

**Massachusetts Military Reservation Cleanup Team
 Building 1805
 Camp Edwards, MA
 October 12, 2011
 6:00 – 8:00 p.m.**

Meeting Minutes

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Handouts Distributed at Meeting:

1. Response to Action Item from the July 13, 2011 MMRCT/SMB Meeting
2. Map: Demolition Area 1 leading edge
3. Presentation handout: J-1 Range Southern and Northern Plumes Groundwater Monitoring Update
4. Presentation handout: J-3 Range Plume Groundwater Monitoring Update
5. Presentation handout: Fuel Spill 28 Plume Update
6. Cape Cod Times article: Operation Cleanup
7. Cape Cod Times article: Picking Up the Pieces
8. Cape Cod Times article: Rebuilding Trust
9. MMR Cleanup Team Meeting Evaluation form

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**Agenda Item #1. Introductions, Agenda Review, Approval of July 13, 2011
MMRCT/SMB Meeting Minutes**

Ms. Donovan convened the meeting of the Massachusetts Military Reservation Cleanup Team (MMRCT) at 6:03 p.m. and introduced LTC Mike Speth as the person temporarily replacing Hap Gonser at the Impact Area Groundwater Study Program (IAGWSP). LTC Speth said that he is looking forward to working with the MMRCT while during his time with the IAGWSP. The other MMRCT members introduced themselves, after which Ms. Donovan asked if there were any changes or additions to the July 13, 2011 MMRCT/Senior Management Board (SMB) meeting minutes. No changes were offered and the minutes were approved as written, pending SMB approval.

Agenda Item #2. Late-Breaking News

Mr. Gregson reported that perchlorate was detected recently at the operable unit known as the Western Boundary study area, for which the final remedy decision was Monitored Natural Attenuation (MNA). He displayed a map of the area and pointed out the monitoring well (MW282-M2) in the Former D Range, where the detection occurred. Recent sampling of the well showed perchlorate at 9 parts per billion (ppb), and the state drinking water standard for perchlorate is 2 ppb and the U.S. Environmental Protection Agency (EPA) interim health advisory is 15 ppb. Prior to the recent detection, all sampling results were below the 2 ppb standard. The well has been resampled and results are expected by the end of the week to see if the detection might be a false positive.

Mr. Gregson then pointed out a location where the Bourne Water District is pursuing permitting for a water supply well, which is about 3,600 feet downgradient of the recent perchlorate detection. He noted that monitoring wells between the two locations have not seen levels of perchlorate like the recent one, and added that the IAGWSP is communicating with the Bourne Water District's consultant and will continue to provide updates and results as they become available.

Ms. Rielinger inquired about the depth of the well with the 9 ppb detection. Mr. Gregson replied that the detection was relatively deep, probably about 100 feet below ground surface. Ms. Jennings asked Mr. Gregson to repeat the distance from the detection to the location where the Bourne Water District wants to set a well. Mr. Gregson replied that the Bourne Water District location is about 3,600 feet downgradient of the recent perchlorate detection.

Agenda Item #3. Demolition Area 1 Update

Mr. Gregson displayed a figure depicting the area where the Demolition Area 1 (Demo 1) perchlorate plume is migrating off base and he pointed out the extraction system that was installed there earlier this year. He also noted that the IAGWSP has been trying to define the downgradient extent of the plume. The most recent result (from a drive-point location) showed perchlorate at about 0.8 ppb, and another location showed perchlorate at 0.5 ppb. The plan is to install additional drive-points on the other side of the nearby pond, which is very shallow and therefore it's believed that the plume would have traveled underneath the pond, if in fact it has traveled that great a distance. Mr. Gregson added that access agreements to drill the additional drive-point locations are in place, and the work should begin in about a week and a half.

Ms. Donovan mentioned that the IAGWSP has been keeping local residences informed about the work in their neighborhoods and notified them of tonight's MMRCT meeting. Mr. Gregson added that the drillers will be provided with handouts for any residents who might request additional information.

Agenda Item #4. J-1 Southern and Northern Plumes Groundwater Monitoring Update

Mr. Gregson showed a map and pointed out the Forestdale neighborhood of Sandwich, the J-1 Southern plume (which is made up of RDX and extends into the neighborhood), and the J-1 Northern plume (which is migrating northwest, into the Central Impact Area). He noted that the J-1 Southern treatment system, which has been operating for several years, is currently running at 45 gallons per minute (gpm) and had treated 120 million gallons of groundwater from system startup through December 2010. In 2010, the system pumped 22.4 million gallons of groundwater, no break-through was seen, and therefore no granular activated carbon (GAC) change-out was required. Mr. Gregson also pointed out the direction of groundwater flow (northwest to southeast) and noted that operation of the extraction well has begun to split the plume in two.

Mr. Gregson reported that in 2007, when the system began operating, RDX and HMX influent concentrations ranged from 10 to 12 ppb, but have decreased over time. A small spike, up to 3.1 ppb, was seen in May, but concentrations dropped again during the reporting period and are now less than 0.5 ppb. He also mentioned contaminant mass removal and noted that the bulk of mass removal occurs when a treatment system first begins operating.

Mr. Gregson then reviewed groundwater sampling results from the three rounds of sampling conducted in 2010 for the J-1 Southern plume. He reported that for the off-post profile borings, 13 of the 72 samples contained detectable concentrations of RDX, including 44 ppb at drive-point 544 (DP-544) on Windsong Road and 71 ppb at MW-524 on Grand Oak Road. He noted that the EPA health advisory for RDX is 2 ppb, the EPA one-in-a-million risk level is 0.6 ppb, and the Massachusetts Department of Environmental Protection (MassDEP) groundwater 1 (GW-1) standard is 1 ppb. He further noted that RDX was detected in eight of 30 well screens, with seven samples containing RDX above 0.6 ppb and four samples containing RDX above 2 ppb. The maximum RDX concentration detected in 2010 was 53.5 ppb (in MW-524M1), where the concentration detected in 2011 was 76 ppb.

Mr. Gregson reported that in the upgradient portion of the plume: a spike in concentration (9 ppb, which has since decreased to 6.1 ppb) was seen at MW-360M2, which is believed to be related to source excavation work conducted in 2009; concentrations decreased the well at Greenway Road (MW-528M1) from 4.6 ppb down to 2.8 ppb; and MW-384, which is adjacent to the extraction well, has tested nondetect since 2008. At the base boundary, most of the wells tested nondetect, with the exception of a 0.98 ppb detection in one piezometer well (MW-488PZ) – nevertheless, the plume is generally being cut off. Mr. Gregson also stated the plume is relatively well-defined off base, and the core is generally aligned with Grand Oak Road.

Mr. Gregson showed a cross-section figure of the J-1 Southern plume and pointed out the source area, the extraction well at the base boundary, and the portion of the plume that remains to be treated. He also reminded the team that that portion of the plume was the subject of a recent Decision Document (DD) that includes the installation of an extraction well. He then noted that no changes to the existing treatment system operation pumping rates are proposed, nor are any changes to the chemical monitoring network or sampling frequencies. Mr. Gregson referred to another map and pointed out the proposed location for the off-post extraction well, on Grand Oak Road. He said that the pipeline will run up the road to an easement through a private property and on to the base where treatment units will be located.

Mr. Gregson then reported that two sampling rounds were conducted in 2010 at the J-1 Northern plume. Eighteen of the 45 wells screens had perchlorate detections, with the maximum detection being 40.6 ppb (the maximum in 2011 was 45.6 ppb). The highest downgradient perchlorate detection, along Wood Road, was 0.068 ppb. Fourteen of the 45 well screens had RDX detections. The maximum RDX detection was 16. Ppb, and in 2011 the maximum was 34 ppb. Downgradient sampling locations, along Wood Road, tested nondetect for RDX.

Mr. Gregson showed another figure and pointed out a couple of significant perchlorate trends in the J-1 North plume – an increase in concentrations at MW-346M1, and a spike in concentrations in MW-370, which has since dropped back down. He also noted that increasing concentrations are seen in the middle part of the plume, as the plume migrates downgradient. Decreasing concentrations in the upgradient part of the plume indicate that the source is depleting. Mr. Gregson then discussed RDX trends, which he described as relatively flat down to the toe of the plume. However, he also pointed out a spike in one well, and said that the highest concentration are at a location near the source.

Mr. Gregson reviewed the recommendations for the J-1 Northern plume: increase sampling frequency at MW-549M1 and MW-549M2 from annual to semiannual until predesign characterization activities are completed; and shift several wells (MW-106M1, MW-477M1/M2, MW-485M1, MW-486-M1, and MW-487M2) to the Central Impact Area sampling program. He noted that next steps for the plume are to evaluate results from additional downgradient wells and determine the exact location for an extraction well in the downgradient part of the plume

Mr. Gregson then referred to a figure, reviewed perchlorate concentrations detected at particular sampling locations, and pointed out that the plume is relatively narrow, with higher concentrations located around MW-564. Based on this information, the IAGWSP drilled at location DW-8, where perchlorate was detected at 6 ppb. The IAGWSP also recently began drilling at location DW-9 in order to better define the right side of the plume, and results are expected soon, after which it's hoped that the IAGWSP and the regulators will be able to come to agreement on a proposed extraction well location.

Mr. Reif asked if the IAGWSP runs its treatment systems until breakthrough or if the program takes a more proactive approach. Mr. Gregson explained that the systems are set up as several containers in series, so breakthrough means that contaminant breaks through from the first vessel to the second, and does not mean that contaminant is released into a reinjection well. Mr. Reif asked if there's been any breakthrough in 2011, and Mr. Gregson replied that there still hasn't been any breakthrough in that treatment system.

Mr. Reif then asked why there is no recommendation to increase sampling frequency at the J-1 Northern mid-plume area, where perchlorate trends look "questionable." Mr. Gregson referred to a figure and pointed out MW-346M1 and the area where an extraction well is expected to be installed over the next year or two, before a significant amount of mass goes by. He also noted that the next extraction well down the line would capture any mass that gets by.

Agenda Item #5. J-3 Range Plume Groundwater Monitoring Update

Mr. Gregson stated that the J-3 Range plume is located along the base boundary with Forestdale, just south of the J-1 plumes. The source of the J-3 plume is the J-3 Range, which was operated by defense contractors, most recently Textron.

Mr. Gregson showed a map of the J-3 plume and pointed out the source area, the direction of groundwater flow (north to south), and an extraction well, where the groundwater is captured and pumped along to treatment vessels located in the Air Force's Fuel Spill 12 (FS-12) treatment plant. Groundwater beyond that area is captured by two additional extraction wells, which also pump water to the FS-12 plant. All treated J-3 water is returned to the aquifer via the Air Force's reinjection wells. Mr. Gregson also noted the following about the J-3 treatment system: it pumps a total of 195 gpm; it has treated 460 million gallons of groundwater to date; it's been operational for about five years; it treated 95 million gallons of groundwater in 2010; it's expected to operate until about 2054; the media has been changed out twice after breakthrough; and perchlorate or explosives have been detected in effluent samples. Mr. Gregson also noted that influent concentrations, which started out somewhat high in 2006, are relatively flat at this point, about 0.5 ppb. He added that some increasing trends in perchlorate have been seen, but that is most likely due to a higher concentration of perchlorate

encountering the upgradient ex well. He also showed a graph illustrating the mass removal rates for HMX, RDX, and perchlorate.

Mr. Gregson then reviewed groundwater sampling results: perchlorate was detected in 45 of 53 well screens, with maximum detection in the reporting period being 8.1 ppb, and the maximum in 2011 being 8 ppb; and RDX was detected in 11 of 46 well screens, with the maximum detection in the report period being 6.8 ppb, and the maximum in 2011 being 7.1 ppb. Mr. Gregson stated that the IAGWSP believes that the plumes are adequately defined by the monitoring well network, and concentrations are showing general decreasing trends. He also showed a cross-section figure of the J-3 perchlorate plume, pointed out Snake Pond, and said that the plume is probably dropping below the pond but doesn't appear to be encountering the pond at this time. He then showed a cross-section figure of the J-3 RDX plume and pointed out that the plume is fairly broken up.

Mr. Gregson then displayed a multi-panel figure that showed J-3 plume depictions from 2007, 2008, 2009, and 2010. He noted that in 2007 it was a fairly wide plume, but it has been collapsing along its axis as the extraction wells started to work. He also said that decreasing concentrations have been seen in the wells immediately upgradient of Snake Pond. Mr. Gregson then reported that samples were collected in April, May, and July at two locations on Snake Pond (the public beach, and a private property on the northwest shore). All results were nondetect for perchlorate and explosives, and AFCEE's sampling program at Snake Pond showed nondetect results for EDB.

Mr. Gregson also reviewed the "Recommendations" slide: the treatment system is operating as intended and no changes to pumping rates are proposed; no changes to the chemical monitoring network or sampling frequencies are recommended; and with the exception of remove the J-3 wetland piezometer, no changes to the hydraulic monitoring network are recommended.

Mr. Reif referred to the influent concentrations graph and asked which well is causing the uptrend in perchlorate concentrations. Mr. Gregson explained that the graph shows the overall trend in influent concentrations to the treatment plant, which receives a combination of water from all three extraction wells. He did, however, point out an area where higher perchlorate concentrations were detected in the monitoring wells. Ms. Jennings further clarified that the graph shows the total concentration of influent coming from the three extraction wells into the treatment plant.

Mr. Reif explained that he was thinking about optimization and perhaps trying to address that potential uptrend. Mr. Gregson replied that the IAGWSP's interpretation is that things are working as they should. An overall increase in influent concentrations is expected as the core of the plume migrates to the south and starts to get captured by "this well."

Ms. Jennings asked Mr. Reif if he's referring to the pumping rate, packering off well screens, or installing another extraction well when he mentions optimization. Mr. Reif replied that he would think that all three would be considered. Ms. Jennings stated that many different alternatives were evaluated, and the three-well system turned out to be the best in terms of performance over a period of time. When the Remedial Investigation/Feasibility Study (RI/FS) is being completed next year and a final decision is made, however, system performance will be assessed to ensure that the design is working as predicted. During this process it will be determined whether optimization or some kind of change to the remedy is needed, but she doesn't think that will be the case with this particular plume. Nevertheless, the data will be examined closely.

Agenda Item #6. Wind Turbine Ribbon-Cutting

Mr. Davis stated that the two new wind turbines will become operational over the next two weeks and a ribbon-cutting ceremony is scheduled for Friday, October 28, 2011 at four o'clock in the afternoon. He noted that MMRCT members will be invited to the event, and he reported that the Undersecretary for the Air Force will be one of the distinguished visitors in attendance.

Agenda Item #7. FS-28 Plume Update

Mr. Davis stated that FS-28, an EDB plume located in the Hatchville area of Falmouth, is behaving as predicted. He also said that by the time the plume was found in the mid-1990s, it had already detached from its source area on the base, and was deep and migrating. No other fuel components could be detected at that time, indicating that it had been decades since the fuel had entered the groundwater. Mr. Davis noted that the Massachusetts maximum contaminant level for EDB is 0.02 ppb, and in 2011 the maximum concentration in the plume was a little over 1 ppb. The historical maximum EDB concentration for the plume was 15 ppb, which occurred in the 1996/1997 timeframe.

Mr. Davis stated that the FS-28 extraction system, which began operating in 1997, includes a northern extraction well and currently processes a total of 625 gpm. More than 200 shallow well-points used to operate as part of the treatment system, but have been since been decommissioned. A couple of years ago a southern extraction well was installed to address the leading edge lobe of the plume, which was not mapped when the main extraction well was installed. The southern well pumps 75 gpm.

Mr. Davis then reviewed the slide entitled “Summary of Risks – Groundwater”: no current exposure, residences in the immediate vicinity of the plume were connected to town water in 1997; a Land Use Control (LUC) known as the Private Well Verification Program has been completed for all 151 parcels in the FS-28 area, no private drinking water wells were identified, and seven wells used for irrigation were identified, but they present no exposure risk; and as a precautionary measure, Falmouth’s Coonamessett Water Supply Well, which is screened shallower than the plume and has never had a detection of EDB, is pumped to the town’s Crooked Pond wellhead treatment system, which has both an air stripper and carbon.

Mr. Davis also discussed the slide entitled “Summary of Risks – Surface Water”: cranberry bogs in the area were not harvested in 1997, 1998, or 1999, due to detections of EDB throughout the river system, and the Air Force compensated the growers for their lost crops; from 2007 to 2010 no EDB was detected in surface water; a sub-MMCL concentration was detected in one bog in June 2011, but was not repeated in the August 2011 sampling event; and the cranberries have been harvested since 2000, except for the cranberries from one small bog, in 2005, in which case the grower was compensated.

Mr. Davis reported that from July 2010 to June 2011, the FS-28 treatment system treated 314 million gallons of groundwater. From system startup through the end of the reporting period, the system treated 4.75 billion gallons of groundwater and removed 14.6 pounds of EDB (enough to put water from 132,000 Olympic size pools at the MMCL of 0.02 ppb).

Mr. Davis showed photos of the FS-28 treatment plant and one of the bubblers that’s used to discharge the treated water into the river system. He reminded the group that the shallow well-point system was decommissioned, and he noted that the sheet piling installed to keep the bogs separated from the river has been removed. He then showed several photos of the decommissioning/removal work, as well as a figure depicting surface water sampling locations along the river system. He also reviewed costs associated with the FS-28 treatment system: for fiscal year 2011 – \$420 thousand; for 1997 to 2011 – \$51 million; and estimated costs from 2012 to 2041 - \$10 million.

Mr. Davis stated that the main FS-28 extraction well is pumping at 550 gpm, and was optimized by packering off the well screen to concentrate the extraction stress deeper. Capture of the main plume is being achieved. To be conservative, the flow rate at the downgradient extraction well was increased to 75 gpm in October 2010, and data indicate that capture is being achieved there as well. Mr. Davis displayed a graph showing influent EDB concentration trends and described the northern extraction well as “a big catcher’s mitt...waiting for the plume...” He also showed an “EDB Concentration Trends” figure, noted the declining trends throughout the main body of the plume, and reiterated that

the monitoring network indicates that the EW-1 is achieving capture. Mr. Davis displayed another figure and pointed out the mass heading for EW-2.

Mr. Davis reported that in the area of the shallow well-point system there's only one EDB detection above the MMCL (at 0.039 ppb), which is a deeper concentration that is not upwelling. Therefore, the data support the appropriateness of the decision to decommission the shallow well-point system. Mr. Davis also said that concentrations are declining in the wells that define the leading edge lobe of the plume. He then noted that part of the decision to install EW-2 was based on monitoring that indicated that the plume might upwell into Pond 14, which is part of the river system. He reported that "that downgradient location" and those just downgradient of the extraction well have dropped to nondetect, showing that the well is achieving capture.

Mr. Davis also showed a cross-section of the plume (from the 2009 data set) and pointed out Coonamessett Pond, the Coonamessett water supply well (which is screened about 110 to 120 feet above the top of the plume), and the remainder of the main part of the plume, which is migrating toward EW-1. He then showed a cross-section of the southern part of the plume and pointed out the area where the shallow well-points used to be located, the downgradient lobe, and EW-2.

Mr. Davis reviewed the "Conclusions" slide, which noted the following: a continued decline in EDB concentrations was observed in the main body of the plume; data support the conclusion that EW-1 is capturing the main EDB plume; the maximum detected EDB concentration in the main body of the plume is now 1.1 ppb (declining from 2.54 ppb in April 2007 and 2.89 ppb in April 2006); no EDB was detected at wells screened shallow in the aquifer near the former shallow well-point system, and data continue to support the decision to shut down the system in November 2008; monitoring data indicate improved capture of the deep leading edge lobe by EW-2 at the optimized flow rate of 75 gpm; the remedial objective of capturing and cutting of this portion of the plume is being met; and remedial system performance monitoring data are consistent with the conceptual site model, remedial goals are being met, and remediation is progressing as expected.

Mr. Davis reviewed next steps and recommendations for the FS-28 plume: continue monitoring, optimize as appropriate, and finalize the LUC well determinations, which are just being published and will soon be sent to the regulatory agencies for review. He concluded his presentation by showing depictions of the plume over time, beginning in 1998, and noted that some good progress has been made.

Agenda Item #8. Next Meeting Schedule and Adjourn

The group discussed when to meet next, given the upcoming holidays and potential agenda items, and scheduled a meeting for December 7, 2011. (*Note – the next meeting date was subsequently changed to January 11, 2012.*)

Mr. Goddard inquired about the status of the Natural Resource Trustee Council (NRTC) process. Mr. Davis said that he hasn't heard anything on the NRTC. Mr. Goddard said that he thought that the NRTC was going to be holding meetings in the area. Ms. Donovan reminded Mr. Goddard that he had generated an action item on this issue at the last MMRCT meeting, and the response, which is included in tonight's meeting packet, was that the MMRCT would be informed when there's something to report.

Ms. Donovan then adjourned the meeting at 7:08 p.m.