Former Pease Air Force Base (AFB)
Restoration Advisory Board (RAB)
Meeting Minutes

April 19, 2016, 6:30 p.m.
Department of Environmental Services (DES)
222 International Drive, Suite 175
Portsmouth, New Hampshire

Attendees:

Name	***Organization***
Dr. Steve TerMaath	Air Force Civil Engineer Center (AFCEC)
Mr. Peter Forbes	RAB member, Air Force Civil Engineer Center and DOD Co Chair
Ms. Linda Geissinger	AFCEC, Public Affairs
Mr. Scott Johnston	Sytsma Group, Public Affairs support contractor
Mr. Rob Singer	AMEC/Foster Wheeler, AFCEC remediation contractor
Mr. Mike Quinlen	CB&I
Mr. Ted Connors	RAB Member, Newington resident
Mr. Bud Fitch	US Senator Kelly Ayotte's office
Ms. Libby Bowen	AMEC/Foster Wheeler, AFCEC remediation contractor
Ms. Christine Miller	RAB member, Dover resident
Mr. Mike Daly	RAB member, US EPA
Mr. Peter Sandin	NHDES
Mr. Gene Schrager	RAB member, Portsmouth resident
Mr. Art Ditto	Rye resident
Ms. Marilyn St. Fleur	US EPA Region I Rep, community involvement coordinator
Mr. John Frink	Newington resident
Mr. Tom Sedoric	Rye resident
Ms. Barbara Sedoric	Rye resident
Ms. Peggy Lamson	RAB Member, Newington resident
Ms. Pixie Cummings	Local resident
Mr. Jameson "Jamie" Paine	RAB member, RAB Community Co-Chair
Mr. Brian Goetz	RAB member, Dep. Dir. of Public Works, City of Portsmouth
Mr. Andy Smith	RAB member, Environmental Manager, 157 Air Reserve Wing, NH Air National Guard located at Pease Tradeport
Ms. Lisa Griffith	Dover resident
Mr. Jeff McMenemy	Reporter, Portsmouth Herald
Mr. Nicholas Chaves	Student, Boston resident
Ms. Alayna Davis	Dover resident
Ms. Courtney Carignan	RAB member, Portsmouth resident
Ms. Andrea Amico	Portsmouth resident
Mr. Al Pratt	Dept. of Public Works, City of Portsmouth
Ms. Maria Stowell	RAB member, Pease Development Authority
Mr. Scott Hilton	RAB member, NHDES Representative
Ms. Ona Ferguson	RAB Facilitator, Consensus Building Institute

The facilitator, Ms. Ferguson called the meeting to order at 6:30 p.m. and welcomed everyone to the newly reestablished Pease Restoration Advisory Board. Ms. Ferguson invited each attendee to introduce him or herself.

Ms. Ferguson informed everyone that the RAB was reestablished to focus on the overall restoration at Pease. Ms. Ferguson explained the RAB's objective, *to create a forum for discussion that facilitates completing environmental restoration activities at an installation in an open and cooperative environment.*

RAB Historical Overviews and Objectives

Mr. Forbes presented a brief history of the Pease Restoration Advisory Board (see Attachment 1). He explained the Pease RAB was reestablished as a result of renewed interest in Pease's restoration program, in particular, due to the Perflourinated Compounds (PFCs) detected in the Haven Well.

RAB Administration Items

Ms. Ferguson presented RAB Administrative Items (see Attachment 1) that included *Purpose of the RAB, Operating Procedures, Meeting Minutes and Comment Cards* for the public. Mr. Paine, RAB Community Co-Chair, said the RAB Operating Procedures are being drafted and when complete, will be distributed to the RAB members for their input.

Pease Restoration Overview/Environmental Restorations Key Regulations

Mr. Forbes provided a brief overview of the Pease restoration program (see attachment 1), including the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) process and the New Hampshire Code of Admin Rules Env-Or 600, Contaminated Site Management. He said the Air Force has 83 sites at the former base. Of those, 51 are closed. Of the remaining 32, remedial actions at 11 are completed, but still being monitored. The remaining 21 sites are the main focus of the RAB. Restoration technologies in place at each of the sites were described in general terms. Activities underway during the 2016 field season were also explained.

Questions asked during Environmental Restoration presentation:

Ms. Miller asked for an opinion on GAC (Granular Activated Carbon) filters, are they worthwhile, are they helpful, are they being used? Mr. Daly responded they are part of many treatment systems in use currently. Mr. Forbes agreed and said they are very effective for certain compounds. Mr. Daly added they work for solvents and PFCs as well.

Ms. Miller also asked about Orthophosphate Acidizing and disinfection. Mr. Daly responded that he believes that is a sanitizing agent. Ms. Miller said she would try to find more information to clarify her question.

Ms. Miller asked if there is validity to heating these elements to above 600 degrees Celsius to transform them into carbon dioxide. Mr. Forbes responded it would be effective, but it cannot be done in the ground or in the water. Elements would have to be pulled out, first. It could be used for the final treatment once things are pulled out. Ms. Miller asked about Freeday Photocatalysis and advanced oxidation. Mr. Daly responded that's another technology related to treatment of PFCs using oxidation. Ms. Geissinger added there is a specific step in the CERCLA process where we consider the best technologies, such as those Ms. Miller was inquiring about. This is the Feasibility Study stage and can be found on the CERCLA flow diagram posted at the front of the room.

Ms. Lamson asked if Mr. Daly remembered when they cleaned planes and the foam would go toward the oil/water separator, is that the same thing that is used for firefighting? Mr. Daly said it looked like it came out of a washing machine, and was not nice stuff. It would go all the way out to Great Bay. Mr. Forbes asked if that was soap. The paved surfaces on the airfield drain into a stormwater collection point. In some ways it's beyond our ability to track it. Ms. Lamson said it was not very nice stuff and not the best for the environment. This was back in 1989 and 1990. Ms. Miller asked what the name of the cleaning agent was. Mr. Forbes said he did not know. Mr. Smith said typically the firefighting AFFF is very

different from a cleaning agents used for aircraft. It would have been soap. It's unfortunate that it was released into the environment, but it wouldn't have PFCs in it. Dr. TerMaath said the wash racks had oil/water separators to separate the oil and water washed off the planes. The discharge typically went to a treatment plant. Ms. Lamson said she could see that, but there was also an oil/water separator at Macintyre Brook. Dr. TerMaath said he's not saying some didn't get by, but that was what it was supposed to do. Ms. Lamson said the people on that side of Pease were affected by it; all that stuff was going into the hay fields.

PFCs at Pease

Mr. Forbes presented information regarding the PFCs at Pease (see attachment 1). In 2012, the Air Force established interim guidance for responding to possible releases of PFCs. This led to a nationwide comprehensive assessment process in 2014.

Mr. Forbes described how PFCs are an emerging contaminant and a component of Aqueous Film Forming Form used by the Air Force since 1970 to fight petroleum-type fires.

In 2009, the EPA set a Provisional Health Advisory (PHA) number; any concentrations in drinking water above this number trigger action. The Air Force issued guidance on investigating PFC potential sources, specifically fire training areas.

At Pease, PFCs were discovered in the Haven Well at levels above EPA's Provisional Health Advisory. The City of Portsmouth took the well off-line immediately in May 2014. In coordination with the USEPA and NHDES, the Air Force initiated an investigative program to better understand the location and extent of the problem at Pease.

Protecting drinking water is the top priority for the Air Force. Air Force has monitored public water supply wells weekly for the past 90 weeks and concentrations have not changed. We continue to monitor public drinking water wells in accordance with the Sentry Well Monitoring Plan.

All private drinking water wells within a one-mile radius of Pease where access was granted were sampled, and one well had PFCs above PHA. Air Force immediately provided water to the homeowner and installed an in-home treatment system. Air Force continues to monitor these wells in accordance with the Long Term Residential Well Monitoring Plan.

To recap, the Air Force has been monitoring almost 2 years and concentrations remain not only very stable, but also very low. As our investigation evolves, we will continue to evaluate monitoring frequencies to ensure protection of water supplies.

Mr. Forbes introduced Mr. Singer, part of a team assisting the Air Force with PFC response work at Pease since 2014. In the past 20 months, the Air Force's understanding of PFCs as grown substantially.

In addition to continued monitoring of the public water supply, the Air Force has installed more than 55 new wells, collected more than 200 groundwater samples and 60 soil samples.

Mr. Singer showed maps depicting well locations and 21 sites where PFC may have been used, stored, or released. The Air Force has investigated groundwater at all areas where AFFF was potentially released. Groundwater flow paths demonstrate these sources are the primary contributors to the PFCs in the Haven Well.

Frequent monitoring has shown stability and reinforces our understanding of the source areas. Again, we know where it is coming from. The four locations identified by the dark spots on the map are the primary contributors to the areas in orange on the map.

Mr. Forbes stated the Air Force is committed to the protection of public and private drinking water supplies. The Air Force, USEPA, NHDES, and City of Portsmouth are working together to address the

presence of PFCs at Pease, both short and long term. The Restoration Advisory Board is a key forum for continued communication on progress of PFC work.

Questions asked during the PFC presentation:

Ms. Miller asked Mr. Singer the difference between an aquifer sample and a pore water sample. Mr. Singer said an aquifer is groundwater beneath the ground surface. Pore water is collected from shallow soil or sediments in stream bottoms and represents water that is flowing from the ground into rivers and creeks.

Ms. Miller asked Mr. Forbes about the in-home treatment system. He said it was a carbon filter system.

Ms. Miller asked if it was the same as a nano-filtration system. Mr. Forbes said it was not the same.

Mr. Schrager asked if there is a way to estimate how many gallons of firefighter foam was used. Mr. Forbes said the Air Force estimated using more than 100,000 gallons of a diluted mixture of three percent AFFF were used during the 1990 aircraft fire response. The Air Force does not know how much was used in the routine fire training exercises.

Mr. Schrager asked if the bedrock wells on the base are contaminated. Mr. Forbes said the compounds are mobile and have been detected in bedrock as well as the shallow aquifer.

Mr. Paine asked about the depth to water. Mr. Forbes said, it varies, but in general, the soil is 20-30 feet deep before you hit bedrock. The water table is 10-15 feet below ground surface. When you get deeper than 50 feet in the bedrock, you get less water. Most of the water in the fractured bedrock is in that top 50 feet.

Mr. Paine asked about next steps for areas with the highest concentrations near the training areas. Devices will be put in that will bypass or dilute that area. Is there consideration for soil removal, or is it too much? Mr. Forbes said the quickest way to address the problem is to use the interceptor system.

Mr. Paine asked about a cost estimate and wondered if there is more money, are there faster results? Mr. Forbes said in the last two years the Air Force has committed more than $15 million on PFCs across multiple installations. A treatment system like the one the city is installing costs $9-10 million. The Air Force does not have an independent cost estimate for the remediation systems yet. When contaminated water is pulled from the ground, diffusion and other physical processes limit how much and how fast chemicals can be removed from the soil. Even when maximum extraction rates are reached, the chemicals don't always diffuse faster. So having two systems may not work faster than one.

Dr. TerMaath added that groundwater moves very slowly, and only so much can be pumped before it starts sucking air. Mr. Forbes said there are physical limits to what can be done. With this technology it could be decades before the aquifer is restored.

Mr. Paine asked if the state comes in with a lower threshold than EPA's, will the Air Force meet that requirement. Mr. Forbes said yes, the AF would use the lower standard.

Ms. Miller asked about the extracted water from the pump and treat system. Does it just get buried, incinerated, or shot up into space? Mr. Forbes said the treatment system uses carbon filtration. When the filter can no longer absorb material, it is trucked off and burned or buried.

Dr. Carignan said she'd like to see reports on the monitoring wells to see the data. Mr. Singer said the

report is being prepared right now and will be made available when it is completed. Mr. Daly said as the EPA receives the data from AMEC-Foster Wheeler it is added to EPA's website.

Dr. Carignan said it would be more useful in a graphic form. Mr. Forbes said there are three memos on the Administrative Record site. They have data and graphical information. The most recent memo is from December 2015. Search for Tier 1, 2 and 3.

Dr. Carignan asked if anything has been done for the wells that are under the PHA. Mr. Forbes said the Air Force continues to monitor those wells with quarterly sampling and all results are shared real time with the homeowners.

Dr. Carignan asked for more information about treatment options under consideration, specifically for the water. She suggested it for a topic on the next RAB agenda.

Dr. Carignan asked if there was sampling for PFCs at Pease prior to 2014. Mr. Forbes said the Air Force began its investigation at the fire training area, the most logical starting point when investigating a source. Flow pathway information at that time indicated it was flowing away from the Haven Well.

Dr. Carignan asked if the PFCs at the fire training area are moving toward the Haven Well. Mr. Forbes said it looks like what's affecting the Haven Well is from the fire station.

Dr. Carignan asked if drinking wells are monitored for other contaminants at Pease and where that data can be found. Mr. Forbes said yes, historically other contaminants have been addressed. The data is in the Administrative Record. Mr. Geotz added the Haven Well had a full suite of samples taken to include testing for volatile organics and synthetic organics in 2013. It has a non-detect the last round of sampling for all the required parameters.

Dr. Carignan asked if the Air Force is looking into potential migration of PFCs into the bay and the potential to contaminate fish and shellfish. Do people fish for sustenance there? Mr. Forbes said the Air Force has not measured PFC concentrations in shellfish. It's on the radar, however.

Dr. Carignan said she would hope there is no commercial fishing going on in Great Bay. Mr. Daly said it is a data gap that will have to be evaluated.

Mr. Schrager asked if Site 8 is the worst site at Pease and has there been a remediation system there for many years? Mr. Forbes said it used to be the worst site, but right now it is almost completely cleaned up, excluding the newly found PFCs. There is only one monitoring well with Volatile Organic Compounds.

Mr. Schrager asked which labs analyze the PFCs. What's the cost per sample and how long does it take? Mr. Forbes said there are not a lot of labs available. Someone from the audience said it costs around $300 per sample.

Ms. Lamson said Mr. Hilton and Mr. Daly were talking about the fire training area within the confines of the town of Newington, off Arboretum. The last testing was done there in 2014? Mr. Hilton said two rounds of PFC testing were done in 2013; the final report was issued in January 2014.

Ms. Lamson asked if DES alerted the town health officer. Mr. Forbes said he has been in regular contact with him.

Mr. Paine asked if the treatment plant discharges to the Piscataqua River. And theoretically it could be below the standards, but still be discharged to the river. Mr. Forbes said yes, it does.

Ms. Lamson asked if anything has been tested near Railway Brook before going into the Piscataqua. Mr. Forbes said the Air Force has been looking at the streams and brooks in the area, looking for areas where water might be coming up from the ground. That's the pore water sampling that was mentioned earlier.

Ms. Miller asked for Mr. Singer's email. Mr. Singer said he'd provide it.

Dr. Carignan asked Mr. Singer what the different symbols on the map mean. Mr. Singer said stars are residential wells, circles are groundwater monitoring wells, and diamonds are pore water samples.

Ms. Ferguson summarized the public comment guidelines and opened the floor for public comments.

Public Comments:

Ms. Andrea Amico:
1. In reference to administration record file #420842, indicating the firefighting training site groundwater was tested and found to have high levels of PFCs in June and September 2013. Why did it take almost a year later to test the drinking water wells especially when there were levels of PFOA as high as 120,000 parts per trillion and PFOS at 95,000 parts per trillion?

Answer:
Knowledge of the aquifer at the time of the June and September 2013 sampling, specifically the distance from the fire training area and the assumption that the groundwater flow direction was predominantly to the north and therefore moving away from the Haven well, did not suggest the impacts to the drinking water well were likely.

2. What is the Air Force's health and safety policy on emerging contaminants and notifying the public? Would you typically notify the public when you found levels that high at the firefighting training site in the groundwater and then why did it take a year to test the water?

Answer:
The Air Force follows applicable regulatory requirements when reporting environmental conditions identified during site investigations. In this case, conditions were reported to the USEPA, the NHDES, and the City of Portsmouth.

3. Has the Air Force tested for PFCs in the drinking water on Pease prior to April and May of 2014?

Answer:
Mr. Forbes answered no.

4. Are there any old buildings or water tanks on Pease that we may be able to get water data from?

Answer:
The Air Force has considered investigating whether there are sources of "old" water the Pease site and sampling these for PFCs. No specific sources of old water have been identified and the usefulness of this data, if were to be obtained, has not been fully evaluated.

5. Has the wildlife in the area been tested for PFCs? Are there any plans to test the wildlife?

Answer:

The USAF has not sampled wildlife in the area for PFCs and there are no current plans to. The USAF will complete the appropriate sampling based on requirements of the USEPA and NHDES in order to investigation conditions at the site and protect human health and the environment.

6. For the Air National Guard – Have you notified former servicemen and women about PFC contamination and blood testing?

Answer:
The Air Force sent letters to former Air Force military and civilian members stationed at Pease between 1990 and 2014 of potential exposure to water containing PFOS and PFOA. In addition, the Air Force posted notices of potential exposure to the Air Force Services Agency and NAF Jobs sites. The Air Force Personnel Center posted a news article, a Fact Sheet and posted the notice on Facebook. The Veterans Administration posted the notice on its Blog. The Air Force further published a public notice which ran for two weeks in the Portsmouth Herald ending on 06 January 2016. The Air Force is not involved in blood testing of any former Air Force or civilian workers at Pease.

7. For the EPA – The community wants more consistent and lower standards for PFCs nationally. It's confusing to have different states and EPA regions that have different standards.

Answer:
The Air Force will work to comply with all applicable state and federal standards. Since the April 2016 RAB meeting the USEPA has issued revised lifetime Health Advisory (HA) values for PFOS and PFOA. The State of NH has issued Emergency Ambient Water Quality Standards for PFOS and PFOA that are consistent with the USEPA HA values.

8. The community remains concerned about low level PFCs in two Portsmouth wells below the EPA PHA. Why aren't those wells being treated too? They are also in the southern well field with the three other wells being treated for PFCs.

Answer:
PFCs detected in the Smith and Harrison Wells have consistently been below both the USEPA Provisional Health Advisory (PHA) and the newly established HA values. Water from these wells meets drinking water standards and is mixed with water from other wells within the Portsmouth drinking water supply, which further reduces PFC concentrations prior to distribution. The USAF conducts regular sampling of the active wells within the southern well field as well as sampling groundwater monitoring wells upgradient of the well field to ensure that PFC impacted water is not migrating toward the active wells. This sampling plan was reviewed and approved by the USEPA, and data collected as part of this monitoring program is shared with the USEPA, the NHDES, and the City of Portsmouth on a regular basis.

9. Will the Air Force be offering tours to the Pease community too?

Answer: Yes the public will be invited to go on the tour. The next RAB meeting will be a tour of the sites, this visit is scheduled for July 14, 2016 and more data will be provided to the RAB members and the public as plans are finalized.

10. How many other former Air Force bases are actively dealing with PFC contamination at this time?

Answer:
The Air Force has assessed AFFF usage at all 39 of its former bases. Of those 39, AFFF usage at 22 has warranted investigation to assess whether AFFF usage has caused PFC impacts to groundwater.

Mr. John Frink:
1. Does PFOA get absorbed into plant tissue?

Answer:
While we don't have much information on this topic, we are looking into it and will report our findings when we learn more.

2. Is the dirt "dirty dirt" and does it have to be disposed of?

Answer:
Site investigation activities indicated some PFC impact to soils at the site, but the primary concern at Pease is the presence of dissolved PFCs in groundwater. At this time there is no indication of an on-going source of PFCs in soil and no plans to excavate soil as part of response activities at the site.

3. What is the migration direction of the contamination?

Answer:
In general, the direction of groundwater flow at the site is toward the south east, approximately along the same axis as the air field. There appears to be a groundwater divide in the northern portion of the site causing groundwater in the northern portion of the site to flow northeast toward the Piscataqua River. Locally, groundwater flow could be effected by residential and or municipal pumping wells.

4. Do plants take it up at all? Plants are not included in the EPA fact sheet.

Answer:
We don't have much information on this topic. We are looking into it and will report our findings when we learn more

Ms. Alayna Davis:
1. Why was the letter to former servicemen and women only included from 1990 to 2014? That misses 20 years of service and civilian people that could have been exposed to PFCs.

Answer:
The range of dates was identified based on the potential for exposure to PFCs from the Haven Well. Based on the assumption that a firefighting foam release, which occurred during an aircraft fire, is the source of PFC contamination found in the Haven Well, a conservative start date of January 1990 was selected.

2. Is there more history that can be provided on the TCE contamination; when it was originally discovered in the Haven Well, what was done to treat it and was it completely eliminated before the well was reopened?

Answer:
Information on historical TCE impacts at the site are available at the USEPA and NHDES. All documents relating to assessment and remediation that were submitted to regulatory agencies are public record and are available for review.

3. Does the incineration of the carbon filters cause any air pollution risk? Or does it turn into a different chemical when it is incinerated?

Answer:

Incineration of carbon filters would break the PFCs down into different compounds. The disposal facility has air discharge permits to limit discharge of potentially harmful byproducts and protect air quality.

4. How much time in between the installation of treatments?

Answer:
If this questions refers to the timeline for installation of the treatment system on the Smith and Harrison Wells by the City of Portsmouth and installation of the USAF's system, the answer is this: The City of Portsmouth has ordered the carbon filters that will be installed to treat water from the Smith and Harrison Wells. It is expected that these filters will be up and running by late summer 2016. The USAF is in the process of planning an aquifer pump test that will allow collection of data necessary to design a treatment system that will most effectively remove PFCs and restore the Pease aquifer. The USAF is working with the USEPA to establish a realistic schedule for installation and activation of this system.

RAB members around the table:
Ms. Stowell said thank you for the information and status of PFC studies. I'm wondering if we're going to be looking at some of the other sites too, to get status reports on those.

Ms. Lamson said she is very pleased to bring up the fire training area and feels that it would be very good to educate the public and RAB members so they will have a better understanding of it. A tour would be excellent for everyone. Thank you very much for having this.

Mr. Connors asked what seasonal variations are? Mr. Forbes said they are in reference to the timing of water quality measurements. If you measure it in Spring or Fall, there is a difference, based on the seasonal effects. Rainfall plays a big part.

Dr. Carignan thanked everyone for coming and said we are all concerned about levels below the PHA, especially chronic exposures and exposures during early life.

Mr. Smith said this is the first time I've been a part of a RAB. I think this is an excellent forum to educate the community. Some really great things were brought up today and it's going to help the process move forward in a better way. Is there any network to share information with other agencies?
Answer: Dr. TerMaath said yes, there is multi-service information sharing. At the Department of Defense, there's cross-service communications, as well.

Mr. Paine thanked everyone for coming and thanked Mr. Forbes and his group for the work that they're doing. His biggest concern is getting the process done as quickly as possible.

Mr. Schrager said he enjoyed being part of the committee. Are there areas in the US where there have been definitive effects by PFCs, and what are those effects to people, if any? And when will the pilot testing be conducted?

Answer:
Mr. Goetz said next week and that the pilot takes six weeks and we'll have information for the RAB.

Answer:
Dr. TerMaath said the Air Force does not have data on areas or people affected by PFCs. He suggested that question be asked at the Community Assistance Panel with ATSDR next week. Mr. Hilton said to try searching for the C8 study on the Internet.

Ms. Miller thanked Mr. Forbes for getting everything done in a month. Last time there was mention of a reading list, so if there's anything I can read I would love to have it.

Mr. Daly wanted to clarify regarding the recent press about EPA's forthcoming health advisory numbers. It will be coming later this Spring. He also has information on Technical Assistance Grants and would be willing to give a presentation on the topic in the future.

Mr. Hilton thanked everyone for coming and said it has been productive and he's looking forward to the next one.

Mr. Forbes thanked everyone for coming and being prepared and asking questions and giving us things to think about and talk about next time.

Meeting Wrap-up
Ms. Ferguson said the plan is to have quarterly meetings. The next meeting will be a site tour, with buses, and the public is welcome.
Ms. Ferguson adjourned the meeting at 8:37 p.m.

Note: After the meeting adjourned, the next Pease RAB meeting will be a site tour scheduled for July 14, 2016 at 10:00 a.m.

Attachments:
1. April 19, 2016 RAB meeting slide handout
2. Sign in sheet