

**Massachusetts Military Reservation Cleanup Team (MMRCT)**  
**Building 1805, Camp Edwards**  
**May 13, 2009**  
**6:00 – 8:45 p.m.**

**Meeting Minutes**

<b><u>Member:</u></b>	<b><u>Organization:</u></b>	<b><u>Telephone:</u></b>	<b><u>E-mail:</u></b>
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**Action Items:**

1. Ms. Grillo requested that all MMRCT members be emailed the SMB way-forward proposal (developed by Virginia Valiela with input from the SMB selectmen representatives from the Towns of Bourne, Sandwich, and Mashpee) and be encouraged to attend the next SMB meeting, on May 27, 2009.
2. MMRCT members who haven't attended any meetings over the past year will be notified that they are no longer part of the team, the membership list will be revised, and an updated list will be provided to current members.
3. Ms. Keating (EPA) recommended that the MMRCT be provided with a presentation on findings in the DNT dissolution studies report, when completed.

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4. Mr. Goddard requested that upcoming community outreach products include a side-by-side listing of IRP and IAGWSP investigation/cleanup terms (such as RSP = PP, DD = ROD).

**Handouts Distributed at Meeting:**

1. Responses to Action Items from the April 8, 2009 MMRCT Meeting
2. Presentation handout: CS-19 Groundwater Proposed Plan Revised Plume Layout
3. Figures to accompany CS-19 Presentation
4. MMRCT Annual Review Survey Results
5. Presentation handout: Gun & Mortar Firing Positions Update
6. Presentation handout: Soil Removal and Treatment Update
7. Presentation handout: L Range Remedial Investigation and Feasibility Study
8. Presentation handout: Tungsten Update

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**Agenda Item #1. Introduction, Agenda Review, Action Items Review, Approval of 4/8/09 MMRCT Meeting Minutes**

Mr. Field convened the meeting at 6:06 p.m., reviewed the agenda, and asked if there were any comments on Responses to Action Items from the 4/8/09 Massachusetts Military Reservation Cleanup Team (MMRCT) meeting. No comments were offered. Mr. Field also asked if there were any changes or additions to the April 8, 2009 MMRCT meeting minutes. Again, no comments were offered and the minutes were approved as written.

**Agenda Item #2. Community Involvement Update**

Mr. Karson stated that over the past six months or so it was agreed that the Army Environmental Command's (AEC's) Impact Area Groundwater Study Program (IAGWSP) and the Air Force Center for Engineering and the Environment's (AFCEE's) Installation Restoration Program (IRP) would take over production of the groundwater findings map/fact sheet, which had previously been produced by the Environmental & Readiness Center (E&RC). He noted that a draft of the document, which will be expanded from four to eight pages, will be issued in late May/early June, with the goal of having it finalized sometime in June and distributed to local realtors, libraries, town halls, and so forth. Mr. Karson further noted that the issue of updating the plume booklets is being tabled until later this year, at which time it will be decided whether two individual booklets or one combined booklet will be developed. He also reported, however, that both cleanup programs are in the process of updating all plume booklet information on their respective websites in order to ensure that it's available to the public.

Mr. Karson then noted that community involvement (CI) staff had discussed the IAGWSP and IRP Community Involvement Plan (CIPs), which, although outdated in terms of years, still meet the federal requirements of both programs. It was determined that, rather than undertake full updates (or a combined update) at this time, CI staff would produce somewhat synopsisized, updated versions of the CIPs, without extraneous detailed information on sources, program histories, and so forth, but including information about required (and not required) CI activities. Mr. Karson noted that a CIP outline has been provided to the agencies and he will probably have more to report to the MMRCT at the June meeting.

Mr. Karson also reminded the group that for many years the E&RC has been coordinating annual base environmental agency updates to the local Boards of Selectmen and Boards of Health. He noted that he recently received tentative June dates for meeting with all four Boards of Selectmen. He explained that these events involve brief presentations by himself representing the IRP, by Lynda Wadsworth of E&RC, and by Kris Curley of the IAGWSP, and noted that the meetings are televised on local channels. He also noted that he is in the process of scheduling annual updates to the Boards of Health

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for June/July, which is a requirement of AFCEE's Land-Use Controls (LUCs) program. In addition, Mr. Karson noted, as one example of the many "behind-the-scenes" CI activities, that an E&RC-sponsored Environmental Fair for 200 Bourne Middle School students at the beginning of May, which involved all of the various environmental base organizations, was a great success that gave the students very good exposure to the goings-on at MMR.

Mr. Goddard inquired about the content of the 8-page fact sheet to be issued this summer. Mr. Karson confirmed that it will include the updated all-plume map and additional information from both cleanup programs. Mr. Goddard asked if the document will be called the groundwater findings fact sheet. Mr. Karson replied that this is the current name, but it may be renamed. Mr. Goddard then asked about distribution of the document. Mr. Karson reiterated that the basic distribution will be to libraries, post offices, realtor's offices, town halls, and the like. He also noted that distribution as a newspaper insert in the Enterprise newspapers (for all four towns, plus the free publication) is being considered. Mr. Goddard mentioned posting the fact sheet on both programs' websites, and Mr. Karson assured him that that would be done. Mr. Goddard also recommended emailing the document to town websites and letting the realtors know that a link is available.

Mr. Goddard asked if the MMRCT would be part of the review process for future plume booklets. Mr. Karson assured him that it would, if team members desire. Mr. Goddard also inquired about the schedule for the "focused" CIP update. Mr. Karson replied that there's no definite schedule yet, but he expects it would be issued by late July/early August. Mr. Goddard asked if the MMRCT would see a draft of that document, and Mr. Karson replied that he expects so, especially since it will probably go out for public comment. Mr. Goddard said it's his understanding that this would not replace the previous CIP. Mr. Karson agreed that it will really be more of a supplement to the existing CIP.

### **Agenda Item #3. CS-19 Groundwater Proposed Plan**

Mr. Minior informed that team that the Chemical Spill 19 (CS-19)/Central Impact Area plume depiction has been updated. He displayed both the former and the updated figures, noting that the updated figure shows a small amount of Central Impact Area contamination slightly upgradient of the CS-19 source area, and a small amount (perchlorate) deep in the vertical, downgradient of CS-19. The updated figure also shows CS-19 as a continuous plume. Mr. Minior then explained that it was determined at last month's MMRCT meeting debrief with the regulatory agencies that the CS-19/Central Impact Area figure was a "little bit confusing," after which new figures were developed and sent out to the team, and the public comment period on the CS-19 Proposed Plan was extended. He also confirmed that the three CS-19 Feasibility Study alternatives have not changed: Alternative 1 – no action; Alternative 2 – monitored natural attenuation (MNA) with LUCs; and Alternative 3 – active treatment with long-term monitoring and LUCs.

Mr. Minior then referred to the "spider diagram" (a figure entitled "RDX Concentration Trends in CS-19 Monitoring Wells") and pointed out that the latest round of sampling, from February or March 2009, showed the highest concentrations of RDX was 1.4 parts per billion (ppb) "right along this area," with an RDX detection of nearly 1 ppb "right at the leading edge." He noted that this part of the plume, which is downgradient of the extraction well associated with Alternative 3, doesn't have a lot of high RDX concentrations. He also mentioned that the CS-19 plume contains about 5.2 pounds of RDX mass, while the Central Impact Area plume contains about 50 pounds.

Mr. Minior then displayed the revised CS-19 plume conceptual model as well as a chart comparing the predicted performance of the three alternatives, which, he noted, shows estimated cleanup years for each alternative based on cleanup to 0.6 ppb, a risk-based number. He also noted that in 2008 approximately 142 million gallons of water was impacted by RDX above 0.6 ppb, adding that the estimated cleanup year for Alternatives 1 and 2 is 2037, while the estimated cleanup year for

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Alternative 3 is 2030. He further noted that for Alternatives 1 and 2 the estimated plume volume at 2030 is 116 million gallons, and for Alternative 3 at that time it is zero.

Mr. Minior stated that the components of AFCEE's preferred remedy (Alternative 2) are groundwater monitoring of the plume and LUCs, with expected outcomes being cleanup by approximately 2037, no migration past the base boundary of concentrations greater than 0.6 ppb, and a present value cost of \$900K. He then referred again to the "spider diagram," noting that monitoring well 2 (MW-2) at the source area went from concentrations of about 21 ppb in 2003/2004 to about 1.8 ppb currently. Concentrations at MW-9, which is in front of the source area, have been generally declining, going from 15 ppb to about 10 ppb in the last two sampling rounds, and concentrations at all the other wells shown on the figure are currently less than 1 ppb or nondetect.

Mr. Minior concluded his presentation by reiterating that AFCEE had released the clarifying information about the CS-19 plume. He also noted that the public comment period has been extended to May 28, 2009, and the public hearing has been rescheduled for Wednesday, May 14, 2009 at the Bridge Bourne Hotel.

Mr. Goddard repeated the comment he'd made after the previous CS-19 presentation, which was that he thinks there should be downgradient monitoring between the leading edge of the plume and the base boundary so that the Town of Bourne doesn't encounter any problems in its landfill sentinel wells first. Mr. Minior noted that Mr. Goddard's comment would be considered when the comprehensive long-term monitoring plan for the CS-19 remedy is being developed. Mr. Goddard then said that after the previous CS-19 presentation he'd also recommended that the CS-19 decision have the flexibility to ensure that the possibility of utilizing future Central Impact Area plume treatment systems not be prohibited.

Mr. Taylor stated that he is "in favor of Alternative 3 – 100%," adding that although CS-19 is a relatively small plume, 142 million gallons worth of five-gallon containers "would go from here to Phoenix and back..." He also said that mistakes have been made in the past because of reliance on monitoring, and therefore he'd rather see a "proactive result."

Mr. Pinaud made a point of clarifying that none of the estimated cleanup times or mass removal numbers had been changed – only the plume shells were revised and updated, with the corresponding pages replaced in the Feasibility Study and Proposed Plan – and the public comment period was extended.

Ms. Jennings noted that it was during the debriefing of the April MMRCT meeting that the agencies realized there was some confusion about the CS-19/Central Impact Area figures, which is why clarification and correction of the figures was requested. She said that the only parts of the CS-19 plume related to the Central Impact Area "are the gray spots." She further stated that often decisions are made (trying to balance cost, economics, long-term protectiveness) where portions of plumes are allowed to naturally attenuate with monitoring – and she believes that if the comprehensive remedy for the entire area were being presented right now, it would be easier to understand and accept MNA with LUCs as the remedy for CS-19. Ms. Jennings also noted that if the plume doesn't behave as predicted, there are tools in place to take action without having to wait for the plume to travel off base. She then asked team members to keep in mind that there is precedent for "not treating every little plumelet" at the base, and she also said that there is still much cleanup to be done, but the source of money isn't infinite.

Mr. Goddard noted that the plume is headed toward an "impaired area" where the Bourne landfill is located, and there's a town bylaw that no drinking water wells can be installed downgradient. Mr. Davis asked if there are known contaminants from the landfill in the area downgradient that's covered by the bylaw. Mr. Goddard explained that in order to get the permits, the Massachusetts Department of Environmental Protection (MassDEP) required the town to conduct a hydro-geological study to

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demonstrate that there were no downgradient drinking water sources. Mr. Davis suggested that it was a business decision then. Mr. Goddard agreed and noted that there town spent a lot of money to connect residences to Bourne Water District water.

Mr. Dow mentioned that he received an email from Sue Walker (a former member of the Plume Cleanup Team [PCT]) to which she attached her comments on CS-19, which were in favor of Alternative 3. Mr. Dow then noted that he submitted Sierra Club comments this afternoon, also in favor of Alternative 3. Mr. Field said that Ms. Walker's remarks (which were sent to MassDEP) need to be addressed to AFCEE in order to be accepted as a public comment. Ms. Grillo noted that she responded to Ms. Walker regarding this matter.

Mr. Dow then reported that Sierra Club comments included a concern that the MNA/LUCs proposal assumes that the base will be maintained as a military facility; however, given that the "Air National Guard's already departed" he thinks it conceivable that MMR could be subject to a Base Realignment and Closure (BRAC) process in the future, which could mean much less or no military training at the base and much different land use. Mr. Dow also noted that the Sierra Club's national policy is that the answer to toxic pollution is not dilution.

Ms. Jennings clarified that the assumption that went into the CS-19 risk assessment was residential use, not military use. Therefore she's not certain why Mr. Dow thinks that the land use affects the decision for groundwater in this particular case. Mr. Field asked if it's correct that the military would be responsible for managing the LUCs required in the CS-19 Record of Decision (ROD). Ms. Jennings confirmed that this is correct. Mr. Davis added that the primary LUC to prevent a water supply well from being installed is a MassDEP regulation that pertains to both military and non-military property – a requirement to go through the MassDEP permitting process for any water supply well that serves 25 or more customers. He also noted that there's a moratorium on the base on installing wells that serve fewer than 25 customers.

Ms. Jennings remarked that "LUCs" (land-use controls) is poor terminology for what are really groundwater-use controls – that is, until the groundwater is safe to drink, there are multi-layered mechanisms in place, which continue to be monitored to ensure that no one's drinking the water. And if over time it's discovered that someone is drinking water because these controls aren't working, the protectiveness of the remedy would be reevaluated and it's possible that a more aggressive cleanup strategy would be required. She also said that she thinks a more difficult question is the land itself – for example, could someone build a house in that area, although a great deal would have to happen before that would even be a possibility. Ms. Jennings then said that "some of these questions" are going to be very interesting when dealing with the Central Impact Area remedy, as many items remain at the source area and the extent of the source remedy over time will rely on LUCs "until it is safe for some other use." She then reiterated that with respect to cleanup of groundwater, the control is really a groundwater control, not a land control.

Mr. Davis clarified that the Air National Guard has not left the base, although its mission has changed and is growing with numerous Military Construction projects. Given these construction projects, he doesn't have the sense that the Air National Guard is leaving any time soon, although future BRAC actions are not actually predictable.

Ms. Grillo noted that the previous BRAC affected the southern 5,000 acres of MMR and MassDevelopment is involved in that process. She also noted that the Environmental Management Commission (EMC) was put in place to protect the Upper Cape Water Supply Reserve (the northern 15,000 acres) – resulting in "environmental protection and compatible military training." Ms. Grillo said that she foresees that the EMC will continue to have a role in that protective stance, ensuring that any activities in the Reserve are protective of the sole-source aquifer.

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Mr. Taylor said that he thinks the base lease goes to 2030. Mr. Minior clarified that it goes to 2052. Mr. Taylor remarked “of course they can always get out of a lease if they don’t want to be there,” which is why there’s concern about the property. He also said that there’s been a lot of discussion about commercial uses for the base, which could be “much more intense than residential” and therefore would warrant protection of water resources. Mr. Taylor again expressed his preference for active treatment of CS-19, noting that “we’ve missed the boat” before, such as in 1984 when the public was told that all the plumes were within the boundaries of the base.

Mr. Dow noted that he had served on the Community Working Group, and Mr. Taylor is correct that there was a great deal of discussion about commercial ventures on the base. Mr. Dow also said that it seems the most logical use would be for a large-scale wind farm, as MMR is the only place on Cape Cod that has adequate space.

Mr. Field confirmed that MMRCT members still preferred to submit individual comments on the CS-19 Proposed Plan, rather than a joint comment. Mr. Minior reminded the group that the public comment period ends on May 28, 2009, and that the public hearing takes place at 6:00 p.m. on May 14, 2009 at the Bridge Bourne Hotel.

#### **Agenda Item #4. MMRCT Annual Check-In**

Mr. Field reviewed the results from the MMRCT survey, noting that: most team members agree that the merger of the PCT and the Impact Area Review Team (IART) was very effective; team members agree that meeting agendas are about right in terms of length and topics; most agree that the amount of detail and depth of the presentations is about right; most agree that the meeting frequency is about right; some agree, some are indifferent, and some disagree that the team should find a way to increase its membership; most agree that the balance of IAGWSP and IRP meeting topics is about right; all agree that the meetings should continue to be facilitated by an independent neutral; most agree that the team should continue to meet, as needed, after all final decisions and remedies are in place; most team members feel that they are getting what they want out of the team; and some strongly agree, some agree, one is different, and two disagree that the MMRCT and the Senior Management Board (SMB) should continue to meet together one to two times per year.

Mr. Goddard said that he disagrees with and is concerned about the comments that MMRCT discussions “are without much detail from the technical side,” the team is just “an exercise in producing public meetings,” and that the “heavy filter of AFCEE project managers dilutes discussions.” He then said that when the team engages in detailed discussions he relies on all the project managers, including U.S. Environmental Protection Agency (EPA) and MassDEP project managers, to be the technical experts, to understand how the models are working, and so forth. He also said that he thinks the team has influenced “the way things are done here” and he mentioned the Ashumet Valley decision, noting that he certainly doesn’t feel that the team is “propaganda or window dressing.” Mr. Goddard further noted that he relies on the regulators to ensure that the IRP and the IAGWSP are providing the team with what it needs to hear. He also remarked that although he supposes the meetings could be more technical and detailed, there is only so much time to spend at them, and he would recommend offering some kind of “science update” meeting once a year for those who might be concerned about a lack of technical detail. Mr. Goddard then said that he thinks there will still be a need for the MMRCT even after the AFCEE portion seems to be “done,” and added “there’s still a lot of work out there.”

Mr. Taylor asked how many surveys were returned. Mr. Field noted that eight individuals responded to the survey, which was sent to about 18 citizen team members, some of whom hadn’t attended any meetings in more than a year. He said that the response rate for active members was high, and for inactive members was very, very low.

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Mr. Field also said that (based on the survey results) there doesn't seem to be much need for adjustment at this time. He also noted that Mr. Karson had suggested advertising in the local Enterprise newspapers as a relatively low-cost way to generate additional team membership. Mr. Goddard inquired about the possibility of sending out a mass email. Mr. Karson replied that unfortunately, he does not have an email database, only a list of about 20 to 25 individuals in the community, including the news media. He also clarified that he had suggested sending out a news release to the Enterprise newspapers, which generally runs all of the IRP's releases, and added that perhaps a paid ad could be run as well. Mr. Goddard recommended including a solicitation for new members in the groundwater findings fact sheet to be issued this summer. Mr. Karson remarked that that is a good idea.

Mr. Taylor inquired about the circulation of the Enterprise. Mr. Karson replied that he doesn't know offhand, but an insert in the Enterprise would provide circulation to all paid subscribers on the Upper Cape, and would also be included in the Enterprise's free weekly publication. Mr. Goddard mentioned including a link to the fact sheet on the IRP and IAGWSP websites.

Mr. Dow recommended that CI staff meet with the Cape Cod Times editorial board; he noted that coverage of MMR issues has nearly vanished from the Cape Cod Times. Mr. Karson agreed that coverage has lessened over the past five to seven years, as much progress has been made. He also noted, however, that since George Brennan was assigned to report on MMR issues, the amount of coverage has increased somewhat. He then said that talking to the editorial board is still a good suggestion, since it never hurts to get more coverage.

Mr. Davis reported that three SMB members attended the last MMRCT meeting, and then sometime later caucused and developed a proposal to be presented at the May 27, 2009 SMB meeting. He noted that Virginia Valiela, the Falmouth representative on the SMB, asked him to inform the MMRCT about this proposal, which she put together based on her conversations with the other SMB citizen members. He noted that the idea, which is still a work in progress, is that the SMB would maintain its identity and membership, meet approximately two times a year, focus on broader issues such as "how clean is clean," and monitor the overall progress of the cleanup rather than specific sites (unless there's a particular controversial issue). Also, the SMB would meet before, but on the same night as an MMRCT meeting. Mr. Davis noted that MMRCT members are welcome to attend the May 27, 2009 SMB meeting and participate in the discussion about this proposal. Ms. Grillo asked Mr. Davis to send out an email about this matter to MMRCT members who are not in attendance at tonight's meeting, and Mr. Davis agreed to do so. Mr. Goddard said that he thinks that having the SMB and MMRCT meet on the same night is an interesting idea.

Mr. Field reminded the group that the team groundrules regarding attendance are that individuals who don't attend a meeting for six months are put on a standby list and those who don't attend a meeting for 12 months are no longer considered members. He then noted that there are about six individuals on the team list who have not attended any meetings for more than a year, and asked if the MMRCT wants to follow the groundrules and send out letters thanking them for their past participation and informing them that they are no longer part of the team. Mr. Goddard recommended following the groundrules, and no other team members objected to this approach. Mr. Goddard then asked that the team be provided with an updated membership list after the letters are sent out, and Mr. Field agreed to see that that is done.

Mr. Taylor questioned why the SMB would feel the need to have a "private and advanced meeting, rather than with the whole group." Mr. Davis replied that he thinks the SMB probably wants to weigh in on certain remedy decisions that are yet to be finalized. He also said that the SMB selectmen can generate interest in the media, with other political levels, and up through the Department of Defense (DoD), if needed. Mr. Taylor said that he doesn't know any selectmen in the four towns who are really involved. Mr. Field clarified that the SMB meetings would be fully public, with everyone on the MMRCT invited and encouraged to attend.

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Ms. Jennings noted that the SMB members who attended the last MMRCT meeting were very interested in the Central Impact Area discussion, and indicated that this actually solidified in their minds that the SMB forum should continue. She also said that SMB members “still believe that they represent a policy-making organization,” and therefore feel that decisions such as how much of the Central Impact Area plume should be pumped and treated and how much of the UXO should be remediated are significant enough to be addressed at their level. Mr. Taylor noted that the selectmen on the SMB are only a few out of about 20 selectmen. Ms. Jennings agreed, but explained that when deemed necessary the SMB representatives would ask for a presentation to their Board of Selectmen, as Ms. Valiela did with respect to the Ashumet Valley plume decision. Ms. Jennings also said that anyone who isn’t satisfied with CS-19 or any other decision being made should call his or her selectmen. Mr. Taylor maintained that he still doesn’t understand why the SMB feels the need to be separate. Ms. Jennings replied that she doesn’t disagree, but the idea is “to move this in a stepwise process towards something that works for everybody.”

Mr. Goddard said that he recalls a time when “the big meeting to go to was the SMB,” but its significance has diminished over the years, mostly because the programs are moving forward. He also said that he thinks that Ms. Valiela’s solution “may be a good stepwise way to go,” and it may improve efficiencies in terms of having both an SMB and MMRCT meeting on one night. He further noted that MMRCT members could speak at the SMB meeting, and SMB members could speak at the MMRCT meeting, which may be a good way to go forward for the next year.

Ms. Grillo noted that there was a great deal of discussion about this topic at the March SMB meeting, and she encouraged people to read those meeting minutes once they are approved (at the May SMB meeting) and posted on E&RC’s website. She also referred to the mention of “policy” and clarified that all the public teams were in fact designed to be *advisory* in nature.

Mr. Dow stated that when he first become involved with MMR cleanup issues and the meetings between the military and the citizen advisory panel were closed to the public and the press, he wrote a letter to Gary Studds asking him to use his influence to open up those meetings to the public and move the process from investigation to actual cleanup. Mr. Dow noted that Rep. Studds replied that the reason he hadn’t taken an active role was that he hadn’t heard from the local politicians. And then, after the Cape Cod Times published its exposé on the mishandling of MMR issues, everyone became interested in the process and the SMB and other citizen advisory teams were established.

Mr. Dow also said that he thinks that SMB members “actually have a lot of influence with state politicians and federal ones.” He then noted that important processes such as Natural Resource Damages Assessment (NRDA) are discussed at SMB meetings, but not at MMRCT meetings, and he thinks that SMB members are in a good position to try to provide input on how some of those monies might be used locally, if and when they become available. In addition, Mr. Dow noted that SMB members are knowledgeable about water supply issues in their respective towns.

Mr. Pinaud remarked that many good points were made in this discussion, and he encouraged MMRCT members to attend the next SMB meeting and ask questions. He noted that the meeting is scheduled for May 27, 2009 at 6:30 p.m. at the Bridge Bourne Hotel.

#### **Agenda Item #5. Gun & Mortar Positions Update**

Mr. Gallagher reported that the Gun & Mortar Positions workplan was approved in March 2009. He displayed a figure showing the positions being investigated, which he noted are located south, west, and northwest of the Impact Area. He also noted that the positions vary in size (with gun positions generally larger than mortar positions) and the sites are basically flat areas cleared of vegetation.

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Mr. Gallagher then provided the following background information: there are 23 gun positions and 14 mortar positions being investigated – a total of 37 sites where artillery and mortar rounds were fired at targets within the Impact Area; the primary artillery used were 105mm and 155mm projectiles; the primary mortars used were 60mm and 81mm projectiles; positions were established as early as the 1940s, which was also the period of highest use (World War II); firing of high explosive (HE) rounds ended in 1989; firing of inert rounds and low intensity training rounds (LITR) ended in 1997; artillery and mortars were propelled by charges loaded in gun barrels or mortar tubes, and the amount of propellant not consumed in the firing of a weapon was expelled onto the ground surface, likely causing a deposition of propellant-related contamination at a position; each round was supplied with the maximum amount of propellants necessary to fire the item the greatest distance, therefore excess propellant bags were removed in order to fire shorter distances, and up through 1989 those excess bags were burned on the ground surface, which may have caused deposition of propellant-related contamination at the positions.

Mr. Gallagher reviewed findings from previous Gun & Mortar Position investigations, noting that: soil sampling that used five- and nine-point compositing techniques found a wide range of propellant constituents, with the primary one being 2,4-DNT; twenty-one positions had no detections of 2,4-DNT or other propellant-related compounds; eight positions had 2,4-DNT detection at concentrations less than 700 ppb; eight positions had 2,4-DNT detections at concentrations greater than 700 ppb; and the significance of 700 ppb is that it's the Massachusetts Contingency Plan (MCP) standard for 2,4-DNT. Mr. Gallagher also reported that other contaminants detected at some of the sites included 2,6-DNT, nitroglycerin, n-nitrosodiphenylamine, perchlorate, metals, and the pesticide Dieldrin. He further noted that no artillery or mortar propellant constituents were detected in the eight multiple-screened monitoring wells installed at the positions, nor were they detected in other wells in the vicinity (some of which, however, might not be ideally located).

Mr. Gallagher then discussed the Rapid Response Actions (RRAs) conducted at Gun Position 7 (GP-7) and GP-6, noting that in 2000 fifty-seven tons of soil was removed to a depth of two feet at GP-7 and treated by soil washing, and in 2004 seven-hundred and fifty tons of soil was removed to a depth of six inches at GP-6 and treated using low-temperature thermal desorption.

Mr. Gallagher continued his presentation by talking about the focused groundwater investigations at GP-10 and GP-11, which were chosen because they had some of the highest 2,4-DNT concentrations of all the positions. He noted that six drive-points and one permanent monitoring well were installed at each location, and no explosives or perchlorate were detected at GP-10. At GP-11, however: 0.9 ppb of RDX and 0.26 ppb of 4-amino-2,6-DNT were detected in a drive-point at 95 to 100 feet below ground surface (bgs); di-n-octylphthalate was detected at several drive-point locations, with the highest concentration being 3.8 ppb at drive-point #2; and contaminant detections in the drive-point where a permanent monitoring well was installed were not confirmed in three sampling rounds from that well.

Mr. Gallagher also reported that the ongoing soil investigation (using the multi-increment sampling [MIS] approach) involves: soil sampling at GP-9 and GP-19 to reassess soil contamination where it was not previously detected (using five- and nine-point composite sampling); soil sampling at GP-6, GP-7, and GP-12 to reassess site conditions with low concentrations of propellants in soil; and soil sampling at GP-8, GP-10, GP-11, GP-17 and mortar position 1 (MP-1) to reassess sites with higher-level propellant detections. Mr. Gallagher reminded the group that the primary contaminant detected at the positions is 2,4-DNT. He also noted that the ongoing soil investigation is expected to be completed by May 2009, with an investigation report to be issued in the fall. The need for any additional actions will be based on the risk screening that will be conducted as part of the investigation report.

Mr. Dow suggested that the 1970s, because of the Vietnam War, must have been another peak use time for the gun and mortar positions. Mr. Gallagher agreed. Mr. Dow also noted that use of HE rounds ceased in 1989, and asked if the groundwater downgradient of the positions has been tested to see

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whether contaminants might have migrated “out from where the soil contamination’s been located.” Mr. Gallagher replied that monitoring wells were installed at the leading edge of ten of the positions, and no DNT was detected there – but Mr. Dow is probably wondering if the contaminant could be farther downgradient. Mr. Dow confirmed that he is, noted that a number of plumes are detached from their source area, and suggested that contamination from HE rounds (whose use stopped in 1989) and propellant bag burning (which stopped in the early 1990s) may have migrated beyond the edges of the current positions.

Mr. Gallagher stated that the current conceptual model is that the DNT is bound in nitrocellulose (a fibrous-like material), and therefore is not accessible to dissolution. He also noted that some dissolution studies have been undertaken, and added that the bottom line is that it’s not believed that DNT will migrate to groundwater unless that nitrocellulose matrix has been degraded, allowing the DNT to be exposed to the environment. Mr. Dow made a point of noting that termites can live in the soil and degrade cellulose using protozoa and bacteria in their guts, as can other soil organisms. He then asked if the propellants used in the 1940s and 1970s had the same characteristics as the nitrocellulose. Mr. Gallagher noted that two types of propellants were used at Camp Edwards – a single-base propellant (containing primarily nitrocellulose with DNT as an additive to slow degradation of the propellant) and a double-base propellant (containing nitrocellulose and nitroglycerin at approximately 40%). Mr. Dow asked if these were used all the way back to the 1940s, and Mr. Gallagher confirmed that they were.

Ms. Keating, the remedial project manager for EPA overseeing the work at the gun and mortar positions, noted that the draft final report on the dissolution studies is due to be issued in final form soon. She then suggested that it would be helpful for the MMRCT to have a presentation on the findings of the dissolution studies before the Gun & Mortar Firing Positions Investigation report is finalized. Mr. Field said that this could be considered as a potential agenda item for a future MMRCT meeting.

#### **Agenda Item #6. Soil Removal and Treatment Update**

Mr. Gregson stated that the IAGWSP is going to conduct two actions – an assessment of various soil treatment alternatives, and a soil excavation activity at L Range. He noted that bench scale tests are being done to evaluate the remediation of contaminated soil through the application of various amendments – MuniRem (a chemical method of denitrification), lime (a chemical method of alkaline hydrolysis), DARAmend (a proprietary material that sets up a biotic method of degradation), and composting (a more traditional method of biotic method of remediation). He also reported, however, that soil collected from L Range for the bench tests was all nondetect, and therefore more L Range soil needs to be collected and analyzed to ensure that contaminated soils are used for the bench tests.

Mr. Gregson also reported that the IAGWSP put together a project note that describes the excavation and stockpiling of L Range soil for treatment on a field scale or pilot scale. This pilot scale action will involve 3,600 tons of explosive-contaminated soil (primarily RDX, with some HMX and TNT as well) to be excavated and stockpiled on L Range. The selection of the technology to treat the soil will be based on results of the bench scale tests. The soil excavation is scheduled for early summer, and the IAGWSP will be evaluating the applicability of the selected treatment alternatives to other sites. Mr. Gregson also showed a figure entitled “L Range Multi-Increment Sample Results” and another figure entitled “L Range Proposed Excavation Area.”

Mr. Goddard asked if in reality the soils would be removed and brought to a special location for treatment, more like the bench-test conditions. Mr. Gregson replied that, using L Range soil, the bench tests will determine application rates, the effectiveness of the amendment, how long it takes to work, and so forth. The pilot scale test, which will be done in the field, will involve excavating soil, putting it into piles, and applying the amendment selected through the bench scale tests. Mr. Goddard asked if the piles would be covered. Mr. Gregson replied that the piles probably would be covered, not only to

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keep out precipitation, but also to control the moisture content of the piles. Mr. Goddard mentioned that there are technologies used in the waste business to (such as the “Ag Bag”) that encapsulate and accelerate the decomposition of yard waste, while allowing moisture.

**Agenda Item #7. L Range Remedial Investigation/Feasibility Study (RI/FS)**

Mr. Gregson stated that L Range, which is about 600 feet wide by 1,500 feet long, is located within MMR about 500 feet from the base boundary, and the site also includes Cleared Area 11 and Areas 46 and 79. He then reported that L Range was used from the 1940s to the 1990s, initially as an infiltration course and later as a grenade-launcher range (in the late 1960s to mid 1990s). Mr. Gregson noted that a 40mm grenade launcher, which is usually underneath the barrel of an M-16 rifle, fires a grenade 40mm in diameter and about three inches long. He also reported that Area 46 was used during construction, operation, and maintenance of the IRP’s Fuel Spill 12 (FS-12) source area treatment system, and that Area 79 and Cleared Area 11 were identified in aerial photographs examined during initial investigation.

Mr. Gregson also reported that prior to 2008, soil investigation at the L Range operable unit involved the analysis of 473 samples from 60 locations; no explosives or perchlorate were detected in soil. Groundwater investigations conducted prior to 2008 involved 340 samples from more than 70 monitoring wells screens (since 2004), and found several small noncontiguous plumes of explosives and perchlorate migrating to the southeast. The current RDX concentration in groundwater is 3.6 ppb and the current perchlorate concentration is 1.9 ppb, with the historic maximum concentrations being 9 ppb and 3 ppb respectively. The state cleanup number for RDX is 1 ppb and the state cleanup number for perchlorate is 2 ppb; also the  $10^{-6}$  cancer risk level for RDX is 0.6 ppb and the health advisory for RDX is 2 ppb.

Mr. Gregson also mentioned that the small area of L Range groundwater contamination is surrounded by larger areas of groundwater contamination (the FS-12, J-3 Range, and J-1 South plumes), providing numerous monitoring wells that were already in place to help with the investigation. Mr. Gregson then showed a “spider diagram” and noted that there’s been a general decrease in RDX and perchlorate concentrations over time. He also showed another figure and pointed out the FS-12, J-3 Range, and J-1 South plumes, all of which have active treatment systems in place. He then showed several cross-section figures and pointed out the various plumes and areas of RDX contamination as well as the “small blobs” of perchlorate contamination.

Mr. Gregson reminded the group of the Air Force Research Laboratory (AFRL) robotics work conducted at L Range last year to demonstrate and refine the ability to pick up 40mm practice and HE grenades from the range, with safety being the major advantage of using robotics. He noted that targets were removed using an excavator with a bucket and thumb attachment, vegetation was flush-cut using a remote-controlled Bobcat with a brush-cutter attachment, a geophysical magnetic survey was conducted over eight acres of the range using a remote-controlled tow vehicle with a multi-sensor array, and metallic debris and munitions were removed using the Bobcat with various attachments, including a power rake, rototiller, and beach cleaner. This activity removed about 53 HE items and 12,000 pounds of various parts of practice munitions, meaning that thousands of practice rounds were recovered.

Mr. Gregson stated that after AFRL completed its work, the IAGWSP conducted an extensive soil sampling program at L Range. The effort, which included 37 MIS samples from 23 areas or decision units, yielded the following results: explosives and some low levels of perchlorate were detected in shallow soils; RDX at eight locations and HMX at four locations exceeded state S-1/GW-1 standards (1 part per million [ppm] for RDX and 2 ppm for HMX); RDX concentrations ranged from 0.2 ppm to 92 ppm; HMX concentrations ranged from 0.44 ppm to 9.7 ppm; and TNT at four locations exceeded the RCS-1 standard of 100 ppm, with concentrations ranging from 0.19 ppm to 450 ppm. Mr. Gregson

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noted that all of the detections occurred in the mid-range area, with no explosives or perchlorate detected in any samples collected from up-range or down-range. He also said that the purpose of the soil remedial action he spoke of earlier is to clean up the RDX, HMX, and TNT contaminated soil at the mid-range area.

Mr. Gregson then showed a figure entitled “L Range Post-AFRL Soil Sample Results,” noting that the grids shown in red indicate RDX contamination, the ones in blue indicate TNT, and the ones in yellow indicate both RDX and TNT contamination – all of which are located in the mid-range area. He also displayed the “L Range Soil and Groundwater Conceptual Model” figure and pointed out the firing points and the downrange targets, explaining that small amounts of RDX leached from the grenades that contained HE and happened to misfire or break open over time. The contamination was then transported through the vadose zone soil and into the water table where it formed small discontinuous plumes migrating southwest with groundwater.

Mr. Gregson stated that the alternatives evaluated in the L Range Groundwater Feasibility Study were: Alternative 1 – no further action; Alternative 2 – long-term management (long-term monitoring with institutional controls to prevent contact with the groundwater): and Alternative 3 – extraction, treatment, and reinjection (ETR) with long-term monitoring, which would involve one extraction well pumping the water to a treatment unit at the adjacent J-1 South plume.

Mr. Gregson reviewed the features of Alternative 1: groundwater contamination would be reduced through natural processes; long-term groundwater monitoring would be discontinued; no institutional controls would be implemented; RDX would be expected to dissipate to below 2 ppb by 2013 and to below 0.6 ppb level by 2027; and the cost (for well abandonment and closeout documentation) would be about \$104K. He also reviewed the features of Alternative 2: groundwater contamination would be reduced through natural processes; long-term groundwater monitoring would continue until cleanup levels were reached; institutional controls would be implemented to protect against use and contact with the groundwater; RDX would dissipate to below 2 ppb by 2013 and to below 0.6 ppb by 2016; and the cost (for groundwater monitoring, well abandonment, and closeout documentation) would be about \$1.7 million.

Mr. Gregson then showed a time-series figure entitled “Alternatives 1 & 2, Model-Predicted RDX Concentrations, 2007.5 to 2027.5.” Mr. Goddard asked if, without active treatment, L Range contamination would reach the FS-12 treatment system. Mr. Gregson replied that it appears that the L Range groundwater contamination would not make it that far before dissipating. Mr. Davis added that at this point only one extraction well within the FS-12 plume, two at the toe of the plume, and one to the west are operating. Mr. Goddard suggested that the FS-12 system might serve as backup if the RDX contamination did reach that far. Ms. Jennings noted that the IAGWSP is using some space in the IRP’s FS-12 treatment building to house tanks for the J-3 Range plume treatment system.

Mr. Gregson reviewed the features of Alternative 3: groundwater contamination would be remediated using one extraction pumping at 50 gallons per minute (gpm); long-term groundwater monitoring would continue; institutional controls would be implemented to protect against use and contact with the groundwater; RDX would dissipate to below 2 ppb by 2012 and to below 0.6 ppb by 2016; and the cost would be about \$3.6 million. He then showed a layout of Alternative 3, pointing out the extraction well location, the pipeline to the existing J-1 South plume treatment system, and reinjection through the existing infiltration trench there. Mr. Gregson also showed the time series figure for Alternative 3.

Mr. Goddard referred to the northernmost FS-12 extraction well, said that it would be equidistant to go north with the pipeline, and asked if a southern approach was considered. Mr. Gregson replied that he doesn’t think it was. Mr. Goddard also noted that the difference between Alternative 3 and the other two alternatives is that the active alternative cleans up to 0.6 ppb nine years sooner and costs about an additional \$2 million.

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Mr. Gregson then showed the animation for Alternatives 1 and 2 and, in response to an inquiry from Mr. Davis, confirmed that the J-3 Range and J-1 South extraction wells are operating in the model. Mr. Gregson also showed the animation for Alternative 3.

Ms. Jennings observed that the modeling began in 2004 and questioned how the prediction compares to the five years worth of real data that's since been collected. Ms. Thomas stated that recent concentrations indicate that 2009 is close to the model predictions shown in the animation for Alternatives 1 and 2. She also noted that these data will be presented to the technical team as part of the May 28, 2009 technical presentation. Ms. Jennings said that actual performance is generally better than modeled performance. Mr. Gregson noted that there isn't any active treatment in place; the animation just showed ambient conditions. Mr. Minior asked when the pumping well begins operating under Alternative 3, and Mr. Hill replied that that occurs in 2010. Ms. Jennings explained that she's just interested in comparing the no-action alternative modeling with what's actually being seen, and added that it seems that she'll find out about that on May 28, 2009.

Mr. Gregson then showed the "L Range FS Alternative Performance" chart and noted the following: Alternatives 1 and 2 have no extraction, while Alternative 3 has one well pumping at 50 gpm; concentrations drop below 2 ppb at 2013 for Alternatives 1 and 2 and at 2012 for Alternative 3; concentrations drop below 0.6 ppb at 2027 for Alternatives 1 and 2 and at 2016 for Alternative 3; concentrations are predicted to reach below detectable levels at 2040 for Alternatives 1 and 2 and at 2024 for Alternative 3; mass removed under Alternative 3 is 0.08 kilograms, or about 0.25 pounds (not applicable for first two alternatives); system shutoff for Alternative 3 is expected to be 2012 (not applicable for first two alternatives); capital cost for Alternative 1 is \$35K, for Alternative 2 is \$20K, and for Alternative 3 is \$2.2 million; operation & maintenance cost is not applicable to Alternative 1, is \$1.6 million for Alternative 2, and is \$1.4 million for Alternative 3; including reporting and closeout, the present value costs for the three alternatives are \$104K, \$1.7 million, and \$3.6 million respectively.

Mr. Gregson concluded his presentation by reviewing the "Next Steps" slide: await agency comments on the draft L Range RI/FS, resolve same, and finalize the document; issue a Remedy Selection Plan (RSP) this summer; have a public comment period on the proposed remedy in July and August and present the RSP to the MMRCT; and prepare a Decision Document/Response to Comments this September.

Mr. Goddard said that hopes that the groundwater models for both cleanup programs are being updated with actual data on a regular basis and that the regulators are verifying the modeling. He also said that he recommends that this happen if it is not. Mr. Goddard then asked when the FS-12 system is expected to be shut down. Mr. Davis replied that there's quite a bit uncertainty associated with that, but it's being run out to the 2040 timeframe. Mr. Goddard asked if the northern FS-12 extraction well would capture any L Range groundwater contamination that might go by. Mr. Davis clarified that the northern extraction well shown in the picture isn't operating – only the one in the heart of the plume, two at the toe, and the one near Snake Pond. Mr. Goddard referred to one of the operating FS-12 wells and suggested that it might draw in L Range contamination. Mr. Davis replied that at those concentrations it would never be detected in an extraction well, or in a water supply well.

Mr. Goddard also inquired about the small amount of contaminant above 0.6 ppb that seems to remain. Mr. Gallagher explained that it is trapped in a low-conductivity layer. Mr. Goddard also asked if an RSP is the same thing as a ROD. Mr. Gregson clarified that an RSP is the same thing as a Proposed Plan, and a Decision Document is the same thing as a ROD. Mr. Goddard requested that upcoming community outreach products include a side-by-side listing of IRP and IAGWSP investigation/cleanup terms.

Ms. Dolan asked why Figure 10-1 shows the RDX contour to 0.6 ppb at the base boundary and Figure 11-2 shows the RDX contour to 0.6 ppb beyond the base boundary. Ms. Thomas explained that the

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Figure 10-1 depiction is based on data through 2007 and professional judgment, while the Figure 11-2 depiction is an older plume shell based on 2004 data that's been migrated in the model. She also said that although slightly different, conceptually they are very similar.

Mr. Dow asked how much of the plume mass is trapped in impermeable layers. Mr. Gregson replied that he doesn't know offhand, but also noted that perchlorate concentrations are currently very low, below the state MCL – so given the low concentrations and the small area, “there's very little mass there to begin with.” Mr. Dow said that he's concerned about both RDX and perchlorate eventually leaching out of the impermeable layers and causing some kind of downgradient water issues. Mr. Gregson said that concentrations of both RDX and perchlorate are very low to begin with, and would leach out over time at very low concentrations. Ms. Dolan added that the IAGWSP would have to have monitoring well screens downgradient of that portion of the aquifer, so any issues would be detected.

#### **Agenda Item #8. Tungsten Update**

Mr. Gregson reminded the group that tungsten became an issue in 2006 when tungsten believed to be from tungsten-nylon bullets used at the base as a substitute for lead was detected in some groundwater monitoring wells, after which the use of tungsten-nylon bullets was stopped. Also, tungsten-contaminated soil was excavated (to 150 ppm) and stockpiled and has been in stockpiles ever since. Mr. Gregson said that the questions that remain are how to address the stockpiled soil from the ranges where tungsten-nylon bullets were fired and whether more tungsten needs to be removed from the berms where tungsten-nylon bullets were fired.

Mr. Gregson then stated that since the last MMRCT meeting, the IAGWSP has provided the agencies with the Phase II Fate & Transport Study report, and yesterday received agency comments on the report. In addition, the IAGWSP provided the agencies with preliminary findings from the final phase of the study, which has to do with speciation (the different forms of tungsten in the environment). Mr. Gregson also noted that preliminary information on the U.S Army Center for Health Promotion and Preventative Medicine (CHPPM) tungsten toxicity study was provided to EPA. In addition, the workplan for groundwater monitoring near the stockpiled soil has been submitted to the agencies for review.

Mr. Gregson then reviewed a slide entitled “Planned Activities,” which noted the following: meet with the agencies (tomorrow) to review available information on the fate & transport/health studies; determine if the study findings can be used to establish a soil level that is protective of groundwater; resolve what action, if any, is necessary to address the stockpiled soil, which is at C & KD Ranges; and resolve whether further action is required to address soil in berms where tungsten-nylon bullets were used (at B, C, D, G, H, I, J, and KD Ranges). Mr. Gregson also displayed a map showing the ranges, and reported that approximately 7,500 tons of soil – a fairly significant amount – is currently stockpiled.

Mr. Goddard asked if MassDEP's Office of Research and Standards is looking at tungsten standards. Mr. Pinaud confirmed that MassDEP is independently looking at establishing soil and groundwater standards for tungsten. He also noted that MassDEP's modeler and someone from the Office of Research and Standards will be on the phone tomorrow during the meeting. He added that after tomorrow's meeting, MassDEP will determine if it has everything needed to move forward.

Ms. Jennings said that she'd hoped that the Phase II results would have been reviewed and next steps determined prior to this MMRCT meeting, which is why she'd requested that the tungsten update be included on the agenda. She noted that tungsten will probably be an update topic for the next few MMRCT meetings. She also said that EPA's perspective is that the current version of the Phase II report has some computational errors that need to be corrected before the true findings of the study can be known. She further noted that EPA thinks the study has “some interesting information about mobility,” although there are still many unanswered questions. She also said that she expects that a

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Phase III set of studies will have to be scoped in order to figure out what the fate & transport mechanisms look like – relying on more real time data as opposed to modeling. Ms. Jennings further stated that the goal is to make a decision on tungsten by the end of this fiscal year.

Mr. Goddard asked if EPA plans to set its own standards or rely on the state. Ms. Jennings replied that the state will probably come out with enforceable standards more quickly than EPA could promulgate standards. She also said that she thinks that the hope is to “put all our bodies of information together and agree on a number.” She further noted, however, that she doesn’t think everyone has all the same information, especially with respect to toxicity, as not all of the toxicity studies have been conclusive – and so a first step will be to ensure that everyone does have the same information. Ms. Jennings remarked that she hopes that the state comes out with a number “that we can all live with and work with.”

**Agenda Item #9. Next Meeting Schedule and Adjourn**

Mr. Goddard took this moment to inform the team that he is still pursuing the NRDA process and after having sent a letter “to everybody under the sun last year” recently spoke with Mark Forrest at Rep. Delahunt’s office, who had asked him to wait until the new administration was settled. Mr. Goddard noted that Mr. Forrest said that the transition is not yet complete, and so “the players aren’t in place yet to really push it hard.” Mr. Goddard noted that he plans to follow up again this summer. He also said that he thinks the Textron settlement is a great template for trying to negotiate a NRDA settlement for groundwater and other technologies that can be used right away at MMR.

Mr. Field stated that the MMRCT would meet next on Wednesday, June 10, 2009. He then adjourned the meeting at 8:52 p.m.