical Quantitation Limit (PQL) and Background Threshold Values (BTV); also used are the health-based standards such as NJDEP Fresh Water Acute Toxicity and EPA's Maximum Contaminant Levels or drinking water standards. In response to a question about background values, Mr. White said samples are collected from site-specific, non-impacted areas and the concentrations used to represent background or naturally occurring conditions. He stated the information is used for constituents like metals which occur naturally and are not always related to contamination. Mr. Llewellyn suggested if there was interest, a presentation could be done at the next meeting on the background study. Ms. Lettman asked if the background study was at the library, and Mr. Frye said it is part of the administrative record with a final report issued in 2012 but may contain data back to 2000.

Mr. White advised in 2016 two rounds of surface water sampling was conducted at six locations; he displayed an aerial photograph showing locations where the results exceeded a standard. He stated toluene was detected at 1.8 ppb which exceeded the PQL of 1.0 ppb but was 500 times lower than the Maximum Contaminant Level of 1000 ppb. He said pyrene (a PAH), a man-made compound or naturally occurring from the combustion of products, was detected at 0.54 ppb which is above the PQL of 0.1 but several hundred times below the NJ Fresh Water standard. Mr. White stated arsenic was detected slightly above the PQL but below the drinking water standard. He said iron was detected at 45,000 ppb which exceeds the BTV of 4,990 ppb but is believed to be naturally occurring.

Mr. White discussed the surface water sampling results from the culvert and stated chlorobenzene was detected at 2.1 ppb which exceeds the PQL of 1 ppb but is significantly below the MCL of 100 ppb.

Mr. White said the surface water sampling at LF-04 detected Bis(2-Ethylhexyl)phthalate at 8.7 ppb which exceeds the PQL of 3 ppb and the MCL of 6 ppb. He advised this compound is also a common lab contaminant and was only detected in one round of data.

Mr. White summarized the OU-1 Focused Feasibility Study and the remedial alternatives that were evaluated in the study.

Mr. White advised there are four alternatives evaluated in the Feasibility Study. He stated the

first alternative is No Action which is required by law to be evaluated and provides a baseline to evaluate the other alternatives. He said the second alternative is an Optimized Soil Cover which would involve ensuring the existing soil cover has a minimal amount of thickness. He explained the third alternative is a Two-Foot Soil Cover which would install a two-foot soil cover over the waste, regardless of the existing soil cover. He continued explaining that the fourth alternative is a Resource Conservation and Recovery Act (RCRA Subtitle D Landfill Cap), an engineered cover used by municipal solid waste landfills and consisting of a multi-layer cap that would prevent infiltration of rainwater into the groundwater. He noted alternatives three and four would involve cutting a number of trees.

Mr. White showed a graphic of what an Optimized Soil Cover might potentially look like. He noted soil borings had been taken to see how deep the existing soil cover is and more than 90 percent of the site is covered by two or more feet of soil. Mr. White showed a graphic of a sub-grade plan for the third and fourth alternatives and noted there would be areas where dirt would have to be moved to another site to grade.

Mr. White stated OU-3 has similar landfill sites and similar alternatives except for the optimized soil cover. He explained the OU-3 sites are clear cut already so only the two-foot soil cover or RCRA landfill cap are being evaluated.

Mr. Doug Pocze asked if the alternatives would still include monitoring. Mr. White said the alternatives would include long-term monitoring and land use controls.

In response to a question about why excavation of the landfills was not evaluated, Mr. White said the level of practicality and implementability is a factor in evaluating alternatives. Mr. White noted the landfill is very large, about 400,000 cubic yards, and would take more than a year to excavate; excavation would create the potential for the waste to be exposed to precipitation. Mr. White said another factor that is evaluated is the short-term risks, such as the potential risks created by having 4,000 trucks drive on public roads through numerous communities to a final disposal site. Mr. Llewellyn added the cost of excavating the landfill to move it from Air Force property to an off-base location and re-burying the waste would be significant and mostly likely not be a good risk management decision. Mr. Frye stated the reasons mentioned by Mr. White and Mr. Llewellyn are the reasons landfills are typically not removed but managed in place. Mr. Frye said the rule of thumb is generally landfills more than five acres are managed in place and not excavated as the risks and costs outweigh the benefits. Mr. Frye added that if the landfills were removed, the forested areas of the landfills would need to be clear cut which would be a negative impact to the environment.

Mr. Llewellyn said the Proposed Plan will be released in the summer of 2017 and will have a 30-day public comment period. He welcomed input from the Board and the general public on the alternatives.

10) BOMARC Surface Water Data:

Mr. Tim Llewellyn of Arcadis, a contractor to the Air Force, reviewed three questions he would be addressing regarding surface water quality at the BOMARC site—what are the concentrations of trichloroethylene (TCE) in the surface water, when was the last time surface water data was collected and are the trends declining, and how far downstream has sampling been completed and are the downstream areas impacted?

Mr. Llewellyn said the highest TCE detection observed to date was in 2009 at surface water sampling location SW-11 at 186 parts per billion (ppb); the Pinelands standard is 1 ppb, the New Jersey drinking water standard is 1 ppb, and the recreational use (wading, swimming) advisory is 38 ppb. Mr. Llewellyn said current levels are below the recreational use standard, and the goal is

to achieve the 1 ppb level. He advised the last time the stream was sampled was 2014 so it may be time to re-sample. He explained declining concentrations had been seen in the surface water, as well as in the groundwater which discharges to the stream.

Mr. Llewellyn next discussed how far downstream has been sampled and impacted. He advised the US Geological Survey did some studies in early 2000 and went about two miles downstream, and no TCE detections were seen at that location.

Mr. Llewellyn showed the location of the BOMARC site off Route 539. He explained it was a former missile launch area where there are two sources of TCE which has entered the groundwater and created a dissolved plume which moves towards Success Branch. He noted the groundwater discharges to about an 800-foot section of Success Branch, with about 90 percent of the groundwater discharging to a 300-foot section which is where the highest concentrations are seen. He displayed a graphic of the regional watershed and stated Toms River is about eight miles away. Mr. Llewellyn pointed out the downstream location where USGS has sampled and did not see any detections. He said impacts are seen at the point of discharge to about three-quarters of a mile from the discharge point.

Mr. Tamn asked what the plan is to address the site since the barrier wall did not work. Mr. Llewellyn said the barrier wall pre-dated Arcadis' contract, but it was a pilot test that did not work well at this site. Mr. Llewellyn stated a Feasibility Study has been submitted to NJDEP for review, and a Proposed Plan is targeted for release in the summer of 2017 for public comment. He explained it would be about another six months after the Proposed Plan for the remedy to be in place. He said the proposed remedial alternative is to put air sparge barriers across the plume. He stated this is a proven technology that will remediate the groundwater in about 10 years which means Success Branch will be remediated in 10 year or less. Mr. Tamn asked if monitored natural attenuation had been evaluated, and Mr. Llewellyn said monitored natural attenuation would take more than 40 years, possibly up to 60 or more years to remediate the site.

Mr. Tamn asked about restoration of the land after the barrier is installed. Mr. Llewellyn said an advantage of the air sparge remedy is that it can be installed in between the existing trees so there would be very limited cutting of trees.

Mr. Tamn asked what the pH is in the area, and Mr. Llewellyn said he would check but believed it to be between 4 and 5. [After the meeting, Mr. Llewellyn advised the average pH level from sampling in 2015 was 4.96.] Ms. Lettman asked if the pH levels are checked, and Mr. Llewellyn said the levels are checked when monitoring is performed. He stated the area is very acidic so bioremediation alternatives are not being considered.

Mr. Tamn invited any questions from the Board members, and none were offered.

11) Meeting Adjourned:

Mr. Tamn asked for a motion to adjourn the meeting. A motion was made, seconded and unanimously passed to adjourn the meeting at 8:57 PM.

The 2017 meeting scheduled is being developed. Potential topics can be emailed to Mr. Curt Frye or Ms. Nicole Brestle.