

**Massachusetts Military Reservation Cleanup Team (MMRCT)**  
**Building 1805**  
**Camp Edwards, MA**  
**July 14, 2010**  
**6:00 – 8:25 p.m.**

**Meeting Minutes**

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**Action Items:**

1. Mr. Dinardo requested an update on the status of the Towne Cleaners MCP site near the Ashumet Valley plume.
2. Mr. Goddard requested an MMRCT update on the Former A Range, to be presented prior to the public comment period on the Decision Document.

**Handouts Distributed at Meeting:**

1. Responses to Action Items from the May 19, 2010 MMRCT Meeting
2. MassDEP email re: Textron/MMR NRD Final Restoration Plan
3. Presentation handout: Explanation of Significant Differences: Source Area and Groundwater
4. Presentation handout: Testing of Private Wells, Ponds, and Harbors
5. Presentation handout: Ashumet Valley Plume Update

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6. Presentation handout: Former A Range Update
  7. Remedy Selection Plan for J-1 Range
  8. Table: Contaminants of Concern
  9. MMR Cleanup Team Meeting Evaluation Form

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**Agenda Item #1. Introductions, Agenda Review, Action Items Review, Approval of  
May 19, 2010 MMRCT Meeting Minutes, and Brief Update**

Ms. Donovan convened the meeting at 6:05 p.m., asked the Massachusetts Military Reservation Cleanup Team (MMRCT) members to introduce themselves, and reviewed the agenda. She then asked for any comments on the Responses to Action Items from the May 19, 2010 MMRCT meeting. Mr. Pinaud referred to Action Item #2 and noted that the Massachusetts Department of Public Health (MDPH) is updating its annual ponds fact sheet and plans to issue the new version next week at the earliest. Mr. Hurley referred to Action Item #3 and reported that the Massachusetts Division of Fisheries & Wildlife (MDFW) has a sampling crew on Ashumet Pond this week to conduct a visual scan for papillomas on brown bullhead.

Ms. Donovan asked if there were any changes or additions to the May 19, 2010 MMRCT meeting minutes. Mr. Pinaud noted that a statement regarding perchlorate on the bottom of page 3 was erroneously attributed to him rather than to Mr. Gonser. Mr. Taylor noted that his name should have been included on the list of attendees. The May 19, 2010 MMRCT meeting minutes were approved with these changes.

Ms. Donovan provided MMRCT members with copies of an email announcing that the Textron/MMR Natural Resource Damages (NRD) Final Restoration Plan is available for review. She also noted that the email includes the link to the document.

**Agenda Item #2. Groundwater and Source Area Explanations of Significant Differences**

Mr. Davis stated that an Explanation of Significant Differences (ESD) is used to document changes to previously selected remedies – changes that don't rise to the need for a Record of Decision (ROD) Amendment. A public comment period for an ESD is optional, and rather than holding public comment periods for the two ongoing ESDs, the Air Force Center for Engineering and the Environment (AFCEE) opted to use this MMRCT meeting as the forum for presenting the documents.

Mr. Davis noted that two ESDs are being prepared; one for groundwater and the other for source areas. The Groundwater ESD addresses all groundwater plume remedies, which were issued under numerous RODs, and provides clarity and consistency for the plume remedies. The Source Area ESD, which addresses three source area sites, each of which has a separate ROD associated with it, completes the paper trail for remedy decisions and integrates updated cleanup standards. Mr. Davis also mentioned that the need for many aspects of the ESDs was identified through the Five-Year Review process, which is undertaken to ensure that remedies are protective.

Mr. Davis stated that the Groundwater ESD does the following: implements consistent Land Use Control (LUC) requirements for all plumes, including Residential Well Verification for all off-base plumes; implements consistent language for Remedial Action Objectives (RAOs) (to correct inconsistencies such as “prevent residential exposure...” and “prevent or reduce residential exposure...” or “restore to usable groundwaters...” and “return to usable groundwaters...”) and includes a table listing all RAOs for all groundwater remedies; clarifies the role of monitored natural attenuation (MNA) by depicting which portions of plumes are relying on MNA as a remedy component; and implements consistent 3-Step Process language and clarifies that the 3-Step Process will be used to achieve site closure, rather than RAOs. Mr. Davis then reminded the group that the steps in the 3-Step Process are: 1) conduct plume and system monitoring; 2) conduct residual risk

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assessment and continue remediation if needed; and 3) evaluate the feasibility of continuing remediation to approach or achieve background. He also mentioned that the Storm Drain 5 (SD-5) plume is likely to be the first to go through the 3-Step Process.

Mr. Davis showed a table entitled “Global MMR Groundwater ESD Scope Matrix” as well as a map entitled “IRP Plumes, Treatment Systems, and Land Use Control Areas – July 2010.” He noted that the LUC area outlines can be changed as needed in coordination with the regulatory agencies, without having to issue a new ESD. He also showed another map depicting plume areas undergoing active treatment versus those relying on MNA.

Mr. Davis then discussed the Source Area ESD, which addresses the Chemical Spill 10 (CS-10), Fuel Spill 1 (FS-1), and FS-9 source areas. He reviewed the CS-10 source area changes that will be reflected in the document: remove restrictions on use of the property for future residential use; document the most current remedial action levels for soil; remove hot air injection and add thermal oxidation (the method that ended up being used) for the Soil Vapor Extraction remediation system; add the removal of an underground storage tank at Detail C, which was not mentioned in the ROD; add that there will be no remedial action at Detail F, a wetland, based on a site-specific ecological evaluation; and add that there will be no further action for subsurface soils, based on a leaching analysis.

Mr. Davis noted that the change for the FS-1 source area is to remove restrictions on the use of the property for future residential use. The changes for the FS-9 source areas are to: remove restrictions on use of the property for future residential use; document the most current remedial action levels for soil; and remove the requirement for groundwater monitoring and Five-Year Review, which were mentioned in the original ROD. Mr. Davis also stated that ESD documents will be posted in the Administrative Record.

Mr. Reif inquired about the method for determining the size and shape of the LUC areas. Mr. Davis replied that the LUC areas actually follow parcel boundaries, which is why they can sometimes take on a strange shape. He also noted that the LUC areas fully encompass areas of known groundwater contamination, based on plume data, and extend a little downgradient where there’s no active treatment at the toe of a plume.

Mr. Dinardo asked how often LUC areas would be reviewed and changed. Mr. Davis replied that they would be changed each time a plume outline is redrawn, which can happen as often as every year, depending on what the data indicate.

### **Agenda Item #3. Testing of Private Wells, Ponds, and Harbors**

Mr. Davis showed a map entitled “Residential Well Program Locations and Private-Well LUC Areas” and reminded the group that the Residential Well Program has been merged into the Private Well Verification Program, one of AFCEE’s LUCs. He said that many private wells previously sampled under the Residential Well Program have been dropped from the testing program because they are outside of current plume areas. He also noted that the Private Well Verification Program includes irrigation wells and involves nearly 2,000 properties. So far, 276 private wells have been identified, eight of which are being use for drinking water, and 93 of which are being use for non-potable purposes (watering). Operational wells will undergo a technical evaluation in order to determine their safety, and those associated with the Landfill 1 (LF-1) plume will be completed by the beginning of this September, as the ROD calls for completion of that effort within three years.

Mr. Davis referred to the map and explained that the red triangles represent residential wells that were part of the Residential Well Program but are not included in the Private Well Verification Program. He noted that most of these wells are located on the eastern side of Johns Pond, and if plume constituents were to be detected in that area again in the future, those wells could be added back into the program.

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He also noted that green dots on the map represent private wells that will transition into the Private Well Verification Program LUC.

Mr. Davis then reported that all pond sampling test results were nondetect. Also, the PCE detection (associated with the LF-1 plume) in a groundwater seep at Squeteague Harbor was consistent with what's been seen in the past and was below the drinking water standard of 5 micrograms per liter ( $\mu\text{g/L}$ ).

Mr. Goddard inquired about postings at the recreational ponds and about the MDPH fact sheet. Mr. Davis replied that AFCEE no longer posts signs at the ponds. He also said that the MDPH publication, which addresses the Upper Cape area, is produced in a newsletter format. Ms. Donovan added that the MDPH document includes a general fish advisory about mercury in the ponds. Mr. Pinaud stated that the document, which is titled "Recreational Use of Water Bodies On or Near the MMR," is usually updated every year and pertains to ponds adjacent to MMR as well as other ponds on the Upper Cape. Mr. Goddard asked if the document is distributed to the local Boards of Health and Mr. Pinaud confirmed that it is.

#### **Agenda Item #4. Ashumet Valley Plume Update**

Ms. Forbes stated that the Ashumet Valley plume is located entirely off base and in the town of Falmouth and is disconnected from its source areas. The primary contaminants of concern (COCs) associated with the plume are perchloroethylene (PCE) and trichloroethylene (TCE), chlorinated solvents for which the maximum contaminant level (MCL) is 5  $\mu\text{g/L}$ . The historical maximum PCE concentration was 190  $\mu\text{g/L}$  (October 1998) and the current maximum PCE concentration was 43  $\mu\text{g/L}$  (May 2009). The historical maximum TCE concentration was 83  $\mu\text{g/L}$  (August 1997) and the current maximum TCE concentration was 12  $\mu\text{g/L}$  (May 2009).

Ms. Forbes then reported that as part of the Ashumet Valley Plume ROD process, in June 2009 manganese and thallium were added as COCs in source area groundwater. She noted that the MCL for thallium is 2  $\mu\text{g/L}$ , and the historical maximum concentration was 5.7  $\mu\text{g/L}$  (July 1998). The health advisory for manganese is 300  $\mu\text{g/L}$ , and the historical maximum concentration was about 7 milligrams per liter (mg/L), in October 1999. Ms. Forbes also said that manganese and thallium, which have not yet been incorporated into the monitoring network but will be later this year, are naturally occurring in Cape Cod soils and sediments. She further noted, however, that reducing conditions mobilize the metals, resulting in the detections.

Ms. Forbes stated that Firefighter Training Area 1 (FTA-1), one of the two Ashumet Valley plume source areas, was used for firefighter training exercises from 1958 through 1985. These activities resulted in soils contaminated with fuels and other volatile organic compounds (VOCs), and subsequently contaminated groundwater. Remedial actions to address the soil contamination at FTA-1 involved excavation and on-site thermal desorption treatment, treating more than 42,000 tons of soil. The other Ashumet Valley plume source area is the former sewage treatment plant, which operated at the base from 1936 through 1995. The sand filter beds, sludge drying beds, and sludge piles associated with the plant contained various contaminants, including semi-volatile organic compounds (SVOCs), pesticides, PCBs, and phosphorus. The excavation and off-site disposal of 6,000 tons of source area soil eliminated the SVOCs, PCBs, and pesticides, but some phosphorus still remains in soil and groundwater.

Ms. Forbes reported that in September 2001 an alum treatment (aluminum sulfate) was applied at Ashumet Pond to sequester the phosphorus and make it unavailable. Then, in August 2004 a geochemical barrier utilizing iron filings was installed along the shoreline of the pond; the phosphorus reacts with the iron to form an immobile mineral called vivianite, which helps reduce the flow of phosphorus into the pond. Monitoring of the quality of the pond has continued over the years, and the data now suggest that another alum treatment is needed, which is planned for this fall.

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Ms. Forbes reported that the Final Ashumet Valley ROD, which was signed in June 2009, called for continuing active treatment of the plume using the existing extraction/treatment/injection (ETI) system, expanding treatment into the southern portion of the plume, and implementing LUCs. The groundwater treatment systems at the plume now include the ETI system that began operating in November 1999 with three extraction wells, two treatment buildings, and two infiltration trenches, at 1,200 gallons per minute (gpm). After an optimization in May 2007, the ETI system now operates with one extraction well, one treatment building, but still two infiltration trenches, at 350 gpm. Ashumet Valley plume treatment systems also now include an extraction/treatment/discharge (ETD) system that began operating in August 2009 and consists of one extraction well, one mobile treatment unit (MTU), and one discharge bubbler in a Backus River bog ditch, at 175 gpm.

Ms. Forbes displayed an Ashumet Valley plume map and pointed out the outline that identifies the source area groundwater monitoring area (for thallium and manganese), the main body of the plume, the extraction wells installed in 1999, and the new extraction well and MTU. She showed several photographs, including an ETI treatment building, infiltration trenches, and the MTU, which she noted is situated near the Backus River. She also showed schematic drawings of the ETI and ETD systems.

Ms. Forbes stated that model projections suggest that the treatment system can be shut down in 2018, although a small area of MCL exceedances is expected to persist until about 2021 and will be monitored at least until that time, but probably longer. She also mentioned that any model has some uncertainty associated with it, and field data continue to be collected in order to verify and refine the model. She further noted that AFCEE is always looking to optimize systems in order to expedite cleanup time and reduce the cost and impact of remediation. She also noted the following: there is no current risk of exposure as the residences in the immediate vicinity are connected to town water; the Private Well Verification Program, which is part of AFCEE's LUC Program, is under way; surface water sampling for PCE and TCE is conducted periodically (three times in 2009) to determine the marketability of the cranberries, and as long as any detections are below the MCL the cranberries don't need to be sampled and are considered marketable; and irrigation well water is sampled at least once per summer (or more, if the bog operator allows access) to ensure that concentrations are within range of those determined by MDPH to be acceptable, based on its consult in 2005. Ms. Forbes then stated that the costs associated with the Ashumet Valley plume are a little more than \$1 million for fiscal year 2009, about \$45 million for 1997 to 2009, and another \$10 million estimated for 2010 to 2038. She also mentioned that these numbers include nutrient management costs as well as plume monitoring and treatment systems.

Ms. Forbes stated that the groundwater monitoring results mostly include data from October 2008 through May 2009, although she did update some data where it made sense to do so. She noted that: 54 monitoring wells were sampled for VOC analysis (32 annual, 22 semiannual); surface water sampling was conducted at Backus River locations in May, July, and September 2009; irrigation system locations were sampled in August 2009; and system performance monitoring of the ETI system continues, as well as startup and performance monitoring of the ETD system. Ms. Forbes then displayed a map of the plume and pointed out: the northern zone, where source area monitoring occurs on a triennial basis; the central zone, where the ETI system is located; and the southern zone, where the ETD system is located at the leading edge of the plume and where surface water monitoring and irrigation well monitoring occur.

Ms. Forbes reported that the data that were collected support the decision to optimize the treatment system in May 2007 by shutting down the two northern extraction wells. She also noted the following: overall concentrations are decreasing; one monitoring well (MW-172), located near extraction well 2 (EW-2), showed a PCE concentration slightly above the MCL, but this is not a big concern because the contaminant is within the capture zone; the data show that the plume is collapsing at the western plume boundary, especially in the central portion; some PCE and TCE contaminant mass continues to be seen

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upgradient of EW-3; PCE increased from below reporting limit (BRL) in 2006 to 17.6 µg/L in 2008 at MW-1232A, which is near the edge of the capture zone, but it's believed that that increase may be due to a change in the flow field from packering of EW-3 as part of the optimization in May 2007; PCE concentrations at MW-106, which is outside of the plume boundary, have been fluctuating around and above the MCL, which warrants further investigation that will occur in the form of direct-push work; and overall the data support the conceptual site model, which suggests that the shallow portion of the Ashumet Valley plume continues to upwell into the Backus River while the deeper portion may migrate south below Mill Pond/Green Pond, at low concentrations. Ms. Forbes also mentioned that the highest remaining concentrations are in the 20 µg/L to 30 µg/L range.

Ms. Forbes showed an aerial figure of the plume and pointed out the leading edge, the new extraction well, the LUC boundary, and MW-106, which is outside of the plume and had PCE detections that require further investigation. She also pointed out a proposed direct-push location on town property, and another proposed direct-push location, contingent on what's found at the first location. She also pointed out a proposed direct-push location along Route 28 at the edge of the LUC area, which she noted is being proposed because there isn't very much monitoring downgradient of the leading edge, with the exception of one well cluster that was installed by the U.S. Geological Survey (USGS) some time ago.

Ms. Forbes then reviewed surface water and irrigation system monitoring results: PCE and TCE were not detected at concentrations above MCL in any surface water samples collected in 2009, and therefore no cranberry sampling was required and the fruit was harvested; the distribution of PCE and TCE detections in surface water in 2009 was similar to prior monitoring periods (the highest detections were PCE at 3.3 µg/L and TCE at 2.2 µg/L, in bog 13); and the distribution of PCE and TCE detections in irrigation system samples were also similar to prior monitoring periods (the highest detections were seen in the northernmost well, with PCE increased to 20 µg/L in August 2009, although concentrations remain similar to values evaluated by MDPH in 2005 for potential health effects and found to be of no concern). Ms. Forbes also displayed a figure showing the surface water/irrigation sampling area.

Ms. Forbes then noted that from January to December 2009 the ETI system removed slightly more than 12 pounds of PCE and TCE, while the ETD system just began operating in late August 2009 and therefore hasn't remove much mass, plus the influent concentrations were very low. She further noted that since startup in November 1999, a total of 306 pounds of PCE and TCE were removed, which is enough mass to put 11,200 Olympic swimming pools at the MCL of 5 µg/L. In terms of energy use, about 200 megawatt hours were used from January to December 2009, and about 10,500 megawatt hours were used since system startup.

Ms. Forbes showed a graph entitled "Ashumet Valley ETI System Influent Concentration Trends" and pointed out that influent concentrations increased in the remaining extraction well after the May 2007 optimization of shutting off the two northernmost wells. She noted that the influent concentrations there now hover around the MCL for PCE, but have been consistently below the MCL for TCE. She also showed a graph called "Air Emissions – 2009" and noted that by purchasing 50% green energy overall air emissions were reduced by 50%, with additional reduction in air emissions from the wind turbine, which it's hoped will eventually completely offset emissions. She stated that AFCEE is very interested in keeping its systems sustainable.

Ms. Forbes reported that the ETD system began operating in August 2009. She also noted that concentration trends at nearby monitoring wells were very heterogeneous, with some low concentration areas and some discontinuous high concentration areas. Since influent concentrations at the extraction well were so low, AFCEE sought to optimize the new extraction well and conducted flow testing at various flow rates, and based on that testing decided to operate the system at the design flow rate of 175 gpm.

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Ms. Forbes displayed a figure of the Ashumet Valley 2008 PCE plume shell, explained that the different colors represent different concentration ranges, and noted that either the higher concentrations haven't reached the extraction well yet or they aren't as large as anticipated. She also mentioned that some PCE and TCE appears to be getting by the extraction well, but at very low concentrations. She then reminded the group of the direct-push locations that are going to be added to monitor the detection at MW-106 and to have additional monitoring at the leading edge of the plume.

Ms. Forbes reviewed the "Conclusions" slide, which noted the following: the ETI system is performing as expected and remedial goals are being met, and the data support the decision to shut down EW-1 and EW-2 in May 2007, which has improved mass removal efficiency at EW-3; the plume continues to discharge to the Backus River, however no PCE or TCE MCL exceedances were detected in surface water and the cranberries were harvested in 2009; there's evidence that the leading edge of the plume is migrating south based on an increase in COC concentrations at MW-106; data trends at wells within the southern portion of the plume indicate discontinuous zones of contaminant mass, supporting the conceptual site model; EW-4 started up successfully, however low initial influent concentrations/mass removal results are being seen because of plume heterogeneity in the aquifer. Ms. Forbes also reviewed the "Recommendations" slide: perform System Performance and Ecological Impact Monitoring (SPEIM) chemical network optimization using fall 2010 sampling data that will include long-term management for manganese and thallium for the area west of Ashumet Pond near the source area, and performance monitoring for EW-4; and conduct direct-push drilling work at the leading edge for data gap investigation.

Mr. Taylor inquired about the number of gallons of Ashumet Valley plume groundwater being treated per day. Mr. Davis replied that about three-quarters of a million gallons per day are being treated.

Mr. Reif asked if maximum concentration data for 2010 are available. Ms. Forbes replied not yet, and explained that the available maximum concentration information is based on 2009 data. Mr. Reif then asked if thallium and manganese are actually COCs or if they are artifacts. Ms. Forbes replied that as part of the risk assessment and ROD process, thallium and manganese were identified as having risk associated with them, based on historical concentrations. Mr. Reif asked if the metals are associated with historical MMR activities. Ms. Forbes replied not necessarily, and explained that the metals tend to be naturally occurring in the aquifer. She also noted, however, that a lot of biodegradation occurs after a spill and the bacteria use up the oxygen in the aquifer, which produces reducing conditions that cause the metals to mobilize in the groundwater and be detected in monitoring wells. Mr. Reif asked if it's correct that the remediation caused the metals to mobilize. Ms. Forbes clarified that it was the original contamination that created the problem, although it's important to watch the metals when doing certain types of in situ biodegradation remedies.

Mr. Reif also remarked that the data appear to be truncated in some of the graphs that Ms. Forbes showed. Mr. Davis explained that different monitoring wells are sampled at different frequencies, so if the data seem truncated it's just because the wells haven't come up on their next monitoring event yet. He noted that some of the wells are only sampled once every three years.

Mr. Marchessault referred to the plume shell figure and asked Ms. Forbes to roughly identify the capture zone associated with the southern extraction well. Ms. Forbes indicated the capture zone on the figure and said that the well was intended to capture the higher concentration area but is not expected to capture whatever was already downgradient or some of the other areas on the edge. Mr. Marchessault noted that the capture zone Ms. Forbes indicated differs from the one included in Mr. Davis's ESD presentation earlier this evening. Ms. Jennings added that the point is that it doesn't appear that the well is doing a good job of capturing the plume. She also said that "there's a lot of interpretation" especially for the southern part of the plume, the U.S. Environmental Protection Agency (EPA) has "a lot of issues" with the modeling there, and she doesn't think "this does it justice in terms of how much of that lower half of the plume is actually being actively remediated." Ms. Forbes noted

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that her “pointer” capture zone might not be entirely accurate, and added that she would include the capture zone on the figure for the next presentation.

Mr. Goddard inquired about any access problems for the direct-push wells. Ms. Forbes replied that typically an effort is made to locate wells on town property, because access is so much easier to obtain than with private property. Mr. Goddard asked if AFCEE has access for what it needs to do with regard to the direct-push work that’s planned. Ms. Forbes replied that it does. Mr. Goddard also referred to an area on the map near MW-106 and asked if it might be a gravel pit. Ms. Forbes replied that she’s not sure. Mr. Goddard then asked about the plan for dealing with thallium and manganese and whether the treatment systems would address them, since they are said to have risk associated with them. Ms. Forbes replied that the metals have been identified for long-term monitoring. Mr. Marchessault added that the metals area is very small and far upgradient of any extraction wells. Mr. Goddard also asked if it’s correct that the MTU is part of the ETD system. Ms. Forbes confirmed that it is.

Mr. Saucier asked if it’s correct that the presence of thallium and manganese in groundwater is an indicator of the contaminants. Ms. Forbes clarified that it’s an indicator of the degradation of the contaminants. She also noted that the metals are mainly in soil, but in this situation they were definitely mobilized by the aerobic-to-anaerobic processes, although manganese is often seen in groundwater at background concentrations.

Mr. Dinardo asked if it’s correct that there’s currently no restriction on the marketability of the cranberries in the bogs. Ms. Forbes confirmed that that’s correct. She also said that if concentrations in surface water go above MCL, the cranberries would be sampled, and if clean, could be marketed.

Mr. Dinardo also asked if the Towne Cleaners site on the edge of the LUC area enters into AFCEE’s process at all. Ms. Forbes replied that AFCEE looked at the site because there are some monitoring wells downgradient of it (although they are quite shallow) and just to be aware of any other known contamination in the area. She also noted, however, that it’s really not connected to AFCEE’s cleanup program at all. Mr. Pinaud added that the Towne Cleaners site is a PCE site managed under the Massachusetts Contingency Plan (MCP), and he could provide the data on the site, if Mr. Dinardo wants it. Mr. Dinardo said that he’s just like to know the status of the site, but does not need all the data.

#### **Agenda Item #5. Former A Range Investigation**

Mr. Gallagher stated that Former A Range, which is located west of the Camp Edwards Impact Area in the southern portion of Training Area B-9, is approximately 2,600 x 1,500 feet in size, and was used from 1941 until the mid 1970s. Originally it was used as a gravity anti-tank range where cars would be brought up to the top of hill and, by gravity, go down the hill, moving through a series of switchbacks, and these targets would be fired upon by soldiers using small artillery rounds (37mm and 40mm rounds) and 3.5-inch rockets. In the 1960s the range was reconfigured to be a machinegun range, and 50-caliber rounds were fired.

Mr. Gallagher reported that initial soil investigations at Former A Range focused on the backstop berms of the target area, the target roll-out area, and the firing point, while soil sampling conducted from 2004 to 2009 focused on characterizing contaminants detected in the initial sampling. Soil from the target area was sampled for explosives, SVOCs, and metals; soil from along the corridor of the rail line was sampled for PAHs; soil from throughout the target area was sampled for metals associated with small arms. Mr. Gallagher also noted that some deeper detections of explosives were found in soil in an area upgradient of the range, but they are not believed to be from Former A Range.

Mr. Gallagher reported that four monitoring wells were installed specifically to monitor potential contamination from Former A Range. He showed a figure of the range, pointed out the monitoring wells and the direction of groundwater flow, and noted that the other monitoring wells in the area were



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associated with the Central Impact Area plume. These wells were also sampled, but generally they weren't screened at the proper depths to monitor Former A Range contamination.

Mr. Gallagher stated that geophysical investigations of Former A Range began with an air magnetometry (air mag) survey conducted in 2001 over the entire B-9 training area, and the one significant feature observed at the range at that time was the railroad track. Also, an EM-61 survey was conducted at the primary backstop berms most heavily impacted by munitions firing. That survey found unexploded ordnance (UXO) items, primarily 37mm and 40mm projectiles. A target area configuration study, in order to try to determine the dimensions of the range, was also conducted. This involved investigating anomalies in transects from the main target area. Results indicated that the most heavily impacted areas were the rail line switchbacks and through the center of the rail line, and the indication is that the width of the range is roughly the width of the rail tracks. Mr. Gallagher also reported that an ordnance penetration study was conducted at the most heavily impacted backstop berms, with results indicating that approximately 85% of the munitions were in the first one-foot lift, and almost all of the remaining 15% were in the one-to-two foot lift, so not very deep penetration into the berms.

Mr. Gallagher began discussing removal actions at the range by noting that as part of a robotics technology demonstration, UXO, small arms, and metal debris were removed from the backstop berms using an excavator equipped with a large electromagnet. In 2009 a soil removal action was conducted at the most heavily impacted berms, each of which was excavated to a depth of two feet. Approximately 2,500 cubic yards of soil was removed, screened for UXO, and put in a staging area where the stockpiles were sampled for disposal/treatment options. Sampling results show that there isn't much contamination in the soil and one potential use being considered for the soil is for backstop berms at a small arms range.

Mr. Gallagher stated that the investigation findings for groundwater were low levels of TNT and its breakdown products and some perchlorate in one monitoring well (MW-249M3), all at concentrations below the MCL or health advisory. He also noted that at one time RDX was also detected in MW-249M3, but at a concentration of less than 0.5 parts per billion (ppb), with the health advisory for RDX being 2 ppb. Mr. Gallagher then reported that the most frequently detected contaminants in soil were TNT and its breakdown products, SVOCs, and metals in the target area. The maximum TNT concentration detected on the range was 9 parts per million (ppm), the maximum 2,A-DNT detection was 6.8 ppm, and the maximum 4,A-DNT detection was 2.4 ppm. Ms. Donovan mentioned to the group that a data table is included in the handout package. Mr. Gallagher confirmed that a preliminary screening table, which involves more data than could readily be presented at this meeting, is included in the handout package.

Mr. Gallagher then continued his presentation by noting that RDX was detected in soil on the range, but only at post-BIP (blow-in-place) locations, so it's believed that the RDX is associated with the donor charge used to destroy the items. In addition, propellants and SVOCs (2,4-DNT, di-n-butyl phthalate, and n-nitrosodiphenylamine) were detected in soil at the firing point, but at concentrations below regulatory limits. Geophysical investigation findings included UXO, most of which were 37mm and 40mm projectiles that contained very small amounts of explosive compounds. A few larger items were also discovered, including some 81mm mortars, some 75mm shrapnel rounds that contain black powder, and a few rockets, although generally smaller artillery projectiles were fired on Former A Range.

Mr. Gallagher stated that a risk screening was conducted for the Former A Range report, which, he noted, has not yet been submitted to the regulatory agencies, and so is subject to change based on their input and comments. He then said that a site-wide evaluation was conducted in order to assess whether any analytes detected in soil or groundwater warranted further evaluation on an area-specific basis. The site-wide evaluation highlighted naphthalene and chloroform because their detections in soil and

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groundwater exceeded screening criteria. Also, five metals and ten SVOCs, including naphthalene, were highlighted because they exceeded Massachusetts Department of Environmental Protection (MassDEP) cleanup standards. Copper, which has no MassDEP cleanup standard, was also carried forward because it's likely related to the 50-caliber rounds, which have a copper jacket over a steel projectile. Chloroform was not selected for further evaluation because detections in soil and groundwater have been attributed to sources unrelated to MMR activities. Mr. Gallagher stated that altogether six metals and nine SVOCs were selected for further evaluation.

Mr. Gallagher reported that the area-specific risk screening involved two distinct areas of the range (the target area and the rail line) where the concentration and distribution of the 15 contaminants (six metals and nine SVOCs) were evaluated. At the target area five metals and eight SVOCs were detected at concentrations above MassDEP cleanup standards; however, the average concentrations were below MassDEP standards. At the rail line eight SVOCs (specifically PAHs, which may be related to creosote or to petroleum products used during rail line operations) were detected in excess of MassDEP cleanup standards, but again the average concentration was below the MassDEP standard.

Mr. Gallagher reviewed the "Summary" slide, noting the following: groundwater does not appear to be significantly impacted by past range activities; soil on the range does not appear to be a threat to groundwater or human health, and there's no mappable plume; and as a result of the investigation and removal actions, and based on the types of UXO discovered, it's unlikely that residual sources represent a significant threat to groundwater. Mr. Gallagher also noted, however, that some additional investigation outside the target area is under way to confirm that no areas of high munitions density remain. That investigation involves an EM-61 survey along what are called meandering paths to identify anomalies that warrant further evaluation. And it will be determined in consultation with the regulators which of the anomalies should be excavated. Mr. Gallagher clarified that the goal of this effort is to show that there are no significant high density areas of munitions left, and, it is hoped, achieve closeout on the site.

Mr. Gallagher then reviewed the "Next Steps" slide: complete the soil remove project (summer 2010) with respect to disposition of the excavated soil; complete the geophysical survey and anomaly investigation (summer 2010); issue the final Investigation Report (fall 2010); and issue the Decision Document (fall 2010), which will have a public comment period associated with it.

Mr. Goddard inquired about the term "BIP." Mr. Gallagher replied that BIP stands for blow-in-place. Mr. Goddard asked if it's correct then that the UXO that were discovered were blown in place. Mr. Gallagher replied that most of the items were blown in place, and he noted that the crater beneath a BIP is sampled right after the event, any residual contamination is excavated, and a post-excavation sample is collected. He also said that some of the items, which were determined safe to move, were destroyed in the contained detonation chamber (CDC).

Mr. Goddard asked how much soil is stockpiled. Mr. Gallagher replied 2,500 cubic yards. Mr. Goddard asked if the stockpiles are covered with a tarp. Mr. Gallagher said that the piles did have tarps on them, but he believes that the tarps were taken off after they were sampled and no significant contamination was detected. He also said that a project note regarding the final disposition of the soil is being developed for submittal to the regulatory agencies. Mr. Goddard said that it's confusing to hear about MCL exceedances and that there doesn't appear to be any threat to groundwater and that averaged concentrations are "okay." Mr. Gallagher replied that preliminary results certainly do not show significant contamination. He then reminded the group that it's sometimes difficult to find explosive contamination because it's heterogeneously distributed. He also said that the goal was to remove the soil and UXO and ultimately determine whether the soil needed to be treated in some way. Mr. Goddard asked if it's correct then that from a source area standpoint, everything is okay to the point that the stockpiles don't need to be covered, but the groundwater situation is yet to be determined. Mr. Gallagher asked Mr. Goddard to keep in mind that many of the standards are just preliminary screening

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levels chosen by the cleanup program as very conservative leaching based concentrations. He also noted that the MCP does allow averaging of concentrations, and added that ultimately MassDEP will weight in on that after reviewing the report.

Mr. Gonser further explained that different lines of evidence are considered – for example, there might be an exceedance of a screening level, but it only occurred once in 380 samples, which isn't going to cause a groundwater problem. Factors to consider include frequency of detections, the extent of the exceedance over the screening level, whether the contaminant is seen in groundwater, whether it's widely distributed, and so forth. Mr. Gonser also mentioned that averaging concentrations more or less represents the whole berm, and all of those averages were below the standards, so it doesn't seem that any action is really needed. Mr. Goddard asked if it's correct that the source area has been addressed. Mr. Gonser confirmed that it has. He also said that all the detections in groundwater were below the standards, so there isn't much of an issue there.

Mr. Goddard then said that he'd like to hear if the regulators agree that the stockpiles don't need to have tarps on them, as he wouldn't want to see the stockpiles end up creating another source area. Mr. Gallagher acknowledged that providing the data table in the presentation handout was a little dangerous because there's no context or perspective to go along with it, and any data highlighted in yellow automatically raises concern. He also informed the group that the stockpiles were sampled under the direct supervision of EPA, and he believes that EPA was satisfied with the sampling procedure and the results.

Ms. Jennings confirmed that the agencies have not yet received the Former A Range report, but had agreed to go forward with the MMRCT presentation on the report. She also stated, however, that having watched this investigation unfold over a period of time, EPA "would agree with everything that they're saying." She also confirmed that multiple lines of evidence are examined, the first being groundwater, and there's very little, if any, contamination showing up there. The second line of evidence is soil, and all of the obvious contaminants (RDX, perchlorate, the DNTs) are "within check and nothing that we're concerned about." Ms. Jennings also said that based on her first review of the preliminary results, she thinks that what's being done in terms of managing the soil piles is fine. She also said that the agencies will follow through with a more official decision this fall and present the information more clearly.

Mr. Goddard requested another MMRCT update on Former A Range before the Decision Document public comment period occurs.

Mr. Pinaud confirmed that it is perfectly acceptable under state cleanup regulations to average concentrations in soil across the same horizon. And once MassDEP receives the report it will be looking to ensure that those calculations were done correctly, and that quality control of the sampling was satisfactory. He also said that any issues MassDEP has would be articulated in its comment letter.

Mr. Reif asked if it's correct that spot sampling was conducted at the bottom of the berms after they were excavated. Mr. Gallagher replied that first of all, that work is not completely finished. The next step is going to be to conduct an EM-61 survey to see if there are any anomalies, and if so, dig those up, after which confirmatory samples from the excavation will be taken. Mr. Reif said that he thinks that taking the confirmatory samples and compositing them would provide a very conclusive data point, and be useful in the report. Mr. Gallagher replied that there are few placeholders being kept in the report for that type of data. He also said that it's important to note that RDX is not being seen at the range, which is probably the most mobile explosive seen at other sites.

#### **Agenda Item #6. XCTC After-Action**

MAJ Koski reported that approximately 2,000 soldiers were trained and evaluated for mobilization during the Exportable Combat Training Capability (XCTC) event at MMR this past June. He also

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mentioned that 500 of those soldiers are being deployed within a couple of days. Preparations for the event began last year, and the end result was that Camp Edwards was basically transformed into “a small piece of Afghanistan.” He explained that a number of contractors came in and set up relocatable housing units (RHUs) to create small villages that allowed the soldiers to train and become proficient at tasks for when they go to their specific areas of responsibility in Afghanistan. He also noted that a Hollywood theater company came in with some simulated explosions that provided realistic training that further benefited the soldiers. And of particular note, a contractor came in and did 3-D mapping of the entire base using a number of different repeater towers/antenna sites. In this way the contractor was able to track every soldier, every vehicle, every weapon system, and every movement on a real-time basis – the end result of which is a great after-action review or report that allows the soldiers to see exactly what they did wrong and what they did right.

MAJ Koski then mentioned that the Joint Visitors Bureau had hosted tours during the XCTC training event. He also noted that MMR’s Tactical Training Base (TTB) Kelly plus an expanded portion were used to house about 1,200 soldiers at a time during the training and provide every living support system, including laundry, showers, dining, entertainment, and an exchange trailer. MAJ Koski then showed several photographs of the village sites and a three-minute video of the training event.

Mr. Dinardo said that he had been privileged to go on the tour, found the XCTC event to be most impressive, and commended everyone involved. He then asked about the likelihood of another XCTC training event occurring at MMR. MAJ Koski explained that it is a culminating training event for a number of soldiers deploying at once, therefore it depends on the deployment cycle. Based on the Massachusetts deployment cycle it’s unlikely that there’ll be another XCTC event next year, although other states in the area might have that need. Mr. Dinardo then asked if there is a break-even point in terms of the number of troops to be trained in order to make the event affordable. MAJ Koski replied that he doesn’t know what the break-even number is, but he does know that 2,000 is on the lower end of what’s normally done. However, other training areas are significantly larger than the one here.

Mr. Goddard said that he was also on the tour and found it to be outstanding. He also thanked Adjutant General Carter for hosting the tour and said that he hopes the troops are better prepared and come home safely because of the training they received. He also mentioned the importance of combining combat readiness with protection of the environment. He then asked if the “big” Army has shown any interest in XCTC training, which he understands is a National Guard initiative. MAJ Koski clarified that the Army conducts the same training on an ongoing basis at the Joint Readiness Training Center in Louisiana.

Mr. Reif asked if anyone was seriously injured during the event. MAJ Koski replied that there were no significant real-life injuries, just some knee and ankle sprains. He also noted that there was one accident involving an unauthorized dirt-bike rider on the base, but that had nothing to do with XCTC. Mr. Reif remarked that that is very impressive.

#### **Agenda Item #7. J-1 Range Remedy Selection Plan**

Ms. Jennings stated that it was hoped that the J-1 Range Remedy Selection Plan (RSP) would be out for public comment before this meeting, but instead it is being distributed tonight. She noted that the official 30-day public comment period starts July 19 and runs through August 17, 2010. Also, a public meeting on the RSP will occur on Monday, August 2, 2010, in the Forestdale section of Sandwich, since the contamination from the J-1 Plume is migrating into that neighborhood.

Ms. Jennings then urged MMRCT members to attend the J-1 Range RSP public meeting, and even more importantly, to provide feedback on the J-1 Range decision. She noted that many recent remedy decisions have been fairly straightforward no-further-action remedies; however the remedy for the J-1 Range plumes is “a little bit trickier.” She said that feedback from residents in the neighborhood where the southern plume is located is expected, and feedback from the MMRCT would be very much

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appreciated. Ms. Jennings then thanked Mr. Reif for his input on the L Range document and stressed again that it's very important to get MMRCT feedback, even if it's just in the form of a quick email. She explained that receiving the team's feedback demonstrates to the agencies' management that MMRCT meeting are worthwhile, and she once again said that she'd really like to hear from team members on the remedy being proposed.

**Agenda Item #8. Next Meeting Schedule and Adjourn**

Ms. Donovan stated that the next MMRCT meeting is scheduled for September 8, 1010. Ms. Donovan then adjourned the meeting at 8:08 p.m.