

**Joint Base Cape Cod Cleanup Team Meeting
 Building 1805
 Camp Edwards, MA
 09 October 2019
 6:00 – 8:00 p.m.**

Meeting Minutes

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Handouts Distributed at Meeting:

1. Draft of the 10 July 2019 Meeting Minutes and Responses to Action Items
2. Presentation: Emerging Contaminants, IRP
3. Presentation: Military Munitions Response Program (MMRP) Sites, IRP
4. Presentation: IAGWSP Groundwater Plumes Update, IAGWSP
5. Presentation: 6-month Look-Ahead, IAGWSP, IRP
6. Joint Base Cape Cod Groundwater Plume Map
7. Standard Operating Procedure for the Collection and Field Processing of Quahog and Oyster Samples, Massachusetts Department of Public Health, 2001. (Action Item Response)

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Agenda Item #1. Introductions, Late-Breaking News, Approval of 10 July 2019 JBCCCT Cleanup Team Meeting Minutes

Ms. Donovan, MassDEP, began the meeting and asked the team members to introduce themselves. New team member, Timothy Pasakarnis of the Cape Cod Commission, introduced himself.

No late breaking news was reported. Ms. Donovan asked for comments on minutes from the 10 July 2019 JBCCCT meeting. No comments.

Agenda Item #2. Emerging Contaminants, IRP - Ms. Rose Forbes, IRP

Ms. Forbes gave updates and response actions on sites with emerging contaminants (PFOS/PFOA and 1,4-dioxane) as outlined in the handout. Sites covered in the presentation included Ashumet Valley, Tanker Truck Rollover Sites (TTRS), Chemical Spill-10 (CS-10), CS-20, Landfill-1 (LF-1), and the Flight Line Sites.

There are currently three residences receiving bottled water from AFCEC but letters have been sent to 2 homeowners letting them know that the detection levels have decreased enough that bottled water delivery is no longer needed. 108 residences have been connected to municipal water supplies. Homeowners with filtration systems can choose to keep and maintain their systems or have AFCEC remove them once they are no longer needed.

Mr. Goddard asked what the highest PFOS/PFOA concentrations were in the Mashpee Village Public Water Supply well. Ms. Forbes responded 0.072 µg/L.

The Ashumet Valley Supplemental Remedial Investigation (RI) is ongoing and results show PFOS/PFOA present in both source areas (Fire Training Area [FTA-1] and Former Sewage Treatment Plant [STP]) with higher concentrations in the FTA-1 source area. PFOS/PFOA results for sediment samples collected from Ashumet are pending.

The TTRS RI is ongoing. PFOS/PFOA contamination extends from the TTRS to Hen Cove. The majority of work is complete. There are plans to sample seeps and surface water in the northern area of Red Brook Harbor and AFCEC is also awaiting approval to sample shellfish in Hen Cove.

The Explanation of Significant Differences (ESD) for CS-10 has been submitted with recommendation that 1,4-dioxane be added as a contaminant of concern (COC) for the CS-10 groundwater plume. Responses to comments for the ESD are currently being reviewed by USEPA and MassDEP. AFCEC is preparing responses to comments to finalize a Supplemental RI at CS-20 which proposes that 1,4-dioxane is not a COC as there is only one detection of 1,4-dioxane and it is in a lower conductivity area and likely will not migrate far.

The 1,4-dioxane plume at LF-1 has been defined and is mostly within the main LF-1 plume footprint on base. The PFOS/PFOA plume has been delineated and is entirely within the LF-1 plume footprint on base. The LF-1 Supplemental RI has been finalized and recommends adding 1,4-dioxane, PFOS, and PFOA as COCs. AFCEC will proceed with a Supplemental Feasibility Study (FS) to evaluate remedial alternatives based on EPA's risk based concentration of 0.46 µg/L for 1,4-dioxane but PFOS/PFOA standards are pending from regulatory agencies.

The Expanded SI for PFOS/PFOA at the Flight Line sites is ongoing. Investigation continues on the source of PFOS/PFOA at FS-1; it could be related to Runway 32/Building 118 area. Former Building 122 has been demolished but remains an IRP PFOS/PFOA site. PFOS/PFOA is present in samples from inside drains, the grease trap, and the oil/water separator. Results are pending for groundwater samples taken from a downgradient direct push boring. At USCG Hangars, samples were collected in advance of construction activities with no PFOS/PFOA detected in the asphalt results. Ms. Forbes referred to Figure on page 12 of presentation which shows the Flight Line Area Sites.

Mr. Goddard asked how much above the LHA the exceedances are in the plume shell figures. Ms. Forbes responded that the highest concentration at the TTRS was 13 µg/l for PFOS/PFOA which converts to 13,000 ng/L, and Ashumet Valley's highest concentration is higher at 130 µg/l which converts to 130,000 ng/L. Mr. Goddard asked that AFCEC report the contaminant levels going into the plant at LF-1 and going out using current technology to see how the compounds affect the current carbon change out schedule. Ms. Forbes responded that IRP is monitoring that and that the carbon at Ashumet Valley has already been changed out due to PFOS/PFOA in the influent/effluent, but standards have not been promulgated yet to determine further treatment requirements. Mr. Pinaud, MassDEP, added that the cleanup standards should be promulgated by December and the Massachusetts Maximum Contaminant Level (MMCL) will follow.

Mr. Dow asked what cleanup approaches will be considered if Ashumet and Johns Ponds turn out to be significant sources of PFOS/PFOA as was reported at the URI STEEP Program held the previous week. Ms. Forbes referred to the page 14 figure which show the difference in plume footprints over time along with the current PFOS/PFOA plumes. She pointed out that some of the PFOS/PFOA contamination from the source areas followed the Ashumet Valley plume but other PFOS/PFOA contamination went into Ashumet and Johns Ponds. The concentration levels at Ashumet and Johns Ponds are above the LHA, and since they are kettle holes, they are feeding the groundwater downgradient. Ms. Forbes reiterated that the highest PFOS/PFOA concentrations are at the source area but that there are other concentrations throughout the Ashumet Valley Plume and the levels decrease as you move further away from the source area.

Mr. Seaver, Cataumet resident, asked why the health levels of PFOS/PFOA are almost 1000 times lower than health levels for lead. Mr. Pinaud responded that MassDEP has a working group of risk assessors who are determining what levels should be, and would follow up with Mr. Seaver as an action item. Mr. Swatts, USEPA, referred Mr. Seaver to the USEPA webpages dedicated to PFAS which includes points of contact.

Mr. Cusack, Mashpee resident, asked if PFOS/PFOA levels in Ashumet and Johns Ponds are in the water in the pond or in the plume below. Ms. Forbes responded that the Ponds are kettle hole ponds so the plume is the groundwater. Mr. Cusack asked what the Explanation of Significant Differences is for CS-10. Ms. Forbes responded that it is a document prepared to add a new COC to the plume.

Mr. Dow asked if there was any endeavor to look at PFAS levels in fish. Ms. Forbes replied that USGS is investigating PFAS effects on fish (fathead minnows) using water from the Fire Training Area.

Agenda Item #3. Military Munitions Response Program (MMRP), IRP - Ms. Rose Forbes, IRP

Ms. Forbes gave updates and response actions on MMRP sites as outlined in the handout. The two tables in the handout are blue representing Air Force funded sites (Former Otis Target Butt, Former Otis Bomb Storage Magazine, Skeet Range, Ordnance Area 1) and green representing Army funded sites (Otis Gun Club, Old Grenade Courts, Mock Village, Old K Range, Former Ammunition Supply Point (FASP)). Each table specifies the status of current documents being prepared for each MMRP site.

The Former Otis Target Butt Site No Further Response Action Planned Decision Document (NFRAP DD) has been approved and is pending AFCEC signature. The Former Otis Bomb Storage Magazine NFRAP DD is awaiting regulatory concurrence; there were no public comments received during 30-day public review period. Lead concentrations were found in the Skeet Range at higher levels than anticipated so an RI Work Plan is being prepared. A Draft RI/FS is in preparation for Ordnance Area 1 which will include clearance of off-base portion of site. If no ordnance found, will prepare NFRAP DD to close site.

Mr. Seaver asked what the levels found in the Skeet Range are. Ms. Wagner, EA, responded there was one concentration in surface soil over 1000 mg/kg and several over 400 mg/kg. Subsurface samples will be collected as part of the RI.

AFCEC is responding to regulatory comments on the Draft RI for the Otis Gun Club Site and the Draft RI/FS for Mock Village. A Draft RI/FS is in preparation for Old Grenade Courts but a portion of the site extends off-base onto Crane Wildlife property, and AFCEC cannot enforce Land Use Controls (LUCs) on non-federal properties. AFCEC is working with stakeholders to resolve. The RI for the Old K Range is being finalized and the FS is being prepared. AFCEC is responding to EPA's request for more information on the Former Ammunition Supply Point (FASP) site.

Mr. Cambareri asked if lead was in soil at all of the MMRP sites. Ms. Forbes replied that only the small arms ranges contain lead and pointed out the Otis Gun Club and the Skeet Range on the figure.

Agenda Item #4. IAGWSP Groundwater Plumes Update - Mr. Benjamin Gregson, IAGWSP

Mr. Gregson began the presentation showing the list of twelve IAGWSP groundwater plumes. He reviewed the investigation efforts and findings to-date, which includes 1,200 monitoring wells at over 700 location and the collection of 100,000 groundwater and soil samples. He noted that 16 treatment systems are in place for 7 of the groundwater plumes and the remaining sites are being handled with Monitored Natural Attenuation (MNA). Mr. Gregson reported that 4.1 million gallons of groundwater are treated per day, with 12 billion gallons treated to date. The IAGWSP has partially cleared approximately 300 acres of Unexploded Ordnance (UXO) and 68 acres in the Central Impact Area have been cleared to 90%. Over 120,000 tons of soil has been excavated and treated with nearly 280,000 removed and disposed off-site. Six hundred tons of munitions-related scrap has been recycled.

Mr. Gregson showed a plume map with the locations of the seven treatment systems. The next figure showed maps from 2009 to 2019. A series of slides showed the individual plume maps and background information for Demolition Area 1 (Demo 1), the Central Impact Area (CIA), J-1 Range North (J-1N), J-1 Range South (J-1S), J-2 Range North (J-2N), J-2 Range East (J-2E), J-3 Range, L Range, Northwest Corner (NWC), Demolition Area 2 (Demo 2), and the Western Boundary (WB).

For the Demo 1 site, Mr. Gregson pointed out that 28,000 tons of soil were removed and treated and a groundwater system was installed and expanded over the course of 12 years. To date, 3.7 billion gallons has been treated at Demo 1. The historic maximum RDX detection was 370 ppb and the current level is now at 2.9 ppb. The historic maximum perchlorate concentration was 500 ppb and is now at 19.4 ppb.

For the CIA site, Mr. Gregson noted a long-term response plan was created to address 4,000 to 9,000 munitions items and contaminated soil. More than 50 acres have been cleared of munitions and ~15,000 tons of soil have been excavated and treated on-site or disposed of off-site. An additional 25 acres will be cleared in 2019/2020. A groundwater treatment system with three extraction wells has treated over 1.8 billion gallons to date. The historic maximum RDX detection was 44 ppb and it is now at 12 ppb. The historic maximum perchlorate detection was 11 ppb and it is now at 5 ppb.

Mr. Goddard asked about if a smaller “lobe,” shown on the CIA plume map, was detached from the larger plume and anticipated to dissipate. Mr. Gregson confirmed this will be addressed through MNA. Mr. Goddard also asked if the areas that have been cleared of munitions will be entered into the wildlife/fire-adapted-habitat management program. Mr. Gregson said the area have not been cleared to 100% so there is still some safety risk to workers in that area. Mr. Cody added that the removal efforts have helped with habitat restoration efforts by removing the pitch pine and allowing the scrub oak to come back. Mr. Pinaud noted that the IAGWSP works closely with Mr. McCumber, the MA Integrated Training Area Manager and Fire Manager to assist with habitat preservation and restoration. He suggested this could be a briefing at a future JBCC CT meeting.

Mr. Dow asked what type of treatment was used to remove perchlorate from the soil. Mr. Gregson replied that low temperature thermal desorption was used (albeit at a higher temperature than normal).

For the J-1N site, Mr. Gregson noted there is a pump and treat system with two extraction wells and one mobile treatment unit, which has treated over 750 million gallons to date. Over 5,700 tons of soil has been treated and 3,300 items removed. The historic maximum RDX detection was 88 ppb and it is now at 45 ppb. The historic maximum perchlorate detection was 78 ppb and it is now at 14 ppb.

For the J-1S site, Mr. Gregson noted there is a pump and treat system with two extraction wells and one mobile treatment unit, which has treated over 560 million gallons to date. The historic maximum RDX detection was 130 ppb and it is now at 23 ppb for the on-base portion of the plume and 3.5 ppb for the off-base portion.

For the J-2N site, Mr. Gregson noted there is a pump and treat system with three extraction wells that have treated over 2.5 billion gallons to date. The historic maximum RDX detection was 16 ppb and it is now at 4.2 ppb. The historic maximum perchlorate detection was 198 ppb and is now at 68.6 ppb.

For the J-2E site, Mr. Gregson noted that there is a pump and treat system with three extraction wells that have treated over 2.5 billion gallons to date. The historic maximum RDX detection was 18 ppb and it is now at 9.4 ppb. The historic maximum perchlorate detection was 88 ppb and it is now at 31.9 ppb.

For the J-3 site, Mr. Gregson noted there is a pump and treat system with four extraction wells that have treated over 1.28 billion gallons to date. The historic maximum RDX detection was 38 ppb and it is now at 5.5 ppb. The historic maximum perchlorate detection was 770 ppb and it is now at 7.7 ppb. Additionally, a soil sampling and geophysical anomaly removal action was completed with 2,500 tons of soil treated along with 1,900 munitions items and 30,000 lbs. of range debris removed.

For the L Range site, Mr. Gregson noted that 4,100 tons of soil were excavated and treated on site with alkaline hydrolysis. 165 munitions items and 24,000 lbs. of munitions debris were removed. The approved remedy for this site is MNA. The historic maximum RDX detection was 10 ppb and it is now at 2.1 ppb.

For the NWC site, Mr. Gregson noted the RDX mass is believed to be from the CIA based on the nature, depth, and orientation. The approved remedy for this portion is MNA. The historic maximum perchlorate detection was 26 ppb and it is now at 0.6 ppb, with no sample results exceeding 2 ppb since May 2013.

For the Demo 2 site, Mr. Gregson noted that 1,200 tons of soil was removed. The approved remedy for this portion is MNA. The historic maximum RDX detection was 7 ppb and it is now at 0.52 ppb in only one well.

For the WB site, Mr. Gregson noted that investigations were initiated to evaluate perchlorate detections upgradient of the Bourne water supply wells. The approved remedy for this portion is MNA. Perchlorate has not exceeded the remedial goal of 2 ppb since 2008. Perchlorate in groundwater samples in 2013 was below the 0.35 ppb background level. A Demonstration of Compliance Report was issued in 2016. In 2017, 26 off-base wells were abandoned and 9 wells were entered into the Bourne Water District monitoring program.

Mr. Gregson then showed a slide with predicted cleanup timeframes for each site. He pointed out that two sites (Western Boundary and the Former A Range) have achieved cleanup goals already. Closeout procedures will begin for the NWC. Monitoring wells will be installed at the CIA and Demo 1 and source removal actions will continue at the CIA.

Mr. Goddard asked if the predicted models are being updated and calibrated. Mr. Gregson replied that three hydrogeologists from the US Army Corps of Engineers work on the IAGWSP and they update plume shells/depictions annually. He added that they do an entire rebuild of the models every five years. Mr. Goddard asked, "Is the science we are learning here being shared for modeling to be applied to other sites around the DoD or science in general, for EPA? Is there a master model?" Mr. Gregson replied that USGS does a lot of work related to groundwater on the Upper Cape, of which the IAGWSP sites are a part. The USACE modelers work on other sites all around the region and country so they would apply what they learn elsewhere.

Mr. Goddard said to Mr. Lim, "I am curious if the EPA overseeing all of these types of programs from the macro level... is this being fed up to some sort of master 'lessons learned' from a science perspective so that the next site comes along they're not starting all over again?" Mr. Lim said he is not aware of any official, nationwide study on the progress and lessons learned of groundwater cleanups but he stated that he recently brought US EPA officials to JBCC for a briefing and tour of some of the AFCEC sites. One of the officials commented that the progress was considerable. Mr. Lim does not know if there was a specific plan to report the information on a national scale. Mr. Lim echoed Mr. Gregson's points about the USGS and USACE efforts are likely being shared in other arenas. Mr. Cody commented that USGS create a regional model and IAGWSP helped to update that. He added that locally the information is shared and forwarded up the chain. He hopes that is true elsewhere too.

Mr. Cody noted that Mr. Gregson and Ms. Forbes also attend the "UMASS Soils Conference" to share information about our programs. Mr. Cambareri mentioned that the USGS recently released the 2019 Cape Cod Regional Model and much of the information (and funding) originates from the DoD programs at JBCC.

Mr. Dow stated that he noted MNA is being used for several of the plumes with RDX and perchlorate. Mr. Dow asked if that meant the chemicals are just being diluted in the ground or if there was active microbiological biodegradation happening and the assumption that they will continue to decrease over time. Mr. Gregson replied, "For perchlorate, it is pretty much dispersion and there is no biodegradation. There might be some biodegradation of RDX but it is not a significant factor in attenuation." Mr.

Mr. Dow stated that there is a public drinking water well in Falmouth that is contaminated with perchlorate and he asked if the group had any idea what that perchlorate source could be. Mr. Gregson replied that he is not familiar with that particular case but other instances with private wells with perchlorate detections have been attributed to nearby septic systems. Mr. Jacobs added that household practices and use of disinfectants in the immediate vicinity contributed to the contamination.

Agenda Item #5. 6-Month Look-Ahead for IAGWSP and IRP– Mr. Benjamin Gregson, IAGWSP and Ms. Rose Forbes, IRP

Mr. Gregson continued his briefing by reviewing the upcoming work over the next several months. This includes monitoring well installations at the CIA and Demo 1. CIA source removal will also continue. Closeout procedures for the NWC have begun and a Demonstration of Compliance Report will be submitted.

PFAS sampling was conducted at the OB/OD areas (Demo 1, J-1N, J-2E, and J-3). At Demo 1, sampling was conducted at the influent at the treatment plants and two additional monitoring wells, focusing on wells that had existing perchlorate contamination. At J-1N, sampling was conducted at the influent of the treatment plant and three additional locations. At J-2 N, sampling was conducted at the influents of the MTUs and the treatment plant at the toe of plume and three locations along the spine of the plume.

At J-E, sampling was conducted at the influents of the MTUs and three locations within the plume. At J-3, sampling was conducted at the influent of the treatment plant and two wells along the spin of the plume.

A chart of the sampling results was displayed. No detections exceeded the EPA PFAS/PFOA or MassDEP current regulatory thresholds. Some resampling has/will occur for some of the wells based on some higher detections, mainly at the J-3 Range (but still below the thresholds).

Mr. Pasakarnis asked if the sampling was done at the effluents of the locations as well. Mr. Gregson confirmed that had not happened but it is planned. He stated that the water goes through ion exchange and granular activated carbon so the contamination should be captured in most cases. Mr. Pasakarnis noted that, in some cases, depending on what else is adhering to the carbon, there can be breakthrough.

An audience member asked how much of the nationwide PFAS problem could be attributed to fire fighting foam and how much was due to frying pans, clothing, food packaging, etc. Mr. Gregson replied that the fire fighting foam seems to be the biggest source. Ms. Forbes added that manufacturing sites for the household products is also a major source for groundwater contamination, air pollution, etc. Mr. Gregson added that at the UMass Soils Conference, air emissions from plastics factories were presented as a source.

Mr. Dow stated that several years ago, ATSDR did a health study related to contaminants from the base because of high breast cancer rates. Many activists felt the source of exposure was airborne from munitions burning or the fire training area. Other people felt the major source was groundwater and the source and plumes have since been identified and addressed. Mr. Dow noted that at Pease AFB, airborne was determined to be a significant source of exposure. He asked if airborne exposure has been/would be investigated at JBCC. Mr. Gregson and Ms. Forbes replied that had their programs have not discussed that.

IRP Look-Ahead: Ms. Forbes divided IRP's 6-month look-ahead into three sections: IRP sites, Emerging Contaminants, and MMRP. Sampling and operations and maintenance (O&M) of treatment systems will continue at IRP sites. Several documents are planned for submission including: an updated O&M Plan; the FS-29 Three Step Process Step 3 Report which will lead to site closure (Steps 1 and 2 are complete); the Land Use Control (LUC) Implementation Plan Update; Plume Booklet update, LF-7 Work Plan which will lead to site closure, and the 2019 LUC Letter Report.

Ms. Forbes covered the 6-month look-ahead for Emerging Contaminants and MMRP sites during her Agenda Items #2 and #3 presentations.

There were no questions on the 6-month look-ahead.