

**Joint Base Cape Cod Cleanup Team
Building 1805
Camp Edwards, MA
October 12, 2016
6:00 – 8:00 p.m.**

Meeting Minutes

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Handouts Distributed at Meeting:

1. Draft final of the January 13, 2016 Meeting Minutes
2. Presentation: Request to Modify USEPA Administrative Order #2
3. Presentation: Emerging Contaminants Update
4. Presentation: IAGWSP Central Impact Area UXO Removal Update
5. JBCC CT Agenda Topics

Agenda Item #1. Introductions, Late-Breaking News, Approval of January 13, 2016 JBCC CT Cleanup Team Meeting Minutes

Ms. Donovan began the meeting and asked the team members to introduce themselves. She then introduced Kendall Walker, a DEP staff member newly assigned to the cleanup programs on JBCC. Lynne Jennings explained that she would be moving on to another job within EPA and she introduced the EPA staff that had been recently assigned to JBCC, Anni Loughlin and Ginny Lombardo.

Ms. Donovan asked if there were any comments on the January 13, 2016 meeting minutes. No comments were made. Ms. Donovan then reviewed the agenda and the items included in the handout packets.

Agenda Item #2. Public Comment Period: Request to Modify US EPA Administrative Order #2 (Request to End the Prohibition on Small Arms Live Fire and Pyrotechnics Subject to the Approval of and Oversight by the EMC) – MAJ Bagaglio, MANG and Lynne Jennings, US EPA

LTC Bagaglio, Massachusetts Army National Guard (MAARNG) Environmental Program Manager, gave a presentation on the MAARNG's request to the US Environmental Protection Agency Region 1 (US EPA) to modify its Administrative Order 2, lifting the prohibition on small arms live fire and pyrotechnic use at Camp Edwards on Joint Base Cape Cod.

LTC Bagaglio explained that the request would include ending the Pilot Period for the STAPP™ ranges (Juliet, Kilo and Tango Ranges) and allow for the continued use of those ranges, lift the prohibition on live fire and pyrotechnic use, and recognize the Commonwealth of Massachusetts' Environmental Management Commission (EMC) as the oversight body for small arms range and pyrotechnic activity at Camp Edwards.

Currently, he said, there is oversight through two bodies: the US EPA, through Administrative Order 2, and the EMC, through the Environmental Performance Standards established by Chapter 47 of the Acts of 2002. The two bodies have very similar pieces. The EMC consists of the Commissioners of the Departments of Fish and Game, Environmental Protection, and Conservation and Recreation. They are supported by two advisory councils, the Science Advisory Council and the Community Advisory Council, along with an Acting Environmental Officer, Mr. Len Pinaud, who is the primary enforcement agent for the Environmental Performance Standards (EPSs).

LTC Bagaglio said the EPSs dictate how the MAARNG utilizes the Camp Edwards Training Area/Upper Cape Water Supply Reserve and they were developed by a team of scientists, legal professionals and the community through the Massachusetts Environmental Policy Act (MEPA) process. The standards were set to provide further protection of the wildlife habitat and groundwater in the Training Area and ensures environmentally-compatible military training. He explained that one general EPS limits ammunition/live weapon fire, prohibiting it outside of established small arms ranges. Live weapons-fire is not allowed on established small arms ranges except in accordance with EPS 19, other applicable EPSs and a range-specific plan approved through the EMC. EPS 19 establishes several key elements, including capturing and containing ammunition, range maintenance and monitoring, and communication.

LTC Bagaglio said that reducing redundant processes will still provide for oversight through the EMC, maximize limited training time and resources, utilize small arms weapon systems, ensure compatible military training, provided opportunities for community input through the EMC's advisory councils, and maximize joint use. He said that EPS 19 contains all of the requirements of Administrative Order 2, as well as the requirements established in Chapter 47 of the Acts of 2002.

He then explained the environmental monitoring conducted by the MAARNG including soil, porewater and groundwater sampling on the Small Arms Ranges. Since the return to live fire, nothing has been found above regulatory limits. All soil samples have been nondetect or below the action levels for metals, and groundwater samples have been nondetect or below the action levels with one anomalous exception. The MAARNG also sampled porewater, for which there are no established regulatory limits. Antimony has been found about action levels established in the Operations, Maintenance and Monitoring Plan of 6 ppb at Juliet, India and Kilo ranges. LTC Bagaglio said that these findings are attributed to legacy range soils and the use of phosphates to bind lead. Phosphates increase antimony mobility; the mobility is abated when antimony hits native soils. He said that sampling below and around the lysimeters has been nondetect. He explained that the anomalous lead detection in groundwater was about the action level of one half the drinking water standard. When the sample was taken, there was not enough water to sample so a grab sample was taken using a bailer. The analysis showed 24 ppb for lead. When it was resampled, the analysis should 4.1 ppb, below the action level.

LTC Bagaglio discussed the EMC's approval process for Small Arms Ranges. The EMC's Environmental Officer reviews the range design, range management and environmental monitoring plans, and reviews pyrotechnic use and standard operating procedures. There are multi-level reviews throughout the process.

Mr. Winter asked, "What are pyrotechnics and which kind were used?" LTC Bagaglio explained that they are items which make noise, but are not ammunition, such as hand grenade simulators or the percussion actuated neutralizer used by the Explosive Ordnance Team, which fires blanks.

Ms. Reilinger asked why a STAPP™ system will not be used on Echo Range. LTC Bagaglio said that the STAPP™ systems are costly to maintain in terms of maintenance and water removal (pumped out of the system) and, based on the science, the ammunition that will be fired on Echo range does not break apart and become exposed to the environment because the round moves much slower when fired. He said that with monitoring, an earthen berm will be as effective and it is easier to maintain and remove the bullets than a STAPP™ system.

Mr. Dinardo said it's encouraging to know the program works to increase some of the ranges uses. He asked if the monitoring program is fully funded and supported. LTC Bagaglio said that it has been funded since its inception and he manages the budgets for that.

Mr. Amirault asked about the cost difference/cost savings between operating the STAPP™ system as opposed to managing an earthen berm. LTC Bagaglio responded that there are two full-time employees that manage STAPP™ maintenance and the MAARNG is in the midst of conducting the first cleanout of one of the systems, with a bid of \$135,000. The useful life of the system is 10-15 years before it needs to be replaced and when removed, the entire system is treated as hazardous waste because of the lead in it. A new system would then need to be installed. Another cost is the \$6.50 per gallon for disposal of the water removed from the systems; approximately 1,500 gallons per year are removed. He said that added up, it's upwards of ½ to ¾ million dollars over a ten year period versus an earthen berm, which is mostly an employee salary and there is also much less concentration of hazardous material.

Mr. DeWitt said that the MAARNG has relied on the Community Advisory Council, but they've been having trouble meeting. He asked if there are impacts associated with the inability of the CAC to meet. LTC Bagaglio said that in the year that he's the Environmental Program Manager there have been two successful meetings with quorums. He has not seen any problem with making a meeting happen.

Mr. DeWitt asked that, primarily related to pyrotechnics, how the MAARNG determines which contaminants should be monitored. LTC Bagaglio said that the MAARNG looks at the MSDS (material safety data sheets) for a product and that is vetted through EMC/EPA and they determine what should be monitored and then the MAARNG develops a plan to monitor that. Mr. Cody gave the example of perchlorate, which many years ago was an emerging contaminant found at JBCC. That put the Department of Defense on track to find munitions that are environmentally friendly. When those are developed, the MAARNG looks at the MSDS and works with the EMC for any type of decision to be made.

Ms. Jennings gave a presentation on the EPA's position on the MANG request to modify the prohibition on firing of lead ammunition and the use of pyrotechnics. She provided background on EPA's role and said that starting in 1997, EPA issued four Administrative Orders under the Safe Drinking Water Act. The Orders were intended to protect drinking water supply; the first Order required investigating if training was impacting groundwater. Once it was determined that there were actual impacts from training, Administrative Order 2 ceased all training on the base, from large munitions to small arms training, including pyrotechnics. Training was terminated until EPA could investigate and determine the extent of the contamination and what needed to be done to clean it up.

Ms. Jennings said that when EPA issued the Orders, it actually did contemplate that the orders could be amended in the future, if the MAARNG showed/demonstrated training could be done in an environmentally safe and responsible manner. She said that EPA required several things to be done before the Orders could be amended. First, a complete investigation of the base be conducted, but more importantly if there was a range that was going to be used for training, EPA wanted to finish the investigation and cleanup of that range before allowing it to be used for

training. Also, if it could be demonstrated to EPA through a pollution prevention plan that training could be done in a safe manner, EPA would consider an actual amendment to the order.

Ms. Jennings explained that EPA has amended Administrative Order 2 several times in the past, the first was in 2007 to allow training with lead bullets on Tango Range, when STAPP™ was first introduced. EPA took a lot of precautions in allowing that training to resume. The MAARNG put together an OMMP and approved it under a pilot program with monitoring and data provided to the EPA. In 2009, Administrative Order 2 was amended when two more ranges were brought on line--Juliet and Kilo. Since then, EPA has approved annual extensions of the pilot program.

In addition, the MAARNG petitioned EPA on three occasions to authorize pyrotechnic devices. To receive approval, the MAARNG had to prove that they could be used in an environmentally safe way. The MAARNG provided a list of the inert items in them. In the first pyrotechnic to be approved, there was a trace amount of perchlorate, so the MAARNG had to do a physical demonstration of the pyrotechnic before the approval was granted. On each occasion, in 2012, 2013, and 2016, the MAARNG had to demonstrate that it could be used in an environmentally safe way. In all cases they were approved with a specific plan in place.

For the MAARNG's current request, they sent a letter to EPA requesting to modify Administrative Order 2 again to alter the prohibition on lead and alter the prohibition on pyrotechnics, terminate the pilot project and approve the Pilot Period Final Report, which demonstrates that training was done in an environmentally safe way, and to recognize that the EMC should be recognized as the oversight body.

Ms. Jennings said that to amend the order, the EPA has to make certain findings of fact to support the decision. She said the key items to making the decision are: all the Soil Cleanup has been completed at all Small Arms Ranges per the Administrative Orders; during the nine-year pilot period, the Action Levels for soil didn't exceed the target action levels at the active Tango, Juliet, or Kilo ranges; based on current data, the EPA has a good comfort level that the MAARNG can train with lead bullets in an environmentally safe way; and the MAARNG have been monitoring the groundwater and will continue to do so.

Regarding pyrotechnic use, Ms. Jennings said that impacts from pyrotechnic use can be minimized with proper controls: limiting the numbers used, approved standard operating procedures and preapproving the chemical makeup of the items. With certain limitations, the MAARNG has been allowed to proceed with the three simulators.

Along with looking at the whole process, Ms. Jennings explained that EPA evaluated the regulatory structure. She said it's true that there is a lot of redundancy between the EPA's requirements and the state's requirements. When the Administrative Orders were first issued in 1997, there was no EMC and no EPSs. EPA wanted to make sure they had confidence in the state's ability to not only regulate that but provide staff to oversee it. We have a lot of confidence of the state's ability to oversee this into the future, she said.

Ms. Jennings said that EPA proposes to permit firing of lead ammunition at Juliet, Kilo, and Tango; permit firing of lead ammunition or other "live" ammunition at other small arms ranges; permit the use of pyrotechnics M116A1 Hand Grenade, the M228 fuse used with the M69 Hand

Grenade, and the Percussion Actuated Neutralizer; permit the use of other pyrotechnics at or near the Training Range and Impact Area will not be excluded, provided each receives continued approval and oversight from EMC in accordance with the EPSs.

Ms. Jennings explained that this is not a “blanket lift,” everything must be in accordance with the EPSs, which are consistent with Administrative Order requirements. She said the other conditions are in place: continued compliance with all conditions established by the EMC; that the MAARNG requests and receives the funds necessary to ensure compliance with the approved Operations, Maintenance, and Monitoring Plans; does not extend to any other ammunition or training device—it is specifically limited to Small Arms Range and pyrotechnic use; training will not interfere with the completion of investigation and cleanup activities; and EPA will evaluate the decision every five years.

Ms. Jennings said the next steps are a public comment period. EPA’s proposal is in a very detailed letter, which is available on EPA’s web site. Written comments may be submitted to Ms. Jennings. EPA will then consider the comments and issue a final decision in a letter sent to the MAARNG.

Mr. Goddard asked if there has been a replacement for Mr. Mark Begley, the former EMC environmental officer. Mr. Pinaud answered that he is currently the acting environmental officer. Mr. Goddard asked if, in that acting position, Mr. Pinaud has time allotted for site inspections. Mr. Pinaud said that he spends some of his time in the Southeast Region and some at Camp Edwards. He has done 20 to 21 inspections since January 2016.

Mr. Goddard asked Ms. Jennings to describe the process of management on Echo Range, in particular when the berm will be screened. Ms. Jennings replied that is still being worked out. Mr. Goddard asked if the entire berm would be replaced if there is degradation into the soils. Mr. Cody said that normally, the MAARNG would remove the bullets out of the “pocket” behind the target. He said the MAARNG doesn’t want bullets to build up in the pocket where they could hit each other. Ms. Jennings said that when the berms were originally built, there were a lot of rocks in the soil, causing the bullets to fracture. She said the new Echo Range berm design specifies the type of soil to be used. Mr. Cody said it’s as close to sand as possible and still maintain growth. Mr. Goddard asked if there will be a layer of clay on the bottom of the berm. Mr. Cody replied not necessarily clay, but it’s something that under discussion going forward. Ms. Jennings said there’s ways to compensate. With STAPP™, she said, the frequency of opening it and pulling lead out was allowed to go for a while because of the underlying liner. A soil berm could mean removing the bullets more frequently and evaluating concentrations of lead in the soil. She said that will be worked out in the Operations, Maintenance and Monitoring Plan.

Mr. Winters referred to EPA’s review of the decision every five years and asked if monitoring data will be reviewed every year to ensure problems are found prior to the five year review. Ms. Jennings said the MAARNG provides an annual report which includes groundwater data to EPA every year and they will continue looking at those. The MAARNG has been monitoring for nine years and they haven’t seen anything, which gives EPA some comfort, she said.

Mr. Amirault asked if EPA will address responses to substantial comments received in an errata sheet format. Ms. Jennings said that they will paraphrase/summarize significant comments and

will provide written responses, including how the comment was considered and how it affected EPA's decision. That is attached to the final decision, she said.

Mr. Hocking asked about the potential for groundwater contamination, "Is it zero evidence or no evidence below a certain standard?" Ms. Jennings replied that data from groundwater monitoring that began since they've been training shows that training has no impacts; there are no contaminants above the drinking water standard or the action levels in the groundwater right now. She expects that to continue as long as the MAARNG operates the ranges as they've been approved. Mr. Hocking said that "no impacts" is a little different than his understanding of what is happening on Currier Road where "impacts are zero and not below a standard." Ms. Jennings explained that is a different compound and contamination from a different activity, which will be addressed in a presentation later in the evening. Ms. Jennings said she is only talking about impacts to groundwater related to training with bullets. There are other activities on base that caused impacts to groundwater and residents' wells. She said we don't expect this activity to add any other contaminants to the groundwater. Mr. Hocking asked if Ms. Jennings is saying there's zero evidence of any contaminants from the use of live ammunition. Ms. Jennings reiterated that there's no evidence from training with bullets or pyrotechnics.

Agenda Item #3. Emerging Contaminants Public Meeting Update

Ms. Forbes defined AFCEC's role at JBCC and explained how AFCEC has been responsible for working on multiple source areas and groundwater plumes since 1996. She stated that the plumes originated on base and most have migrated off-base, and that the following presentation is on emerging contaminants, mainly focusing on perfluorinated compounds (PFCs) and 1,4-dioxane.

Ms. O'Reilly from CH2M presented the Emerging Contaminants update for 1,4-dioxane at sites Chemical Spill-20 (CS-20) and CS-10, PFCs at the Flight Line Area and PFCs and 1,4-dioxane at Ashumet Valley and Landfill-1 (LF-1).

Ms. O'Reilly presented background information on PFCs and 1,4-dioxane. She explained that PFCs are compounds used in the formulation of Aqueous Film Forming Foam (AFFF) which the Air Force has used in fire training exercises, suppressing aircraft and other vehicle fires, and in aircraft hangar fire suppression system since 1970. She said that AFFF is used in other fire departments on the Cape and elsewhere. PFCs are also used extensively in household and industrial products, clothing and food wrappers.

Ms. O'Reilly explained that the most commonly encountered PFC compounds are perfluorooctane sulfonate (PFOS) and perfluorooctanoic acid (PFOA). There are no Federal Maximum Contaminant Levels (MCLs) or Massachusetts MCLs (MMCLs) for PFCs. In May 2016, EPA issued the Final Health Advisory values (HAs) for PFOS and PFOA which is set at 0.07 micrograms per liter ($\mu\text{g/L}$) for each and combined. The Provisional Health Advisory (PHA) values of 0.2 $\mu\text{g/L}$ for PFOS and 0.4 $\mu\text{g/L}$ for PFOA have been updated with the Final HAs.

Ms. O'Reilly presented information on 1,4-dioxane. The primary industrial use of 1,4-dioxane was to stabilize solvents, particularly 1,1,1-trichloroethane (1,1,1-TCA). 1,4-Dioxane is commonly associated with 1,1,1-TCA or its breakdown product 1,1-dichloroethene (1,1-DCE). 1,4-Dioxane has also been used in printing and textiles (e.g., polyester), household cleaners and detergents, cosmetics, paints, varnishes, and paint remover, industrial processing of fats and oils, pharmaceuticals, and the chemical industry. 1,4-Dioxane is soluble and mobile in groundwater and does not readily break down in the environment. There are no MCLs or MMCLs for 1,4-dioxane in drinking water, but there is an EPA risk-based Regional Screening Level of 0.46 µg/L and MassDEP Massachusetts Contingency Plan (MCP) Groundwater-1 (GW-1) Standard and Office of Research and Standards Guidance of 0.3 µg/L.

Ms. O'Reilly reported that the Air Force Civil Engineer Center (AFCEC) is completing Preliminary Assessments (PAs) to determine potential releases of PFCs at 82 Air Force and Air National Guard (ANG) installations nationwide related to suspected releases from AFFF usage or storage. Ten JBCC sites where the potential for AFFF to have been released into the environment were included in the Flight Line Area SI. AFCEC completed an SI equivalent 1,4-dioxane field investigation in 2013/2014 at the JBCC chlorinated solvent plumes and 1,4-dioxane was detected in four plumes: Ashumet Valley, CS-10, CS-20, and LF-1. AFCEC is conducting Supplemental RI/Feasibility Studies (FS) at these four JBCC groundwater plumes to determine the nature and extent of 1,4-dioxane contamination and to gather the data required to complete Supplemental RI/FS reports. The Supplemental RI/FS reports for Ashumet Valley and LF-1 will also include PFCs since their source areas (Fire Training Area-1 [FTA-1] and the former Sewage Treatment Plant [STP] at Ashumet Valley and a landfill at LF-1) are also potential sources for PFCs.

Ms. O'Reilly reported on the CS-20 Supplemental Remedial Investigation. The field program included the sampling of 32 monitoring wells, two extraction wells, two treatment plant ports, one private drinking water well currently in the CS-20 Land Use Control (LUC) program, and one Deep Pond surface water sample. The Draft Supplemental RI report was submitted in June 2016. 1,4-Dioxane was detected at concentrations exceeding the MCP GW-1 standard of 0.3 µg/L in two monitoring wells and was detected above the reporting limit in two additional wells. These four wells were sampled between March 2014 and August 2015 and were resampled in May 2016 and concentrations in all four wells decreased. 1,4-Dioxane concentrations in only one well currently exceed the GW-1 standard with 0.48 µg/L detected at 69MW1422 in April 2016. There is no current complete exposure pathway to the 1,4-dioxane groundwater contamination, the extent of contamination is very limited, and the remaining 1,4-dioxane contamination is expected to decrease to concentrations below the GW-1 standard within one to two years through the process of natural attenuation. An interim monitoring program for 1,4-dioxane at CS-20 will be conducted for a period of two years to monitor the continued natural attenuation of the remaining 1,4-dioxane contamination and the data from the interim monitoring program will be used to determine next steps. Ms. O'Reilly presented a figure depicting CS-20 sampled wells and detections of 1,4-dioxane in the groundwater.

Ms. O'Reilly reported on the CS-10 Supplemental RI summary and conclusions. The field program included the sampling of 61 CS-10 monitoring wells, the CS-10 influent and effluent plant sampling ports, the 19 operating CS-10 extraction wells, the JBCC water supply well (JWELL) and the JBCC golf course irrigation well (BWELL), three surface water samples located in Ashumet Pond, and three surface water samples located in Johns Pond. The Draft

Supplemental RI report was submitted in September 2016. 1,4-Dioxane was detected at concentrations exceeding the MCP GW-1 standard in 10 monitoring wells with a maximum concentration of 3.7 µg/L in 03MW1066B. These 10 wells are located in the northwestern portion of the CS-10 plume. Although there are some areas of uncertainty, the 1,4-dioxane plume was conservatively delineated as extending over an area that is approximately 3,000 feet (ft.) wide, up to 3,000 ft. long, and up to 130 ft. thick. The presence of 1,4-dioxane at CS-10 is not expected to extend the current estimate of restoration timeframe (2060) for trichloroethene (TCE). 1,4-Dioxane will be added as a contaminant of concern for the CS-10 plume and a streamlined Supplemental FS will be completed that evaluates remedial alternatives. Additional sampling is planned prior to proceeding with the FS. Ms. O'Reilly presented a figure depicting CS-10 wells sampled and detections of 1,4-dioxane in the groundwater.

Ms. O'Reilly gave an update on the LF-1 Supplemental RI. Since PFC contamination has been associated with other landfills, the EPA requested sampling of the LF-1 extraction wells for PFCs. Results confirmed the presence of PFCs at LF-1 and PFCs were added to the LF-1 Supplemental RI Program initially established for 1,4-dioxane. The field program included the sampling of 105 LF-1 monitoring wells, the LF-1 influent and effluent plant sampling ports, the six operating LF-1 extraction wells, and surface water/seep sampling in Red Brook Harbor and Squeteague Harbor. Validated analytical results were presented for 69 monitoring well locations. 1,4-Dioxane concentrations in 18 monitoring wells exceeded the GW-1 standard of 0.3 µg/L for 1,4-dioxane. The highest concentration (2.8 µg/L) was detected in 27MW2134A which is located approximately 1,000 ft. downgradient of the LF-1 landfill. PFOS concentrations in three monitoring wells exceeded the HA of 0.07 µg/L. The highest concentration (0.37 µg/L) was detected at 27MW1003A. PFOA concentrations at three monitoring wells exceeded the HA of 0.07 µg/L. The highest concentration (0.24 µg/L) was detected at 27MW1007B. PFOS + PFOA concentrations exceeded the HA of 0.07 µg/L at six monitoring wells. The Draft Supplemental RI report is scheduled for submittal in June 2017. Ms. O'Reilly presented figures depicting LF-1 wells sampled and detections of 1,4-dioxane and PFOS and PFOA in the groundwater.

Ms. O'Reilly reported on the Flight Line Area SI Report summary and conclusions. The investigation strategy for the SI focused on determining whether a release of AFFF to the environment had occurred by sampling the groundwater media at 10 sites for PFC analysis. The draft report was submitted in April 2016 and groundwater monitoring results were presented in comparison to the PHAs. PFOS concentrations exceeded the PHA of 0.2 µg/L at six sites. The maximum PFOS concentration detected was 21 µg/L at the Former Building 118 Release Area/Drainage Ditch #3 site. PFOA concentrations exceeded the PHA of 0.4 µg/L at one site, the Former Building 118 Release Area/Drainage Ditch #3 site. The maximum PFOA concentration detected was 0.8 µg/L. Due to conflicting information the Runway 32 Approach Area will be investigated under future RI activities for the Former Building 118 Release Area site. Further action was recommended at Hangar 3170/3172 because of the high probability for soil contamination based on AFFF use and the operational history at this location. PFC concentrations in the groundwater did not exceed PHAs at the remaining two sites (FS-1 and Hangar 2816) but concentrations did exceed the HAs and these two sites are also recommended for further investigation. Ms. O'Reilly presented a figure depicting the flight line area sites and group classifications of AFFF with Group 1 showing the highest concentration of AFFF. She followed with a table of the Flight Line Area Site Inspection report summary.

Ms. O'Reilly report on the two separate tanker truck rollovers. Truck Rollover #1 occurred on 19 January 2000 within the southwest portion of JBCC on Connery Avenue, near the JBCC entrance near the Route 28 rotary. A tanker truck rolled over while entering the base, releasing approximately 300 gallons of fuel. The Base Fire Department responded to the crash site and applied approximately 500 gallons of 3% AFFF/water mixture (15 gallons of AFFF concentrate) to suppress the flammable vapors. AFFF may have drained into storm sewer inlets near the rollover area. Tanker Truck Rollover #2 occurred off base on 19 September 1997 within the Route 28 Rotary, west of the JBCC entrance. The tanker truck rolled over at the Route 28 Rotary as it was heading south to the steamship authority, releasing approximately 520 gallons of fuel. The Base Fire Department responded to the crash and used AFFF/water mixture to suppress the flammable vapors. AFFF may have drained into storm sewer inlets near the rollover area. Private well outreach and sampling were added to the Tanker Truck Rollover #1 and #2 SI field program after PFC contamination was detected in direct push groundwater vertical profile borings located downgradient of the base boundary. Eight private drinking water wells were identified (Valley Farm Road); one residence is unoccupied. Seven private wells were sampled for PFC analysis and PFOS concentrations at three private wells are above the HA. Bottled water delivery began in March 2016 and is continuing for the three residences that are above the HA. Household filtration systems for these three residences are being evaluated by AFCEC. Surface water samples were collected from the Wilson Bog complex which is located adjacent to Valley Farm Road and results were screened against HAs for drinking water. Three samples were collected from the W-2 bog ditch (FLSW0001), Red Brook Pond irrigation pipe intake (FLSW0002), and Wilson Bog Pond outlet (FLSW0003). PFOS concentrations were above the HA at FLSW0001 (0.31 µg/L) and FLSW0003 (0.16 µg/L). Ms. O'Reilly reviewed a figure depicting the PFOS and PFOA results from both truck rollovers.

Ms. O'Reilly gave an update on the Ashumet Valley Supplemental RI. The field program included the sampling of 126 monitoring wells, five irrigation wells, four extraction wells, the Ashumet Valley influent and effluent plant sampling ports, surface water sampling in Ashumet and Johns ponds, and the completion of five direct push groundwater vertical profile borings. Regarding groundwater she reported that 1,4-dioxane concentrations at 16 monitoring wells, one extraction well, and one direct push boring exceeded the MCP GW-1 standard of 0.3 µg/L. The highest concentration (0.993 µg/L) was detected in the northern plume lobe (30MW0585A). PFOS concentrations at 35 monitoring wells and one direct push boring exceeded the HA of 0.07 µg/L. The higher PFOS concentrations are located between the source areas (FTA-1 and STP) and Ashumet Pond. The highest concentration (27 µg/L) was detected near the source area (USFW343057). PFOA concentrations at 32 monitoring wells and one direct push exceeded the HA of 0.07 µg/L. The highest concentration (9.8 µg/L) was detected near the source area (30MW0417C). PFOS + PFOA concentrations exceed the HA of 0.07 µg/L at 42 monitoring wells and one direct push boring. Monitoring results indicate the need for source area soil sampling for PFCs. Ms. O'Reilly stated that 1,4-dioxane has detached from the source area just like the volatile organic compounds (VOCs) have. Tetrachloroethene (PCE) and TCE are being treated by carbon, but because carbon is ineffective at removing 1,4-dioxane, the 1,4-dioxane was being discharged to the trenches.

Ms. O'Reilly discussed the residential well sampling program at Ashumet valley and said that due to the presence of PFCs and 1,4-dioxane in the Ashumet Valley plant influent and/or effluent, residential well sampling near the infiltration trenches has been ongoing. Outreach to neighborhoods located downgradient of Ashumet Valley infiltration trenches identified 54

private drinking water wells. Many wells have been sampled quarterly since July 2015. ReInjection of plant effluent to the Currier Road trench was discontinued on 29 September 2015 since these private wells are located near the Currier Road trench. 1,4-Dioxane concentrations are below the GW-1 standard of 0.3 µg/L at all private wells, decreasing trends have been observed at private wells located along northern portion of Currier Road, and 1,4-dioxane continues to be nondetect in private wells near Sandwich Road infiltration trench. The sum of PFOS and PFOA currently exceeds the HA at six private wells. Bottled water is being delivered to these six residences. One residence dropped below the HA in June 2016. Decreasing trends have been observed along the northern portion and increasing trends have generally been observed southeast of the trench. PFC concentrations in private wells near the Currier Road trench is primarily comprised of PFOA. PFOS appears to have been more effectively treated by granular activated carbon. Ms. O'Reilly presented figures depicting Ashumet Valley sampled wells and detections of 1,4-dioxane and PFOS and PFOA in the groundwater. Ms. O'Reilly presented a figure showing private well PFOS and PFOA results in the Ashumet Valley infiltration trench areas.

Ms. O'Reilly presented the Ashumet Valley surface water sampling program. She stated that surface water samples from each of the recreational beach locations along the shores of Ashumet and Johns ponds were sampled for 1,4-dioxane and PFCs. 1,4-Dioxane was detected in one surface water sample collected from Johns Pond (03SWJP03) at a very low estimated concentration (0.018J µg/L) below the reporting limit. 1,4-Dioxane was not detected in the other five surface water samples. PFOS was detected at all six locations at concentrations ranging from 0.083 µg/L to 0.18 µg/L. PFOA was also detected at all locations at lower concentrations (0.025 µg/L to 0.059 µg/L). Shallow, mid-depth, and deep pond samples were collected from an interior location at each pond (ECAMP02 and ECJNP03) to characterize the water column in each pond. PFOS and PFOA results were consistent with initial sampling. Surface water samples were collected from other ponds on Upper Cape Cod and submitted for PFC analysis. Data indicate that PFOS and PFOA are present in Ashumet and Johns ponds at concentrations greater than nearby surface waters. In response to detections of PFOS and PFOA in surface water at Ashumet and Johns ponds, the areas downgradient of the ponds were reviewed for the presence of private drinking water wells.

Ms. O'Reilly discussed the Ashumet and Johns Ponds Residential Well Sampling Program. She stated that AFCEC reviewed Mashpee Water District (MWD) account records and 11 private wells have been identified to date. Ten private wells have been sampled and access is pending at one location. Results have been received for nine locations and the sum of PFOS + PFOA concentrations are above the HA at seven locations. Bottled water is being delivered to seven residences that are above the HA, one residence is seasonal and currently unoccupied. Water account records at the town of Falmouth Water Department and MWD are being reviewed to identify properties that have a structure but no municipal water account. She referred to the figure which depicted the researched area. Ms. O'Reilly presented two figures – one depicting PFOS and PFOA results at Ashumet and Johns Ponds private wells and another showing the research area for Ashumet and Johns Ponds private wells.

Ms. O'Reilly reported on the surface water/irrigation well sampling program. She stated that eight Backus River surface water and four irrigation wells were sampled in June and August 2016. PFCs and 1,4-dioxane detections were below applicable advisory values/standards. Surface water/irrigation well samples were collected from additional cultivated bog/farm areas in

September 2016. One surface water (95SWCB01) and one irrigation well sample (95IG0007) were collected from Collins Bog. Three surface water samples were collected from Bourne's Pond River (Hammond Bog) (ECBPR03, ECBPR05, and ECBPR06). One surface water sample was collected from Pond 14 (69SW0527) which provides irrigation for Andrews Farm. Bogs south of Pond 14, Quashnet, Garner, and Farley Bogs are not cultivated and were not sampled. PFCs and 1,4-dioxane detections were below applicable advisory values/standards. Ms. O'Reilly presented a figure displaying particle tracks originating at Ashumet and Johns Ponds. In conclusion to the presentation, Ms. O'Reilly presented the path forward. She stated that AFCEC will begin interim monitoring program for 1,4-dioxane at CS-20 and finalize the Supplemental RI report after interim monitoring program is completed. AFCEC will continue the Valley Farm Road private well sampling program, the Ashumet Valley private well sampling program, and Ashumet and Johns ponds outreach and private well sampling program. Installation will begin of water filtration systems at residences with HA exceedances. The Ashumet Valley Supplemental RI/FS scope will be expanded to include the Ashumet Valley source area soil investigation and Ashumet and Johns ponds areas. A determination of the scope of interim Ashumet Valley deliverables and submittal dates will be made. The Draft Focused SI Report for PFCs at the Flight Line Area will be finalized, and AFCEC will also determine the scope of follow-up investigations for sites identified in the report. The Draft Supplemental RI Report for 1,4-dioxane at CS-10 will be finalized and the Draft Supplemental RI Report for 1,4-dioxane and PFCs at LF-1 will be submitted. Sample results and field program updates will be presented to the agencies at Technical Update Meetings and to the public at future JBCC Cleanup Team Meetings. Lastly, AFCEC, EPA, and MassDEP will follow-up on the MassDEP letter on cranberries and surface water.

Mr. Goddard asked if the cleanup standards for PFCs are based on ingesting them. Ms. Forbes stated that the health advisories are for ingestion and that bottled water should be used for drinking and cooking but that showering in water with PFCs was not a concern.

Mr. Goddard asked if the PFCs are being treated by the Granular Activated Carbon (GAC) units in the treatment plants. Ms. Forbes stated yes. Mr. Goddard then asked what can treat 1,4-dioxane. Ms. O'Reilly stated that there are other treatment options to remove 1,4-dioxane as carbon is not an effective treatment. Ms. Forbes stated that ultraviolet oxidation will be evaluated as an option as part of the upcoming feasibility study to address 1,4-dioxane.

Mr. Goddard suggested that Air Force sample for PFCs at all treatment plants on a regular basis so not to be surprised later on to find PFC detections there.

Ms. Forbes explained that as part of the Preliminary Assessment the Air Force is identifying places where AFFF was used. She continued that there is no evidence of AFFF use at CS-10 or any of the other plumes not currently being investigated. She said where there is evidence of PFCs, the Air Force will conduct sampling.

In reference to the two tanker truck rollovers at the Otis Rotary, Mr. Goddard asked if there was any liability for the carriers. Ms. Forbes stated that the 1997 rollover involved a tanker truck under contract to the Steamship Authority and the other in 2000 was a military transport. She stated it might be hard to identify the effects/liability for each but that might be looked at in the future.

Mr. Winters stated that he appreciated the details on the figures. He also asked about getting more data or a scale showing the ranges. Ms. Forbes stated that a data table or using larger

colored dots for higher concentrations could be used in the future. Mr. Gregson mentioned “spider maps” which are call-out boxes for individual monitoring wells that show contaminant trends over time, which have been used in the past. Ms. Forbes stated that there is much more information to come.

Mr. DiNardo asked that groundwater flow direction would be helpful if depicted on all figures, not just some. He asked if the Air Force is attributing the PFC detections around the rotary only to AFFF from rollovers since it was only about 30 gallons of AFFF combined from both rollovers that was used. Ms. Forbes responded that the conceptual site model confirms it is from the rollovers. Mr. DiNardo asked about the current stockpile of AFFF and future plans for it. Ms. Forbes stated the AF has a 3-phase approach to dealing with AFFF. First, any AFFF in barrels are to be removed from inventory and shipped for destruction through incineration. Second, any AFFF in fire response vehicles should be removed and replaced with an alternative. Third, remove and replace any AFFF devices in hangars. Ms. Forbes stated that this is only Air Force policy and that the base fire department is a state-run operation.

Mr. DiNardo asked if there was a replacement for AFFF. Ms. Jennings, USEPA, stated that replacements exist. Mr. Goddard stated that they replaced AFFF at the Bourne Landfill with organic FireGuard which is specifically designed to avoid contamination, but that it is very expensive. Mr. Goddard asked if the state has a position or plan for future use of AFFF. The comment was taken as an action item to be addressed by MassDEP.

Mr. McCarthy, homeowner on Currier Road and McCarthy Lane, stated that bottled water is being supplied by the Air Force at both locations. He stated that one of his neighbors had the carbon filtration system installed but it was not filtering effectively. Mr. McCarthy asked if the filtration system was the only option or is getting hooked up to town water still a possibility. Ms. Forbes stated that the carbon systems will only be effective if maintained and that is part of the contract which has been awarded and eligible homeowners should be contacted in the next two weeks to arrange a site visit and then installation. She also stated that 1,4-dioxane is not removed by carbon but that all private well test results to date for 1,4-dioxane have been below the GW-1 standard.

Mr. McCarthy asked how many homes in his area will get filters. Ms. Forbes stated there are currently six. She stated that even though one dropped below the health advisory level for PFCs in the June sampling round that home is still slated to receive a filter as several rounds of sampling are needed to establish that the well water will be safe to use in the future.

Ms. Valente, homeowner in Mashpee, stated that she is receiving bottled water. She asked why municipal water connections were not being provided for the affected Mashpee homes and thus forgo the need for bottled water, filtration/maintenance. Ms. Forbes stated that municipal water connections would take a much longer time and is very expensive but it remains an option. Ms. Valente asked about 1,4-dioxane in the Johns Pond area. Ms. Forbes stated that 1,4-dioxane is not an issue around Johns Pond nor for area private wells.

Mr. Amirault asked if there will be any residual 1,4-dioxane in the piping to households – “Will there be any dioxane memory?” Ms. Forbes asked if Mr. Amirault was referring to PFCs and he replied yes. Ms. Forbes stated that PFCs should not stick to the piping and that testing of the effectiveness of the filtration systems will be confirmed at the time of installation.

Denis LeBlanc asked how PFC concentrations in Currier Road private wells compare to levels seen in the effluent at Ashumet Valley Treatment Plant. Ms. O'Reilly stated that there was consistency and that recent direct push borings near the two trenches supported that. She also said that in Mashpee, the levels of PFCs in Ashumet and Johns Ponds are consistent with levels found upgradient in monitoring wells.

Mr. LeBlanc stated that there is growing evidence that septic systems are a contributor to the PFCs in groundwater. Ms. O'Reilly stated that is a difficult task to identify what is coming from septic discharge and the infiltration trenches. Ms. Forbes mentioned that a lot of research has been done by Silent Spring that shows very low levels of PFCs in various areas on Cape Cod. Mr. James Hocking, Currier Road resident, asked if filtration devices would only be provided to those homeowners whose wells tested above the health advisory limit or will nearby properties also be put on filters. Ms. Forbes stated that current Air Force policy is to provide filters for only those properties above the EPA health advisory level. Mr. Hocking stated that is not encouraging.

Mr. Arthur Vose stated that he has chickens, horses and a garden and asked if the PFCs are affecting the animals, eggs and garden and if anyone was looking at this issue. Ms. Lynne Jennings stated that the current EPA health advisory is only for human consumption. She stated that it is too early in the process for determining the full impact of emerging contaminants and future studies and findings will give us more information.

Mr. Leonard Pinaud stated that a letter had been sent to the Air Force on 23 September 2016 by several state agencies: MassDEP, Mass DPH and the Massachusetts Department of Agricultural Resources. He stated that the letter asked for an immediate response from the Air Force to the state's request for: the sampling and analysis of cranberries where PFCs have been detected in bog water, development of a baseline and guideline for the safeness of cranberries with respect to PFCs, providing a subject matter expert in the future to better inform the stakeholders on this issue, and providing compensation to the grower if the Air Force won't conduct testing. He also stated that the bog owner, Mr. Handy, has delayed the harvesting of his affected bog in Pocasset but will probably harvest in the next 10-14 days. Mr. Pinaud stated that he has not received a formal response from the Air Force.

Mr. Goddard asked about past protocols related to cranberries (EDB and the Fuel Spill 28 plume). Ms. Forbes stated that in that situation a special congressional action occurred to provide reimbursement to the affected cranberry growers. Mr. Pinaud stated that the state will continue to work with EPA and the Air Force to come to some resolution on this issue.

Ms. Diane Rielinger asked if any new exceedances in private wells would result in bottled water and a filtration system. Ms. Forbes stated that in the Currier Road area the Air Force is treating each property on a case by case basis as the emerging contaminants appear to be moving south. She stated that bottled water would be provided as the initial response for an exceedance and then a filter installation until such time that the Air Force can demonstrate that the emerging contaminants have moved beyond the property/properties. At that time the Air Force will contact the owner to determine whether the owner wants to keep the filtration device and assume all future maintenance costs, or have the Air Force remove the filtration device and return the private well to normal operation.

Agenda Item #4. IAGWSP Central Impact Area UXO Removal Update

Mr. Gregson showed a figure of the Central Impact Area and pointed out the areas where artillery firing had occurred, resulting in RDX contamination. He then pointed out the groundwater treatment systems installed to complete the groundwater remedy. The EPA Decision Document requires removal of 75-95% of UXO in two phases: 30 acres and 28 acres. He showed a figure of the removal area for the two phases.

Mr. Gregson explained the tools that are used for UXO identification and removal. Metal Mapper uses classification sensors to examine items/munitions beneath the ground. The traditional EM-61 uses one horizontal sensor on a horizontal plane but Metal Mapper uses a horizontal sensor and two vertical planes. Mr. Gregson used a pie chart to show how much time and money are saved by characterizing the items beneath the ground surface before removal. It is estimated that only 1% of the metal beneath the ground surface is actually UXO. The remaining items are empty shells that look like UXO (8%) and Clutter, non-hazardous metal (91%). Therefore, metal mapper reduces the time and cost of the UXO removal and meets cleanup objectives. The items suspected of being UXO are investigated by a UXO Contractor and all metal is removed within a 1-meter radius. Mr. Gregson show a picture of munitions debris that is stored for recycling.

Mr. Gregson displayed a chart that showed the results of the field operations for Phase I and Phase II, thus far. Overall there have been:

- 89,160 anomalies investigated by metal mapper
- 36,898 were excavated
- 1,131 UXO items were recovered
- 4,893 UXO-like items were recovered
- And 3,270 pounds of explosives were recovered.

Ms. Jennings expressed surprised at the number of UXO items recovered, noting that it exceeded the density estimates that were made during the development of the Decision Document. She acknowledged that some areas were expected to have higher density and that others would have lower but, on average, the final estimate was about nine items per acre. She commented that if UXO items continue to be found with the same amount of frequency, the actual density could be more than double what the estimates were. Mr. Gregson noted that the areas with the highest expected density were being worked on first and therefore the current number is high but subsequent work will probably not yield as many UXO items. Therefore, the average density is still expected to be in line with the earlier estimates. He stated that the IAGWSP is monitoring this closely.

Mr. Gregson explained that for quality control purposes, ¼ acre grids area randomly selected and 100% of all targets are excavated to see what, if anything, has been left behind. Only two UXO items were missed (1 partial 81mm and 1 very deep 81 mm). This far exceeds the Decision Document removal requirement of 75-95% removal. The IAGWSP is also meeting the classification goal to reduce clutter by 70%. The program is just under the classification goal of 95% of targets-of-interest due to site conditions (depth and clutter).

Mr. Gregson summarized the presentation by noting that Phase I (30 acres) and the 100% digs for five ¼ acre test grids have been completed. Two additional test digs are underway, as is the

work for Phase II (28 acres). Metal Mapper is complete in Area 1 and nearly complete in Area 2. Area 3 will be done in early 2017.

Mr. DiNardo asked if the database that catalogs items is still being used. Mr. Gregson replied that it is and noted that there is increased efficiency since the UXO technicians are more familiar with the items in question.

Agenda Item #8. Final Discussions, Adjourn

Ms. Donovan stated that the next meeting date has not been set. A notification will be sent to the team when the meeting is scheduled. The meeting was adjourned.