

**Microsoft TEAMS Virtual Meeting
Camp Edwards, MA
28 Oct 2020
6:00 – 8:00 p.m.**

Meeting Minutes

Member:	Organization:	Telephone:	E-mail:
Shawn Cody	IAGWSP	508-968-5834	shawn.c.cody.mil@mail.mil
Rose Forbes	AFCEC/JBCC	508-968-4670x5613	rose.forbes@us.af.mil
Phil Goddard	JBCC CT/Bourne	508-759-3043	Pag456@comcast.net
Ben Gregson	IAGWSP	508-968-5821	benjamin.p.gregson.nfg@mail.mil
Steve Hurley	MassWildlife		Steve.hurley@state.ma.us
Bob Lim	USEPA	617-918-1210	Lim.robert@epa.gov
Douglas Karson	AFCEC/JBCC	508-968-4678	douglas.karson@us.af.mil
Len Pinaud	MassDEP	508-946-2871	leonard.pinaud@state.ma.us
Tim Pasakarnis	Cape Cod Commission		Tim.pasakarnis@capecodcommission.org
Tom Cambareri	Cape Cod Commission	508-364-2644	tomcambareri@gmail.com
Facilitator:	Organization:	Telephone:	E-mail:
Ellie Donovan	MassDEP	508-946-2866	ellie.donovan@state.ma.us
Attendees:	Organization:	Telephone:	E-mail:
Pamela Richardson	IAGWSP	508-566-6390	Pamela.j.richardson.nfg@mail.mil
Lori Boghdan	IAGWSP	508-509-2869	lori.p.boghdan2.nfg@mail.mil
Jennifer DeAngelis	BB&E	508-968-4670	jennifer.deangelis.ctr@us.af.mil
Nikki Wagner	EA	508-968-4754	nwagner@east.com
Elliot Jacobs	MassDEP	508-946-2786	elliott.jacobs@state.ma.us
Kendall Walker	MassDEP	508-946-2846	kendall.walker@state.ma.us
George Seaver	Resident of Cataumet		
Michael Cusack	Resident of Mashpee		mike.cusack@comcast.net
David Dow	Sierra Club		ddow420@comcast.net
Jane Dolan	USEPA		Jane.dolan@epa.gov
Darriel Swatts	USEPA		Darriel.swatts@epa.gov

Handouts Distributed at Meeting:

Available online at the AFCEC webpage and IAGWSP website or by email upon request.

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Agenda Item #1. Introductions, Late-Breaking News, Approval of 09 October 2019 JBCCCT Cleanup Team Meeting Minutes

Mr. Karson reviewed the agenda.

No late breaking news reported.

Mr. Karson asked for comments on minutes from the 09 October 2019 JBCCCT meeting. No comments.

Agenda Item #2. Military Munitions Response Program (MMRP), AFCEC - Ms. Nicole Wagner, EA

Ms. Nicole Wagner gave a background briefing on the MMRP at JBCC as outlined in the presentation. The MMRP follows the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the National Contingency Plan (NCP) and that JBCC's Federal Facility Agreement (FFA) does apply to MMRP sites but does not apply to operational ranges, operating storage manufacturing facilities, or to permitted treatment and disposal facilities. Ms. Wagner reviewed the MMRP process.

Referring to the first figure in her presentation, Ms. Wagner gave a status of each site. The Former Otis Target Butt site and the Former Otis Bomb Storage Magazines site are both closed with the former having been used for small arms training and the latter for ordnance storage. The Skeet Range is used for small arms training and is currently under a Remedial Investigation for lead, and field work is in progress. The Otis Gun Club is also used for small arms training and a Remedial Investigation (RI) Report was completed in August 2020 and a Feasibility Study (FS) is in preparation.

Ordnance Area 1 is used for ordnance storage and is in an Expanded Comprehensive Site Evaluation (CSE) Phase II Investigation and a Supplemental Munitions and Explosives of Concern (MEC) Investigation, with the intent to obtain no further action and site closure pending results. The Old Grenade Courts is where training with practice and live grenades was held and a Remedial Investigation is in preparation with the Feasibility Study to follow. The Mock Village is an urban training complex of a mock German village and the Draft Streamlined RI/FS has been submitted for regulatory review.

The Old K Range has small arms and rocket range training, and a Draft FS is in preparation. A CSE Phase II has been completed at the Former Ammunition Supply Points (FASP) East and West and a path forward is being determined with regulators.

There were no questions or comments.

Agenda Item #3. MassDEP Final PFAS Drinking Water Regulations 310 CMR 22.00 - Mr. Paul Locke, MassDEP

Mr. Locke reported that the drinking water standard for PFAS has been promulgated and published as of 02 October 2020. He described the Maximum Contaminant Level (MCL) and how it applies to PFAS including regulations and violation responses.

He explained that Massachusetts Drinking Water Program is a delegated program for the EPA, and Massachusetts has its own statutory powers and regulations. As a delegated program, MassDEP standards have to be at least as stringent as those promulgated by EPA, but can promulgate standards where EPA has not promulgated a number yet. PFAS is one of those standards.

Mr. Locke reported that the Final "PFAS-6" MCL is 20 ng/L and includes the sum of six PFAS: PFOS, PFOA, PFHxS, PFNA, PFHpA, and PFDA. Compliance is based on three monthly samples and applies to community and non-transient/non-community supplies. The monitoring requirements are being staggered for lab capacity.

The PFAS-6 MCL is the same as the MCP Method 1 GW-1 Standard for regulatory consistency. Under CERCLA, Massachusetts identifies promulgated MCLs as Applicable or Relevant and Appropriate Requirements (ARARs) in all GW-1 areas.

Mr. David Dow, Sierra Club, asked Mr. Locke how the new cleanup standards are applied to the source areas of the following sites: the former fire training area, the former wastewater treatment plant at JBCC, and the water and sediment of Ashumet Pond.

Mr. Locke replied that first and foremost MassDEP is looking at drinking water supplies that are affected by any of these plumes. The drinking water program is for public water supplies and/or the waste site cleanup programs and for private wells. The program focuses on what people are drinking and working to make sure the exposures at the drinking water supply are addressed as quickly as possible. Public and private water supplies on Cape Cod are being addressed by agencies. For PFAS, MassDEP is looking back at source areas and plumes – how the assessment of those and potential remediation of plumes will progress. In the PFAS world they are still at beginning at looking at what are the most effective ways of dealing with the plumes and source areas. At the Barnstable Fire Training Academy steps have been taken to remediate soil which has been contaminated with PFAS and steps to eliminate or minimize the infiltration of rain and minimize the leaching of the remaining soil into the groundwater and the other areas will be addressed as well. There are a number of different approaches to get at the source areas and groundwater plumes depending on site-specific basis.

Mr. Bill Winters attempted to ask a question via phone but was unsuccessful.

Mr. Timothy Pasakarnis, CC Commission, noted that the slides showed that compliance is based on three monthly samples and asked Mr. Locke if there is more information on how the monthly sampling is going to roll out say for a water system that is in compliance, will they continue taking monthly samples as long as they are below the MCL? Is there the potential for monitoring frequency to change or is there a schedule on that depending on what the results are?

Mr. Locke replied that the three monthly samples are initiated once a positive hit has resulted, and it will include subsequent samples. The drinking water regulations or the implementation of the sampling schedule will be looked at. As it is the beginning of this process, and Mr. Locke is not in that program, he did not want to stray too far into other areas. MassDEP has money available and is offering to do the initial rounds of sampling for all public water supplies in the state. The money has been made available through the state legislature to kick start the sampling and find out fairly quickly what is out in the drinking water supplies. The goal is to have routine PFAS monitoring become part of the regular monitoring that is done for all of the other standards. Different monitoring schedules will be implemented depending on the different requirements and will likely vary as time goes on.

Mr. Michael Cusak, Mashpee resident, asked if Massachusetts developed its own standard because EPA didn't have one?

Mr. Locke replied that the genesis comes from doing sampling for PFAS in public water supplies and finding it and the public asking MassDEP what does it mean and what is MassDEP going to do about it. For public water supplies the best tool MassDEP has is promulgating the standard. This gives MassDEP the legal regulatory authority to require broad scale testing in the public water supplies, and if something is found that MassDEP believes poses a health risk, it gives them the regulatory authority to require action. There are other provisions, and the first thing MassDEP did was put out an ORS guideline similar to the EPA Health Advisory which gives MassDEP some ability to use that to interpret results that come in from water supplies. MassDEP wants to make sure that the contamination is addressed in a timely way, and promulgating a standard is the best way to do it. In terms of timing, states are generally more nimble than EPA as we are closer to the ground, and we are responding to people who are closer to us. It is not surprising you see states enacting standards that are faster than you are seeing national standards and we will see how all of this progresses. It was not intentional specifically to get something lower or just because EPA didn't have it. It really was to answer the questions – is it there and what can everybody do about it.

Ms. Diane Rielinger asked, with current lab technology, what is the detection limit of the current tests? Is it possible to have a number of these compounds present? But would the total equal more than the 20 µg/L?

Mr. Locke replied that the detection limits and the EPA methods that are out there are getting around the low part per trillion levels, so 20 parts per trillion of the sum of the six. It would very unlikely to have a large number of these additional PFAS compounds present in a matter that would add up to greater than 20. Mr. Locke said he is not sure that the 20 ppt would apply to those other compounds either. He said there is a lot of work being done on the toxicology of these compounds and there is still a lot to learn. But, generally, it is believed that the longer chain PFAS compounds tend to be, more problematic. The ones that are being looked at are the ones they are more confident in the toxicity information. They have been grouped on their structure and their similar abilities to be accumulated in the body and to have affects within in humans. The 20 ppt overall is protective and MassDEP recognizes there may be other PFAS compounds present at lower concentrations and others that are not specifically added up in this standard, but certainly as a first step in this process, given what is known at the time – 20 ppt is a good protective value.

Mr. Bill Winters second attempt to ask question via phone was unsuccessful.

Ms. Rose Forbes, IRP, replying to Mr. Dow's earlier question to Mr. Locke on how the new cleanup standards are applied to the source areas at JBCC, clarified that the Air Force (AF) policy is and has been addressing PFOS and PFOA only and comparing that to the lifetime health advisory that the EPA has which is 0.07 µg/L. The AF is looking at but has not adopted the Massachusetts PFAS-6 number yet. The AF needs to review the analysis and its applicability to determine if Joint Base Cape Cod is going to use the MassDEP standard. The understanding is that EPA still has to review the analysis that MassDEP did for the PFAS-6 as well. Ms. Mary O'Reilly's presentation next will show that the AF is only comparing numbers to EPA's Lifetime Health Advisory.

Mr. Locke added that it is an interesting comment and statement as to how the Air Force is looking at it. MassDEP does look at CERCLA and the National Contingency Plan and the Federal law and regulations that recognize ARARs, specifically promulgated standards that are applied consistently across the state, which may be more stringent than the federal requirements and consistently MCLs are routinely identified as ARARs. He said it would be highly unusual if not unique for EPA and DOD to look at a legally promulgated drinking water standard and determine it is not an ARAR.

Mr. Mike Mazzota, asked if there is any type of data sharing mechanisms? Once an analysis is performed on public water supplies, how can a citizens access the data?

Mr. Locke responded yes. The Public Water Supply sampling that is done, whether for PFAS any of the other routine drinking water sampling for all of the public water supplies, is available on the data portal that MassDEP and the Executive Office of Energy and Environmental Affairs runs. The url is: <http://eeaonline.eea.state.ma.us>. The user can enter a town or chemicals, and historic and current data is available on the site. That is a product of the work of the public water suppliers and labs, and MassDEP and EPA, to funnel all the information in an easy way to get into the EPA data systems.

There were no further questions for Mr. Locke.

Agenda Item #4. AFCEC Emerging Contaminants Update - Ms. Mary O'Reilly, Jacobs Engineering

Ms. O'Reilly gave an update of ongoing activities for emerging contaminants. The following reports are in process: Supplemental Remedial Investigation for 1,4-Dioxane and PFOS and PFOA at Ashumet Valley, Remedial Investigation for PFOS/PFOA at the Tanker Truck Rollover Sites, Explanation of Significant Differences for 1,4-Dioxane at the CS-10 Plume, Supplemental Remedial Investigation and Fact Sheet for 1,4-Dioxane at CS-20, Supplemental Feasibility Study for 1,4-Dioxane and PFOS/PFOA at Landfill-1 (LF-1), and Expanded Site Inspection for PFOS/PFOA at seven Flight Line Sites.

The response actions for PFOS and PFOA concentrations are based on EPA Lifetime Health Advisory (LHA) of 0.07 µg/L which were released in May of 2016. Since then, AFCEC has been performing a response action for any drinking water well that had an exceedance. As investigations were being conducted, any time there was an exceedance of PFOS/PFOA in groundwater, outreach was completed to see if there were any private or public water supply wells in the area. Refer to slide 3 of the presentation for specific response actions taken at Ashumet Valley and Tanker Truck Rollover Site source areas which includes supplying bottled water to residences, municipal water connections, and filtration systems.

Ms. O'Reilly reviewed the EPA values for PFOS, PFOA and PFAS on slide 4. The AV Supplemental RI includes groundwater, soil, private well, and treatment system sampling. Groundwater samples were collected from 229 locations with the highest concentration of PFOS/PFOA at 130.39 µg/L at a boring in the Fire Training Area-1 (FTA-1). Soil samples were collected at 58 locations with the highest PFOS/PFOA concentrations at 630 µg/kg at the FTA-1 source area. Surface water samples were collected from 10 ponds/rivers resulting in the highest concentration of PFOS 0.2 µg/L and PFOA 0.059 µg/L in Ashumet Pond. Sediment samples from Ashumet Pond resulted in one detection of 1.1 µg/kg of PFOS and PFOA was not detected. 1,4-Dioxane at AV is very limited and only has three locations above the risk-based concentration (RBC) of 0.46 µg/L with the highest concentration at 0.75 µg/L at a monitoring well, thus neither the FTA-1 or Sewage Treatment Plant (STP) is a continuing source of 1,4-dioxane. Ms. O'Reilly referred to figures which illustrated sampling results for AV.

PFOS groundwater contamination at the Tanker Truck Rollover Sites (TTRS) extends from Route 28 (Otis) Rotary to Shore Road and discharges into Hen Cove and Red Brook Harbor. The TTRS RI field program included 26 groundwater vertical profile borings, 38 soil samples, 10 fresh water pond/wetlands surface water samples, sediment samples at Flax Pond, Hen Cove and Red Brook Harbor, and private well sampling. Ms. O'Reilly referred to the page 10 figure for TTRS PFOS/PFOA groundwater concentrations. The highest groundwater PFOS/PFOA concentration is 13.22 µg/L within the Route 28 rotary. The highest soil concentrations for PFOS/PFOA (570 µg/kg and 17 µg/kg respectively) are located in the median strip on Connery Avenue where one of the tanker trucks overturned. Surface water sampling at Turtle Pond detected 2.8 J µg/L PFOS and 0.026 µg/L PFOA. One sediment sample from Hen Cove detected PFOS at 1.5 µg/kg with no detection of PFOA in sediment samples. The majority of the field work has been completed and installation of a TTRS monitoring network is planned. MassDEP is also planning to sample shellfish in Hen Cove.

Per the Draft Explanation of Significant Differences (ESD) for 1,4-Dioxane at Chemical Spill-10 (CS-10), 1,4-dioxane will be added as a contaminant of concern (COC) at CS-10. The EPA indicated that the remediation goal (RG) for 1,4-dioxane should be set at 0.46 µg/L, which is an RBC developed using federal risk assessment guidance. The public comment period was completed and the agencies are reviewing the draft responsiveness summary.

The Final Supplemental RI for CS-20 was submitted in January 2020 which included a comprehensive conceptual site model that concluded that no unacceptable risk from 1,4-dioxane exists at CS-20. A Draft Fact Sheet went through agency review and a public comment period and the Responsiveness Summary is being reviewed by agencies. Site Closure for the CS-20 PCE groundwater plume is expected in 2021.

The Final Supplemental RI at LF-1 recommended 1,4-dioxane, PFOA, and PFOA be added as COCs. A Supplemental Feasibility Study (FS) for LF-1 will be completed to evaluate remedial alternatives for groundwater following Air Force review and approval of available standards and/or policies for PFOS and PFOA.

The Flight Line Area Expanded SI Work Plan, which includes seven Flight Line Area sites, will assess the potential of ongoing source from soil to groundwater and will determine whether groundwater contamination has migrated off-base potentially impacting drinking water supplies. The Expanded SI field program is ongoing and includes the Former Fire Department Building 122, Lower 40 Ramp Area-

Helicopter Hangar 2816, Former Building 118 – Runway 32, USCG Hangars 3170 and 3172, ANG Motor Pool, Fuel Spill-1 (FS-1), and the WWTP Infiltration Beds.

AFFF had been stored in Former Building 122. The field program included seven groundwater vertical profile borings, sampling soil and asphalt and concrete and sediment from inside drains and the grease trap and oil/water separator. The highest PFOS/PFOA concentrations detected were: 34.5 J $\mu\text{g/L}$ in groundwater, 330 $\mu\text{g/kg}$ (PFOS) and 28 $\mu\text{g/kg}$ (PFOA) in soil; 150 $\mu\text{g/kg}$ (PFOS) and 5.1 $\mu\text{g/kg}$ (PFOA) in asphalt, and PFOS/PFOA was present in the concrete and sediment inside drains and in the grease trap and oil/water separator.

The highest concentration of PFOS/PFOA in the groundwater at the Lower 40 Ramp/Hangar 2816 was 1.132 J $\mu\text{g/L}$ and the highest concentrations in the soil were 40 $\mu\text{g/kg}$ (PFOS) and 0.25 J $\mu\text{g/L}$ (PFOA). PFAS were not detected in the asphalt.

Former Building 118 groundwater sampling resulted in 21.8 $\mu\text{g/L}$ as the highest concentration and soil sampling resulted in 3.4 $\mu\text{g/kg}$ PFOS and no PFOA was detected. Additional soil sampling is planned.

USCG Hangars 3170 and 3172 field program was expanded to include Building 3160 and the West Delta Hot Fuel Spot Training Area west of the hangars. The highest PFOS and PFOA groundwater concentration was 3.1 $\mu\text{g/L}$ near the south side of Building 3160. The highest PFOS and PFOA concentrations in soil was 8 $\mu\text{g/kg}$ (PFOS) and 1.4 $\mu\text{g/kg}$ (PFOA). PFAS were not detected in the asphalt.

The field sampling program for the Air National Guard Motor Pool resulted in the highest PFOS and PFOA concentration in groundwater at 2.5 $\mu\text{g/L}$. Twelve monitoring wells located between the ANG Motor Pool and the CS-10 Sandwich Road (SR) extraction fence along with ten SR extraction wells were sampled. PFOS and PFOA was detected above the LHA in one well at 0.0927 J $\mu\text{g/L}$ and at one SR extraction well at 0.1568 $\mu\text{g/L}$ which indicates that the PFOS and PFOA contamination extends to and is captured by the SR extraction fence. Soil samples from the drainage ditch south of the building resulted in the highest PFOS concentration of 410 $\mu\text{g/kg}$ and no PFOA was detected.

FS-1 field sampling program resulted in 1.9 J $\mu\text{g/L}$ as the highest PFOS concentration in groundwater and 0.074 $\mu\text{g/L}$ was the highest PFOA concentration. PFOS and PFOA were not detected in the unnamed surface water body west of the FS-1 source area. Additional groundwater sampling was recently completed to evaluate the vertical distribution of PFOS and PFOA near the base boundary and results are pending. Surface water and sediment sampling is planned for the Quashnet River and bogs.

The WWTP Infiltration Beds plant sampling results ranged from 0.185 J to 0.8383 J $\mu\text{g/L}$ for PFOS and PFOA in the influent and 0.2691 to 0.789 $\mu\text{g/L}$ in the effluent samples. Two monitoring wells were sampled at the WWTP infiltration beds in 2015 and 2018 which resulted in PFOS and PFOA groundwater concentrations in exceedance of the LHA. Sanitary sewage samples were collected from 10 manholes and lift stations and PFOS and PFOA exceeded the LHA at five manholes located near Building 122. Sources to the sanitary sewers within the Flight Line are being evaluated.

Ms. O'Reilly reviewed the path forward which includes completing RI field programs, private well monitoring, outreach, continuing to conduct response actions when needed and presenting sample results and updates to public and at future JBCC Cleanup Team meetings.

Mr. Bill Winters called in with a question on the first table. The LHA of 0.07 – what is the LHA and why is it different from other numbers? Ms. Forbes responded that it is over a lifetime with assumptions of a certain person with a certain body weight, drinking 2 liters per day over their life. Mr. Bob Lim, USEPA, responded the LHA is not a promulgated standard like the MCL or MMCL. As Ms. Forbes stated there are several assumptions involved in the LHA. The other numbers chart different scenarios involving different media like those the Air Force was investigating at Ashumet Valley. Mr. Lim stated that the table includes

both adult and child recreational swimmers whose exposure would be from incidental ingestion while swimming. Mr. Winters said he still was not clear on how the LHA is determined for a person – what the factors are involved, but said he can research on his own. Mr. Winters followed up with a question about swimming and asked when would you assume a child would not be swimming in a body of water? It would seem that you would want to use the lower number just in case a child was swimming in that body of water. Mr. Lim responded that we are not just looking at adult exposure but also the number for children. Ms. Forbes replied that in the risk assessment we are required to do under the remedial investigation, various scenarios must be evaluated. Mr. Winters asked Ms. O'Reilly about her statement that if contaminants dropped below the MCL would AF supplied water be discontinued to a household or facility, and would there be follow up afterward to ensure that level stays below the MCL with periodic testing? Ms. O'Reilly responded that it had to be below the LHA for several sampling events over a two year period. The one private well that is still receiving bottled water has been below the LHA but the residence is still being supplied with bottled water. Ms. Forbes added that it does not just depend on the concentration and the number of sampling events that are done, it also depends on the conceptual site model of the particular site. When the infiltration trench was shut down at Ashumet Valley, it was known that eventually clean water was going to flush through there so it could be evaluated by understanding the area of contamination along with the results. If there is uncertainty, like with the residence in the Tanker Truck Rollover Sites that has been below the LHA for some time, the well continues to be sampled and bottled water continues to be provided.

Mr. George Seaver from Cataumet who lives over the LF-1 Plume and has been involved with base meetings since the 1990s, expressed his concern that the rigorous standard has unintended consequences and that what will be done to the shellfishermen in Bourne is what has been done to some fishermen – and that is to make them into an endangered species so to speak. Mr. Seaver continued that the unintended consequence is that a lot of shellfishermen couldn't earn their keep anymore in Hens Cove, etc.. Ms. O'Reilly responded that the MassDEP is planning on sampling shellfish for PFAS in Hens Cove.

Mr. Dow said he recently received an EPA pdf on co-contaminants at PFAS sites and listed for fire-training areas BTEX, chlorinated solvents, 1,4-dioxane and surfactants in AFFF components. Mr. Dow stated he supports the proposal to add 1,4-dioxane to PFOS and PFOA to be addressed at the plumes that were mentioned in the presentation. Mr. Dow continued that the state of New York has developed an MCL for 1,4-dioxane and suggests MassDEP does the same. Mr. Dow said that it is difficult to do risk assessments for PFAS chemicals where you have high molecular weight compounds like PFOS and PFOA which have long half times in the body and are known to have various kinds of negative health consequences, versus the short-chain chemicals like GEN-X which have short half lives in the body but have unknown epidemiological consequences. Mr. Dow stated that he believes there should be a risk assessment that combines the potential harm from both short-term PFAS chemicals which have different biological chemical and physical properties with long-term ones like PFOS and PFOA. Ms. O'Reilly responded that 1,4-dioxane is being looked at in the Ashumet Valley and LF-1 Plumes and the risk based concentration from the EPA is being used since there isn't an MCL.

Mr. Goddard commented in the chat on the standards of the groundwater concentrations and what the unit of measure standards should be. Ms. O'Reilly responded micrograms per liter has been used for chlorinated solvents so will continue to be used for PFOS and 1,4-dioxane to be consistent. Ms. Forbes added that the LHA that EPA has is reported at 0.07 micrograms per liter (70 nanograms per liter). Mr. Goddard commented that the DEP-6 is in nanograms per liter.

Mr. Mazzota asked with regards to co-contaminants, is there any analysis of heavy metals in correlation with PFOS and PFOA? Ms. Forbes responded that heavy metals have not been looked at in PFOS and PFOA. There are thousands of fluorinated compounds in the overall PFAS group which are components of AFFF. There is no evidence of AFFF having heavy metals.

Agenda Item #4. AFCEC Program Update and Six Month Look Ahead - Ms. Rose Forbes and Mr. Douglas Karson, AFCEC

Mr. Karson presented on community involvement activities. The Final Annual Land Use Control Letter Report has been distributed, the Community Involvement Plan, the AFCEC Groundwater Plume Maps and Information Booklet, Understanding Exposure Fact Sheet, and Land Use Control Implementation Plan are being reviewed. After the public comment periods, Responsiveness Summaries for CS-20 and CS-10 are being prepared. Outreach continues in areas of PFOS/PFOA and 1,4-dioxane. Sampling for PFOS/PFOA in private wells continues and neighborhood notices are delivered in area of direct push drilling. Groundwater plume maps are provided to the local boards of health. The AFCEC webpage: <https://www.massnationalguard.org//JBCC/afcec.html> is being updated with presentations and final documents.

Mr. Goddard asked if drafts of the CIP and Plume Booklet would be available or notice as to when they are out? Ms. Forbes responded that, yes, they would be available once the drafts are completed.

Ms. Forbes reviewed current activities at IRP sites. This includes routine monitoring at groundwater plumes and operations and maintenance of treatment systems. PFOS/PFOA/1,4-dioxane investigations are ongoing. The FS-29 Remedial Action Closure Report is being signed which will make it the first groundwater site to be closed. The removal of low level radioactive monolith at Landfill-7 is planned.

Ms. Forbes reviewed the MMRP Sites. Skeet Range Remedial Investigation soil and groundwater sampling is being conducted. Digital Geophysical Mapping investigation is being conducted at off-base portion of Ordnance 1 as part of the Supplemental Comprehensive Site Evaluation Phase II effort. The Old K Range FS is pending resolution of the Mock Village RI/FS which is in regulatory review. The Draft Streamlined RI/FS for the Old Grenade Courts and the Draft Otis Gun Club FS are also being prepared.

Mr. Dow commented that one of the issues that has been raised in the past is whether PFOS and , PFOA contaminate fin fish and shellfish in Ashumet Pond, Waquoit Bay or other places that are impacted by the plumes at Joint Base Cape Cod. When he was recently on the University of Rhode Island STEEP Cape Cod Community Advisory Committee call, a program was described that is being done with the Mashpee Wampanoag Tribe where they are going to test PFAS chemicals in fin fish and shellfish in areas that the tribe uses as resources for food. The effect of plumes from Joint Base Cape Cod on the health of the Mashpee Wampanoag Tribe is also going to be examined. Mr. Dow said that this is a component of environmental justice that may be relevant eventually to supplement the information available at the JBCCCT meetings. Mr. Dow also participated in the National Academy of Sciences, Engineering, and Medicine PFAS Research meeting. During the meeting, Laurel Schaidler of the Silent Spring Institute and Elsie Sunderland of the Harvard School of Public Health discussed PFAS sampling in foods – seafood and vegetables and other crops, as an exposure pathway. Mr. Dow suggested that the JBCCCT consult them for more information.

Agenda Item #5. IAGWSP Program Update – Mr. Benjamin Gregson, IAGWSP

Mr. Gregson from the Groundwater Study Program provided a program update. He began with the Central Impact Area (CIA) source removal project, which also included installation of five monitoring wells to track the progress and benefits of the removal work. The EPA Decision Document for the CIA, signed about eight years ago, requires source removal of 75 – 95% of UXO. To date, that level of removal has been completed at 83 total acres (for reference the CIA is 330 acres in total). It has yet to be determined if UXO removal will be needed at all 330 acres. The results of the current investigations of the density of UXO in the CIA will determine the future level of effort necessary.

The 2020 Field Season has been able to continue on schedule. The Metal Mapper data collection was conducted at all of the survey units that had been designated for the year. The target lists have been provided to the geophysicists for their QA/QC work. Work in the Phase III, Area 3 (10 acres) is underway (a map was displayed). Metal Mapper data collection and classification is complete for survey units 6 and 7, data collection is complete in survey unit 9 and it is ongoing in survey unit 8.

Once the geophysicist have finished their classification, the UXO technicians physically remove the UXO based on the signals provided by the Metal Mapper. The digs in survey unit 6 are complete. The teams have conducted assessment of 100% validation grids at two locations so far. Pictures of field equipment and progress charts were shown.

A map of the CIA was displayed with the phases of munitions removal color-coded. A cluster of removal areas in the middle was apparent and is due to the concentration of UXO in the Impact Area. Transects from the higher density areas were investigated to determine the levels of drop off away from the targets and these transects were also shown on the figure.

A table showing the historical progress was provided. Results from Phase 1, from 2013-2015 when advanced geophysical techniques like Metal Mapper began, show 1,828 lbs of explosives removal. Phase 2 (28 acres) resulted in over 2,000 lbs of explosives removal. Phase 3, the current phase, has had 1,000 lbs of explosives removal to date. The total of these three phases is nearly 5,000 lbs and the total explosives removal for the entire program is close to 8,000 lbs.

Mr. Gregson explained that the program wanted to gauge the benefits of the source removal by installing five shallow monitoring wells to monitor the water table at the CIA. A figure was shown. Three water table wells monitor the impacts of ongoing munitions removal work. They are located along Turpentine Road and downgradient of the Phase III Areas A and B source removal areas. A fourth well monitors the downgradient area of the 2,000 meter berm plume and the fifth well monitors the downgradient junction of Turpentine & Tank Alley Roads, co-located with MW-184 to fill a gap between existing screens.

Mr. Gregson then moved on to discuss the Small Arms Ranges (SARs). A Completion of Work report is being reviewed by the agencies for all post-Decision Document (DD) fieldwork at the SARs. Fieldwork was completed to address soil contamination at ten SARs, including six inactive operational ranges (B, C, D, G, N and Former N) and four non-operational ranges (Former B, Former C, Former D and Former M2). Approximately 20,500 cy of soil from these ranges with elevated concentrations of lead (>200 mg/Kg), antimony (>20 mg/Kg) and tungsten (>160 mg/Kg) were excavated, transported and disposed of at approved off-site facilities. These cleanup levels allow for unrestricted use. Samples were then collected to verify that all of the soil with elevated concentrations has been removed and, based on the post-excavation sampling results, no further action is recommended at these ranges. Site improvement and restoration fieldwork was also performed, including the following: Building demolition and disposal at B, C, D, and G Ranges; Backfilling and grading of excavation footprints and bollard installation around groundwater monitoring wells at B, Former B,C, D, Former D, G and Former M2 Ranges; Vegetation removal and retaining wall installation at D Range; Gravel installation in access roads, and gravel and wooden guard rail installation at parking areas and paths at B, C and D Ranges; and seeding at B, Former B, C, Former C and G Ranges.

Mr. Gregson then presented information about ongoing work at the Training Area Ranges. A post-DD investigation/remediation effort is underway at the Former E Range, which was an anti-tank rocket range in the WWII era. Work is ongoing to determine if explosives contamination is present in the soils and to remove any additional UXO that exist on the range. Soil sampling did not identify significant contamination. Vegetation clearance and UXO surface clearance has been completed in an approximately 20-acre investigation area. Vegetation was flush-cut to ground level and was generally limited to immature pitch pine, scrub oaks and low shrubs. Mature trees were left in place to the extent possible. Technicians used hand-held magnetometers (ferrous) and EM61 Digital Geophysical Mapping over the entire extent of

the 20-acre area to clear the surface munitions and to map anomalies for investigation. All munitions and explosives of concern and munitions debris identified are being removed and managed for disposal in accordance with previously established protocols. As of October 2020, approximately 20% of the acreage is complete

Mr. Gregson continued his program update with information on the J-2 and J-3 Ranges. Additional post-DD confirmation investigations were performed at these ranges to verify that previous efforts were complete. At the J-3 Range, confirmation surveys were conducted in Barrage Rocket target area in four grids to determine if any items remained after completion of the previous survey where a 0.5 foot or larger criteria was applied as a dig threshold. A total of 3 items classified as MEC were found: one 4.5" rocket and two 81mm mortars. All the items were consolidated and secured in the CIA for destruction in the Buried Explosives Module (BEM).

At the J-2 Range, work has included munitions and explosives of concern (MEC) removal. There was an intrusive investigation and subsequent removal of all anomalies over the entire area in eight 30 x 30 meter grids in Study Areas 1 and 2. A total of 14 items classified as MEC were found. All of the items were consolidated and secured in the CIA for destruction in the BEM. The majority of MEC items found were 30mm projectiles (12). Six of these were cracked or partially-cracked, including two that were co-located. The remaining MEC items uncovered include a 57mm projectile and an 81mm projectile. Reports documenting the findings with recommendations for next steps (if needed) will be submitted to the regulatory agencies soon.

Mr. Gregson then moved on to present information about per- and polyfluoroalkyl substances (PFAS) sampling. This work was a follow-up to the 2019 PFAS sampling conducted at open burn/open detonation (OB/OD) areas. The 2019 results showed some detections but none exceeded the regulatory thresholds. Locations sampled this summer included the J-3 Demolition Area and J-3 melt/pour facility (where the melting/pouring or pressing of plastic bonded explosives occurred) and the J-1 Interberm Area and J-2 Disposal Area 2 (where the subsequent disposal in liquid or solid form of the explosives occurred).

Mr. Gregson noted that there are no private or public water supplies in the vicinity of any of the PFAS sampling locations. Results were compared to EPA's Health Advisory (PFOS + PFOA) of 70.0 nanograms per liter (ng/L) and MassDEP's GW-1/MMCL standard (for the sum of the concentrations of six specific PFAS: PFOS, PFOA, PFHxS, PFNA, PFHpA, and PFDA) of 20.0 ng/L. The results from samples collected in July from 17 monitoring well screens at the J-3 Range indicated that two wells had detections above 20 ng/L (sum of six MassDEP compounds): MW-143M2 (26.0 ng/L) located on Greenway Road, just east of the perchlorate plume boundary and MW-197M2 (54.1 ng/L) located approximately 250 feet southwest of the former melt/pour facility. EPA (PFOS + PFOA) compounds of concern were detected in 11 wells, with a high concentration of 15.8 ng/L in MW-30, which is located adjacent to the former melt/pour facility. MassDEP PFAS compounds of concern were observed in 13 of the 17 wells at concentrations below the 20 ng/L MMCL standard and two samples were non-detect. Mr. Gregson pointed out that all three of the well exceedances above the standards have sampling histories where HMX was present. This indicator suggests that the PFAS contamination is related to the former melt/pour facility, where explosive materials were extensively formulated/handled.

Recent results from the J-2 Range show all PFAS levels were below EPA and MassDEP thresholds. Recommendations for sampling of additional wells and further investigations are being developed for Agency review and approval.

Mr. Gregson discussed the upcoming Groundwater Study Program work, which will include a continuation of CIA source removal work and investigation of munitions and explosives at the Former E Range. This is anticipated through March 2021.

Mr. Gregson stated that a Draft Demonstration of Compliance Report for Northwest Corner is currently under reviewed by the agencies. He added that PFAS follow-up sampling will continue at the J-1 and J-2 Ranges, along with as-needed sampling based on results from the long-term monitoring/sampling program. Mr. Gregson noted that operations and maintenance and monthly sampling at all treatment facilities will also continue.

Following the presentation, Mr. Dow asked if there was any potential interaction between the UXO and bullet removals and the physical disturbance of soil causing increased detections of explosives, like HMX and RDX, in the underlying groundwater. Mr. Gregson replied that yes, in the CIA and at the Southeast Ranges (J-2 and J-3), occasionally after a soil removal action, there is an increase in concentrations of RDX afterwards. The “spike” is assumed to be related to the soil disturbance because particles of RDX that were previously protected from any further dissolution are then exposed to rainwater and can move into groundwater. Mr. Gregson added, “These spikes are usually very short-lived (6 months to a year) and then concentrations return to previous levels.” He noted that this is not the case at the SARs or firing points because there is no RDX at the SARs.

Ms. Lockwood stated that Mr. Goddard had asked a question via, the “chat feature” in the virtual format, regarding “how long the work had been going on.” Mr. Karson and Ms. Forbes replied to Mr. Goddard (also in the chat feature) saying it had been 22 years. Mr. Goddard then asked if PFAS would be investigated as part of the CIA plume. Mr. Gregson replied that the Groundwater Study Program had considered areas where open burning/open detonation had taken place with the assumption that fire suppressants might have been used there but nothing has been found to date. He said the program would certainly keep open the possibility for PFAS sampling in the future if a revised Conceptual Site Model indicated a potential for PFAS contamination.

Agenda Item #6. Final Discussion

There were further questions or comments from the meeting participants and Mr. Karson thanked the attendees. He stated that the next meeting date has not been determined at this time but is anticipated for early 2021. Mr. Karson also noted that the meeting presentations are available for review on the program websites.