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Decision Document
Addendum No. 2
Demolition Area 1
Off-base Leading Edge Groundwater Plume

Joint Base Cape Cod
Cape Cod, Massachusetts

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A. SITE NAME

The subject site is the Demolition Area 1 ("the Site"), which is located at Camp Edwards at the Joint Base Cape Cod (JBCC) formerly the Massachusetts Military Reservation (MMR) (Figure 1). The Site is composed of a groundwater plume and a former source area which was remediated. The *Demolition Area 1 Groundwater Operable Unit Decision Document* , dated November, 2006 (the 2006 Decision Document) established the selected remedy for the groundwater plume on the JBCC migrating from the source area. The *Decision Document Addendum No. 1 Demolition Area 1 Source Area* dated September, 2009 (Addendum No. 1) established the selected remedy for the source area. This Decision Document Addendum No. 2 (Addendum No. 2) addresses groundwater contamination from Demolition Area 1 that has migrated beyond the base boundary.

An area of groundwater contaminated by explosives and perchlorate is migrating from the source area through the JBCC and into the Town of Bourne (Figure 2). The groundwater contamination was initially addressed in 2004 by an interim response action that consisted of a pump and treat system that extracted and treated 460,000 gallons of groundwater per day. That system, which included two extraction and three injection wells, along with four modular treatment units, operated until June 2007 when it was replaced by a more comprehensive treatment system outlined in the *2006 Decision Document*. The comprehensive system treated more than 1.3 million gallons per day using five extraction wells, four injection wells, one modular treatment unit and a permanent facility which replaced three of the four modular treatment units. It was predicted to restore the groundwater to risk-based levels by 2018. The Decision Document included the contingency that additional extraction wells be added to the system if the plume was found to migrate further than expected. In 2010, monitoring wells located at the JBCC boundary showed detections of perchlorate; therefore, an additional extraction well and treatment system (currently operating at 60 gallons per minute [GPM]) were installed in June 2011 and began treating the portion of the plume that had migrated towards the base boundary. Currently the treatment system operates six extraction wells pumping at a combined rate of 665 gallons per minute. The total system treats 964,000 gallons per day and since 2006, has treated 2.2 billion gallons of groundwater and removed 109 pounds of perchlorate and 48 pounds of RDX from the aquifer.

B. STATEMENT OF BASIS AND PURPOSE

This Decision Document Addendum No 2. (Addendum No. 2) modifies the 2006 Decision Document to include additional response actions to address the leading edge of the Demo 1 groundwater plume.

Addendum No. 2 supplements, incorporates, and is incorporated into and made part of the 2006 Decision Document, and every requirement in Addendum No. 2 is enforceable as a requirement of the 2006 Decision Document. The 2006 Decision Document contains the Demolition Area 1 site description, selected response action, community participation and state role.

Addendum No. 2 presents the selected response action for the Site. The selected response actions were chosen in accordance with Section 1431(a) of the Safe Drinking Water Act (SDWA), 42 USC § 300i(a), as amended, and the Administrative Order (AO) concerning response actions issued thereunder, U.S. Environmental Protection Agency Region 1 (EPA) Administrative Order No. SDWA-1-2000-0014 (AO3). The authority to select the necessary response action(s) has been delegated to EPA Region 1's Regional Administrator pursuant to EPA Delegation No. 9-17 (1200-TN-350) dated May 11, 1994, and further delegated to EPA Region 1's Director, Office of Site Remediation and Restoration, pursuant to redelegation of authorities dated April 6, 2010.

This decision is based on the Administrative Record, which has been developed in accordance with AO3 and with a previous EPA Administrative Order, SDWA 1-97-1019 (AO1), including consideration of the substantive cleanup standards of the Massachusetts Contingency Plan (MCP) 310 CMR 40.0000. The Administrative Record is available for review at the Impact Area Groundwater Study Program (IAGWSP) office, PB 516 West Outer Road, Camp Edwards, MA. Key supporting documents included in the Administrative Record related to Demolition Area 1 are listed in Appendix C.

C. ASSESSMENT OF THE SITE

On July 13, 1982, EPA determined that the Cape Cod Aquifer is the sole or principal source of drinking water for Cape Cod, Massachusetts, and that the Cape Cod Aquifer, if contaminated, would create a significant hazard to public health (47 Fed. Reg. 30282). Contaminants from the Training Ranges and Impact Area at Camp Edwards at JBCC are present in and may enter and

migrate in the aquifer. The response actions selected in Addendum No. 2 are necessary to protect the Cape Cod Aquifer, an underground source of drinking water on which the public relies.

D. DESCRIPTION OF RESPONSE ACTION

Addendum No. 2 sets forth the selected response action taken or to be taken for addressing groundwater contamination at and emanating from the Site. Addendum No. 1modified the 2006 Decision Document to include response actions taken to address contaminated soil, munitions and explosives associated with the Demolition Area 1 source area. Addendum No. 1 declared that no further remedial action was necessary for the Demolition Area 1 source area.

Data collected from the Fall of 2010 to the Winter of 2013 during a supplemental investigation indicated that perchlorate and hexahydro-1,3,5-trintiro-1,3,5-triazine (RDX) contamination exceeding acceptable levels was present beyond the JBCC boundary, with perchlorate detected as far west as County Road in Pocasset. This investigation characterized an off-base portion of the Demolition Area 1 groundwater plume over 3,700 feet west of the base boundary. The historic maximum detection in this portion of the groundwater plume was 13 µg/L of perchlorate. In response to these findings, a base boundary extraction well and treatment system was installed as in interim measure in June 2011. This treatment system is currently operating at 60 gpm. As of August 2013, the current maximum detected concentration is 5.7 µg/L. Updated groundwater modeling also suggested that the time to achieve cleanup may extend beyond the 11 years predicted in the 2006 Decision Document. EPA required the development of a technical memorandum to evaluate alternatives for addressing the groundwater contamination that was present off base as well as alternatives to expedite cleanup of the on base contamination.

1. Evaluation of Groundwater Alternatives

Eight alternatives were developed and evaluated in the Technical Memorandum. The alternatives developed were intended to help EPA address two questions: 1) what additional actions are necessary to address the contamination that was present past the base boundary and 2) are additional actions appropriate to achieve cleanup of the plume within the timeframe (11 years) required by the remedy selected in the 2006 Decision Document. After reviewing the Technical Memorandum and during the development of the Remedy Selection Plan, EPA determined that Addendum No. 2 will be limited to only those alternatives addressing the off

base contamination (Alternatives 1, 3, 4 and 4A). Correspondingly, costs presented for these alternatives reflect only the off-base portion of the remedy (Table 1). Table 1 summarizes the alternatives which were evaluated. This table includes key information such as a description of each alternative, predicted cleanup times for both RDX and perchlorate, mass capture, and a breakdown of the costs. Figure 3 displays the placement of treatment system components for each alternative (i.e., extraction wells, treatment plants, and infiltration galleries/reinjection wells). All alternatives included Land Use Controls (LUCs), long-term groundwater monitoring, system operation and maintenance, and five year reviews.

Generally, each plume undergoes routine optimization evaluations and changes resulting from these routine optimizations are documented in the Annual Environmental Reports. If significant changes are necessary to optimize a system, a Decision Document Addendum would be issued to address those changes. At this time, only minor changes to the current on base system are recommended and those changes are not the subject of Addendum No. 2.

Detailed information on each of the four alternatives is presented below.

Alternative 1 – Current System with Monitored Natural Attenuation for the Off-base Contamination

Alternative 1 would provide for extraction and treatment of the groundwater using the current system. Under this alternative:

- The plume located past the base boundary would be restored using monitored natural attenuation, no further active treatment would be implemented.
- A long-term groundwater monitoring plan would be implemented and optimized as required to monitor the migration and restoration of the off base plume.
- Land Use Controls (LUCs) would be implemented to prevent use of contaminated portions of the aquifer for drinking water and prevent actions that would interfere with the remedy.
- Monitoring, reporting and site-closeout documentation would be completed.

Contamination within the plume is expected to drop below the 2 µg/L Massachusetts Maximum Contaminant Level (MMCL) for perchlorate by 2026 and is expected to reach background levels by 2059. RDX concentrations are expected to decrease below the 10^{-6} risk-based level of 0.6

µg/L by 2022 and reach background levels by 2025.

Alternative 3 – Current System with One Off-base Extraction Well East of Lily Pond

Alternative 3 would provide for extraction and treatment of the groundwater using the current system with modifications. Under this alternative:

- The pump and treat system would be modified to include:
  - One new off-base extraction well (up-gradient of Lily Pond, operating at 100 gpm, see Figure 3).
  - Treatment with granular activated carbon and ion-exchange resin by expanding the base boundary treatment unit to handle the increased capacity from the off-base extraction well.
  - Infiltration of the treated water with a new infiltration trench located at the base boundary.
- A long-term groundwater monitoring plan would be implemented and optimized as required to monitor the migration and restoration of the off base plume.
- LUCs would be implemented to prevent the use of contaminated portions of the aquifer for drinking water and prevent actions that would interfere with the remedy.
- Monitoring, reporting and site-closeout documentation would be completed.

Contamination within the plume is expected to drop below the 2 µg/L MMCL for perchlorate by 2021 and is expected to reach background levels by 2055. RDX concentrations are expected to decrease below the 10^{-6} risk-based level of 0.6 µg/L by 2022 and reach background levels by 2025. The new off-base extraction well would be installed east of Lily Pond approximately at the intersection of Williams Avenue and Windrush Avenue (see Figure 3). Piping from this extraction well would pass under Williams Avenue, under Route 28 and back onto the JBCC property. The extraction well is located in a neighborhood which is heavily populated and has narrow roadways which could result in some disruption during construction.

This alternative requires directional drilling under Route 28, a state highway, requiring the approval of the Massachusetts Department of Transportation Highway Division. In addition, property easements would be required to construct extraction wells and associated piping.

Alternative 4 – Current System with Two Off-base Extraction Wells

Alternative 4 would provide for extraction and treatment of the groundwater using the current system with modifications. Under this alternative:

- The pump and treat system would be modified to include:
  - Two new off-base extraction wells (one west and one east of Lily Pond, operating at 100 gpm each, see Figure 3).
  - Treatment with granular activated carbon and ion-exchange resin by expanding the base boundary treatment unit and adding a new off-base modular treatment unit (MTU) west of Lily Pond.
  - Infiltration of the treated water with a new base boundary infiltration trench and another one in an area west of Lily Pond.
- A long-term groundwater monitoring plan would be implemented and optimized as required to monitor the migration and restoration of the off base plume.
- LUCs would be implemented to prevent the use of contaminated portions of the aquifer for drinking water and prevent actions that would interfere with the remedy.
- Monitoring, reporting and site-closeout documentation would be completed.

Contamination within the plume is expected to drop below the 2 µg/L MMCL for perchlorate by 2021 and is expected to reach background levels by 2046. RDX concentrations are expected to decrease below the 10^{-6} risk-based level of 0.6 µg/L by 2022 and reach background levels by 2025.

A new off-base extraction well would be installed east of Lily Pond approximately at the intersection of Williams Avenue and Windrush Avenue. Piping from this extraction well would pass under Williams Avenue, under Route 28 and back onto the JBCC property. The extraction well is located in a neighborhood which is heavily populated and has narrow roadways which could result in some disruption during construction. This alternative requires directional drilling under Route 28, a state highway, requiring the approval of the Massachusetts Department of Transportation Highway Division.

A second off-base extraction well would also be installed on private property west of Lily Pond along with a MTU to treat the extracted groundwater. Property easements would be required to construct extraction wells and an infiltration gallery, treatment units and the associated piping.

Alternative 4A – Current System with One Off-base Extraction Well West of Lily Pond

Alternative 4A would provide for extraction and treatment of the groundwater using the current system with modifications. Under this alternative:

- The pump and treat system would be modified to include:
  - One new off-base extraction well (west of Lily Pond, operating at 100 gpm, see Figure 3).
  - Treatment with granular activated carbon and ion-exchange resin by adding a new off-base MTU west of Lily Pond.
  - Infiltration of the treated water with a new infiltration trench (west of Lily Pond).
- A long-term groundwater monitoring plan would be implemented and optimized as required to monitor the migration and restoration of the off base plume.
- LUCs would be implemented to prevent the use of contaminated portions of the aquifer for drinking water and prevent actions that would interfere with the remedy.
- Monitoring, reporting and site-closeout documentation would be completed.

Contamination within the plume is expected to drop below the 2 µg/L MMCL for perchlorate by 2025 and is expected to reach background levels by 2059. RDX concentrations are expected to decrease below the 10^{-6} risk-based level of 0.6 µg/L by 2022 and reach background levels by 2025. A new off-base extraction well would be installed on private property west of Lily Pond along with a MTU to treat the extracted groundwater and an infiltration trench to inject treated water back into the ground. Property easements would be required to construct extraction wells, treatment units and the associated piping.

Alternatives were evaluated using the nine criteria developed for the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA): 1) Overall protection of human health and the environment including prevention of the movement of contaminants into the aquifer and its preservation as a public drinking water supply; 2) Compliance with regulations; 3) Long-term effectiveness and permanence; 4) Reduction of toxicity, mobility and volume through treatment; 5) Short-term effectiveness; 6) Implementability; 7) Cost; 8) State Acceptance; and 9) Community Acceptance.

With the current system operating on base, Alternatives 3, 4 and 4A included treatment of the

off-base portion of the plume. These alternatives differ in the location and number of extraction wells. All of the alternatives would be protective of human health and the environment, and are expected to be in compliance with applicable regulations. They varied in their long-term effectiveness and permanence, reduction of toxicity, mobility, or volume through treatment, short-term effectiveness, implementability and cost.

Alternatives 3, 4 and 4A provide long-term effectiveness and permanence by capture of the off-base portion of the plume. However, their predicted cleanup times for perchlorate vary from 2021 to 2025. Without the off-base extraction, groundwater modeling for Alternative 1 indicates that the plume migrates and crosses County Road, and would take until 2026 for perchlorate to reach its cleanup level. Alternatives 3, 4 and 4A provide a reduction of toxicity, mobility, or volume through treatment, and capture RDX and perchlorate (see Table 1 for capture estimates). However Alternative 4A results in the greatest mass removed through treatment. Alternatives 3, 4 and 4A have impacts due to construction of treatment system components. Impacts from Alternative 4A would be less than Alternatives 3 and 4 because the treatment system would be located on a private property and not within public roadways. Alternatives 3, 4 and 4A are implementable and will require extra safety precautions and coordination with the Town of Bourne, neighborhood, private landowners, and utilities. The present worth costs for the Alternatives ranged from $3,628,000 to $5,500,000 with Alternative 4A falling in the middle with a $4,000,000 present worth cost. The capital costs ranged from $1,420,000 for Alternative 4A to $3,000,000 for Alternative 4. Both State and Community Acceptance are presented in the State Concurrence Letter in Appendix A and Responsiveness Summary of comments received during the Remedy Selection Plan public comment period.

2. Response Action Objectives

The response action objectives for the Site are to restore the useable groundwater to its beneficial use, wherever practicable, within a timeframe that is reasonable given the particular circumstances of the site; to provide a level of protection in the aquifer that takes into account that the Cape Cod Aquifer, including the Sagamore Lens, is a sole source aquifer that is susceptible to contamination; and to prevent the ingestion and inhalation of groundwater containing the COCs (RDX, TNT, 2,4-DNT and perchlorate) in excess of federal Maximum Contaminant Levels (MCLs), Health Advisories (HA), Drinking Water Equivalent Levels (DWELs), applicable State standards or unacceptable excess lifetime cancer risk or non-cancer

Hazard Index (HI).

There currently is no federal drinking water standard for perchlorate. However, in December 2008, EPA issued an Interim Drinking Water Health Advisory for exposure to perchlorate in water of 15µg/L. Also, the Massachusetts Department of Environmental Protection (MassDEP) has promulgated a Massachusetts Maximum Contaminant Level (MMCL) for perchlorate of 2µg/L in July of 2006.

The lifetime federal Health Advisory for RDX in drinking water is 2µg/L, the Massachusetts Contingency Plan (MCP) GW-1 standard is 1 µg/L, and the 10^{-6} risk-based concentration that results in an increased lifetime cancer risk of one in a million is currently 0.6µg/L.

The EPA has selected a response action for the Site under which the aquifer, which has been designated a Sole Source Aquifer by the EPA and a Potentially Productive Aquifer by the MassDEP, will be restored. The response action will ensure that the groundwater containing RDX at concentrations greater than the 10^{-6} risk-based level and/or perchlorate greater than 2µg/L is restored to protective levels.

3. Selected Response Action

The EPA selected response action for the Demolition Area 1 groundwater is Alternative 4A Focused Extraction with the current extraction system (500 gpm at Frank Perkins Road, 100 gpm at Pew Road, and 65 gpm at Base Boundary) and one new off-base extraction well (west of Lily Pond, pumping at 100 gpm), Monitored Natural Attenuation, and Land Use Controls. Extracted water from the new well will be piped to a new mobile treatment unit west of Lily Pond on private property. Treated water will be discharged to an infiltration trench. Figure 4 presents a conceptual layout of this alternative. The remedy is expected to achieve cleanup levels of 2µg/L for perchlorate by 2025 and 0.6µg/L for RDX by 2022 as contaminated groundwater is extracted and treated. In this action, land-use controls are extended off-base from the original boundary set in the 2006 Decision Document and further explained below. The alternative can be viewed as an enhancement of the current treatment systems since active treatment is added to the off-base portion of the plume. This alternative, as presented in the Demolition Area 1 Technical Memorandum, Response Action Groundwater Treatment System Analysis, provides the best balance of the criteria used to evaluate cleanup alternatives.

The selected alternative achieves cleanup goals in a reasonable timeframe and protects human health through the use of groundwater monitoring to ensure that groundwater modeling predictions regarding the reduction and migration of contamination at the Site are correct and that any residual contamination remains below risk-based levels. Human health will be further protected through expansion of the current Land Use Controls area. These controls will prevent use of contaminated portions of the aquifer at the Site for drinking water purposes until groundwater data confirm that contamination has been reduced to below risk-based levels.

The major components of the Demolition Area 1 response action are:

- Continued operation of the current extraction and treatment system consisting of six extraction wells operating at 665 gpm, one permanent treatment facility and two mobile treatment units (MTUs)
- Installation of one new off-base extraction well west of Lily Pond operating at 100 gpm, one off-base MTU, and a new infiltration trench (Figure 5)
- Long-term groundwater monitoring at existing and new monitoring wells to verify that groundwater is being restored as predicted and to ensure that any remaining contamination remains below risk-based levels
- Implementation and verification of Land Use Controls to prevent use of contaminated portions of the aquifer for drinking water until contamination is reduced to below risk-based levels and to prevent actions that would interfere with the remedy (See Figure 6)
- Five year reviews to determine if the groundwater treatment system is still protective and achieving the goals established and to determine if source response actions continue to protect groundwater

The estimated capital cost of the remedy is $1,420,000 and the present worth total cost is estimated to be $4,000,000 [This cost does not include the approximately $6,000,000 associated with construction and operation of current treatment systems].

Additional data will be collected to optimize the off-base extraction well location west of Lily Pond. Two parcels are being evaluated for locating the extraction well, mobile treatment system and infiltration gallery. There are obstacles associated with property access for these parcels. However these obstacles are less compared to the other alternatives involving treatment (i.e.,

smaller parcels and narrow roadways). The IAGWSP, EPA and MassDEP will work with the owners of both parcels to determine the best location for the system components. If access issues should significantly delay the implementation of the remedy, the EPA and MassDEP will evaluate options for modifying the remedy to achieve the cleanup objectives such as proposing an alternate location for the system.

This alternative is selected because it achieves permanent cleanup of RDX and perchlorate. This alternative restores the aquifer by actively treating the mass present, prevents migration of the plume beyond County Road and minimizes the uncertainty of letting the plume migrate un-captured. Long-term groundwater monitoring and data analysis will be conducted to optimize the system components as needed while meeting cleanup goals. Land Use Controls will be extended to off-base areas and be maintained. More detail is described in following paragraphs. Operation & maintenance of all treatment system components will be conducted. Five year reviews will continue as part of base-wide future evaluation.

Land Use Controls

Contaminated groundwater in the Demolition Area 1 groundwater plume currently poses an unacceptable risk to human health if used for drinking water purposes. Administrative and/or legal controls that minimize the potential for human exposure to contamination by limiting land or resource use, known as "Land Use Controls" (LUCs), must be established to avoid the risk of exposure to contaminated groundwater above regulatory standards, health advisories, and/or risk-based levels, maintain the integrity of any current or future groundwater monitoring wells and treatment systems and prevent actions that would interfere with the remedy. The LUCs are needed until the groundwater contamination no longer poses an unacceptable risk.

The performance objectives of the LUCs are to:

- Prevent access to or use of the groundwater from the Demolition Area 1 groundwater plume until the groundwater no longer poses an unacceptable risk, and
- Maintain the integrity of any current or future groundwater monitoring wells and treatment systems.

The LUCs will be implemented in the areas encompassing the Demolition Area 1 groundwater

plume contaminated groundwater and surrounding areas to prevent risks from exposure to contaminated groundwater. The on-JBCC areas of concern are controlled and operated by the Massachusetts National Guard in conjunction with the US Army (Army) which leases the land from the Commonwealth of Massachusetts. It is expected that these entities will operate and lease, respectively, the Site and the surrounding areas for the duration of the remedy specified in this Decision Document. As a result, the Army will coordinate with the Commonwealth of Massachusetts as it fulfills its responsibility to establish, monitor, maintain and report on the LUCs for the Sites. Although homes located in the off-JBCC area have been connected to town water, an additional land use control will be necessary within the Town of Bourne for the areas within the downgradient portion of the Demolition Area 1 groundwater plume.

Each land use control will be maintained until either (1) the concentrations of RDX and perchlorate in the groundwater are at levels that allow for unrestricted use and unlimited exposure, or (2) the Army, with the prior approval of the EPA, in consultation with MassDEP, modifies or terminates the land use control in question.

Specific Land Use Controls

The Army is responsible for ensuring that the following land use controls are established, monitored, maintained, reported on, and enforced as part of this final remedy to ensure protection of human health in accordance with SDWA § 1431(a) for the duration of the final remedies selected in this Decision Document. The Town of Bourne has enforcement authority regarding the first land use control, which is applicable to the off-JBCC portion of the Demolition Area 1 groundwater plume. The Commonwealth of Massachusetts has enforcement authority regarding the second land use control, which applies to all sites. The Massachusetts Air National Guard and Massachusetts Army National Guard have enforcement authority regarding the third and fourth land use controls, which are applicable to the on-base portions of the Site. The Air Force has enforcement authority regarding the fifth land use control, which is applicable to the on-JBCC portions of the Site.

1. The Bourne Board of Health requires a permit for the installation and use of all wells, including drinking water wells, irrigation wells, and monitoring wells. No well will be allowed to be constructed for human consumption or irrigation if its placement is known to be over a known plume of contamination or in the direct

path of an advancing plume of contamination. The minimum lateral distance from potential contamination sources is 400 feet. If a permit to install a drinking water well is approved, the Bourne Board of Health will not approve the use of that well until its water has been tested and the Board of Health has determined that the water is potable. The Bourne Board of Health Well Regulations do not apply to use of existing drinking water wells and irrigation wells.

To assist the Town of Bourne in the implementation of this land use control, the Army will meet with the Bourne Board of Health on an annual basis, or more frequently if needed, to provide and discuss plume maps that document the current and projected location of the Demolition Area 1 groundwater plume within the town of Bourne. While Figure 6 shows the current area of land use controls in the town, the Bourne Board of Health may modify the areas where the Board of Health may require additional well testing, and this land use control will apply to such areas even if they differ from the area shown.

2. In addition to the Town of Bourne Board of Health regulations, which generally apply to small water supply wells, existing land use controls also prevent the possible creation of a large potable water supply well. MassDEP administers a permitting process for any new drinking water supply wells in Massachusetts that propose to service more than 25 customers or exceed a withdrawal rate of 100,000 gallons per day. This permitting process, which serves to regulate the use of the Demolition Area 1 groundwater plume area for any new withdrawals of groundwater for drinking water purposes, constitutes an additional land use control for these final remedies. This land-use control applies to both on-JBCC and off-JBCC areas. (Existing public water supply wells will remain subject to permits currently in place.)

3. For on-JBCC areas, a prohibition on new drinking water wells serving 25 or fewer customers has been established and placed on file with the planning and facilities offices for the Massachusetts Air and Army National Guard (major tenants at the JBCC). The prohibition will be applied to future land-use planning per Massachusetts Air National Guard Instruction (ANGI) 32-1003, Facilities

Board and Massachusetts Army National Guard Regulation 210-20, Real Property Development Planning for the Army National Guard.

4. For the on-post areas, the Massachusetts Air National Guard has administrative processes and procedures that require approval for all projects involving construction or digging/subsurface soil disturbance, currently set forth in Massachusetts Air National Guard Instruction 32-1001, Operations Management. This procedure is a requirement of the Massachusetts Army National Guard, by the Massachusetts Air National Guard, through Installation Support Agreements. The Massachusetts Air National Guard requires a completed AF Form 103, Base Civil Engineer Work Clearance Request (also known as the base digging permit), prior to allowing any construction, digging, or subsurface soil disturbance activity. All such permits are forwarded to the Army for concurrence before issuance. An AF Form 103 will not be processed without a Dig Safe permit number (see next paragraph).

5. The Dig Safe program implemented in Massachusetts provides an added layer of protection to prevent the installation of water supply wells in the Central Impact Area groundwater area and to protect monitoring wells. This program requires, by law, anyone conducting digging activities (e.g., well drilling) to request clearance through the Dig Safe network. The Air Force at the JBCC is a member utility of Dig Safe. The Camp Edwards Training Range and Impact Area, fall within the geographical area identified by the Air Force as a notification region within the Dig Safe program. Through the Dig Safe process, the Air Force will be electronically notified at least 72 hours prior to any digging within this area. The notification will include the name of the party contemplating, and the nature of, the digging activity. Upon receiving Dig Safe notification of any proposed digging activity on Camp Edwards (which includes the Impact Area), the Air Force will promptly transmit the Dig Safe notification information to the Army with a copy to the Massachusetts National Guard JBCC Environmental & Readiness Center (E&RC). The Army (or its designee) will promptly review each notification and if the digging activity is intended to provide a previously unknown water supply well, the Army (or its designee) will immediately notify the project sponsor (of the

well drilling), the EPA, and the MassDEP in order to curtail the digging activity. If the Dig Safe notification indicates proposed work near monitoring wells, the Army (or its designee) will mark its components to prevent damage due to excavation. The extent of the Army's enforcement of this land use control does not address off-base parties failing to file a Dig Safe request or the improper processing of a notification; but if incidents do occur, the Army is responsible for ensuring remedy integrity and, if necessary, repairing damage caused by third parties to the monitoring wells or treatment systems.

In the event that the Town of Bourne fails to promptly enforce the first land use control, the Commonwealth of Massachusetts fails to promptly enforce the second land use control, the Massachusetts Air and Army National Guards fail to promptly enforce the third or fourth land use control, or the Air Force fails to promptly enforce the fifth land use control, the Army will act in accordance with the third to last paragraph in this section, headed "*Activities Inconsistent With Land Use Controls.*" Specifically, if the Army discovers that the party responsible for enforcing the identified land use control has failed to promptly enforce that land use control, then, as soon as practicable, but no later than 10 days after the Army becomes aware of this failure to promptly enforce the land use control, the Army will notify the EPA and MassDEP and initiate actions to address such failure. The Army will notify the EPA and MassDEP regarding how the Army has addressed or will address the breach within 10 days of sending the EPA and MassDEP notification of the breach. For purposes of this paragraph, "promptly enforce" means if the violation or potential violation is imminent or on-going, enforce to prevent or terminate the violation within 10 days from the enforcing agency's (i.e., the Town's, Commonwealth's, Massachusetts Air and Army National Guards', or Air Force's) discovery of the violation or potential violation; otherwise, enforce as soon as possible.

Private Wells

The LUCs are intended to prevent exposure to groundwater impacted by the plumes. However, to ensure that the LUCs achieve the LUC performance objectives, the Army will take the following additional action with respect to the Demolition Area 1 plume.

Within three years of the signing of this Decision Document, the Army shall:

a. Document all private wells (i.e., non-decommissioned wells, including wells not currently in use) located on or off the JBCC that are above or within the projected path of the Demolition Area 1 groundwater plume.

b. Demonstrate and document that the private well is not capable of drawing contaminated groundwater originating from the Demolition Area 1 groundwater plume, or test the private well for contamination and demonstrate the private well to be safe for human use. The Army will continue such testing, on an appropriate frequency as determined in coordination with the EPA and MassDEP, until the plume no longer presents a threat to that well as determined in coordination with EPA and MassDEP.

c. If the Army identifies a well containing COCs, the Army shall assess the risk that current and potential future non-drinking uses of such a well pose to human health. The Army shall submit a draft version of any such risk assessment to EPA and MassDEP for review and EPA approval.

d. If neither b nor c is able to confirm that the identified well is safe for human use, the Army will offer the owner decommissioning of the well. If accepted, the Army will document such action with the Bourne Board of Health, the EPA and MassDEP. If the decommissioning is not accepted, the Army will take other steps to ensure protectiveness to include, but not be limited to, requesting assistance from the Bourne Board of Health to issue health warnings to the property owner and any other person with access to the well (such as a lessee or licensee), offering bottled water (if well is used for drinking), or installing treatment systems on affected wells. In each instance, the Army shall submit a schedule subject to EPA concurrence, outlining and including time limitations for the completion of steps sufficient to prevent exposure to concentrations of contaminated groundwater from the Demolition Area 1 groundwater plume having COCs in excess of cleanup levels.

Monitoring

Monitoring of the land use restrictions and controls will be conducted annually by the Army. The monitoring results will be provided annually in a separate report or as a section of another

monitoring report, and provided to the EPA and MassDEP. The reports will be used in preparation of the Five-Year Review to evaluate the effectiveness of the final remedy.

The annual monitoring report, submitted to the regulatory agencies by the Army, will evaluate the status of the LUCs and how any LUC deficiencies or inconsistent uses have been addressed. The annual evaluation will address (1) whether the use restrictions and controls referenced above were put in place and effectively communicated, (2) whether the operator, owner, and state and local agencies were notified of the use restrictions and controls affecting the property, and (3) whether use of the property has conformed with such restrictions and controls and, in the event of any violations, summarize what actions have been taken to address the violations. In addition, the Annual Monitoring Report will include a discussion of the efforts undertaken during the past year to complete the tasks outlined in "*Private Wells*" above.

Operational Responsibilities and Liability

Upon approval by EPA, after consultation with MassDEP, the Army may transfer various operational responsibilities for LUCs (i.e., monitoring) to other parties, through agreements. However, the Army acknowledges its ultimate liability under the SDWA § 1431(a) for remedy integrity.

Activities Inconsistent With Land Use Controls

For any proposed land use change(s) that would be inconsistent with the land use control objectives or the final remedy, the Army shall seek EPA review and concurrence at least 45 days prior to any proposed land-use change(s). In addition, if the Army discovers a proposed or ongoing activity that would be or is inconsistent with the land-use control objectives or use restrictions, or any other action (or failure to act) that may interfere with the effectiveness of the land use controls, it will address this activity or action as soon as practicable, but in no case will the process be initiated later than 10 days after the Army becomes aware of this breach. The Army will notify the EPA and MassDEP as soon as practicable, but no later than 10 days after the discovery of any activity that is inconsistent with the LUC objectives or use restrictions, or any other action that may interfere with the effectiveness of the LUCs. The Army will notify the EPA and MassDEP regarding how the Army has addressed or will address the breach within 10 days of sending the EPA and MassDEP notification of the breach.

Ensuring Continued Maintenance of LUCs

The Army will provide notice to the EPA and MassDEP at least six months prior to relinquishing the lease to the areas related to the Demolition Area 1 groundwater plume so the EPA and MassDEP can be involved in discussions to ensure that appropriate provisions are included in the transfer terms or conveyance documents to maintain effective LUCs. If it is not possible for the Army to notify the EPA and MassDEP at least six months prior to any transfer or sale of property located within the Demolition Area 1 groundwater plume, then the Army will notify the EPA and MassDEP as soon as possible, but no later than 60 days prior to the transfer or sale of any property, subject to LUCs.

The Army shall not modify or terminate LUCs or implementation actions, or modify land use without approval by the EPA, in consultation with MassDEP. The Army, in coordination with other agencies using or controlling the Demolition Area 1 groundwater plume area, shall obtain prior approval before taking any anticipated action that may disrupt the effectiveness of the LUCs or any action that may alter or negate the need for LUCs. The Army will provide EPA and MassDEP 30 days notice of any changes to the internal procedures for maintaining land-use controls which may affect the Demolition Area 1 groundwater plume area.

E. COMMUNITY PARTICIPATION

From the time the initial investigations at the Site began, through the present, the IAGWSP regularly presented updates to the MMR Cleanup Team, a citizen advisory group established to inform and involve the public, on the investigations and response activities at the Site. With respect to this Addendum, the most important updates were:

- On July 24, 2013, an informational meeting was held at Camp Edwards, MA, to describe the Remedy Selection Plan for the Demolition Area 1 site to the MMR Cleanup Team and the public. At the meeting, the IAGWSP gave a presentation on the Site, the Remedy Selection Plan and EPA's proposed response and answered questions from the MMR Cleanup Team and the public. The IAGWSP notified the public of the meeting in a display ad placed in the July 18 and July 25 editions of *The Enterprise* newspapers. In addition, information about the public comment period and an invitation to the information session was mailed to Bourne residents on July 15, 2013.

- At the request of the community, a second informational meeting was held on August 8, 2013 in Pocasset at the Pocasset Community Club. At the meeting, the IAGWSP displayed posters with information on the Site, provided the Remedy Selection Plan and answered questions from the public. The IAGWSP notified the public of the meeting in a display ad placed in the August 1 edition of *The Enterprise* newspapers. In addition, information about the public comment period and an invitation to the information session was mailed to Bourne residents on July 31, 2013.

- From July 17, 2013 through August 16, 2013, a Public Comment Period was held on the Remedy Selection Plan for Demolition Area 1. The IAGWSP placed copies of the Remedy Selection Plan in the IAGWSP's information repositories at the Bourne, Falmouth, and Sandwich, MA, public libraries. The repository contains documents on Demolition Area 1 investigations and findings supporting selection of the response action including the Technical Memorandum for Demolition Area 1, along with other relevant documents. The Remedy Selection Plan also was made available on the IAGWSP Web site, which also contains the supporting documents and which offered a means of submitting public comments on the Remedy Selection Plan. In addition, the IAGWSP provided copies of the Remedy Selection Plan to MMR Cleanup Team members and distributed it to individuals in attendance at the public meeting and public hearing. The IAGWSP notified the public of the public comment period in a display ad placed in the July 18 and July 25 editions of *The Enterprise* newspapers

All draft and final reports related to the Sites' investigation and response activities were made available through the Information Repository at the public libraries in Bourne, Falmouth, and Sandwich, MA. These documents also were made available to the public through the IAGWSP Web site: www.mmr-iagwsp.org and the Administrative Record by appointment at PB 516 West Outer Road, Camp Edwards, MA.

Media releases on presentations and the Public Comment Period for the Site were distributed to the *Cape Cod Times* and other area media including newspapers, radio and television media.

General fact sheets pertaining to the IAGWSP investigations and findings and on related issues, such as the contaminants of concern, were also published and distributed. The IAGWSP, EPA, and MassDEP also participated in general information sessions, such as open houses, information sessions, community meetings and annual updates to the local Town Managers,

Boards of Selectmen, and Boards of Health on JBCC investigation and response activities. Throughout the course of the Demolition Area 1 off-base investigations, four paid advertisements and six neighborhood notices were distributed to Pocasset residents to provide updates on the investigations. In addition, a presentation was made at the Spring 2013 Bourne Town meeting.

1. Responsiveness Summary

The following table provides a summary of the response to a comment which was received during the public comment period held on the remedy selection plan for Demolition Area 1 from July 17 through August 16, 2013.

Name of Comment Originator	Organization of Comment Originator	Comment	Response
Alve Hart	Falmouth Resident	I am deeply concerned about the Plume at now Otis Air Base. As a resident of Falmouth, MA since I was 1 yr old and now age 75, I support the new plan to ensure levels of perchlorate and RDX by 2018. It is costly to buy bottled water and environmentally absurd not to not take action to have safe drinking water. This negligence has gone on too long – hope your efforts will support this plan.	Preference for the alternative proposed in the Remedy Selection Plan is noted.

F. DETERMINATIONS

The response actions selected in this Decision Document will protect the public health from any endangerment which may be presented by the presence or potential migration of COCs from the Site into the underlying Sole Source Aquifer. The response action selected in this Addendum, issued pursuant to AO3 and Section 1431 of the SDWA, addresses the unacceptable threats to the groundwater aquifer from the site.

As required by AO3, the selected alternatives for the Site (Operation of the current system with one off-base extraction well, Monitored Natural Attenuation and Land Use Controls) provides a level of protection to the aquifer underlying and downgradient of the Site commensurate with the

aquifer's designation as a Sole Source Aquifer and a Potentially Productive Aquifer and is protective of human health.

In addition to annual reports on groundwater monitoring and verification of Land Use Controls, the selected response actions include periodic reviews at frequencies not to exceed five years. The scope of each review will include, but not be limited to, sampling data, modeling data, and other relevant data. EPA, in consultation with MassDEP, will review this and any other relevant information to determine if additional measures are necessary for the protection of human health. This will include information acquired after the implementation of the selected response actions (such as new regulatory requirements or changes in the environmental conditions of the Site).

G. SUPPORTING DATA

Detailed information on the Site is included in the 2006 Decision Document, Addendum Number 1, and the Demolition Area 1 Technical Memorandum; Response Action Groundwater Treatment System Analysis dated July 12, 2013. Additional information can be found in the Administrative Record for the Site.

H. AUTHORIZING SIGNATURE

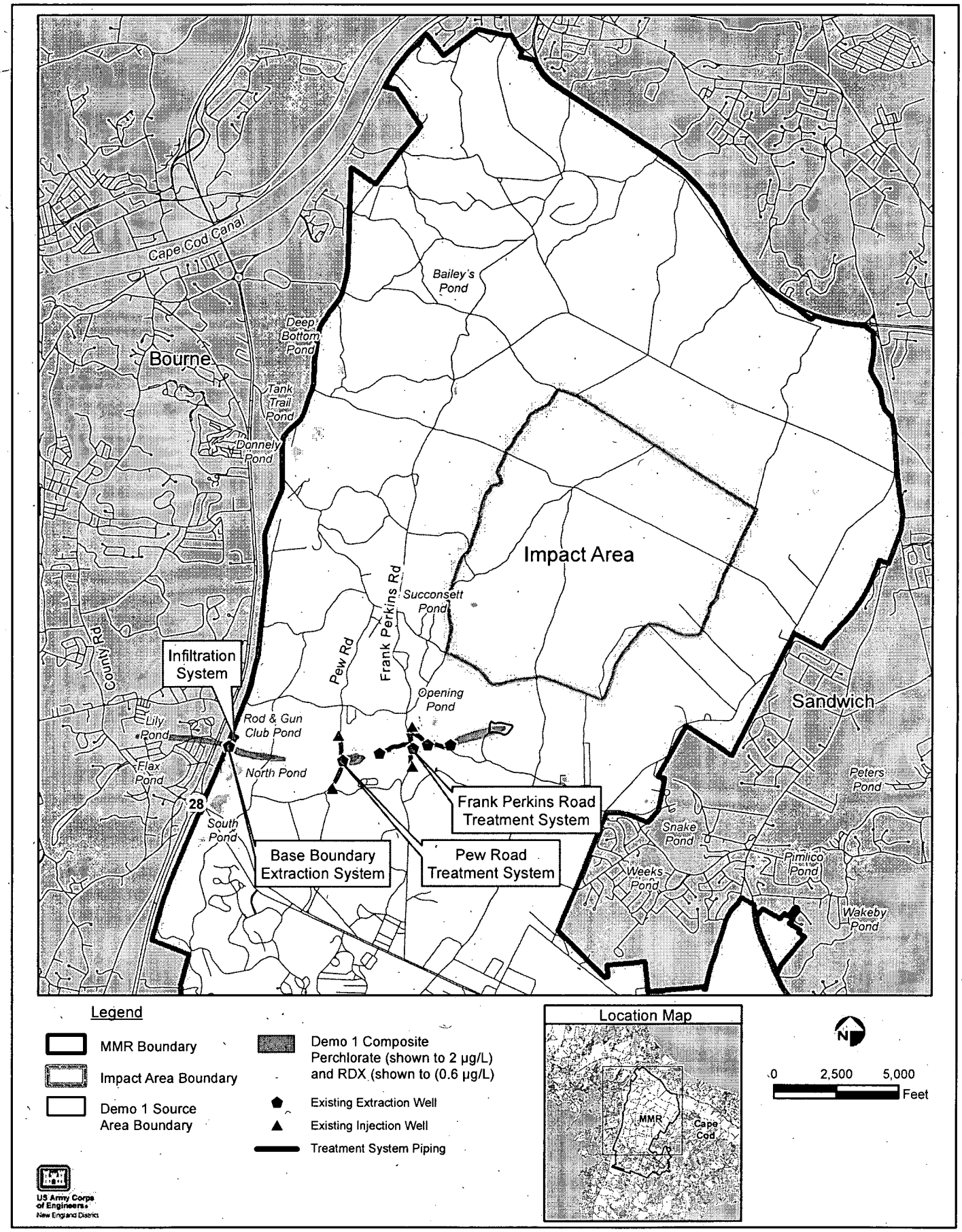
This addendum modifies the 2006 Decision Document to document the selected response action to address the leading edge portion of the Demolition Area 1 plume. This response action was selected by EPA under the authority of the SDWA. The MassDEP concurs with this decision.

U.S. Environmental Protection Agency

By: _____ Date: 09/30/13

James T. Owens, III
Director, Office of Site Remediation and Restoration
Region 1

FIGURES



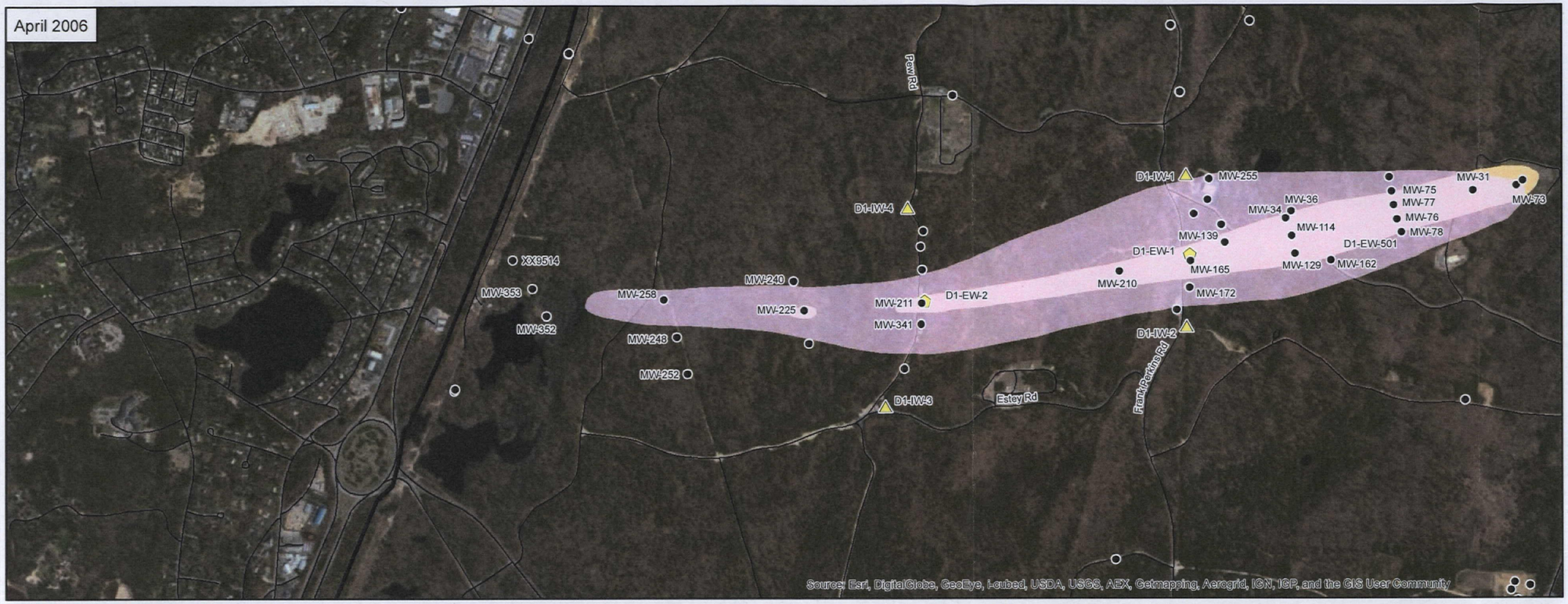
Location of Demolition Area 1

FIGURE 1

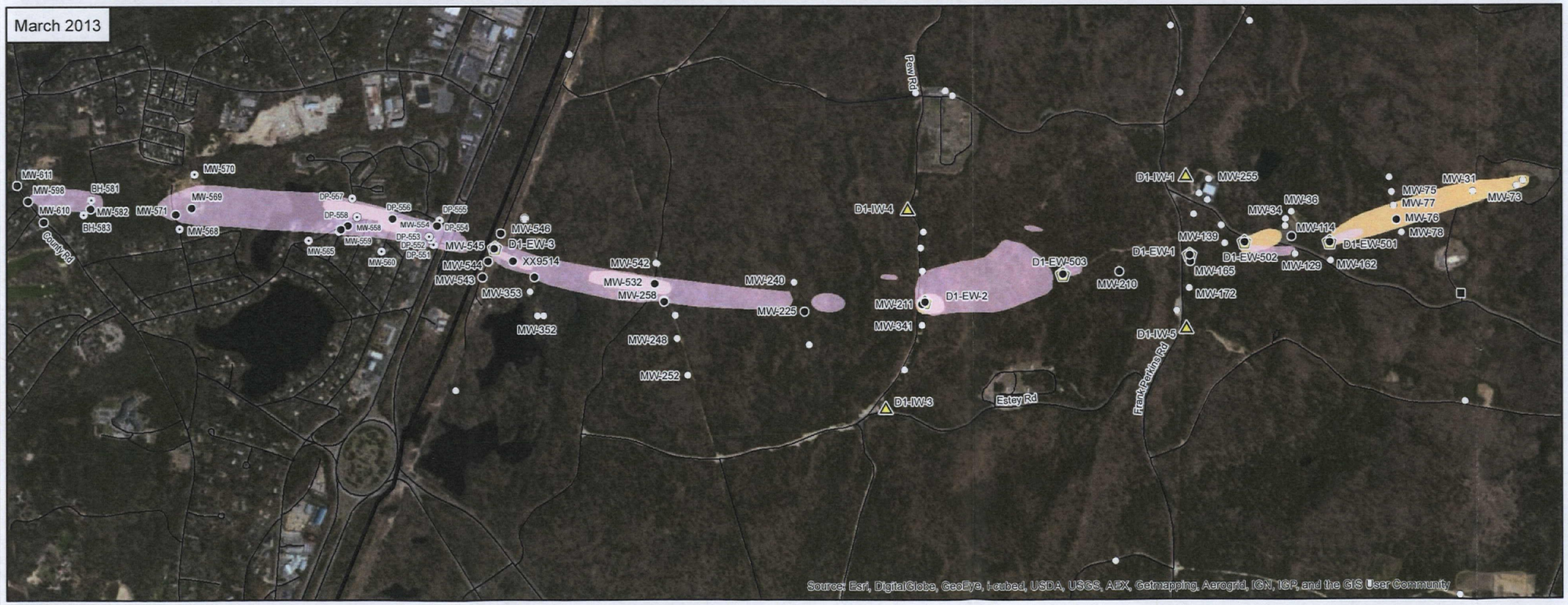
M:\MMR\2013\Demo1\Figures\Fig1_081413.pdf
M:\MMR\2013\Demo1\MXDs\Fig1_081413.pdf
August 14, 2013 DWN: MTW CHKD: PJR

Impact Area Groundwater Study Program

April 2006



March 2013



Impact Area Groundwater Study Program

LEGEND

- Extraction Well
- Injection Well
- Monitoring Well Included in the Network
- Monitoring Well Not Included in the Network
- Drive Point

Perchlorate in Groundwater

> 2 ppb

RDX in Groundwater

> 0.6 ppb

Note: Plume shell illustrated is representative of widest observed at each transect cross-section.

LOCATION MAP

NOTES & SOURCES

Basemap data from US Geological Survey 7 1/2 minute Topographic Maps. Source: MassGIS

Figure 2

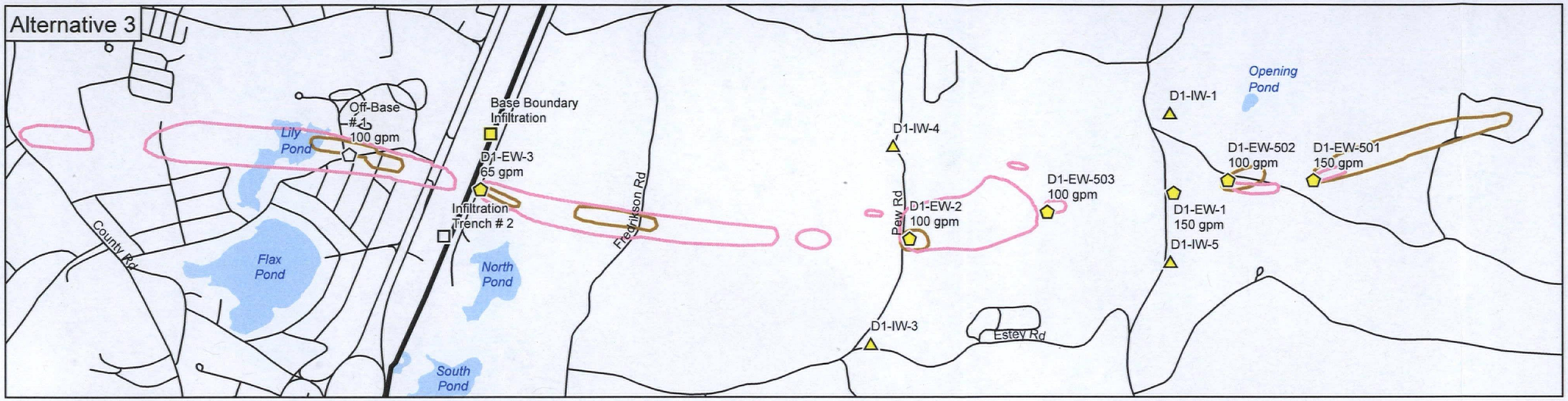
Perchlorate and RDX Distribution in Groundwater April 2006 and March 2013 Demolition Area 1 Groundwater Operable Unit Technical Memorandum

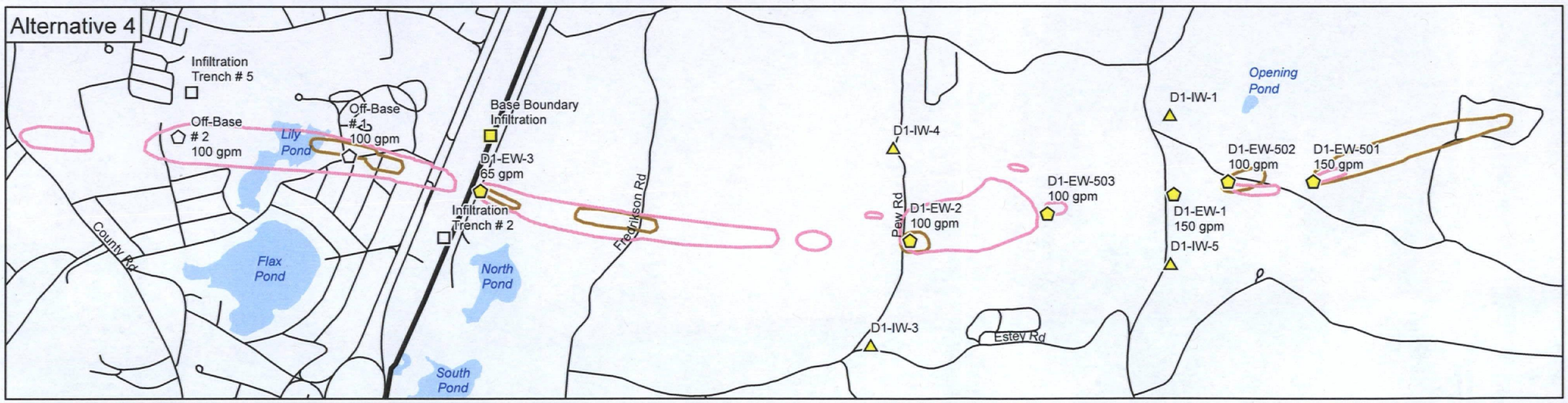
0 1,250 Feet

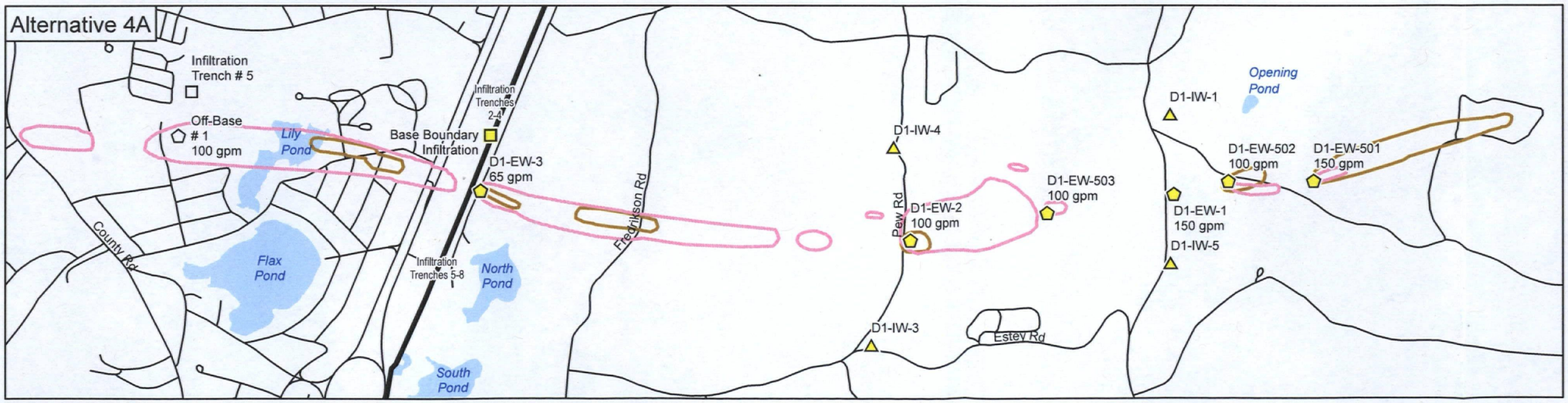
N

US Army Corps of Engineers
New England District

M:\MMR\2013\Demo1\TechMemo\Figures\RSP_062613.pdf
M:\MMR\2013\Demo1\TechMemo\MXDs\RSP_062513.mxd
June 26, 2013 DWN: MTW CHKD: MRK







Impact Area Groundwater Study Program

LEGEND

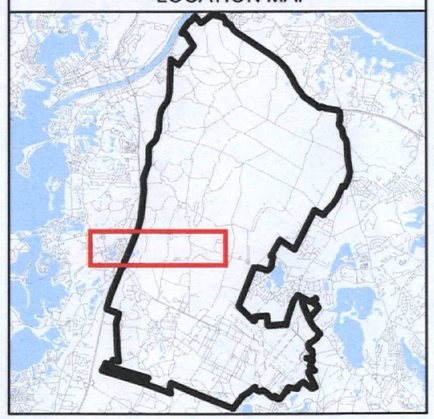
Existing	Alternatives
Extraction Well	Extraction Well
Injection Well	Infiltration Trench
Infiltration Trench	

Perchlorate in Groundwater
2 ppb Contour

RDX in Groundwater
0.6 ppb Contour

Note: Plume shell illustrated is representative of widest observed at each transect cross-section, Groundwater data through March 2013.

LOCATION MAP



NOTES & SOURCES

Basemap data from US Geological Survey 7 1/2 minute Topographic Maps. Source: MassGIS

TITLE

Alternatives 3, 4 and 4A
Demo 1 Groundwater Operable Unit

0 1,250 Feet

N

US Army Corps of Engineers
New England District

FIGURE 3

M:\MMR\2013\Demo1\Figures\Fig3_081413.pdf
M:\MMR\2013\Demo1\MXDs\Fig3_081413.pdf
August 14, 2013 DWN: MTW CHKD: PJR

Impact Area
Groundwater Study Program

Existing

- Infiltration Trench
- Extraction Well

Alternatives

- Infiltration Trench
- Extraction Well
- Perchlorate in Groundwater (2 ppb Contour)
- RDX in Groundwater (0.6 ppb Contour)
- Parcels

Note:
1. Aerial photos: 1:2400 color digital orthophotos
Resolution: 0.5 feet; Date Flown: 2002; Source: EarthData International of Maryland, LLC

Fig. 4 Alternative 4A
Demo 1 Groundwater
Operable Unit

0 600
Feet
1 inch = 395 feet

N

DRAFT Aug 13, 2013

File: P:\GIS\MMR\Demo_1\GIS\Spatial\MXD\20130813_Groundwater_Operable_Unit_Full.mxd
Prepared By: william.scales

Impact Area Groundwater Study Program

- Extraction Well
- Monitoring Well
- Effluent Piping
- Influent Piping
- Mobile Treatment Unit (MTU)
- InfiltrationTrench
- Proposed Access Road
- 25 Year Easement (20')
- Temporary Easement (40')
- Perchlorate in Groundwater (2 ppb Contour)
- Parcels

AREA OF DETAIL

Note:
1. Aerial photos: 1:2400 color digital orthophotos
Resolution: 0.5 feet; Date Flown: 2002; Source: EarthData International of Maryland, LLC

Alternative 4A
Demo 1 Groundwater Operable Unit
(Conceptual; Not for Design)

0 160 Feet

1 inch = 101 feet

N

DRAFT August 20, 2013

File: P:\GIS\MMR\Demo_1\GIS\SpatialMXD\20130813_Groundwater_Operable_Unit.mxd
Prepared By: wilbam.scales

Impact Area Groundwater Study Program

LEGEND

- Extraction Well
- Injection Well
- Existing Monitoring Well/ Surface Water Gauge Point
- Public Water Supply Well
- Influent Pipeline
- Effluent Pipeline
- Infiltration Trench
- MMR Boundary
- Plume Boundary
- Demo 1 LUC Area
- Assessor's Parcels

Massachusetts Military Reservation

MW-02-15
MW-84
PMHP-1
PMHP-2
PMHP-3D
MA-BHW-198
MW-558
MW-556
MW-554
MW-559
MW-546
PZD1001
MW-545
D1-EW-3
MW-544
XX9514
MW-BHW-503-0020 (BHW5030020)
MW-543
MW-353
MW-352
MW-542
MW-532
MW-258
MW-531
MW-533
MW-248
MW-252
MW-240
MW-225
MW-231
IW-D1-4
MW-186
MW-175
MW-173
MW-211
D1-EW-2
MW-341
MW-221
IW-D1-3
D1-EW-503
MW-210
MW-46
MW-46
MW-47
IW-D1-1
MW-255
MW-33
MW-32
MW-34
MW-35
MW-36
MW-114
D1-EW-1
MW-139
D1-EW-502
MW-129
MW-165
MW-172
MW-214
IW-D1-5
MW-74
MW-75
MW-77
MW-76
MW-78
MW-73
MW-79
D1-EW-501
MW-162
MW-64

Area of Detail

TITLE

Demolition Area 1
Land Use Control Area

0 1,250 Feet

N

US Army Corps of Engineers
New England District

M:\MMR\2013\LUC\Figures\Demo1_Fig6_090313.pdf
M:\MMR\2013\LUC\MXDs\Demo1_Fig6_081413.mxd
September 3, 2013 DWN: MTW CHKD: PJR

FIGURE 6

TABLE

TABLE 1. SUMMARY OF ALTERNATIVES

		ALTERNATIVES			
		1	3	4	4A
Description		Current System with MNA for the Off-base	Current System with One Off-base EW East of Lily Pond	Current System with Two Off-base EWs	Current System with One Off-base EW West of Lily Pond
Predicted Cleanup Time	RDX 0.6 ppb 10^{-6} RBC	2022	2022	2022	2022
	Perchlorate 2ppb MMCL	2026	2021	2021	2025
Estimated Mass Captured (pounds)	RDX	2.06	2.24	2.42	2.28
	Perchlorate	6.43	7.99	10.55	10.05
Capital Cost		$517,000	$1,661,000	$3,000,000	$1,420,000
O&M Cost		$1,860,000	$1,960,000	$2,486,000	$2,530,000
Site Closeout		$88,000	$88,000	$88,000	$88,000
Total Present Value		$2,362,000	$3,628,000	$5,500,000	$4,000,000

APPENDIX A
MassDEP Letter of Concurrence

Commonwealth of Massachusetts
Executive Office of Energy & Environmental Affairs

Department of Environmental Protection

Southeast Regional Office • 20 Riverside Drive, Lakeville MA 02347 • 508-946-2700

DEVAL L. PATRICK
Governor

RICHARD K. SULLIVAN JR.
Secretary

KENNETH L. KIMMELL
Commissioner

September 30, 2013

James T. Owens III, Director
Office of Site Remediation and Restoration
U.S. Environmental Protection Agency, Region I
5 Post Office Square Suite 100
Boston, MA 02109-3912

RE: **BOURNE**
Release Tracking Number: 4-0015031
Joint Base Cape Cod (JBCC)
Decision Document Addendum No.2
Demolition Area 1 Off-base Leading Edge Groundwater Plume, Concurrence

Dear Mr. Owens:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed the document entitled **"Decision Document Addendum No.2 Demolition Area 1 Off-base Leading Edge Groundwater Plume"** (Addendum No. 2), dated September, 2013. Addendum No. 2 presents the selected remedy for the leading edge portion of the Demolition Area-1 (Demo-1) groundwater plume. The source of the Demo-1 groundwater plume is located on Camp Edwards at Joint Base Cape Cod (JBCC), formerly the Massachusetts Military Reservation (MMR), in Bourne, Massachusetts. The remedy was selected by the United States Environmental Protection Agency (USEPA) in accordance with Section 1431(a) of the Safe Drinking Water Act (SDWA), 42 USC §300i(a), as amended and Administrative Order No. SDWA-1-2000-0014 (AO3), which includes consideration of the substantive cleanup standards set forth under M.G.L. c. 21E and 310 CMR 40.0000, the Massachusetts Contingency Plan (MCP). The U.S. Army (Army) and the National Guard Bureau (NGB) are Respondents under USEPA AO3.

The selected remedy for the leading edge portion of the Demo-1 plume is Alternative 4A, *Current System with One Off-base Extraction Well West of Lily Pond.* The current Demo-1 groundwater treatment system consists of six extraction wells pumping at a combined rate of 665 gallons per minute, two modular treatment units (one at the JBCC western boundary and one at Pew Road) and a treatment facility at Frank Perkins Road. Treated groundwater is discharged to one infiltration trench and four reinjection wells. All of the components of the current groundwater treatment system are located on JBCC. The selected remedy identified in Addendum No.2 modifies the existing treatment system to address groundwater contamination off-JBCC by adding an extraction well, a modular treatment unit, and an infiltration trench at a location west of Lily Pond in the Town of Bourne. Land Use Controls (LUCs) implemented by the Army/NGB will serve to control access to or use of the groundwater at the Demo-1 operable unit until the groundwater no longer poses an unacceptable risk to human health. Monitoring of the LUCs will be conducted annually by the Army/NGB, and the Army/NGB will submit an annual monitoring report to the regulatory agencies that will evaluate the status of the LUCs.

Environmental investigations conducted by the Impact Area Groundwater Study Program (IAGWSP) for the leading edge of the Demo-1 groundwater plume in 2011 and 2012 identified perchlorate contamination in the groundwater at concentrations above the Massachusetts Maximum Contaminant Level (MMCL) for perchlorate. The explosive hexahydro-1,3,5-trinitro-1,3,5-triazine (RDX) is also identified as a contaminant of concern (COC) for the Demo-1 groundwater plume. The Massachusetts Maximum Contaminant Level (MMCL) for perchlorate in drinking water is 2 µg/L and is considered an Applicable or Relevant and Appropriate Requirement (ARAR). The USEPA RDX risk-based concentration (RBC) in groundwater that results in an increased lifetime cancer risk of one in a million is 0.6 µg/L. The source of the perchlorate and RDX contamination was a 7.4-acre natural topographic depression located on the Massachusetts Military Reservation that was used from the mid-1970s until 1997 for training and disposal of munitions, fireworks, explosives and other items. Decision Document Addendum No. 1 Demolition Area Source Area dated September 2009 established the selected remedy for the Demo-1 source area.

The leading edge of the Demo-1 groundwater plume is located downgradient of the JBCC boundary beneath residential/commercial/undeveloped areas. Groundwater monitoring performed by the IAGWSP indicates that groundwater with perchlorate concentrations above the MMCL extends more than 3,700 feet west and downgradient of the JBCC boundary. There is currently no exposure to the leading edge of the Demo-1 plume since all the residences in the area of the plume are connected to a municipal water supply. The current maximum perchlorate concentration in the leading edge of the Demo-1 groundwater plume is 5.7 µg/L. The maximum historical concentration in the leading edge of the Demo-1 plume is 13 µg/L. RDX has been detected at a concentration (1.55 µg/L) above the RBC of 0.6 µg/L at only one well location in the leading edge of the Demo-1 plume. Modeling predicts that the selected remedy will decrease perchlorate concentrations in the Demo-1 plume to below 2 µg/L by 2025.

Determination

MassDEP concurs with the groundwater remedy proposed in Addendum No. 2, which consists of *Current System with One Off-base Extraction Well West of Lily Pond.* The selected remedy will ensure a sufficient and protective level of control for the Demo-1 groundwater plume such that none of the contamination associated with the Demo-1 groundwater plume will present a significant risk of harm to health, safety, public welfare or the environment during any foreseeable period of time. Moreover, the groundwater remedy has been designed to reduce the level of contaminants to background levels, consistent with MCP requirements.

MassDEP's concurrence with the remedy selected by the USEPA set forth in Addendum No. 2 is based upon representations made to MassDEP by the Army/NGB and assumes that all information provided is substantially complete and accurate. Without limitation, if MassDEP determines that any material omissions or misstatements exist, if new information becomes available, if LUCs are not properly implemented, monitored and/or maintained or if conditions within the Demo-1 groundwater plume changes, resulting in potential or actual human exposure or threats to the environment, MassDEP reserves its authority under M.G.L. c. 21E, CERCLA, the MCP, the NCP and any other applicable law or regulation to require further response actions. MassDEP will review relevant information as it becomes available to determine if additional investigative and/or remedial measures are necessary for the protection of public health, safety, welfare or the environment within the Demo-1 groundwater plume. This includes

information acquired after the implementation of the groundwater remedy, such as new regulatory requirements or changes in the environmental conditions within the Demo-1 groundwater plume.

Please incorporate this letter into the Administrative Record for the Demo-1 groundwater plume. If you have any questions regarding this matter, please contact Leonard J. Pinaud, Chief, State & Federal Sites Management Section at (508) 946-2871 or Millie Garcia-Serrano, Deputy Regional Director of the Bureau of Waste Site Cleanup at (508) 946-2727.

Sincerely,

Benjamin J. Ericson
Assistant Commissioner
Bureau of Waste Site Cleanup

BE/lp/

File : 4-0015031 Demolition Area-1 DD Addendum No. 2 Concurrence Letter 09-2013

Ec: Gary Moran, Deputy Commissioner
Philip Weinberg, Regional Director
Millie Garcia-Serrano, Deputy Regional Director
Leonard J. Pinaud, Chief, State & Federal Site Management
Dawn Stolfi Stalenhoef, Regional Counsel
Mark Begley, Environmental Management Commission
Richard Lehan, Department of Fish and Game
Colonel Gregory McDonald, Post Commander, HQ Camp Edwards
MassDEP Southeast Region
MMR Senior Management Board
MMR Plume Cleanup Team
Upper Cape Boards of Selectmen
Upper Cape Boards of Health

APPENDIX B
Glossary of Terms and Acronyms

GLOSSARY OF TERMS AND ACRONYMS

AO	Administrative Order
COC	Contaminant of Concern
DWEL	Drinking Water Equivalent Level
EPA	United States Environmental Protection Agency
GPM	gallons per minute
HA	Health Advisory; EPA guidelines that represent the concentration of a chemical in drinking water that, given a lifetime of exposure, is not expected to cause adverse, non-cancerous, effects.
IAGWSP	Impact Area Groundwater Study Program
JBCC	Joint Base Cape Cod
LUC	Land Use Control
MassDEP	Massachusetts Department of Environmental Protection
MCL	Maximum Contaminant Level (Federally-promulgated)
MMCL	Massachusetts Maximum Contaminant Level (State-promulgated)
MMR	Massachusetts Military Reservation
MTU	Mobile treatment unit
perchlorate	A water-soluble salt used as an oxidizer
RDX	Hexahydro-1,3,5-trinitro-1,3,5-triazine / Royal Demolition Explosive, an explosive compound
SDWA	Safe Drinking Water Act
TNT	Trinitrotoluene (an explosives compound)
µg/L	Micrograms per Liter, a measure of concentration in liquid, e.g. one part of contaminant in one billion parts of water is 1 µg/L, or 1 microgram per liter

APPENDIX C
Index of Key Supporting Documents

INDEX OF KEY SUPPORTING DOCUMENTS

Demolition Area 1 Technical Memorandum Response Action Groundwater Treatment Systems Alternatives Analysis, 7/2013

Remedy Selection Plan for the Demolition Area 1 Decision Document Addendum, 7/2013

Demolition Area 1 Environmental and System Performance Monitoring Report, Response Action Groundwater Treatment Systems, September 2011 to August 2012, 7/2013

Demolition Area 1 Technical Memorandum Work Scope Project Note, 1/2013

Demolition Area 1 Groundwater Plume, Leading Edge Modeling Presentation, 9/2012

Demolition Area 1 Environmental and System Performance Monitoring Report, Response Action Groundwater Treatment Systems, September 2010 to August 2011, 6/2012

Demolition Area 1 Off-Base Leading Edge Investigation Work Plan, 7/2011

Demolition Area 1 Contingency System Treatment Design, 3/2011

Demolition Area 1 Groundwater ESPM, Proposed Sentinel Well Fence, 8/2010

Decision Document Addendum No. 1, Demolition Area 1 Source Area, 9/2009

Decision Document, Demolition Area 1 Groundwater Operable Unit 11/2006

Technical Memorandum 01-17, Feasibility Study, Demolition Area 1 Groundwater Operable Unit, 8/2005