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THIRD FIVE-YEAR REVIEW REPORT FOR HOCOMONCO POND SUPERFUND SITE WESTBORO, MASSACHUSETTS WORCESTER COUNTY

Prepared by:

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LIST OF ACRONYMS

ADAFs	Age-Dependent Adjustment Factors
ARARs	Applicable or Relevant and Appropriate Requirements
BTEX	Benzene, toluene, ethylbenzene and xylene
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
CSFs	Cancer Slope Factors
DNAPL	Dense Non-Aqueous Phase Liquid
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FYR	Five-Year Review
GEREs	Grants of Environmental Restrictions and Easements (aka: ICs)
ICs	Institutional Controls
IGCLs	Interim Groundwater Cleanup Levels (aka: RAOs)
LTMP	Long-Term Monitoring Program
MA	Massachusetts
MassDEP	Massachusetts Department of Environmental Protection
MCLs	Maximum Contaminant Levels
ug/l	microgram per liter
mg/l	milligram per liter
NAULs	Notices of Activity and Use Limitations (aka: ICs)
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PAHs	Poly-Aromatic Hydrocarbons
PRP	Potentially Responsible Party
RAOs	Remedial Action Objectives
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RI	Remedial Investigation
ROD	Record of Decision
RPM	Remedial Project Manager
SDD	Supplemental Decision Document
SIM	Selective Ion Monitoring
TI	Technical Impracticability

EXECUTIVE SUMMARY

This is the third Five-Year Review (FYR) for the Hocomonco Pond Superfund (Site) located in the Town of Westboro, Worcester County, Massachusetts. The purpose of this FYR is to review information to determine if the remedy is and will continue to be protective of human health and the environment. The triggering action for this Policy FYR was the signing of the previous FYR on September 30, 2009.

The approximately 23-acre Site is located in the Town of Westboro, Massachusetts. The Site is bordered to the northwest by Hocomonco Pond, a 27-acre shallow freshwater pond, to the east by Otis Street and to the south by the Smith Valve Parkway. See Figure B-1 for Site location map.

The remedial investigation (RI) identified four primary areas of contamination on the Site: (1) the former Kettle Pond area; (2) Hocomonco Pond and its discharge stream; (3) the former lagoon area; and (4) the Otis Street embankment. These areas are shown in Figure B-2. In addition, the RI identified three small isolated areas; contaminated soil near MW-1; tank bases adjacent to the former lagoon; and sediments in the southwest drainage channel. The predominant contaminants found in all the areas were creosote compounds, primarily polycyclic aromatic hydrocarbons (PAHs), such as acenaphthene, naphthalene, acenaphthylene, fluorene, phenanthrene, dibenzofuran, and 2-methylnaphthalene.

The September 30, 1985 Record of Decision (ROD) specified a multi-component remedy to address each of the areas of contamination at the Site. The remedies selected involved excavation and dredging of contaminated soil, waste, and sediments from the Kettle Pond area, Hocomonco Pond and its discharge stream, Otis Street, and the three isolated areas, followed by disposal into the former lagoon or a double-lined landfill constructed on the site. The former lagoon area would be capped. The remedy also included dewatering Kettle Pond and lowering the groundwater level prior to and during excavation, relocating the storm drain pipe that was laid along the eastern side of the former lagoon, and sealing the open-jointed storm drainage pipe along the east side of Otis Street.

Pre-design investigations in the Kettle Pond area identified a number of issues, including extensive Dense Non-Aqueous Phase Liquid (DNAPL) contamination at depth. EPA issued an Explanation of Significant Differences (ESD) in 1992 that required active pumping to remove recoverable DNAPL and modified the requirement for dewatering as part of the remedy for the Kettle Pond area to implementation of bioremediation or other in-situ technologies to treat the deeper soils.

Following issuance of the ESD, EPA established cleanup levels for groundwater, sediments, and soil and established the limits of excavation in a 1992 Supplemental Decision Document (SDD). All excavation and dredging activities were completed by 1996 and certification reports documenting completion of the remedial activities were submitted and approved by EPA. DNAPL recovery operations, required by the 1992 ESD, began in 1995. The in-situ bioremediation system also required by the 1992 ESD was constructed and began operation, but was not successful due to significant iron fouling. Other treatment alternatives were evaluated; the evaluation concluded that other treatment alternatives would have limited effectiveness due to the residual and free phase DNAPL present in the Kettle Pond area.

A technical impracticability (TI) investigation was completed in 1997 which identified two TI zones where groundwater restoration was deemed not practicable due to the presence of DNAPL. See Figure B-3. A second ESD was issued by EPA in 1999 that waived compliance with the interim groundwater cleanup levels (IGCLs) within the two TI zones and required continued DNAPL recovery and implementation of a long-term monitoring program (LTMP) to ensure that groundwater concentrations above IGCLs would be contained within the TI zone boundaries. The 1999 ESD stated that, "DNAPL recovery is ongoing and shall continue until such time that it can be demonstrated that it is no longer technically practicable."

In 2003, active pumping of DNAPL was suspended to assess the efficacy of passive recovery methods. These methods demonstrated that active pumping is not required to achieve meaningful DNAPL recovery. Extensive groundwater monitoring concludes that the DNAPL is not migrating, and no potential receptors have been identified. However, in 2002, concentrations of two PAHs, naphthalene and benzene, began to intermittently exceed groundwater cleanup levels in sentinel monitoring well MLC-2. Then in 2007, concentrations of benzene also began intermittently exceeding its cleanup level in sentinel well MLC-3. Both of these wells are located down gradient and just outside of the TI zone associated with the former lagoon area. No increasing trend was evident in either well. In 2012, two new well pairs: MLC-5S/D and MLC-6S/D, were installed approximately 100 feet down gradient of MLC-2 and MLC-3. See Figure A-4. Groundwater samples collected from the new well pairs have shown trace concentrations of only a few PAHs. A third ESD was issued by EPA in September 2013 that expanded the TI boundary associated with the former lagoon area by about 100 feet and modified the remedy for DNAPL recovery from active to passive collection methods.

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site Name: Hocomonco Pond		
EPA ID: MAD980732341		
Region: 1	**State:** MA	**City/County:** Westboro/Worcester

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

REVIEW STATUS
Lead agency: EPA
Author name (Federal or State Project Manager): James M. DiLorenzo
Author affiliation: Employee
Review period: 1/1/2014 - 9/30/2014
Date of site inspection: 7/31/2014
Type of review: Policy
Review number: 3
Triggering action date: 9/30/2009
Due date *(five years after triggering action date)*: 9/30/2014

Five-Year Review Summary Form (continued)

Issues/Recommendations				
Issues and Recommendations Identified in the Five-Year Review:				
OU(s): *Entire Site*	**Issue Category: Institutional Controls**			
	Issue: #1. Deed restrictions are not in place.			
	Recommendation: Finalize NAULs consistent with recent MassDEP regulations approved in May 2014.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP/EPA/MassDEP	EPA/MassDEP	9/30/2015

OU(s): *Entire Site*	**Issue Category: Operations and Maintenance**			
	Issue: #2. Updated O&M plan consistent with current activities is required.			
	Recommendation: Finalize an updated O&M plan.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/MassDEP	12/31/2014
OU(s): *Entire Site*	**Issue Category: Remedy Performance**			
	Issue: #3. Bulk sediment concentrations intermittently exceed ecological cleanup goals.			
	Recommendation: Continue annual monitoring. If sample results continue to exceed cleanup levels, and an increasing trend in concentrations becomes apparent, perform additional toxicity testing.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/MassDEP	9/30/2019

Sitewide Protectiveness Statement	
Protectiveness Determination: Short-term Protective	*Addendum Due Date (if applicable):* not applicable
Protectiveness Statement: The remedy currently protects human health and the environment because physical access to the Site is restricted and there are no potable wells. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: deed restrictions need to be finalized and recorded, an updated O&M plan must be finalized, and active monitoring of sediments and groundwater must continue to ensure long-term protectiveness.	

I. INTRODUCTION

The purpose of a Five-Year Review (FYR) is to evaluate the implementation and performance of a remedy in order to determine if the remedy will continue to be protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121 and the National Contingency Plan (NCP). CERCLA 121 states:

> *"If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each five years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews."*

EPA interpreted this requirement further in the NCP; 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> *"If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such actions no less often than every five years after the initiation of the selected remedial action."*

EPA conducted a FYR on the remedy implemented at the Hocomonco Pond Superfund Site in the Town of Westboro, Worcester County, MA. EPA is the lead agency for developing and overseeing remedy implementation by the Potentially Responsible Parties (PRPs) for the Site. The Massachusetts Department of Environmental Protection (MassDEP), as the support agency representing the Commonwealth of Massachusetts, has reviewed all supporting documentation and provided input to EPA during the FYR process.

This is the third FYR for the Hocomonco Pond Superfund Site. The triggering action for this policy review is the completion of the second FYR on September 30, 2009. This FYR is required due to the fact that hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure. There are no operable units, therefore the entire Site is addressed in this FYR.

II. PROGRESS SINCE THE LAST REVIEW

In addition to routine maintenance and monitoring activities, several important steps have been

completed since the last five year review. In October 2012, the PRPs submitted, "Revised DNAPL Recovery Enhancement and TI Zone Delineation Sampling Work Plan." Field work was completed in late 2012 to early 2013 and included an extended evaluation of groundwater quality in the area down gradient of the former lagoon, and inspection and cleaning of existing DNAPL recovery wells. In addition, two groundwater monitoring wells and one additional DNAPL recovery well were installed. This work was documented in a March 2013 report, "DNAPL Recovery Enhancement and TI Zone Delineation Report." The conclusions gained from this additional field work resulted in EPA issuing a 3rd Explanation of Significant Differences (ESD) for the Hocomonco Pond Site in December 2013. The ESD changed the procedure for DNAPL recovery from active pumping through a large scale groundwater extraction system to passive collection of DNAPL from each well head using submersible pumps, and slightly expanded the TI zone down gradient of the former lagoon area. The 2013 ESD also allows the PRPs to decommission and remove the former groundwater treatment system and associated above ground piping which opens the door to reuse of the property. The Town of Westboro, as the property owner, is actively evaluating reuse options. The Massachusetts Department of Environmental Services (MassDEP) also issued new regulations in May 2014 which will allow pending institutional controls to be finalized on the property.

Table 1 below documents the protectiveness statement from the previous 2009 five-year review report.

Table 2 below summarizes the issues and recommendations for follow-up actions identified in the previous 2009 five-year review report, and provides the updated Current Status and Completion Date. A text discussion of each issue follows.

Table 1: Protectiveness Determinations/Statements from the 2009 FYR

OU #	Protectiveness Determination	Protectiveness Statement
Sitewide	Short-term Protective	The remedy currently protects human health and the environment because physical access to the Site is restricted and there are no potable wells. However, in order for the remedy to be protective in the long-term, the following actions need to be taken; deed restrictions need to be finalized and recorded, and the studies and evaluations referenced in Section 9.0 will be completed to ensure long-term protectiveness.

Table 2: Status of Recommendations from the 2009 FYR

OU #	Issue	Recommendations / Follow-up Actions	Party Responsible	Oversight Party	Original Milestone Date	Current Status	Completion Date (if applicable)
Site-Wide	#1. Deed restrictions are not in place	Finalize draft documents and record deed restrictions	PRP	EPA	12/31/2004	Ongoing	12/31/2014
Site-Wide	#2. Groundwater cleanup levels exceeded at wells MLC-2 and MLC-3, outside the former lagoon TI Zone	Increase frequency of sampling MLC-2 and MLC-3 from annual; evaluate the extent of cleanup level exceedances and need for additional actions to achieve compliance	PRP	EPA/State	9/30/2010	Completed	11/30/2012

OU #	Issue	Recommendations / Follow-up Actions	Party Responsible	Oversight Party	Original Milestone Date	Current Status	Completion Date (if applicable)
Site-Wide	#3. Analytical reporting limit for cPAHs is too high	Use SIM analytical method for PAHs to achieve lower reporting limits	PRP	EPA/State	9/30/2009	Completed	9/07/2011
Site-Wide	#4. Arsenic and chromium data are not available for comparison to IGCLs	Conduct periodic groundwater sampling for arsenic and chromium at site monitoring wells	PRP	EPA/State	9/30/2009	Completed	4/28/2011
Site-Wide	#5. Dissolved-phase plume not contained	Perform additional studies to determine plume extent, discharge location, and presence of a significant exposure pathway	PRP	EPA/State	9/30/2010	Completed	9/30/2013
Site-Wide	#6. DNAPL plume may not be contained	Perform additional studies to determine plume extent, and evaluate opportunities for optimization of DNAPL recover	PRP	EPA/State	9/30/2010	Completed	9/30/2013
Site-Wide	#7. An accurate, up-to-date site monitoring and operations plan does not exist	Prepare an updated site monitoring and operations plan	PRP	EPA/State	9/30/2010	Ongoing	9/1/2014

Issue/Recommendation #1 (Deed restrictions not in place)

- Implementation of Institutional Controls (ICs) in Massachusetts, namely the recording of Grants of Environmental Restrictions and Easements (GEREs), has been a continued challenge for the program. The need to complete ICs has often been identified as an issue potentially impacting future protectiveness as part of Five Year Reviews at this and other Massachusetts sites. In an effort to address this issue and improve the process of completing ICs at Massachusetts NPL sites, the Massachusetts Department of Environmental Protection (MassDEP) has amended its cleanup regulations, the Massachusetts Contingency Plan (310 CMR 40.0000), to allow the same land use controls used at non-NPL sites in Massachusetts to now be used at NPL sites. The amendments became effective on June 20, 2014. EPA and MassDEP are currently working on revising the existing Notices of Activity and Use Limitations (NAULs) form for use at NPL sites. The use of NAULs at Massachusetts NPL sites will streamline the process and result in the implementation of ICs more quickly and efficiently, and address these Five Year review recommendations within a reasonable time frame.

- EPA and MassDEP have entered into discussions specific to finalizing ICs for Hocomonco Pond. Previous draft GERE language provides a baseline for moving forward. The Town of Westboro is the property owner and has expressed a willingness to cooperate. Consequently, ICs are anticipated to be in place by the end of 2014.

Issue/Recommendation #2 (Groundwater cleanup levels exceeded outside TI Zone boundary)

- Interim groundwater cleanup levels were established based on federal and state drinking water standards, referred to as Maximum Contaminant Levels (MCLs). Risk-based concentrations were used to calculate cleanup levels for PAHs that do not have drinking water standards. Cleanup levels for groundwater were established as "interim" concentrations in recognition of the fact that they may need to be modified during the cleanup. Cleanup levels are waived within the established TI zone compliance boundary.

- MLC-2 and MLC-3 are sentinel wells located down gradient and just outside the TI Zone boundary established for the former lagoon area. In 2000, concentrations of benzene and naphthalene in monitoring well MLC-2 climbed above their respective interim groundwater cleanup levels. In 2006, the concentrations of benzene and naphthalene also climbed above the interim groundwater cleanup levels in MLC-3. Through 2011, concentrations in both wells continued to fluctuate above and below the interim cleanup levels, but were more often above. Please see Table B-1 for a summary of results from MLC-2, and Table B-2 for a summary of the results from MLC-3. There were no monitoring wells located down gradient of MLC-2 and MLC-3.

- Between November 5, 2012 and January 3, 2013, the PRPs completed a TI Zone assessment in the area down gradient of the former lagoon and monitoring wells MLC-2 and MLC-3. A vertical profile boring was completed to assess groundwater quality. The groundwater table was encountered and sampled at 35 feet below ground surface. Subsequent samples were collected every 20 feet of depth to the top of bedrock at 130 feet below ground surface. The samples were analyzed for benzene, toluene, ethylbenzene and xylene (BTEX) and total PAHs, including benzene and naphthalene. The interim groundwater cleanup levels were not exceeded in any sample.

- The PRP installed two nested well pairs in the area of the vertical profile boring; MLC-5S/D and MLC-6S/D. These new wells were first sampled in January, and then again in November 2013. Detected benzene concentrations ranged from 0.66 to 0.82 ppb; well below the IGCL of 5.0 ppb. Detected naphthalene concentrations ranged from 0.34 to 2.0 ppb; well below the IGCL of 1,500 ppb. These results are summarized in Table B-3. MLC-5S/D and MLC-6S/D will continue to be monitored annually moving forward and replace MLC-2 and MLC-3 and sentinel compliance wells for the former lagoon TI boundary.

- On September 30, 2013, EPA issued a 3rd Explanation of Significant Differences (ESD) for the Hocomonco Site. Through this ESD, the TI Zone compliance boundary for the down gradient portion of the former lagoon area was extended approximately 100 feet, and MLC-5S/D and MLC-6S/D serve as the new sentinel wells to ensure compliance with the IGCLs.

Issue/Recommendation #3 (Analytical reporting limits for PAHs too high)

- The analytical method for PAHs in groundwater had a detection limit of 0.51 ppb for benzo(a)pyrene which was above the IGCL. Beginning with groundwater samples collected on September 7, 2011, the SIM method 8270C has been used to analyze PAHs. The method detection limit for benzo(a)pyrene is now 0.11 ppb, which is lower than the IGCL of 0.2 ppb.

Issue/Recommendation #4 (Arsenic and Chromium data are not available)

- The 1985 ROD set IGCLs for arsenic at 50 ug/l and chromium at 100 ug/l. The previous Five-Year Review report recommended that arsenic and chromium data be collected. In response, the PRPs conducted a thorough review of the Site file and presented their findings in a memorandum dated April 28, 2011. Arsenic and chromium were sampled on several occasions between 1985 and 1997, including regional background/reference areas known as Jordan Pond and Assabet River Dam, which are located outside the impacted study area. Elevated concentrations of arsenic and chromium above IGCLs were identified in both background/reference areas. In the most recent sampling event (1997), 33 wells across the study area were sampled for both total and dissolved arsenic and chromium. All dissolved (filtered) results were below IGCLs. Total arsenic exceeded the IGCL in 3 of the 33 wells; BRW-2, M-11S and M-12S. Total chromium also exceeded the IGCL in 3 of the 33 wells; LF-1, MLC-1, and TRC-9S. Monitoring wells LF-1, MLC-1 and TRC-9S are located upgradient of the former lagoon and Site operations. Monitoring well M-12S is located cross-gradient to the former Kettle Pond area, and monitoring wells BRW-2 and M-11S are located down gradient of the former Kettle Pond. These results are not consistent with the primary creosote/PAH release. Arsenic and chromium are well documented in soil throughout the New England area as the result of natural occurring releases and depositional activities.[1] A review of the Site specific data conclude that the pattern of arsenic and chromium concentrations in Site groundwater do not follow the same distribution as the known PAH releases. This suggests that the detected concentrations of arsenic and chromium are attributable to background or depositional sources. No further monitoring for arsenic or chromium is required at this time.

Issue/Recommendation #5 (Dissolved phase plume not contained)

- To clarify, the 1999 ESD did *not* require mechanical pumping for hydraulic containment as was implied in the last Five-Year Review Report. The 1999 ESD did require continued monitoring to

[1] Technical Update, "*Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil,*" MassDEP, 05/23/2002. The regional background concentration for arsenic in soil was determined to be 20 mg/kg. The maximum detected concentration was 99 mg/kg. The regional background concentration for total chromium in soil was determined to be 30 mg/kg. The maximum detected concentration was 530 mg/kg.

ensure that concentrations above IGCLs are not exceeded outside the TI Zone boundaries (and hence contained) as well as to establish that contaminant levels generally do not increase in concentration or extent. As discussed in Issue/Recommendation #2, beginning in 2000, concentrations of benzene and naphthalene in monitoring well MLC-2 climbed above their respective IGCLs. In 2006, the concentrations of benzene and naphthalene also climbed above IGCLs in MLC-3. Both wells were located down gradient and outside the TI zone for the former lagoon area.

- As recommended in the last Five-Year Review Report, in April 2011, the PRPs submitted a work plan for expanded testing of existing monitoring wells around the former lagoon area. The purpose of this testing was to gain more data from MLC-2 and MLC-3, and determine if additional exceedances of the TI zone boundary for the former lagoon area existed. Nine wells were inspected and analyzed for BTEX and PAHs. Benzo(a)pyrene was detected in one sample event from monitoring wells TRC-8D and TRC-9D above the IGCL. These wells are located cross-gradient to the former lagoon area and subsequent samples have demonstrated compliance with all IGCLs. The results continued to demonstrate intermittent exceedances of IGCLs in wells MLC-2 and MLC-3.

- In October 2012, the PRPs submitted a TI Zone delineation sampling work plan which included a vertical profile study of groundwater quality immediately down gradient of MLC-2 and MLC-3. In November 2012, a vertical profile was advanced to the top of bedrock (135 feet below ground surface). The groundwater table was encountered at 35 feet below ground surface. As the boring was advanced, discrete groundwater samples were collected at 20 foot depth intervals to the top of bedrock (6 samples collected). Samples were transferred to an off-site laboratory for analysis of benzene, toluene, ethylbenzene and xylenes (BTEX) by EPA method 8060B and poly-aromatic hydrocarbons by EPA method 8070C. Results showed only trace detections of benzene and naphthalene, and two nested well pairs were installed; MLC-5S/D and MLC-6S/D. These well pairs are approximately 100 feet down gradient of MLC-2 and MLC-3. The most recent sampling of the new well pairs in November 2013 demonstrate continued compliance with the IGCLs.

- In September 2013, EPA issued a 3rd ESD for the Site which extended the down gradient compliance boundary of the TI zone around the former lagoon area by approximately 100 feet and requires continued monitoring of the new sentinel monitoring wells MLC-5S/D and MLC-6S/D. There are no known receptors located down gradient of the sentinel wells. Hocomonco Pond is located approximately 100 feet down gradient of the new sentinel wells and is a natural hydraulic barrier to further groundwater migration. See Figure B-5 for locations of the previous and current TI zone boundaries, and monitoring wells. There is an active sediment monitoring program established in the pond.

- The vertical profile data and subsequent installation and sampling of new monitoring well clusters MLC-5S/D and MLC-6S/D, in conjunction with ongoing monitoring of other sentinel

wells verifies no exceedances of IGCLs outside the current TI zone boundaries. Consistent with the September 2013 ESD, concentrations exceeding IGCLs are hydraulically contained within the current TI zone boundaries.

Issue/Recommendation #6 (DNAPL plume may not be contained)

- The 1999 ESD required that DNAPL recovery continue until such time as it can be demonstrated that it is no longer technically practicable. At that time DNAPL removal was accomplished through operation of a large scale groundwater extraction and treatment system. While the 1999 ESD established a TI waiver ending efforts to achieve IGCLs within the TI zone boundaries, active pumping continued to remove DNAPL. This method resulted in a large volume of groundwater being extracted and treated as a consequence of DNAPL capture. The PRPs requested that EPA consider direct recovery of DNAPL from individual wells using submersible pumps (the so called passive method). In order to assess the effectiveness of passive recovery methods, EPA allowed the PRPs to switch from active pumping to passive recovery of DNAPL in 2003. DNAPL is removed from individual wells on a weekly basis without the need to extract and treat large volumes of groundwater. A total of 13 wells are currently inspected weekly. DNAPL is removed when volumes of sufficient thickness are detected. A majority of the DNAPL has consistently been recovered from three wells; DRW-1, DRW-2 and A-4, and more recently from newly installed well DRW-4. Passive recovery rates have ranged from 30 to 120 gallons per month, with an average of about 60 gallons per month. While this rate is lower than the 250 to 500 gallons per month that was previously recovered using active pumping, 60 gallons per month represents a substantial and meaningful volume of mass removal. However, EPA believed that opportunities for enhanced passive recovery existed through optimization and additional passive recovery wells.

- As recommended in the last Five-Year Review Report, in October 2012, the PRPs submitted a DNAPL recovery enhancement work plan which included the inspection and cleaning of existing DNAPL recovery wells and the installation of a new passive recovery well. Inspections and cleaning of well screens was accomplished and in November of 2012, and a new passive recovery well, DRW-4 was installed. DNAPL recovery from DRW-4 was initiated in January 2013. An average of 15 gallons per month of DNAPL is removed from DRW-4. This additional well is expected to increase average monthly recovery rates to 75 gallons per month, however the most productive wells continue to be DRW-2 (~25 gals/month), A-4 (~12 gals/month) and DRW-1 (~10 gals/month). In total, approximately 65,000 gallons of DNAPL have been removed from the Site. The extended inspections and continued passive recovery efforts demonstrate that the DNAPL and associated areas of impacted groundwater contamination appear to be stable and no nearby receptors exist. Figure B-4 shows the DNAPL recovery wells including DRW-4. Table B-4 summarizes the most recent recovered volumes.

Issue/Recommendation #7 (Up to date O&M plan does not exist)

- In September 2013, EPA issued an ESD which changed the recovery method for DNAPL from active to passive, and extended the TI zone boundary in the area down gradient of the former lagoon. In support of this decision, a new DNAPL recovery well, DRW-4 was installed and two new sentinel groundwater monitoring well clusters, MLC-5S/D and MLC-6S/D were installed. These wells have been incorporated into the Site monitoring program and the PRPs are in the process of updating the operations and maintenance plan for the Site to reflect these changes. The updated plan is expected to be finalized by the end of this year.

Remedy Implementation Activities

In response to issues raised in the last Five-Year Review Report, the PRPs submitted a work plan in October 2012 which required additional field work. EPA issued a 3rd ESD for the Site in December 2013, which required the remedial activities summarized in Table 6. The 3rd ESD also re-affirmed the need for pending ICs which are listed in Table 7. Current O&M activities are summarized in Table 8. This activities are discussed in more detail in Appendix A.

Table 3: Summary of Completed Remedial Activities Since 2009

Media	Nature of the Action	Remedy Change
Groundwater	Two new well clusters were installed, MLC-5S/D and MLC-6S/D.	The IT zone compliance boundary down gradient of the former lagoon area was extended by about 100 feet. MLC-5S/D and MLC-6S/D are new sentinel wells.
DNAPL	Existing recovery wells were inspected and cleaned. A new recovery well, BRD-4, was installed.	Active recovery of DNAPL has been changed to passive recovery methods. The groundwater treatment plant will be dismantled.

Table 4: Summary of Pending ICs

Media	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	Entire property	Prevent ingestion of contaminated groundwater. Prevent migration of the DNAPL and dissolved plumes.	Massachusetts activity and use limitation to be recorded on deed. Planned September 2014.
Lagoon/Landfill caps	Yes	Yes	~1 acre former lagoon cap. ~2 acre landfill cap.	Protect the cap by preventing any potentially intrusive activity.	Massachusetts activity and use limitation to be recorded on deed. Planned September 2014.

System Operation/Operation and Maintenance Activities

Table 5: Summary of O&M Activities Since 2009

Media	Activity
Lagoon/Landfill Caps	1. Semi-annual mowing of grass. 2. Semi-annual inspection of side slopes. 3. Semi-annual inspection and removal (as needed) of tree seedlings and other potentially damaging invasive vegetation.
Groundwater	1. Annual gauging for DNAPL. 2. Annual measurement of water table elevations 3. Annual sampling for BTEX, PAHs and typical field parameters from 12 area wells.
DNAPL	1. Weekly gauging of DNAPL from wells DRW-1, DRW-2, DRW-3, DRW-4, A-2, A-4, A-6, A-10, BMW-4, BMW-6, BRW-5, M-11D and M-12S. 2. Weekly removal of DNAPL from wells with a measurable thickness of 1 foot or 4 feet depending on well design. 3. Quarterly removal of DNAPL from all wells with a minimum of 0.3 feet of accumulation.

III. FIVE-YEAR REVIEW PROCESS

Administrative Components

The PRP representative, Mike Bollinger of Beazer East, Inc., was notified of the initiation of the third five-year review on 10/22/2013. The Hocomonco Pond Superfund Site Five-Year Review was led by Jim DiLorenzo of the U.S. EPA, Remedial Project Manager for the Site and Pamela Harting-Barrat, the Community Involvement Coordinator (CIC). Jay Naparstek of the Massachusetts Department of Environmental Protection (MassDEP), assisted in the review as the representative for the support agency.

The review, which began on 4/17/2014, consisted of the following components:

- Community Involvement;
- Document Review;
- Data Review;
- Site Inspection; and
- Five-Year Review Report Development and Review.

Community Notification and Involvement

Activities to involve the community in the five-year review process were initiated with a meeting in December 2013 between the RPM and CIC for the Site. A press release announcing 27 upcoming five-year reviews in Region 1, including the Hocomonco Pond Site, was issued by EPA on 2/13/2014 and provided links to each of the 27 sites where readers could find Site-specific details. On 7/31/2014, EPA hosted a Site tour for local officials and community members interested in reuse options for the Site. That same evening, EPA, MassDEP and the PRP representative made a brief presentation on the Site and answered questions at a meeting hosted by local officials. The results of the review and a copy of this report will be made available at the Site information repository located at Westboro Public Library, on West Main Street in Westboro, MA 01581 and EPA's regional web site.

Document Review

This five-year review consisted of a review of relevant documents including O&M records and monitoring data. Applicable sediment and groundwater cleanup standards as listed in the 1992 SDD were reviewed along with the 1985 ROD, and 1992, 1999 and 2013 ESDs.

Data Review

The O&M plan includes passive recovery of DNAPL, and routine monitoring of groundwater and sediments for BTEX and PAHs. Volume data associated with the DNAPL recovery is presented below, followed by analytical data from monitoring of groundwater and sediment.

DNAPL Data

The DNAPL is creosote containing various volatile and semi-volatile chemicals (primarily BTEX and PAHs). Recovery of DNAPL began in 1995, and therefore a significant dataset exists. This section focuses on data collected since the last five year review in 2009. DNAPL thickness is gauged on a weekly from 13 wells with a known history of DNAPL collection. DNAPL is removed on a weekly basis from any well with an accumulation of 4 or more feet from wells with sumps, or 1 foot or more from wells without sumps. DNAPL which has accumulated to a thickness of 0.3 or more feet is removed from each well at least once per quarter.

DNAPL is removed from each well via a permanently installed or portable submersible pump. Extracted DNAPL is transferred to 55 gallon drums for off-site treatment and disposal. 13 wells are routinely inspected for accumulation and possibly removal of DNAPL, but a majority of the DNAPL is removed from 4 wells; DRW-1, DRW-2, DRW-4 and A-4. DRW-4 was installed in 2012 as part of the passive recovery enhancement effort. Figure B-4 identifies the DNAPL well locations. Table B-4 provides a summary of the most recent recovery volumes. Since 2009, passive recovery rates have average 60 gallons per month and have remained steady. Approximately 65,000 total gallons of DNAPL have been removed to date, with about 3,500 gallons removed since the last five year review. The total remaining volume is unknown.

Groundwater Data

Annual and expanded testing of area monitoring wells for BTEX and PAHs has been performed since the last five year review was completed in 2009. In addition, a vertical profile borehole was completed

and two new monitoring well clusters (MLC-5S/D and MLC-6S/D) were installed. Annual monitoring of groundwater is performed to ensure that concentrations exceeding IGCLs are not detected outside the TI zone boundaries. Vertical profiling and expanded groundwater testing were performed at select wells to assess compliance with the TI zone boundary for the former lagoon area.

9 groundwater sampling events have occurred since the last five year review. A summary of the results from each event follows. Figure B-4 identifies groundwater monitoring well locations. Tables B-1, B-2 and B-3 provide a summary of analytical results for the wells of interest during this five year review. Table A-3 summarizes the IGCls. Generally speaking, no discernable trends exist and groundwater conditions appear stable. No IGCLs have been exceeded outside the TI zone since the TI zone boundary was expanded in December 2013.

November 2009

Annual testing. 10 wells were sampled for BTEX and PAHs. IGCLs were exceeded for benzene in MLC-2 (5.2 ug/l) and MLC-3 (50.6 ug/l).

November 2010

Annual testing. 8 wells were sampled for BTEX and PAHs. IGCLs were exceeded for benzene in MLC-2 (13.4 ug/l) and MLC-3 (7.0 ug/l); and naphthalene in MLC-2 (6,720 ug/l)

September 2011

Annual testing. 12 wells were sampled for BTEX and PAHs. IGCLs were not exceeded.

December 2011

Expanded testing. MLC-2 and MLC-3 were sampled for BTEX and PAHs. IGCLs were exceeded for benzene and naphthalene in MLC-2 (10.4 ug/l and 2,140 ug/l respectively); and benzo(a)pyrene in TRC-8D (0.21 ug/l) and TRC-9D (0.31 ug/l).

March 2012

Expanded testing. MLC-2, MLC-3, TRC-8S/D and TRC 9S/D were sampled for BTEX and PAHs. The IGCL was exceeded for naphthalene in MLC-2 (1,590 ug/l).

May 2012

Expanded testing. MLC-2, MLC-3, TRC-8S/D and TRC 9S/D were sampled for BTEX and PAHs. IGCLs were exceeded for benzene in MLC-2 and MLC-3 (7.6 ug/l and 9.9 ug/l respectively).

August 2012

Expanded testing. MLC-2 and MLC-3 were sampled for BTEX and PAHs. IGCLs were exceeded for benzene in MLC-2 and MLC-3 (7.6 ug/l and 39.4 ug/l respectively); and naphthalene in MLC-2 (2,280 ug/l).

January 2013

Expanded testing. Newly installed wells MLC-5S/D and MLC-6S/D were sampled for BTEX and PAHs. IGCLs were not exceeded.

November 2013

Annual testing. 14 wells were sampled for BTEX and PAHs. MLC-2 and MLC-3 were not sampled and have been replaced by MLC-5S/D and MLC-6S/D. IGCLs were not exceeded.

Sediment Data

Sediments were dredged and removed from the southeast quadrant of Hocomonco Pond in 1995, and replaced with clean off-site material. Subsequent samples of the "clean" sediment collected along the southeast shore line of Hocomonco Pond showed increasing concentrations of PAHs. These results suggested that groundwater from the Kettle Pond area containing dissolved PAHs, primarily naphthalene, was discharging through remediated "clean" sediment along the eastern shore line. A sediment sampling plan was developed in 1998 which included annual and semi-annual sampling events. Since the last five year review in 2009, annual sediment sampling has continued. Samples were previously collected from four near shore stations. In 2009, the PRPs agreed to add two additional stations to assess sediment conditions near the mid-pond limits of excavation. Samples are analyzed for total PAHs and phenanthrene. Total organic carbon content and physical parameters are also measured. The sediments consist predominately of sand and gravel.

Five sediment sampling events have occurred since the last five year review. A summary of results from each event follows. Figure B-6 identifies the six sediment sample locations. Table B-5 provides a summary of analytical results. Generally speaking, no statistical trends exist.

2009

Total PAH concentrations ranged from non-detect at station SED 3-4 to 26.44 mg/kg at station SED 1A. Phenanthrene concentrations ranged from non-detect at stations SED 1, SED 2A and SED 3-4 to 4.10 mg/kg at SED 1A.

2010

Total PAH concentrations ranged from 0.04 mg/kg at station SED DSHP to 59.00 mg/kg at station SED 1A.. Phenanthrene concentrations ranged from non-detect at station SED DSHP to 3.70 mg/kg at SED 2A.

2011

Total PAH concentrations ranged from 0.18 mg/kg at station SED DSHP to 107.00 mg/kg at station SED 1. Phenanthrene concentrations ranged from non-detect at station SED DSHP to 17.00 mg/kg at SED 1.

2012

Total PAH concentrations ranged from 0.10 mg/kg at station SED 3-4 to 49.00 mg/kg at station SED 1. Phenanthrene concentrations ranged from 0.0053 mg/kg at station SED 3-4 to 9.70 mg/kg at SED 1.

2013

Total PAH concentrations ranged from 11 mg/kg at station SED 2 to 161.00 mg/kg at station SED 1. Phenanthrene concentrations ranged from 0.775 at station SED 2 to 25.00 mg/kg at SED 1.

While total PAHs and phenanthrene bulk concentrations appear to demonstrate increasing trends, particularly in the most recent sampling event, consistent with the work plan, statistical analysis of the results was performed using both the Mann-Kendall and Regression Analysis methods. Mann-Kendall concludes no discernible trend exists for total PAHs and carbon-normalized phenanthrene, however an increasing trend appears for bulk phenanthrene. Regressional Analysis shows a downward trend in carbon-normalized total PAHs concentrations and no discernable trend for phenanthrene.

These results may be indicative of the highly variable nature of total organic carbon content within the sediments. While each station has a physical marker and a gps coordinate, it is not possible to extract a sample from the exact physical location during each event. However, these results may also be indicative of near shore discharge of the dissolve-phase plume which is no longer being hydraulically influenced by upgradient groundwater/DNAPL extraction which was discontinued in 2003.

Site Inspection

An inspection of the Site was conducted on 7/31/2014. In attendance were Jim DiLorenzo, U.S. EPA; Jay Naparstek, MassDEP, and the PRP representative Mike Bollinger, Beazer East, Inc. The purpose of this inspection was to assess the protectiveness of the remedy.

Upon arrival, the gate entrance was observed to be secure and locked. No evidence of trespassing was observed anywhere on the property. The former groundwater treatment building was locked and secure. The former lagoon and landfill caps were observed to have been mowed and trees, shrubs and other potentially damaging seedlings had been removed. No erosion was observed. Monitoring and DNAPL recovery wells which were observed during the inspection were locked and secure.

No issues were identified.

At approximately 4:00pm, the town manager, local officials and about 30 interested members of the community arrived for a tour of the property. The pending five-year review was discussed along with potential reuse options being considered by the town including a solar panel array, walking and biking trails and a fire department training facility.

The Site gate was secured and locked upon completion of the tour. Photos are attached in Appendix B.

Interviews

During the FYR process, the EPA RPM interviewed interested parties, including the Manager for the Town of Westboro (who is also the current landowner), the PRP representative and a MassDEP official

who are all involved in Site activities or aware of the Site. The purpose of the interviews was to document any perceived problems or successes with the remedy that has been implemented to date. Interviews were conducted on 7/31/2014. Interviews are summarized below and complete interviews are attached.

Name	REP	DATE	ISSUES AND KEY POINTS
Jay Naparstek	MassDEP	7/31/2014	No issues. Remedy functioning as intended.
Mike Bollinger	PRP	7/31/2014	No issues. Remedy functioning as intended.
Jim Malloy	Town	7/31/2014	No issues or impacts to community.

IV. TECHNICAL ASSESSMENT

Question A: Is the remedy functioning as intended by the decision documents?

Yes. In December 2013, EPA issued a third ESD for the Site which extended the TI zone boundary and formally changed the method of DNAPL extraction from active to passive. Dissolved phase groundwater concentrations remain stable and below interim groundwater cleanup levels outside the current TI zone boundaries. Passive DNAPL recovery rates remain stable. Recent sediment data indicates an increase in bulk PAHs, but when statistically adjusted for normalized total organic carbon, no discernable trend exists.

Remedial Action Performance. The on-Site landfill and former lagoon area caps remain in good condition and are functioning as designed. They are covered by mature grasses and no erosion has been noted. Seedlings have been actively removed as needed to prevent root permeation. The monitoring program established to ensure plume containment within the identified TI zone boundaries is ongoing, as is DNAPL recovery.

Annual groundwater monitoring around the landfill (fully encapsulated) has shown few detections of PAHs. Monitoring around the former lagoon area (capped only, no liner) has detected naphthalene at three of the four sentinel wells. Benzene and naphthalene concentrations in wells MLC-2 and MLC-3, located just down gradient of the former lagoon TI zone boundary, had intermittently exceeded their respective interim groundwater cleanup levels. In 2012, a vertical profile study of groundwater quality was performed about 100 feet down gradient of MLC-2 and MLC-3. This study concluded only trace detections of PAHs, and two new clustered sentinel wells were installed; MLC-5S/D and MLC-6S/D. In December 2013, EPA issued an ESD which extended the down gradient boundary of the former lagoon TI zone by approximately 100 feet. MLC-5S/D and MLC-6S/D are now routinely monitored in place of MLC-2 and MLC-3 as part of the program to ensure compliance with IGCLs outside the TI zone. In December 2011, benzo(a)pyrene was detected slightly above the interim groundwater cleanup standard in sentinel wells TRC-8D and TRC-9D, which are located along the east boundary of the TI zone for the former lagoon area. These wells are cross-gradient to groundwater flow. This one time exceedance has not been repeated in any other sample event and these results are considered to be anomalous.

In December 2013, EPA issued an ESD which formally modified the method for recovery of DNAPL

from active high-rate extraction of mixed groundwater/DNAPL to passive well-head collection of only DNAPL using submersible pumps. Recovered DNAPL is transferred to 55 gallon drums for off-Site treatment and disposal. Through July 2014, approximately 65,000 gallons of DNAPL have been recovered. DNAPL is gauged weekly in approximately 13 wells and continues to be detected, and recovered in the same group of wells where it has historically been found. Recovery rates since 2009 have remained generally stable at about 60 gallons per month. In 2012, all wells with a history of DNAPL were inspected and, to the extent possible, cleaned. An additional recovery well, DRW-4, was installed and has slightly increased monthly recovery rates over the past year. A majority of DNAPL is removed from four wells; DRW-1, DRW-2, DRW-4 and A-4. No consistent trend of increasing, or decreasing DNAPL thickness has been observed.

Total PAH and phenanthrene concentrations in sediments have varied over the last 5-year monitoring period (2009-2013), and are generally consistent with post-remediation sediment data dating back to 1998 (See Table B-5). However, total PAH concentrations have exceeded the ecological cleanup level of 35.00 mg/kg at different stations over the past four sampling rounds. The highest detected total PAH concentration to date, 161 mg/kg, was detected at SED 2 in May 2013. The previous highest concentration was 143.9 mg/kg also at SED 2 in May 2002. The human health sediment cleanup level was established in the 1992 SDD based on total carcinogenic PAHs (cPAHs). At that time, all PAHs were considered to be equal in toxicity to the most toxic, which is benzo(a)pyrene. Since the development of these levels, EPA has approved a relative potency method for evaluating risks to cPAHs whereby each individual cPAH is evaluated using the toxicity value for benzo(a)pyrene in combination with a comparative relative potency factor. Application of the currently approved method demonstrates that measured cPAH concentrations are well below a human health level of concern. However, access to the pond for intrusive recreational activities remains limited and where access is available, signs are posted indicating no swimming or fishing allowed. Statistical review of the data using Mann-Kendall and Regression Analysis shows no discernable trend when adjusted for normalized organic carbon. It is unclear if recent sediment results are indicative of increased discharge of groundwater containing dissolve-phase contamination or variability in total organic carbon content; or both. In response to higher total PAHs observed at SED 2 in 2002, toxicological testing (H.azteca) was performed to survey the health of local benthic community. A few of the replicate tests shows a slight reduction in survival but no overt toxicity was observed.

System Operations/O&M. Annual Site costs have been higher than the ROD estimate for O&M activities. The ROD estimated the following costs for the O&M activities associated with the selected remedies:

•Former lagoon area - $21,000 annually for water quality monitoring and cap maintenance;
•On-Site landfill - $20,000 annually for water quality monitoring; and
•Otis Street storm drain - $5,000 annually for discharge monitoring.

Site costs from the period of 2009 to 2013 had ranged from $70,000 to $216,000 and currently average $102,000. The modifications to the remedy specified in the 2013 ESD are not anticipated to have any significant impact on O&M costs moving forward. Some capital costs were expended in 2012 and 2013 to complete the expanded groundwater testing, install 3 new wells, and inspect and clean existing DNAPL recovery wells. Additional capital expenditures are anticipated to decommission the former groundwater treatment building and related infrastructure, but collectively these costs are anticipated to be minor as compared to reoccurring maintenance and monitoring costs.

Opportunities for Optimization. Field work for optimization of passive DNAPL recovery methods was completed in 2012, including:

- Installation of a new recovery well (DRW-4) designed to increase recovery of DNAPL.
- Inspection of existing DNAPL recovery wells using a borehole televiewer device.
- Cleaning of well casings and screens to the extent possible.

No further opportunities for optimization have been identified.

Early Indicators of Potential Issues. No significant problems with the remedies in place or the on-going O&M activities were identified during this five-year review. Data collected to date indicate that groundwater concentrations are generally stable. DNAPL recovery rates remain steady.

Recent sediment data may indicate an uptick in exceedance of ecological cleanup levels. No discernable data trend exists and results may be indicative of variable total organic carbon content. It is recommended that annual testing continue at all six stations to further assess sediment conditions.

Implementation of Institutional Controls. The ROD, and 1999 and 2013 ESDs all require that institutional controls in the form of deed restrictions be put in place to protect the caps in the former lagoon and landfill areas, prevent development along the embankment of Otis Street, and prohibit extraction of groundwater for purposes other than the remedial action unless certain conditions are met. These restrictions are prepared in draft form but have not yet been finalized and recorded due to regulatory hurdles. However, in May of 2014, MassDEP finalized new regulations which are expected to clear the way to place these restrictions by the end of 2014. The Town of Westboro, as the property owner, is actively pursuing reuse options for the property and is prepared to cooperate with the placement of institutional controls. There are no known potable wells located within the impacted, or immediate downgradient, portions of the Site aquifer. The six-foot high chain link fencing around the perimeter of the property remains in good condition and adequately restricts access. Consequently, all known routes of exposure are currently under control.

Question B: Are the exposure assumptions, toxicity data, cleanup levels, and remedial action objectives (RAOs) used at the time of the remedy section still valid?

Yes. Exposure assumptions and available toxicity information used at the time of remedy selection are still valid. Subsequent changes in toxicity values and risk assessment methods have occurred since remedy selection; however, these changes do not impact the protectiveness of the remedy.

Changes in Standards and TBCs. Since the 1985 ROD was a pre-SARA decision, no detailed listing or analysis of applicable or relevant and appropriate requirements was included. The 2004 Five-Year Review report provided an ARARs evaluation. As was done for the 2009 Five-Year Review, this Five-Year Review focuses on any ARAR changes since the last 2009 Five-Year Review. For the purposes of this review and compliance with current requirements, tables of action-, location-, and chemical-specific ARARs are included in Appendix E of this report.

The action-specific ARARs applicable to the landfill and former lagoon area covering post-closure care have not changed. The federal RCRA regulations in 40 CFR Part 264 (§264.310) and the companion state regulations in 310 CMR 30.633 remain applicable to long-term post-closure care and groundwater monitoring. Since the interim cleanup levels were established for groundwater, the interim cleanup

levels for ethylbenzene, toluene, xylenes (total), and chromium (total) now represent the final MCLs for each compound, rather than the final MCLGs which were in place when the SDD was completed in 1992. Consistent with the NCP, non-zero MCLGs are an appropriate reference for cleanup goals. In most – but not all- cases, the MCL and MCLG are equal. The reference to MCLGs should be retained where the MCLG is not zero.

The 2004 Five-Year Review report suggested that MCP Method 1 GW-1 standards are applicable for the Hocomonco Pond Site. However, as determined in the 2009 Five-Year Review report, Site-specific risk-based cleanup goals established in the SDD, along with the Massachusetts MCLs, provide the protectiveness necessary at the Site. MCP Method 1 GW-1 standards would be appropriate for use in lieu of a detailed risk evaluation, which was performed in the SDD. Therefore, the MCP Method 1 GW-1 standards are not considered as chemical-specific ARARs. However, the standards are useful for evaluation/comparison purposes with respect to analytes where IGCLs were not developed in the SDD. Further discussion of analytes without IGCLs is presented later in this section.

Changes in Exposure Pathways. The zoning of the area around the Site has remained as general industrial. In the previous five-year reviews, it was noted that the Town of Westboro was considering a change to the zoning ordinance and addition of a village townhouse overlay district, but has not pursued this path. The 2013 ESD allows for decommissioning of the former treatment building and related infrastructure which have been physical barriers to reuse. Consequently, the town is actively pursuing reuse options for the Site which currently include passive recreation such as walking trails, a solar panel array and/or a fire training facility. All these options may be implemented consistent with the remedy and current zoning.

Human health exposure pathways evaluated in 1992 included fish ingestion and surface water exposure. These pathways did not show risk/hazards above the EPA risk range or a hazard index of 1 at that time. As the remedy removed the source material, current results are not expected to have increased, even with revisions to dermal calculation methods which have occurred since the 1992 evaluation. However, if recontamination of sediment occurs at concentrations greater than pre-remedial actions, a re-evaluation may be necessary. Pre-remedial sediment concentrations of total PAHs were as high as 1,108.38 mg/kg; and cPAHs were as estimated to be as high as 144.82 mg/kg.

The excavation and dredging actions, and subsequent disposal of the contaminated materials in the on-Site double-lined landfill or within the former lagoon area cap originally eliminated the direct contact, ingestion, and inhalation exposure pathways that were evaluated for human health risks in the SDD. Once the required deed restrictions are in place, any future exposure to materials beneath the caps will be prevented, as will potential exposure via ingestion of groundwater. Sediment sample results from 2013 contained some of the highest post-remediation concentrations measured to date and have been above the ecological risk-based cleanup goals, but remain well below pre-remedial concentrations, and the data are not inconsistent with historical post-remediation sediment results dating back to 2008. There is no increasing trend in concentrations. It is not clear if the recent higher results are due to the heterogeneous nature of sediments or may be indicative of groundwater recharge. Regardless, the collective sediment data indicate that total PAH concentrations remain well below pre-remedial levels and there does not appear to be evidence of current significant risk to human receptors.

One pathway of potential concern that was not evaluated in the previous risk assessments was the future vapor intrusion pathway. This pathway may be of concern at sites where soil and shallow groundwater contaminated with VOCs exists in close proximity to occupied buildings. Except for the groundwater

treatment plant building, there are no buildings located above the groundwater plume that could contain concentrations of VOCs above vapor intrusion groundwater screening values. The treatment building is only occasionally occupied for short periods of time. However, should shallow groundwater VOC contamination continue to exist coincident with future Site development involving regular use of the treatment building or the construction of new buildings that will be occupied consistently (e.g., office space), the vapor intrusion pathway should be further evaluated to determine if there is potential risk to on-Site workers.

Exposure pathways for ecological receptors included potential exposure in shallow sediments of Hocomonco Pond and the former Kettle Pond area. Future exposures in the Kettle Pond area were eliminated based on the remedy involving excavation of contaminated soil/waste and on-Site disposal into the double-lined landfill. Removal of the shallow sediment from the southeastern portion of Hocomonco Pond and its discharge stream was completed to remove potential exposure to aquatic organisms. However, a DNAPL source remains at depth and monitoring of sediments suggests that groundwater discharge of dissolved contaminants may be contributing to exceedances of ecological cleanup levels set by EPA for shallow sediments in the pond, further indicating that an exposure pathway to aquatic organisms may still be present. Although an exposure pathway may still be present, sediment toxicity testing performed in 2003 on pond sediments which had only slightly lower total PAH concentrations as was measured in 2013 concluded that no unacceptable impacts to aquatic organisms existed.

Changes in Toxicity and Other Contaminant Characteristics. In the development of the soil and sediment cleanup levels in the 1992 SDD, all PAHs were considered to be equal in toxicity to the most toxic, benzo(a)pyrene. Since the development of these levels, EPA has approved a relative potency method for evaluating risks to carcinogenic PAHs whereby each individual cPAH is evaluated using the toxicity value for benzo(a)pyrene in combination with a comparative relative potency factor. Among the other cPAHs, only dibenzo(a,h)anthracene is considered equal in toxicity to benzo(a)pyrene. All other cPAHs are considered less toxic. Since the cleanup levels were developed using the benzo(a)pyrene toxicity factor for all cPAHs without the relative potency factors, the levels are more protective than they would be if they were re-calculated today.

Risk-based interim groundwater cleanup levels were calculated for noncarcinogenic PAHs. Toxicity values used in the calculation of interim groundwater cleanup levels (RfDs and CSFs) remain unchanged with the exception of the RfD for naphthalene, which has decreased by 50 percent (historical – 4x10-2 mg/kg-day; current – 2x10-2 mg/kg-day). For this reason, if the interim groundwater cleanup level for naphthalene was recalculated today, it would decrease to 750 µg/L from the existing cleanup level of 1,500 µg/L. Note also that current methods would utilize the naphthalene RfD as a surrogate for other non-carcinogenic PAHs which do not have RfDs (e.g., acenaphthylene, benzo(g,h,i)perylene, and phenanthrene). The cleanup levels for these analytes would then be the same as naphthalene. Based on a review of the available groundwater monitoring data, application of the revised RfD would not impact the current determination of protectiveness with respect to groundwater because there are no current exposure pathways to groundwater.

2-Methylnaphthalene is a non-carcinogenic PAH which has historically not been reported as part of the analytical methods used at the Site. Recent reporting has shown detections of this analyte. Using a current RfD of 4x10-3 mg/kg-day, the cleanup goal for 2-methylnaphthalene would be one-tenth of the historical naphthalene cleanup level (150 µg/L). The detected results are all below this concentration.

Changes in Risk Assessment Methods. Soil and sediment cleanup levels for human health were developed for total cPAHs assuming adult and child recreational exposures to soil and sediment through ingestion and dermal contact. Contact was assumed to occur 24 days per year during summer months at most locations within the Site. For the area of the discharge stream, contact was assumed to occur 12 days per year. The selected cleanup levels correspond to cancer risk levels of 10^{-6}. The assumptions used in developing these cleanup goals remain reasonable.

Sediment cleanup levels for protection of aquatic life were developed for total PAHs and phenanthrene. Three different methods were used to develop the ecological cleanup levels, with the average of the three methods selected as the final level. Since the ecological cleanup level for total PAHs is greater than the human health level for total PAHs, the cleanup level used for shallow sediments (0 to 2 feet) was the more stringent human health-based cleanup level. The sediment cleanup level for phenanthrene of 4 mg/kg was established by EPA (1992) based on Site-specific sediment organic carbon concentrations using three methods. The cleanup levels established by EPA, adjusted for Site-specific organic carbon concentrations in the SDD, are reasonably-based and adequately protective levels.

Interim groundwater cleanup levels for human health were developed based on the assumption that groundwater could be used as a drinking water source. The selected cleanup levels correspond to cancer risk levels of 10^{-6} and Hazard Quotients of 1.0, consistent with current EPA guidelines. Exposure assumptions were consistent with the assumptions that are still accepted today for drinking water scenarios. Subsequent to when groundwater cleanup levels were established in the SDD, dermal absorption and inhalation of volatile contaminants were incorporated into the development of risk-based groundwater cleanup levels, rather than ingestion alone. The impact of this change is minor for most of the PAHs which required development of risk-based cleanup goals, because they are not volatile and are not adsorbed significantly. Naphthalene, however, is volatile and would include consideration of the inhalation pathway during potable water use (e.g., showering/bathing) if cleanup goals were currently developed. As there are no current exposure pathways to the groundwater, the protectiveness of the remedy is not currently impacted by this change.

Subsequent to the SDD, a new method to evaluate compounds with mutagenic modes of action, such as the carcinogenic PAHs, is now recommended by EPA. The current methodology calls for the use of age-specific adjustment factors to account for an increased sensitivity during early life. This supplemental early-life calculation was not performed as part of the SDD evaluation since the EPA carcinogen risk assessment guidance was published subsequent to the completion of the Site-specific risk evaluation. Based on the data available for this five-year review, the early-life calculation would not be expected to change risk conclusions at the Site with respect to what would require remediation. Risk calculated for the media/exposure areas which were not remediated were all below the EPA cancer risk range of 10^{-6} to 10^{-4}. The early-life calculation utilizes age-dependent adjustment factors (ADAFs) which would, at most, increase the risk 10-fold (for a child 0-2 years old) and would generally increase the risk due to cPAHs at the Site by a factor of 3 (the ADAF for ages 2 to 16 is 3 and the Site child evaluated was ages 6 to 18). Either of these increases results in risks remaining within or below the EPA cancer risk range of 10^{-6} to 10^{-4}.

Expected Progress Towards Meeting RAOs. The portions of the remedy involving excavation and dredging of contaminated soils and sediments, and placement in the on-Site double-lined landfill or the capped former lagoon area, have met the RAOs described in the ROD for the areas of contamination. The RAO for groundwater was changed by the 1999 ESD and TI waiver from groundwater restoration to plume containment within the identified TI zones as modified by the 2013 ESD. The on-going long-

term groundwater monitoring program was developed to demonstrate that RAOs are not exceeded outside the TI zone boundaries. Exceedances had regularly been detected in monitoring wells MLC-2 and MLC-3, which are located just down gradient of the former lagoon area and just outside the related TI zone boundary. A study was performed to assess groundwater quality further down gradient from these wells. A clean boundary was determined and two new monitoring well pairs were installed, MLC-5S/D and MLC 6S/D. In December 2013, EPA issued a third ESD for the Site which established a new TI zone compliance boundary for the former lagoon area. Groundwater data collected from MLC-5S/D and MLC-6S/D, and all other monitoring wells tested demonstrate compliance with the groundwater RAOs.

Long-term monitoring of sediments in Hocomonco Pond indicates some exceedances of both total PAH and phenanthrene ecological cleanup levels. Data collected since 2010 seem to indicate an overall increase in the frequency of the exceedances, however statistical evaluation of the data sets indicate no discernable trend for total organic carbon normalized results. In other words, variability in the bulk sediment results appears to be due to the heterogenetic nature of the sediments. Biological testing of the benthic community in 2003 indicated no significant toxicity associated with levels similar to and only slightly lower than currently measured. The existing LTMP (currently being updated) states that if the concentration of PAHs exceed the cleanup levels set in the SDD by EPA, and monitoring indicates increasing trends in sediment PAH levels, additional biological monitoring may be recommended. Further biological testing is not recommended at this time since results do not indicate increasing trends.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No. There is no new information identified through this review which would call into question the protectiveness of the remedy for known potential human health and ecological receptors.

No other information has been identified during completion of this five-year review that could affect the protectiveness of the remedy. There have been no reports of flooding in the low-lying portions of the Site. No new ecological risks have been identified. Additional benthic invertebrate community monitoring will be performed if warranted based on the decision tree process outlined in the LTMP.

Technical Assessment Summary

The landfill and former lagoon area caps are in good condition and are functioning as designed. The monitoring established to ensure plume containment within the identified TI zones is ongoing, as is DNAPL recovery. With the establishment of a new TI zone compliance boundary around the former lagoon area, and based on the available data, there are no exceedances of IGCLs outside the TI zone boundaries. DNAPL recovery has been optimized through inspection and cleaning of existing wells, and the installation of a new recovery well. DNAPL recovery rates have remained constant. While there is no current evidence of negative impacts to human or ecological receptors, recent sediment data suggests that dissolved-phased contaminants in groundwater may be discharging to Hocomonco Pond. Continued monitoring of sediments is recommended. The required deed restrictions are not yet in place; however, there is no evidence of trespassing at the Site and recent changes to regulations at the state level should allow restrictions to be finalized this year.

There have been no changes to ARARs or other applicable standards identified in the SDD and design documents.. There have been no land use changes or changes to exposure pathways. EPA has approved

a relative potency method for evaluating risks to cPAHs whereby each individual cPAH is evaluated using the toxicity value for benzo(a)pyrene in combination with a comparative relative potency factor. All individual cPAHs are considered less toxic or equal in toxicity to benzo(a)pyrene. Since the cleanup levels were developed using the benzo(a)pyrene toxicity factor for all cPAHs without the relative potency factors, the levels are more protective than they would be if they were re-calculated today. However, use of ADAFs for early-life calculations associated with mutagenic compounds would lower the sediment cleanup goal approximately 3-fold.

The RfD for naphthalene has decreased by 50 percent. If the groundwater cleanup level for naphthalene was recalculated today, it would decrease to 750 µg/L from the current cleanup level of 1,500 µg/L. Furthermore, inclusion of the dermal adsorption and inhalation pathways could decrease the groundwater cleanup level for naphthalene to below 10 µg/L.

V. ISSUES/RECOMMENDATIONS AND FOLLOW-UP ACTIONS

Table 6: Issues and Recommendations/Follow-up Actions

Issue	Recommendations/ Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Yes/No)	
					Current	Future
#1. Deed restrictions are not in place.	Finalize NAULs consistent with recent MassDEP regulations approved in May 2014.	PRP, EPA, MassDEP	EPA MassDEP	9/30/2015	No	Yes
#2. Updated O&M plan consistent with current activities is required.	Finalize an updated O&M plan.	PRP	EPA MassDEP	12/31/2014	No	Yes
#3. Bulk sediment concentrations intermittently exceed ecological cleanup goals.	Continue annual monitoring. If sample results continue to exceed cleanup levels, and an increasing trend in concentrations becomes apparent, perform additional toxicity testing.	PRP	EPA MassDEP	9/30/2019	No	Yes

VI. PROTECTIVENESS STATEMENT

Sitewide Protectiveness Statement	
Protectiveness Determination: Short-term Protective	*Addendum Due Date (if applicable):* not applicable
Protectiveness Statement:	

The remedy currently protects human health and the environment because physical access to the Site is restricted and there are no potable wells. However, in order for the remedy to be protective in the long-term, the following actions need to be taken: deed restrictions need to be finalized and recorded, an updated O&M plan must be finalized, and active monitoring of sediments and groundwater must continue to ensure long-term protectiveness.

VII. NEXT REVIEW

The next five-year review report for the Hocomonco Pond Superfund Site is required five years from the completion date of this review (September 30, 2019).

APPENDIX A

EXISTING SITE INFORMATION

A. SITE CHRONOLOGY

Table A-1
Hocomonco Pond
Site Chronology

Event	Date
Montan Treating Company and American Lumber & Treating Company conducted wood-treating operations on the Site.	1928-1946
Facility was converted to an asphalt mixing plant and later into a cement plant.	Late 1940's
Beazer East, Inc. (formerly Beazer Materials and Services, Inc.; formerly Koppers Company, Inc.) purchased the stock of the wood treating operating company.	1950's
Smith Valve Company purchased the property of the former operations (also operates a manufacturing plant on a separate parcel on the southwest side of Hocomonco Pond).	April 2, 1976
An open-jointed storm drain was installed crossing the Site from Smith Valve Parkway to Hocomonco Pond.	1976
MA Division of Fisheries & Wildlife investigated two fish kills at Hocomonco Pond, attributed to creosote contamination.	November 1979 & April 1982
Studies and investigations were conducted to evaluate the source and extent of creosote contamination and evaluate methods to remove or contain the contamination (attributed to creosote and water leaking into the storm drain laid adjacent to the former lagoon and discharging to Hocomonco Pond).	1979-1982
Site proposed for listing on the National Priority List (NPL) due to the threat creosote contamination posed to the Otis Street municipal well and Hocomonco Pond.	Dec. 30, 1982
Excavation during reconstruction of Otis Street resulted in disturbance of contamination in the Kettle Pond area and redistribution of contaminated soil in the road embankment adjacent to the Kettle Pond area.	July 1983
Site was placed on the NPL.	Sept. 8, 1983
Information repositories were established at the Westboro Town Hall and Public Library.	January 1984
Remedial investigation / feasibility study (RI/FS) was issued.	September 1985
ROD was signed.	Sept. 30, 1985

Consent Decree entered into between EPA, the Commonwealth of Massachusetts, and the PRPs. Consent Decree entered by the U.S. District Court for the District of Massachusetts.	Jan. 10, 1988
Pre-design investigations conducted by the PRP.	1988-1992
Relocation of the storm drain (initially installed in 1976) was completed.	January 1990
First Explanation of Significant Differences (ESD), changing the remedy for the Kettle Pond area, was issued by the EPA.	July 22, 1992
Supplemental Decision Document entitled "Cleanup Levels for Sediments, Soils and Groundwater and Limits of Excavation of Sediments and Soils" was issued by the EPA.	Sept. 28, 1992
Remedial design completed.	1993
Groundwater treatment plant constructed.	1993-1994
Excavation of the Kettle Pond area completed; construction of the on-Site double-lined landfill for contaminated soil and sediments completed.	1994
Completed dredging of contaminated sediment from Hocomonco Pond and Brook and sealing and lining of Otis Street storm drain. DNAPL recovery begun.	1995
Soils from the former tank farm area and former storm drain excavated; covers on landfill and former lagoon completed.	1996
EPA issued a letter to the PRP indicating that remediating groundwater to drinking water quality may not be achievable at the entire Site.	May 20, 1997
Technical Impracticability (TI) Work Plan submitted.	June 30, 1997
Field work was conducted to investigate the practicability of groundwater remediation.	Sept. – Nov. 1997
"Report Demonstrating the Technical Impracticability of Restoring Groundwater at the Hocomonco Pond Site" submitted by the PRP.	April 1998
EPA and MassDEP conducted a pre-final Site inspection and determined construction activities were completed.	Sept. 10, 1999
Second ESD and associated TI waiver implemented.	Sept. 21, 1999
"Preliminary Close-Out Report" issued by EPA.	Sept. 22, 1999
"Interim Remedial Action Report" issued by EPA.	Sept. 28, 2000
"Revised Long-Term Monitoring Plan" (LTMP) submitted by the PRP.	September 2001
Baseline biological monitoring conducted, per the LTMP.	May 2002
"Long Term Monitoring Report" submitted by the PRP.	June 2002
Change to passive DNAPL recovery and groundwater treatment plant shutdown	May 2003
EPA agreed to allow passive DNAPL recovery to continue.	July 21, 2003
"Long Term Monitoring Report" submitted by the PRP.	July 30, 2004
First Five-Year Review completed.	Sept. 22, 2004
"Reuse Assessment for the Hocomonco Pond Superfund Site" issued by EPA	September 2004

"Final Long-Term Monitoring Report" submitted by the PRP	November 2005
Second Five-Year Review completed	September 2009
Groundwater sampling plan issued to evaluate TI boundary	April 2011
Results of groundwater sampling to evaluate TI boundary	December 2011
Sediment sampling report	September 2012
Work Plan to evaluate the TI zone and evaluate/enhance DNAPL recovery	October 2012
Third ESD issued to extend the TI zone boundary and modify the DNAPL recovery method	September 2013
Third Five-Year Review Completed	September 2014

B. BACKGROUND

This section contains information pertaining to the Site's physical characteristics, current and prior land use at the property, as well as waste identification and characterization information. This information has been obtained through a review of historical information, previous investigations, zoning and flood maps, and a Site visit.

Physical Characteristics

The approximately 23-acre Site is located in Worcester County, in the Town of Westboro, Massachusetts (Figure B-1). The site is bordered to the northwest by Hocomonco Pond, a 27 acre shallow freshwater pond, to the east by Otis Street, and to the south by the Smith Valve Parkway. The Site lies approximately 3,500 feet south of Massachusetts Route 9.

The Site is located in an industrial zone and surrounding lots are used for light industrial and commercial applications. A regional commuter train station is located across the street. There are no private residences in immediate proximity to the Site. There are approximately 40 residential homes within a ½ mile radius, most of which are located along Fisher Street, to the south.

There are no estimated habitats of rare wetland wildlife or priority habitats for state-listed rare species within one mile of the Site.

Hydrology

The Site is comprised of unconsolidated sediments, characterized as glacial drift deposits and tills, overlying consolidated bedrock (Fluor Daniel GTI, 1998). The glacial drift deposits vary in thickness, with the greatest thickness west of the Kettle Pond. Glacial drift deposits are absent in the southeast portion of the Site. Till is found in most of the Site, but is absent in western and southeastern areas. A sand and gravel layer exists within the till in areas where DNAPL is routinely found. The regional bedrock consists of Precambrian to Ordovician metamorphic rock, primarily schists, gneisses, and granites, which dips westward while striking northeast (EPA, 1985). A dominant geological feature of the Site is a bedrock valley that extends from the northeast to the southwest, with the eastern wall

sloping towards the west from the area near Kettle Pond (Fluor Daniel GTI, 1998). Based on geologic investigations conducted during the 1997 TI study, the "differential weathering and erosion of the bedrock surface" indicates that the bedrock valley appears to have been formed by a fault line (Fluor Daniel GTI, 1998).

The Site is generally well-drained due to its topography and the relatively permeable soils, which overlie the sandy stratified drift deposits. Most of the Site contains coarse-grained, poorly-sorted glacial drift deposits, which are comprised primarily of sand, silt, and gravel. These materials are underlain by dense clay and gravel till. Some locations, such as Kettle Pond and the surrounding area, contain permeable materials, increasing the potential for downward vertical migration of contaminants. Other areas, such as the area surrounding the former lagoon, are underlain by weathered bedrock/saprolite which prevents downward migration of contaminants (EPA, 1992a; Fluor Daniel GTI, 1998).

Groundwater flows northward towards Hocomonco Pond and discharges into the pond. In the extreme north of the Site, data suggest that groundwater may be flowing northward following a general drainage pattern from Hocomonco Pond to more low-lying swamps northeast of Otis Street (BBL, 2002a). The hydrogeologic conditions present at the Site indicate that Hocomonco Pond provides a constant head boundary, thus preventing any Site contaminants from migrating toward the Otis Street municipal well, northwest of the pond, or toward the Smith Valve process well located west of the pond (EPA, 1985). Site contaminants were not found in either of these wells during the remedial investigation or during subsequent routine testing of the Otis Street well. There are no known potable wells within the impacted or immediate down gradient groundwater aquifer.

The Federal Emergency Management Agency flood insurance rate map for the area shows that Hocomonco Pond, its wetlands at both the inlet and discharge from the pond, and the wetlands east of Otis Street, lie within the 100-year floodplain (FIRM, 2002). The Kettle Pond wetland, located between Kettle Pond and Hocomonco Pond, is a 0.1-acre wooded swampy area that is occasionally inundated during major storm events. Hocomonco Pond discharges from its northeast end and flows under Otis Street into wetlands and the Assabet River (see Figure 3-1). The Assabet River wetland is a 70-acre wooded wetland located northeast of Hocomonco Pond (EPA, 1985). An unnamed 8-acre wetland, located northwest of Hocomonco Pond, is primarily wooded and is also contiguous to an inlet stream to the pond (see Figure 3-1)

Land and Resource Use

The current Town of Westboro zoning map shows the Site and properties to the northwest of Hocomonco Pond as town-owned land. The Westboro Master Plan identifies the properties to the northwest as municipal protected and municipal unprotected open space (Daylor, 2003). The areas surrounding the Site and the town-owned parcels northwest of the pond are zoned IB (General Industry). This zoning category allows for light industrial, office, and warehouse use (Daylor, 2003). Currently, and in the past, the surrounding lots were used for light industrial, commercial, and/or residential purposes. Although there are no private residences that directly border the Site, there are approximately 40 residential homes within a ½ mile radius, most of which are located along Fisher Street, to the south. Access to the Site property is restricted on three sides by a perimeter fence. While not completely enclosed, the forth side of the Site property directly abuts Hocomonco Pond, which itself is almost entirely restricted by a perimeter fence. Consequently, no evidence of trespassing has ever existed on the Site property.

The Site lies within a Zone II aquifer, which is a direct recharge area of a public water supply (Westboro, 2001). The Otis Street municipal well is located approximately 2,000 feet northwest and upgradient of Hocomonco Pond. The well is operated at a pumping rate that limits the radius of influence from intersecting Hocomonco Pond (EPA, 1985). Routine testing of the Otis Street well by the town has never detected any Site contaminants (McNulty, 2004). According to town officials, a second municipal well planned for the Otis Street location was not installed due to concerns of the impact of two wells pumping in this area (McNulty, 2004). There are no water supply wells within the impacted portion of the aquifer.

There are no estimated habitats of rare wetland wildlife or priority habitats for state-listed rare species within one mile of the Site. There are a number of potential vernal pools located in the Assabet River wetlands east of the Site and Otis Street (Daylor, 2003).

EPA's September 2004 Draft Preliminary Reuse Assessment for Hocomonco Pond and the Westboro Master Plan include maps that show the major land uses, resources, and zoning discussed above.

Appendix D, "Summary of 2003 Open Space and Recreation Plan," of the Westboro Master Plan includes a plan to transfer the Hocomonco Pond Site to the care and custody of the Conservation Commission when the cleanup is completed and the Site is released to the town by EPA (Daylor, 2003). Town officials have indicated plans for passive recreational use of the Site and noted during the Site inspection that a walking trail proposed for along the Smith Valve Parkway, south of the Site, was constructed in 2004.

History of Contamination

Wood treating operations were conducted on-Site between 1928 and 1946. These activities consisted of saturating wood products with creosote to preserve them (EPA, 1985). Waste produced during these operations was discharged into the 1.7 acre unlined (former) lagoon, located south of Hocomonco Pond. When the lagoon was filled with waste creosote, sludge, and water, its contents were pumped into two depressed areas, approximately 1 acre in size, referred to as the Kettle Pond area. The Kettle Pond area was located east of the operations and near the west side of Otis Street (EPA, 1985). Public information indicates that creosote was not used or stored on the Site after March 26, 1946 (EPA, 1985).
After 1946, the facility was converted to an asphalt mixing plant. Aggregate and asphalt wastes associated with this operation were discarded on the Site. The facility was later converted into a cement plant where dry cement was sold in bulk (EPA, 1985).

An open-jointed storm drainage system was installed in 1976 per order of the Westboro Conservation Commission to collect runoff from Smith Valve Parkway and contain a small watercourse that crossed the Site. Unknowingly, the storm drain was constructed adjacent to the east side of the former lagoon. Rainwater passing through the drainage system transported contaminants from the former lagoon into Hocomonco Pond and a portion of its discharge stream. Between 1979 and the mid-1980s an oil boom was placed in Hocomonco Pond at the drain channel discharge during heavy rains. The boom was used to collect creosote that discharged to the pond (EPA, 1985). The Massachusetts Division of Fish and Wildlife investigated two fish kills, in 1979 and 1982. The fish kills were attributed to creosote leaching from the former lagoon into the storm drain and discharging into and contaminating the pond.

Road reconstruction on Otis Street in 1983 adjacent to Kettle Pond unearthed contaminated soil, which was then redistributed along the roadway embankments (EPA, 1985). Given the historical operations in

the area, EPA collected water, soil, and sludge samples along the Otis Street construction area for risk assessment purposes. Contaminants detected in the sludge samples were consistent with creosote and its by-products.

Initial Response

In the early 1980s Hocomonco Pond was closed for recreational uses, and signs were posted prohibiting fishing, boating, and swimming (EPA, 1985). Access to the Site was restricted by placement of large boulders across the access road. Based on the extent of creosote contamination detected in the Hocomonco Pond area and the potential threat of contamination to the Otis Street municipal well, EPA evaluated the Site and proposed it for inclusion on the National Priority List (NPL) in 1982. The Site was officially placed on the NPL on September 8, 1983 (EPA, 1992). A remedial investigation (RI) was initiated in 1984.

Basis for Taking Action

The RI identified four primary areas of contamination on the Site: (1) the Kettle Pond area; (2) Hocomonco Pond and its discharge stream; (3) the former lagoon area; and (4) Otis Street. In addition, the RI identified three small isolated areas: contaminated soil near MW-1; tank bases adjacent to the former lagoon; and sediments in the southwest drainage channel. The predominant contaminants found in all of these areas of contamination were creosote compounds, primarily polycyclic aromatic hydrocarbons (PAHs) such as acenaphthene, naphthalene, acenaphthylene, fluorene, phenanthrene, dibenzofuran, and 2-methylnaphthalene (EPA, 1985). The extent of the contamination identified in each of these areas is shown on Figure 3-2. A brief description of each of the areas of contamination identified in the RI is provided below, followed by a summary of the endangerment assessment that was performed to address public health and environmental concerns at the Site.

(1) Kettle Pond Area

Creosote contamination was detected in soils at concentrations up to 483 mg/kg at a depth of 0 to 2 feet; and a concentration of up to 55 mg/kg was detected at a depth of 20 feet below ground surface (bgs). The contamination extended below the water table, which was located at approximately 8 feet bgs, and was visible in soil borings to a depth of 17 feet bgs (EPA, 1992a). The RI estimated the volume of contaminated soil to be approximately 24,000 cubic yards with an aerial extent of approximately one acre (EPA, 1992a). Contamination extended to the western bank of Otis Street and north to Hocomonco Pond (EPA, 1985). Downgradient of Kettle Pond, groundwater was contaminated with creosote compounds and phenolic compounds at parts per million concentrations. Iron and manganese were detected at concentrations which exceeded secondary drinking water standards (EPA, 1985). Surface soil adjacent to Hocomonco Pond also contained creosote compounds (EPA, 1992a).

(2) Hocomonco Pond

The RI determined that creosote-contaminated leachate migrated from the former lagoon into the open-jointed storm drain adjacent to the former lagoon, and discharged into Hocomonco Pond (EPA, 1992a). The creosote compounds contaminated the sediments in the discharge stream and along the shoreline of the pond. Most of the metals detected exceeded background levels in both pond and stream sediments. Migration via the storm drain was noted as the primary source of contamination in Hocomonco Pond and the discharge stream. Contaminated surface water was found in the pond only within the oil boom

area at the storm drain discharge. Contamination was not found in surface water beyond the oil boom or in the discharge stream exiting the pond near Otis Street (EPA, 1985).

(3) Former Lagoon Area

Creosote contamination was detected in the soil near the surface and at depths ranging from 5 to 20 feet bgs. Creosote product was observed in the upper 15 feet of the soil, above the groundwater table (EPA, 1985). The RI estimated the volume of contaminated soil in the former lagoon area to be approximately 18,000 cubic yards with an estimated aerial extent of approximately 1.7 acres (EPA, 1992a). Groundwater contamination was not found in wells located downgradient of the former lagoon. Observations made during test pit and soil boring operations suggested that downward migration of contaminants was apparently impeded by impervious layers of sludge and fines in the bottom of the lagoon. The RI concluded that hydrogeologic conditions in the area would prevent migration of contaminants deep into the aquifer and that seepage from the lagoon into the groundwater would likely flow laterally and discharge into Hocomonco Pond (EPA, 1985).

(4) Otis Street

Creosote contamination was not detected in soils or groundwater along the eastern embankment of Otis Street; metals above background levels were found in both soil and groundwater. Manganese was the only compound detected in the groundwater east of Otis Street that exceeded secondary drinking water standards (EPA, 1985). Stream sediments containing creosote contamination were detected 300 feet downstream of Otis Street (see Section 3.5.2).

(5) Isolated Areas

The RI reported that limited creosote contamination was found in the three isolated areas. Shallow soils near MW-1 contained creosote contamination ranging from 2.5 to 9 mg/kg (EPA, 1985). Creosote contaminants were detected in sediments in the southwest drainage channel at concentrations ranging from 6 to 39 mg/kg (EPA, 1985) (see Figure 3-2). Oily creosote compounds were found in the bottom of the tank bases (Golden, 2004).

C. REMEDIAL ACTIONS

Remedy Selection

Four decision documents have been issued for the Hocomonco Pond Site as follows:

1. Record of Decision (ROD) September 30, 1985
2. Explanation of Significant Differences, July 22, 1992
3. Explanation of Significant Differences, September 21, 1999
4. Explanation of Significant Differences, September 30, 2013

The September 30, 1985 ROD specified a multi-component remedy to address each of the areas of contamination at the Site. Based on the conclusions of the RI, remedial action objectives (RAOs) were

identified that would mitigate or eliminate impacts to human health and the environment due to exposure to Site contaminants. The individual RAOs described in the ROD for each area of contamination are summarized in the table below.

TABLE A-2
SUMMARY OF RAOs

Remedial Action Objectives (per ROD)	Areas of Contamination				
	Former Lagoon	Kettle Pond	Hocomonco Pond & Discharge Stream	Otis Street	Isolated Areas
Eliminate inhalation, direct contact and/or ingestion exposure pathways	X	X	X	X	X
Eliminate the contaminant migration potential to downstream areas and to surface waters	X		X	X	X
Ensure no future groundwater contamination	X				
Eliminate impacts on wetlands	X	X		X	X
Eliminate groundwater contamination in this area and east of Otis Street		X			
Eliminate future potential impacts to wetlands and fisheries (e.g. the ingestion exposure pathway)			X		
Enhance future recreational usage of Hocomonco Pond			X		

Source: EPA, 1985

Since remedial alternatives for each area were evaluated separately, the ROD selected separate remedial actions that addressed the specific issues identified for each area. The remedial alternatives selected by the EPA needed to ensure that "the best practical measures were used and the most cost effective alternatives that are technologically feasible and reliable were chosen to effectively mitigate potential harm and provide adequate protection for public health, welfare, and the environment" (EPA, 1985). Therefore as part of the ROD, the EPA issued a separate Statement of Findings for each of the four primary areas to ensure compliance with EPA policy, Executive Orders 11988 (Floodplains Management) and 11990 (Protection of Wetlands), and consistency with Massachusetts state law and local standards. The Statements of Findings were required since some of the proposed remedial actions were in or might potentially affect a 100-year floodplain and/or a wetland. The remedies selected for each area of contamination are briefly described below.

Kettle Pond Area. The remedy selected for the Kettle Pond area involved excavation of contaminated soil/waste and on-Site disposal into a double-lined landfill. The remedy also included dewatering Kettle Pond to lower the groundwater level prior to and during excavation. A groundwater pumping and treatment system would be installed to lower the groundwater level and also to extract and treat contaminated groundwater (EPA, 1985). This alternative was selected since it would remove the soil/waste source of contamination to groundwater. This would be achieved by excavating all visible contamination and approximately 2 to 3 feet of additional soil below the visible contamination and consolidating it into an on-Site double-lined landfill (EPA, 1985).

Hocomonco Pond and Discharge Stream. The remedy selected for Hocomonco Pond and its discharge stream involved mechanical dredging of contaminated sediments with on-Site disposal either into the former lagoon area prior to construction of the cap and/or at an approved landfill facility. This

alternative was selected since it would remove the contamination and essentially restore Hocomonco Pond to a condition suitable for recreational purposes (EPA, 1985).

Former Lagoon Area. The remedy selected for the former lagoon area involved Site grading, construction of a cap, removal/disposal of the storm drain pipe that had been installed along the eastern side of the former lagoon, and installation of a new storm drain pipe outside of the former lagoon limits. This alternative was selected since all soil contamination was located above the water table; therefore containment of the waste material under the cap would prevent migration to Hocomonco Pond and groundwater (EPA, 1985). A deed restriction was also required for the area of the cap to prevent future development (EPA, 1985).

Otis Street. The remedy selected for Otis Street involved sealing the open-jointed storm drainage pipe along the east side of the street. This alternative was selected since it would prevent the migration of contamination from the drainage pipe into Hocomonco Pond, the discharge stream, and adjacent wetlands. A deed restriction would be required for the road embankment area (EPA, 1985).

Isolated Areas. The remedy selected involved removal of the tank bases, contaminated soil near MW-1, and contaminated sediment from the southwest storm drain channel, and consolidation of the materials either on-Site into the former lagoon area prior to construction of the cap and/or at an approved landfill facility. This option was selected to eliminate the potential exposure risk to humans and animals from contaminants in these isolated areas (EPA, 1985).

On January 10, 1988, a Consent Decree was entered into between the EPA, the Commonwealth of Massachusetts, and the following parties: Beazer East, Inc. (Beazer), Chicago Bridge & Iron Co., Smith Valve Corp., Massachusetts Department of Public Works (DPW), and the Town of Westboro (EPA, 1992a). The Consent Decree set forth activities that Beazer would be required to carry out in order to implement the remedies specified in the ROD. The other PRPs agreed to make settlement payments to Beazer (EPA, 1992a). These activities, specified in the Remedial Design/Action Plan (RD/RA Plan), attached as Appendix I to the Consent Decree, included pre-design, remedial design, remedial action, and long term operation and maintenance (O&M) for the remedies selected in the ROD.

As part of the selected remedy for the former lagoon area, the storm drain along the east side of the lagoon area was relocated between November 1989 and January 1990. The contaminated portions of the former storm drain were then excavated as part of the activities described in Section 4.3.1.

Additional Investigations

Along with the remedial alternatives selected for each area of contamination, the ROD listed future actions to support the design process and on-going monitoring. These actions included:

- Soil sampling and analysis during the design process to determine the extent of excavation required at the Kettle Pond area, the former tank farm, the southwest storm drain area, and the MW-1 area;

- A sediment investigation during the design process to determine the extent of dredging that would be required to remediate Hocomonco Pond;

- Water treatability studies for the Kettle Pond area, as necessary, to adequately design a water treatment system for dewatering the area prior to excavation;

- Monitoring of the former lagoon area cap and double-lined landfill to ensure their effectiveness;

- Establishing final groundwater cleanup levels after soil and groundwater remedial actions were completed in the Kettle Pond area; and

- Installing fencing during design and prior to the start of construction activities to prevent direct exposure of the public to contaminants and to the construction activities on the Site.

Pre-Design Investigations

The PRP conducted pre-design investigations in the early 1990s, including sediment, soil, groundwater, and fish tissue sampling, to further refine the extent of contamination in the different areas of the site. During the remedial design, the results of these sampling activities were used to supplement the previous investigations of the site to define the extent of excavation and dredging activities that would be required in each area.

Sediment sampling was conducted at Hocomonco Pond, the discharge stream, and a marshy area and abandoned stream associated with Hocomonco Pond. Soil sampling was conducted at the former wood treating building located to the north of the former lagoon, at the former tank farm area, in the southwest storm drain, around MW-1, Kettle Pond, and the area between Kettle and Hocomonco Ponds. Groundwater sampling was conducted across the site to confirm the location of the bedrock valley and determine the migration path for the creosote contamination. Five fish tissue samples were collected from Hocomonco Pond (EPA, 1992a).

1992 Explanation of Significant Differences

The PRP also conducted additional investigations at Kettle Pond as part of the pre-design activities specified in the Consent Decree. These investigations resulted in new information which questioned the effectiveness and implementability of the remedy specified in the ROD for the Kettle Pond area.

During pre-design investigations in the Kettle Pond area, boulders were encountered in the glacial drift during drilling activities. The investigation also determined that the aquifer in the Kettle Pond area was more transmissive than estimated in the RI. The sheet piling would need to be installed to a depth of 60 to 80 feet to control groundwater inflow from the deep permeable aquifer. The PRP determined that the boulders and overhead utility wires would impede the installation of sheet piles, as required in the ROD to support the excavation sidewalls and prevent water from entering the excavation, since the sheeting could bend and separate and therefore compromise the hydraulic and structural integrity of the remedy (EPA, 1992a).

The investigations also determined that the vertical extent of visible contamination extended to a depth of approximately 45 feet bgs into the saturated soils, rather than 20 feet bgs as reported in the RI. The investigations concluded that lowering the groundwater level in the Kettle Pond to facilitate "dry" excavation, as specified in the ROD, could cause subsidence of Otis Street, a heavily traveled road (EPA, 1992a).

A deep overburden and shallow bedrock investigation was conducted to investigate the December 1988 discovery of creosote product in deeper soils west of Kettle Pond. During this investigation, creosote was observed as a dense non-aqueous phase liquid (DNAPL) at a depth of approximately 140 feet bgs west of Kettle Pond (EPA, 1992a; EPA, 1992b). The DNAPL was found above dense clay soil and/or weathered bedrock, which appeared to have acted as a barrier to further downward migration (EPA, 1992a).

In response to this new information, on July 22, 1992, the EPA issued the first Explanation of Significant Differences (ESD) for the Site which modified the remedy originally selected for the Kettle Pond area. The remedies selected for the other areas of the Site were not modified, as they were not impacted by the new information. To ensure that the Kettle Pond remedy remained protective of human health, welfare, and the environment, the 1992 ESD set forth the following changes:

- The ROD requirement for sheet piling and the dry excavation of sediments and soils was replaced with a requirement for wet excavation of shallow contaminated material to a maximum depth of 5 feet;

- The ROD requirement for excavating, dewatering, and landfilling the deeper contaminated soil was replaced with a requirement for in-situ bioremediation and soil flushing; and

- Since DNAPL in the deep overburden can be a continuous source of dissolved contaminants, the ESD required product recovery prior to and/or during in-situ bioremediation and either on- or off-site treatment or product reuse offsite.

The EPA concluded that "these changes do not fundamentally alter the remedy selected in the ROD" (EPA, 1992a).

Cleanup Levels and Limits of Excavation

The Consent Decree and RD/RA Plan included a requirement that EPA would establish the horizontal and vertical limits of excavation in the Kettle Pond area, Hocomonco Pond, and its discharge stream in a supplemental decision document. On September 28, 1992, EPA issued a final supplemental decision document (SDD) entitled "Cleanup Levels for Sediments, Soils and Groundwater and Limits of Excavation of Sediments and Soil." The document established the vertical and horizontal extent of excavation for the site and also established cleanup levels for soils, sediments, and groundwater across the site (EPA, 1992a). Based on the pre-design investigation results, and other studies, EPA identified contaminants of concern (COCs) for the site. The COCs identified included benzene, toluene, ethylbenzene, and xylenes (BTEX), noncarcinogenic and carcinogenic PAHs, arsenic, and chromium (EPA, 1992a).

The groundwater cleanup levels established by EPA in the SDD are the Maximum Concentration Limits (MCLs) and non-zero MCL goals (MCLGs) for the COCs. However, since MCLs had not been established for non-carcinogenic PAHs and some carcinogenic PAHs (cPAHs), risk-based criteria were used to establish interim groundwater cleanup levels. The interim cleanup levels and the criteria upon which they were based, are shown in Table A-3.

TABLE A-3
INTERIM GROUNDWATER CLEANUP LEVELS

Constituent	Interim Cleanup Level (µg/l)	Reference (criteria)
PAH – carcinogenic		
Benzo(a)anthracene	None	-
Benzo(a)pyrene	0.2	final MCL
Benzo(b)fluoranthene	None	-
Benzo(k)fluoranthene	None	-
Chrysene	None	-
Dibenzo(a,h)anthracene	None	-
Indeno(1,2,3-cd)pyrene	None	-
PAH – noncarcinogenic		
Acenaphthene	2,200	risk-based
Acenaphthylene	None	-
Anthracene	11,000	risk-based
Benzo(g,h,i)perylene	None	-
Fluoranthene	1,500	risk-based
Fluorene	1,500	risk-based
Naphthalene	1,500	risk-based
Phenanthrene	None	-
Pyrene	1,100	risk-based
VOCs		
Benzene	5	final MCL
Ethylbenzene	700	final MCLG
Toluene	1,000	final MCLG
Xylenes (total)	10,000	final MCLG
Inorganics		
Arsenic	50	final MCL
Chromium (total)	100	final MCLG

None = no interim cleanup level established
Source: EPA, 1992b

The SDD stated that these interim levels, which were applied to groundwater within the saturated zone beneath the entire site, could be reassessed during implementation of the remedy and at the completion of the remedial action to ensure its protectiveness. The SDD allowed for periodic assessments and a possible re-evaluation of performance standards associated with the groundwater treatment remedy. The SDD required a risk assessment to evaluate the potential risk of consumption of site groundwater once the groundwater ARARs were achieved (EPA, 1992b). Note that the arsenic MCL has been lowered to 10 ug/l in the time since the SDD was published.

Based on the soil and sediment data collected during the pre-design investigations, EPA established cleanup standards for Hocomonco Pond, the discharge stream, Kettle Pond area, and the isolated areas. Cleanup levels were established based on risks to human health from potential exposure via dermal contact and ingestion as well as risks to aquatic life. No cleanup levels were established for surface water or fish since the risks calculated were less than 10^{-6} (EPA, 1992b). The volumes of sediment and soil in each area that exceeded the respective cleanup standard, and thus required excavation, were then estimated by EPA. The soil and sediment cleanup standards and estimated volumes are summarized below for each area.

Kettle Pond Area. A human health based cleanup level of *4 mg/kg cPAHs* was established for surface soils (less than 2 feet) in the Kettle Pond area. To meet this standard, EPA determined that removal of the top 4 feet of soil, totaling approximately 4,200 cubic yards, was required (EPA, 1992b). Excavating this volume of soil would result in the removal of a considerable volume of contaminated material before the in-situ bioremediation activities were implemented.

Hocomonco Pond. A human health based cleanup level of *4 mg/kg cPAHs* was established for shallow sediments in Hocomonco Pond. In the shallow sediment of the eastern portion of the pond, a cleanup level of *35 mg/kg total PAHs* and *4 mg/kg phenanthrene* was established for protection of aquatic life (EPA, 1992b). EPA determined that dredging pond sediments along approximately 4,000 feet of shoreline at depths ranging from 0.5 to 1.5 feet bgs was required to meet the cleanup standard. The total volume of sediments required to be removed was approximately 1,840 cubic yards (EPA, 1992b).

Discharge Stream. A human health based cleanup level of *7 mg/kg cPAHs* was established for the contaminated sediment in the upper portion of the stream, from Otis Street east approximately 440 feet. A cleanup level of *35 mg/kg total PAHs* and *4 mg/kg for phenanthrene*, in shallow sediments for the entire stream and adjacent soils, was established for the protection of aquatic life (EPA, 1992b). EPA determined that excavation of approximately 500 cubic yards of sediments in the upper portion of the discharge stream was required. Excavation of approximately 50 cubic yards of contaminated sediment in the lower portion of the discharge stream was also required (EPA, 1992b).

Isolated Areas. The human health based cleanup level for soils in the former tank farm area, southwest storm drain, and around MW-1 was *4 mg/kg cPAHs* (EPA, 1992b). Since the tank base and the soil adjacent to the tank base were contaminated, EPA determined that excavation of approximately 940 cubic yards of soil to a depth of 2 feet bgs was required. Approximately 730 cubic yards was required to be excavated near MW-1 (EPA, 1992b).

1999 Explanation of Significant Differences

During 1997, the PRP conducted investigations to establish site-wide groundwater quality conditions and determine whether it would be practical to restore groundwater at the site to drinking water standards. The investigations involved drilling one soil boring downgradient of Kettle Pond, installing 24 pore water sample points in Hocomonco Pond, conducting a site-wide groundwater level and DNAPL measurement event, and performing a groundwater and pore water sampling and analysis round at 55 locations on-site (Fluor Daniel GTI, 1998). Groundwater and pore water samples were collected and analyzed for PAHs, BTEX, and filtered and unfiltered (total) arsenic and chromium.

While the interim cleanup levels established in the SDD were exceeded in some locations for total, or unfiltered, arsenic and chromium samples, the filtered results showed chromium and arsenic

concentrations below the cleanup levels, with the exception of one arsenic exceedance. The exceedance of the cleanup level for total arsenic was attributed to reducing conditions found in the Kettle Pond area. Benzene and naphthalene were the most frequently detected contaminants exceeding the interim groundwater cleanup levels (Fluor Daniel GTI, 1998). Since benzene and naphthalene had historically exceeded the cleanup levels, the technical impracticability (TI) evaluation focused on these compounds as the primary constituents of concern. The results and conclusions of this investigation were presented in a "Report Demonstrating the Technical Impracticability of Restoring Groundwater at the Hocomonco Pond Site," dated April 1998.

During this time frame, sediment data from samples collected along the southeast side of Hocomonco Pond showed increasing concentrations of PAHs. These results suggested that groundwater from the Kettle Pond area containing dissolved PAHs, primarily naphthalene, was discharging through remediated sediments into the southern portion of the pond. A sediment sampling plan was developed in 1998 using guidance provided by EPA and was used to collect a round of sediment samples from three locations in December 1998 (BBL, 2001).

The TI report concluded that there were two primary DNAPL entry locations on the site, the Kettle Pond area and the former lagoon area. Soil samples collected from borings in the Kettle Pond area confirmed that DNAPL was present in both shallow and deep soil samples; test pits in the former lagoon area encountered DNAPL in the unsaturated soils (Fluor Daniel GTI, 1998). The investigations determined that remedial actions at these two areas were able to mitigate the presence and/or migration of DNAPL, even though DNAPL might be present at other locations on the Site.

The TI investigations determined that the till layer located beneath the glacial drift aquifer not only acted as a barrier to vertical migration of DNAPL, but also enhanced the horizontal migration of DNAPL (Fluor Daniel GTI, 1998). The lateral extent of DNAPL contamination at the former lagoon area was estimated to be approximately 125 feet from north to south and approximately 100 feet from west to east. The lateral extent of DNAPL contamination at the Kettle Pond area was estimated to be 375 feet from northeast to southwest and approximately 250 feet from southeast to northwest (Fluor Daniel GTI, 1998). The residual and free phase DNAPL had migrated downward through the glacial drift deposits in areas across the site. In the area west of Kettle Pond, DNAPL was found to a maximum depth of 170 feet bgs (Fluor Daniel GTI, 1998). At the former lagoon area, DNAPL was found in the unsaturated zone, extending to the water table surface, as the downward migration of DNAPL was limited.

Due to the lack of DNAPL at depth around the former lagoon area, DNAPL recovery efforts were focused to the area west of Kettle Pond. By September 1999, approximately 31,000 gallons of creosote DNAPL had been recovered. Given the extent of DNAPL contamination present at the site, the TI report concluded that: "The presence of residual phase DNAPL represents a long-term source for impacts to groundwater since this phase of DNAPL is difficult to remove. Locating all free phase DNAPL sources and the inability to remediate residual phase DNAPL makes groundwater restoration technically impracticable" (Fluor Daniel GTI, 1998).

The report also stated that there was no significant risk to human health or the environment posed by the presence of free phase or residual phase DNAPL at the site, and suggested implementing institutional controls to mitigate potential future risk. Based on these conclusions, the EPA "Guidance for Evaluating the Technical Impracticability of Groundwater Restoration," and other relevant documents, the PRP requested a waiver of interim groundwater cleanup levels for the areas within the defined TI zone. The horizontal extent of the TI zone is shown in Figure 4-2. The vertical extent of the TI zone

was defined as follows: Kettle Pond area (286 feet to 202 feet above mean sea level), area west of Kettle Pond (279 feet to 155 feet above mean sea level), and the former lagoon area (306 feet to 282 feet above mean sea level) (Fluor Daniel GTI, 1998).

Based on the PRP's TI Report, EPA determined that "remediating groundwater to drinking water quality may not be achievable in certain areas of the Hocomonco Pond Site" (EPA, 1999). The 1992 SDD allowed for the re-evaluation of the interim cleanup levels during implementation of the selected remedy. The interim groundwater cleanup levels established in the SDD assumed that groundwater restoration was an achievable goal. On September 21, 1999, EPA issued a second ESD that waived the groundwater ARARs and interim cleanup levels in the two TI zones identified in the PRP's TI report. The 1999 ESD also required that DNAPL recovery continue until it is determined to be "no longer technically practicable."

EPA and MassDEP concluded that this modified remedy was adequately protective of human health and the environment because institutional controls, long-term monitoring, and continuing DNAPL recovery activities were required as part of the TI waiver (EPA, 1999). The 1999 ESD allowed the in-situ bioremediation system to be discontinued, but required DNAPL recovery to "continue until the EPA and MADEP give a written approval stating otherwise" (EPA, 1999). The 1999 ESD also required groundwater monitoring and surface water and sediment sampling to ensure that the groundwater is hydraulically contained and contaminant levels do not increase in concentration or extent. Should levels increase, the ESD stated that additional site work or engineering controls may be required. Finally, the 1999 ESD required that a deed restriction be placed on the Hocomonco Pond property to prohibit groundwater extraction, as discussed in Section 4.3.9 below. The PRP prepared a long term monitoring plan (LTMP), as required by EPA in the 1999 ESD.

2013 Explanation of Significant Differences

This ESD was issued to require the continued removal of DNAPL by passive recovery methods. The 1992 ESD had required that DNAPL be "removed through pumping prior to or during bioremediation." The 1999 ESD stated that "DNAPL recovery shall continue until such time that it can be demonstrated that it is no longer technically practicable." While the 1999 ESD established a TI waiver ending active pumping efforts to achieve cleanup levels, the above statement implied that active pumping to remove DNAPL was required to continue. Passive recovery efforts performed since 2003 have demonstrated that active pumping is not required to achieve meaningful DNAPL recovery. Extensive groundwater monitoring concludes that the DNAPL is not migrating, and no potential down gradient receptors have been identified.

The ESD also establishes a new TI zone boundary in the area just down gradient of the former lagoon. Since 2002, concentrations of naphthalene and benzene have frequently exceeded groundwater cleanup levels in monitoring well MLC-2. Since 2007, concentrations of benzene have also frequently exceeded its cleanup level in MLC-3. Both of these wells are located down gradient and just outside of the existing TI zone associated with the former lagoon area. The shore of Hocomonco Pond is about 200 feet down gradient from the former lagoon area. Previous studies have indicated that the pond provides a natural hydraulic barrier. In 2012, the PRP completed a vertical profile boring and two new well pairs: MLC-5S/D and MLC-6S/D, approximately 100 feet down gradient of MLC-2 and MLC-3. Groundwater samples collected from the profile boring in November 2012 and from the new well pairs in January 2013 show no exceedances of cleanup levels. Where detected, concentrations of naphthalene and benzene were near the laboratory detection limits. The northwest boundary of the TI zone around

the former lagoon area will be extended by approximately 100 feet and remain south of the new sentinel monitoring wells MLC-5S/D and MLC-6S/D. This represents a minor expansion of the established TI zone. MLC-5S/D and MLC-6S/D shall become the new sentinel wells and will be incorporated into the monitoring program to ensure compliance with the expanded TI boundary. The use of monitoring wells to ensure compliance with the TI boundary is consistent with the 1999 ESD. There are no known receptors located down gradient of these new sentinel wells. Hocomonco Pond is located approximately 100 feet down gradient of these new sentinel wells and is a natural hydraulic barrier to further groundwater migration. There is an active surface water and sediment monitoring program established in the pond. Detected concentrations of PAHs in sediment and surface water have remained low and stable.

Remedy Implementation

The groundwater treatment plant was constructed between November 1993 and July 1994 to treat water containing dissolved and suspended oil, and/or solids pumped from several recovery wells located on-Site, as well as the water collected in the drying beds during dewatering of excavations and saturated sediments. The plant was designed to operate at a total flow of about 150 gallons per minute (gpm); approximately 135 gpm would be from groundwater, and 15 gpm from solids and DNAPL. The main unit processes in the treatment plant include pH adjustment, polymer addition, dissolved air flotation, multimedia filtration, and carbon adsorption. Treated effluent was discharged to Hocomonco Pond. Startup of the plant began on August 9, 1994.

The primary objectives of the groundwater pump and treat system were to remove DNAPL from a series of recovery wells and treat the associated contaminated groundwater; and to recover and treat contaminated groundwater from Kettle Pond, add nutrients to enhance bioremediation, and then reinject the treated water through a series of reinjection wells.

The in-situ bioremediation portion of the treatment system began operation on March 4, 1996. Operation of the system was suspended on March 18, 1996 due to problems with dissolved, naturally-occurring iron in the groundwater. The 1992 ESD stated that if the combination of DNAPL recovery and in-situ bioremediation could not remediate the creosote contamination, then other technologies, such as in-situ soil flushing, will be implemented. Two other treatment alternatives, air sparging and natural attenuation, were evaluated. The evaluation concluded that the effectiveness of both technologies was limited due to the presence of residual and free phase DNAPL. Based on experience with other sites contaminated with creosote at DNAPL concentrations, EPA then recommended that a technical impracticability demonstration be completed for certain areas of the Site.

Following shutdown of the bioremediation system in 1996, the DNAPL recovery wells continued to operate at a rate of 5 to 10 gpm. The DNAPL was collected in a storage tank located behind the water treatment plant for off-Site disposal; associated groundwater continued to be processed through the treatment plant and discharged to Hocomonco Pond. Overall DNAPL recovery rates averaged 500 gallons per month (range from 150 to 1,500 gallons per month).

In 1997, the PRP conducted investigations to establish Site-wide groundwater quality conditions and determine whether it would be practical to restore groundwater at the Site to the interim groundwater cleanup standards. The investigations involved performing groundwater and pore water sampling and analysis at 55 locations on-Site. Groundwater and pore water samples were analyzed for PAHs, BTEX, and filtered and unfiltered (total) arsenic and chromium.

Benzene and naphthalene were the most frequently detected contaminants exceeding the interim groundwater cleanup levels. Since benzene and naphthalene had historically exceeded the cleanup levels, the technical impracticability ("TI") evaluation focused on these compounds as the primary constituents of concern. The results and conclusions of this investigation were presented in a "Report Demonstrating the Technical Impracticability of Restoring Groundwater at the Hocomonco Pond Site," dated April 1998.

The TI report concluded that there were two primary DNAPL entry locations on the Site, the Kettle Pond area and the former lagoon area. Soil samples collected from borings in the Kettle Pond area confirmed that DNAPL was present in both shallow and deep soil samples; test pits in the former lagoon area encountered DNAPL in the unsaturated soils only.

Due to the lack of DNAPL at depth around the former lagoon area, recovery efforts were focused to the area west of Kettle Pond. By September 1999, approximately 31,000 gallons of DNAPL had been recovered. Given the extent of DNAPL contamination present at the Site, the TI report concluded that: "The presence of residual phase DNAPL represents a long-term source for impacts to groundwater since this phase of DNAPL is difficult to remove. Locating all free phase DNAPL sources and the inability to remediate residual phase DNAPL makes groundwater restoration technically impracticable."

The report also stated that there was no significant risk to human health or the environment posed by the presence of free phase or residual phase DNAPL at the Site, and suggested implementing institutional controls to mitigate potential future risk. Based on these conclusions, the EPA "Guidance for Evaluating the Technical Impracticability of Groundwater Restoration," and other relevant documents, the PRP requested a waiver of interim groundwater cleanup levels for the areas within the defined TI zone. The horizontal extent of the TI zone is shown in Figure 2. The vertical extent of the TI zone is approximately 80 to 120 feet below ground surface in the Kettle Pond area and 30 feet below ground surface in the former lagoon area.

On September 21, 1999, EPA issued the second ESD which waived the groundwater ARARs and interim cleanup levels in the two TI zones identified in the PRP's TI report. The ESD required a groundwater monitoring program be established to ensure compliance with interim groundwater cleanup levels outside the TI zones. The 1999 ESD also required that DNAPL recovery continue until it is determined to be "no longer technically practicable."

In May 2003, the PRP began operating the DNAPL recovery system in passive mode. This process involves using submersible pumps already installed in wells DRW-1, DRW-2, DRW-3, BRW-4 and BRW-5 to evacuate accumulated DNAPL on a weekly basis. In wells A-2, A-4, A-10 and BMW-6, submersible pumps are not present and DNAPL is removed by bailers. The DNAPL product is then transferred to drums for off-Site disposal. Monthly recovery rates have averaged approximately 60 gallons per month (range from 30 to 100 gallons per month). About 65,000 gallons of total DNAPL have been recovered from combined efforts to date. The passive recovery method is independent of the groundwater extraction and treatment system, therefore operation of the treatment system was discontinued.

The PRPs have drafted deed restrictions as required by the ROD and 1999 ESD. The proposed restrictions prohibit any future development on the landfill and former lagoon area caps, and prohibit the extraction of the groundwater for purposes other than the remedial action unless the extracted

groundwater meets or is treated to appropriate water use or disposal standards. EPA and MADEP are working to finalize the institutional controls and record them on the property deed.

Between November 5, 2012 and January 3, 2013, the PRPs completed several activities with a goal to enhance the passive DNAPL recovery effort. Enhancement activities included:

- Cleaning and video inspection of 6 existing recovery wells: DRW-1, DRW-2, DRW-3, A-4, A-10 and BRW-5. The goal of this effort was to clean the well screens and remove excess sludge from the well sumps to enhance product recovery, and then inspect the condition of the well screens.

- Video inspection of 5 additional area monitoring wells: C-3, MW-11S, MW-11D, MW-12S and MW-12D. The goal of this effort was to ensure the well screens were not blocked since these wells are located in suspected areas of DNAPL.

- Installation and operation of a new passive recovery well: DRW-4. The goal of this effort was to place a new well in a suspected area of DNAPL between 2 existing higher production recovery wells to increase recovery rates. So far this well has produced an average recovery rate of about 15 gallons of DNAPL per month.

The PRP continues to maintain the treatment system and associated building pending a final agency decision on DNAPL recovery, which is being addressed per this ESD.

In 2000, concentrations of benzene and naphthalene in monitoring well MLC-2 climbed above their respective interim groundwater cleanup levels. In 2006, the concentrations of benzene and naphthalene also climbed above the interim groundwater cleanup levels in MLC-3. MLC-2 and 3 are sentinel wells located down gradient and just outside the TI zone established in the former lagoon area (see Figure 4). Through 2011, concentrations in both wells continued to fluctuate above and below the interim cleanup levels, but were more often above (see Tables 1 and 2). There were no additional monitoring wells down gradient of MLC-2 and 3.

Between November 5, 2012 and January 3, 2013, the PRPs completed a TI zone assessment in the area down gradient of the former lagoon and monitoring wells MLC-2 and 3. A vertical profile boring was completed to assess groundwater quality in the area. The groundwater table was encountered and sampled at 35 feet below ground surface. Subsequent samples were collected every 20 feet of depth to the top of bedrock at 130 feet below ground surface. The samples were analyzed for benzene and PAHs. The interim groundwater cleanup levels were not exceeded in any samples.

The PRP installed two nested well pairs in the area of the boring: MLC-5S/D and MLC-6S/D. The new wells were sampled on January 3, 2013. Detected benzene concentrations ranged from 0.66 to 0.82 ppb; well below the cleanup level of 5.0 ppb. Detected naphthalene concentrations ranged from 0.34 to 2.0 ppb; well below the cleanup level of 1,500 ppb.

System Operation/Operation and Maintenance

The ROD specified the following O&M activities for the former lagoon area: long-term groundwater monitoring, cap maintenance, and mowing to maintain the cover and prevent tree growth (EPA, 1985).

In addition, institutional controls in the form of deed restrictions were required. Monitoring wells were installed around the perimeter of the former lagoon. Following baseline monitoring, annual groundwater monitoring was initiated in 1995.

The ROD specified the following O&M activities for the on-site RCRA double-lined landfill: groundwater monitoring, facility inspection and maintenance, and leachate collection and treatment. In addition, land use restrictions were required. The landfill and former lagoon area are visually inspected on a periodic basis and the four monitoring wells around each area are sampled annually.

The remedy for the Otis Street area specified periodic surface water monitoring at the Hocomonco Pond discharge stream as the only O&M requirement. This monitoring requirement has been fulfilled. No surface water monitoring was performed during the current five-year review period. The ROD also required a deed restriction for the Otis Street embankment.

The remedies for the isolated areas, Hocomonco Pond and discharge stream, and the Kettle Pond area all involved placement of dredged or excavated materials in either the former lagoon area or in the on-site landfill designed to meet RCRA technical standards. Therefore there are no separate O&M activities specified in the ROD for these areas beyond those described above.

Consistent with the terms of the 1999 ESD and the TI waiver, the PRP developed a long term monitoring plan (LTMP) for groundwater, DNAPL, and sediment to confirm that levels do not increase in concentration or extent. The first phase of the long term monitoring program included performance of baseline biological monitoring in May 2002. The objective of this monitoring was to characterize the conditions prior to commencement of routine long-term monitoring and collect baseline data to be used to confirm that the TI waiver remains a protective remedy. The baseline monitoring included analysis of sediment samples for PAHs, total organic carbon (TOC), grain size, and percent solids, sediment bioassay testing, and a benthic invertebrate community survey. The benthic survey included locations within the TI zone as well as reference locations elsewhere in Hocomonco Pond.

The LTMP required semi-annual sampling events for a period of 5 years. The 5 years of data would then be used to identify any notable trends according to the criteria in the LTMP (e.g., increasing, decreasing, or no trend). This evaluation, following the decision tree outlined in the LTMP, would be the basis for decisions regarding continued monitoring at the Site, or other actions.

The LTMP was implemented in late 2000, with the first semi-annual event conducted in November. The elements of the LTMP include: water level measurements in 63 wells (semi-annually); groundwater sampling of 6 wells (semi-annually) and 2 wells (annually); measurement of DNAPL thickness (annually); and sediment sampling at 4 locations (semi-annually). Groundwater samples were analyzed for PAHs and BTEX. Sediment samples were analyzed for PAHs, TOC, percent solids, and grain size. Analysis for arsenic and chromium was not included as part of the LTMP based on the results and conclusions of the 1997 investigation which supported the TI waiver and 1999 ESD.

In addition, the 1999 ESD also required collection of sediment samples. Each sample was a composite collected from the upper 6 inches of sediment. All sediment samples were analyzed for PAHs, TOC,

and grain size. A Sediment Sampling Plan, initially developed in 1998, was included as Appendix A of the LTMP. This Plan states that the sediment sample results will be compared to the cleanup criteria established in the SDD. If the sediment monitoring data indicate that cleanup levels are exceeded, the Plan states that the agencies and PRP will "discuss and agree upon appropriate additional investigative activities."

While these general O&M activities continue, an updated LTMP is necessary to describe the specific monitoring activities consistent with the 2013 ESD. The specific O&M activities which are currently being performed are summarized in Section 2, Table 5 of this report. Annual O&M costs currently average $102,000.

APPENDIX B

ADDITIONAL FIGURES, TABLES AND PHOTOS

FIGURE B-1: SITE LOCATION MAP

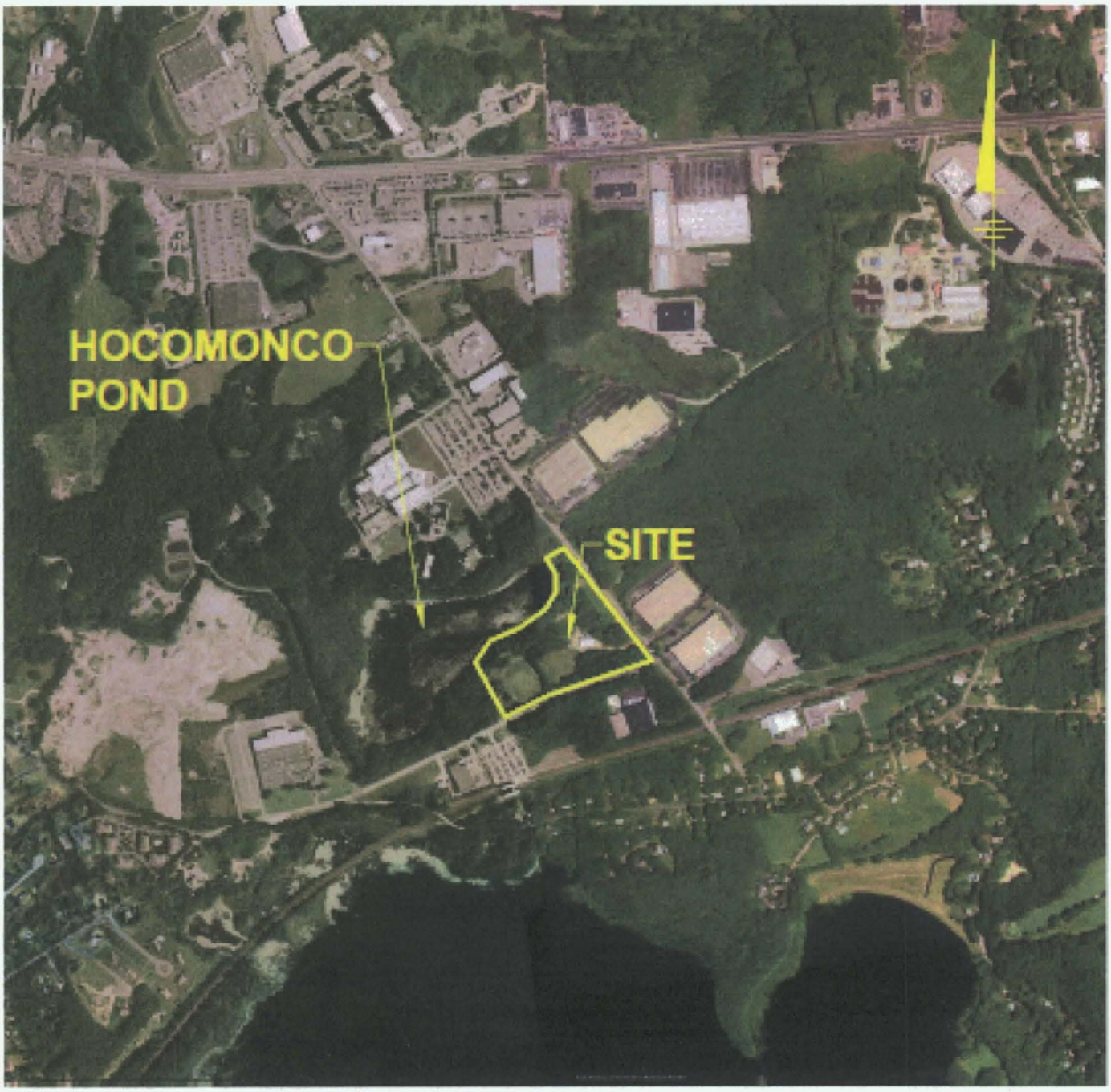


FIGURE B-2: FOUR PRIMARY AREAS OF CONTAMINATION

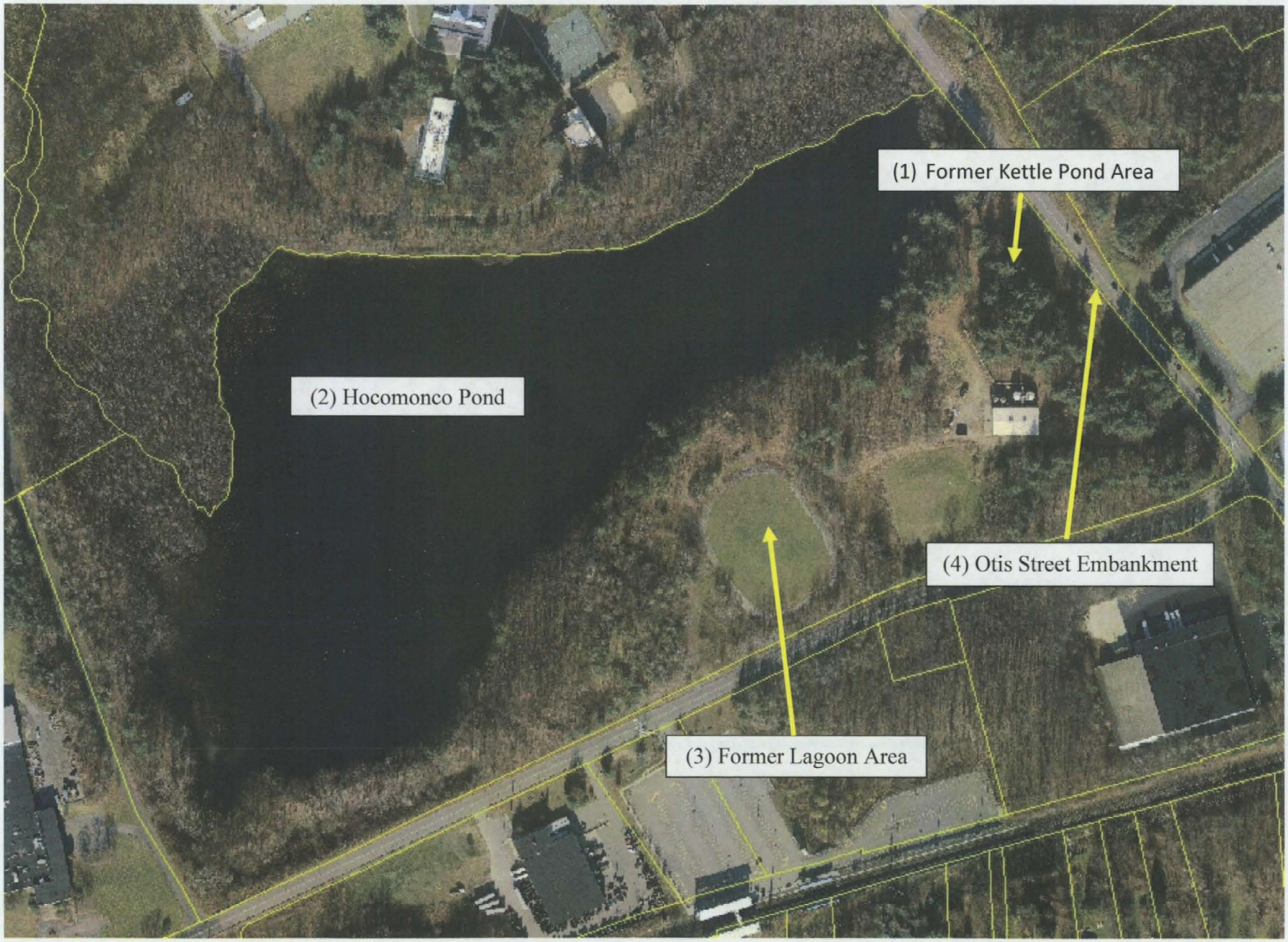


FIGURE B-3: TI ZONES ESTABLISHED IN 1999 ESD

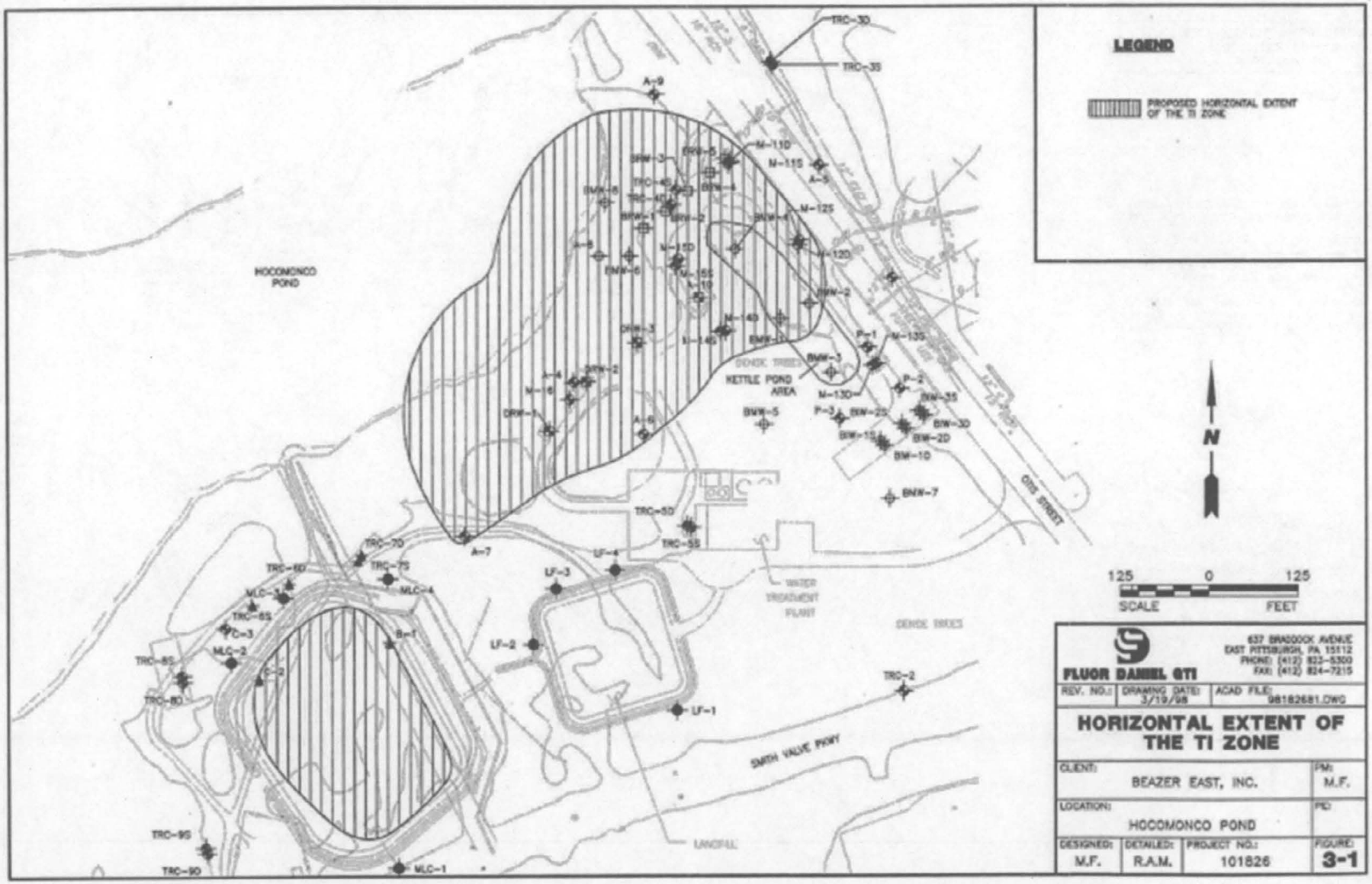


FIGURE B-4: Hocomonco Pond Site Monitoring Wells and DNAPL Recovery Wells (shown in yellow highlight)

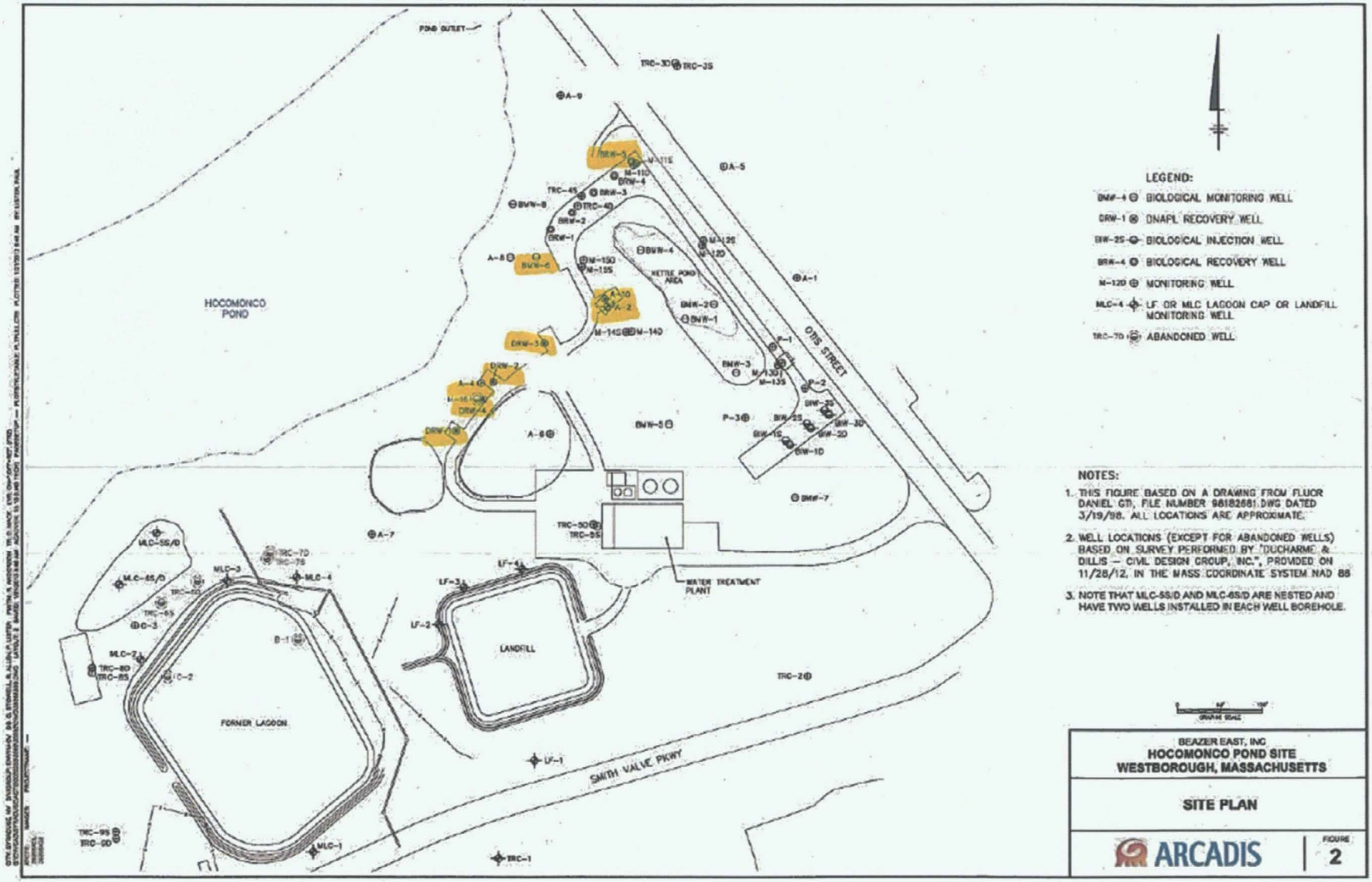
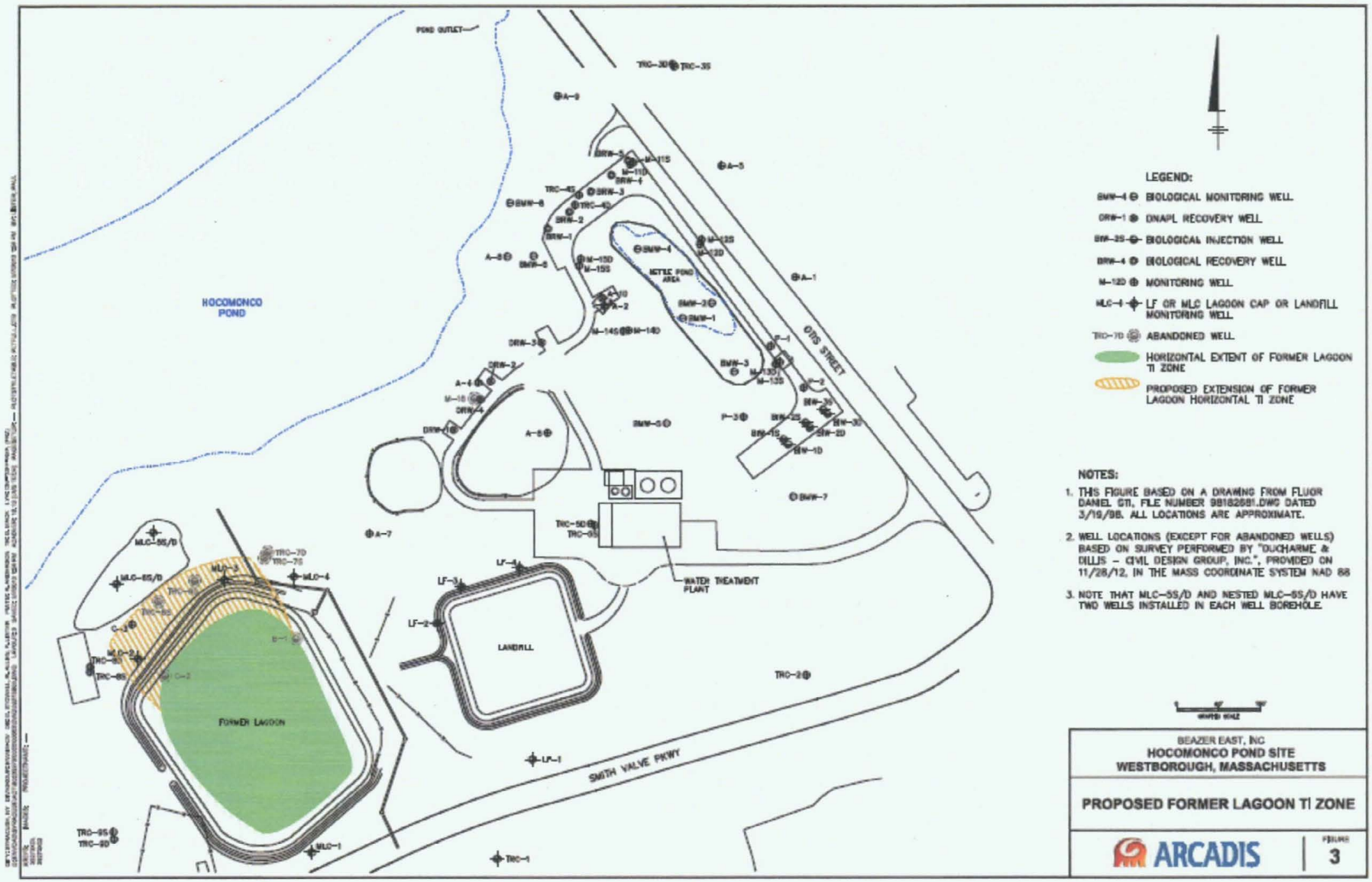


FIGURE B-5: Expanded TI Zone Compliance Boundary for the Former Lagoon



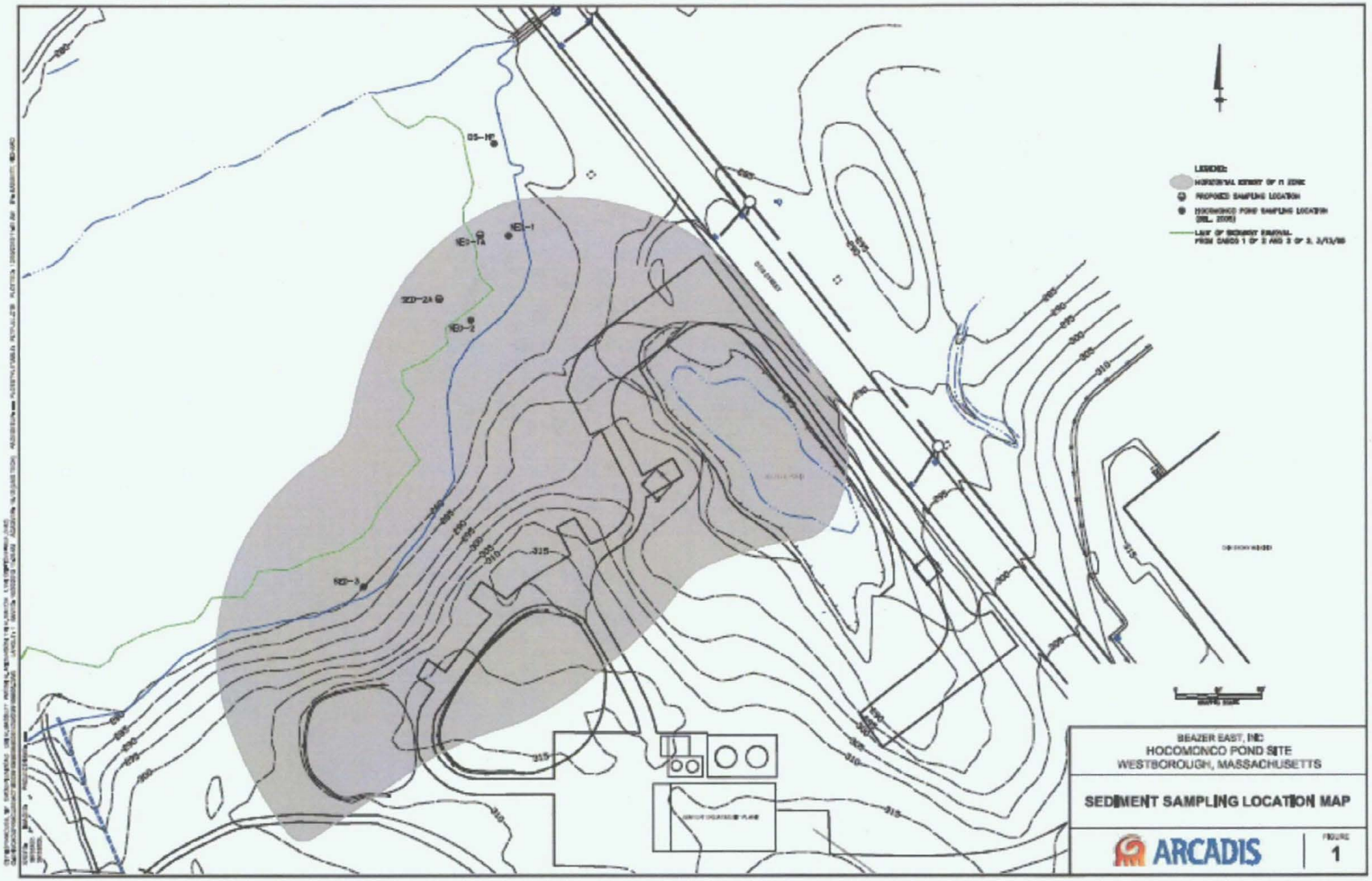


FIGURE B-6: Sediment Sample Locations

TABLE B-1: MLC-2 Concentrations 2000 to 2011 (Exceedances in yellow highlight)

Compound/Analyte	Units	MLC-2														
		11/3/00	10/31/01	10/31/01	10/30/02	10/30/02	12/18/02	10/30/03	10/28/04	11/14/06	11/13/07	11/11/08	11/17/09	11/2/10	9/7/11	12/29/11
VOCs																
BENZENE	ug/L	5.6	21	19.2	NA	NA	12.3	22.6	13.2	11.3	4.4	7.9	5.2	13.4	1.1	10.4
TOLUENE	ug/L	5.0 U	40.7	38.4	NA	NA	21.5	35.3	33.4	36.4	18.3	22.7	21.9	50.7	1.5	21.1
ETHYLBENZENE	ug/L	5.0 U	15.3	13.3	NA	NA	11.8	14.3	12	14.5	7.2	10	9.3	15.6	1.2	12.2
XYLENE (TOTAL)	ug/L	8.4	68.6	65.4	NA	NA	51.1	64.9	51.2	59.7	28.3	37.4	38.6	62.9	3.9	56.8
SVOCs																
2-METHYLNAPHTHALENE	ug/L	NA	NA	NA	NA	NA	NA	NA	NA	39.4	23.6	24.1	24.0	21.5	6.4	23.9
ACENAPHTHENE	ug/L	200 U	16.7	19	51 U	51 U	NA	7.9	12.7	17.8	17.5	23.8	19.5	59.7	7.7	1.1
ACENAPHTHYLENE	ug/L	200 U	5.3 U	2.8 J	51 U	51 U	NA	1.3 J	1.8 J	5.1 U	1.0 J	1.9 J	5.0 U	4.0	0.43	0.11 U
ANTHRACENE	ug/L	26 J	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	30.8	0.11 U	0.053 U
BENZO(A)ANTHRACENE	ug/L	200 U	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	5.4 U	0.055 U	0.11 U
BENZO(A)PYRENE	ug/L	200 U	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	11 U	0.11 U	0.092
BENZO(B)FLUORANTHENE	ug/L	200 U	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	5.4 U	0.055 U	0.11
BENZO(G,H,I)PERYLENE	ug/L	200 U	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	11 U	0.11 U	0.11 U
BENZO(K)FLOURANTHENE	ug/L	200 U	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	11 U	0.11 U	0.11 U
CHRYSENE	ug/L	200 U	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	11 U	0.11 U	0.11 U
DIBENZO(A,H)ANTHRACENE	ug/L	200 U	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	11 U	0.11 U	0.11 U
FLUORANTHENE	ug/L	200 U	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	11 U	0.11 U	34.4
FLUORENE	ug/L	200 U	9.9	11.6	51 U	51 U	NA	3.1 J	7.2	8.6	15.3	13.3	13.4	69.5	10.1	0.11 U
INDENO(1,2,3-CD)PYRENE	ug/L	200 U	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	11 U	0.11 U	26.8
NAPHTHALENE	ug/L	2000	4140	4190	5350	4110	NA	1630	1240 D	2230	1660	2110	701 D	6720	423	2140
PHENANTHRENE	ug/L	29 J	39.7	46.1	51 U	51 U	NA	12.4	16.5	9.6	13.3	9.9	12.5	30.4	2.6	14.5
PYRENE	ug/L	200 U	5.3 U	5.2 U	51 U	51 U	NA	5.6 U	5.0 U	5.1 U	5.3 U	5.3 U	5.0 U	11 U	0.11 U	0.11 U

NOTES:

ug/L - Micrograms per liter.

J - The compound was positively identified; however, the associated numerical value is an estimated concentration only.

U - The compound was analyzed for but not detected. The associated numerical value is the practical quantitation limit.

D - The compound concentration was determined after sample dilution.

TABLE B-2: MLC-3 Concentrations 2004 to 2011 (Exceedances in yellow highlight)

Compound/Analyte	Units	MLC-3								MLC-4							
		10/28/04	11/14/06	11/13/07	11/11/08	11/17/09	11/2/10	9/7/11	12/29/11	10/28/04	11/14/06	11/13/07	11/11/08	11/17/09	11/2/10	9/7/11	12/29/11
VOCs																	
BENZENE	ug/L	NA	67.1	84.3	36.2	50.6	7.0	4.4	1.4	NA	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
TOLUENE	ug/L	NA	35.5	39.3	18.2	41.7	1.7	1.7	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.00 U	1.00 U	1.0 U	1.0 U
ETHYLBENZENE	ug/L	NA	25.2	21.6	11.2	16.2	1.3	1.4	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.00 U	1.00 U	1.0 U	1.0 U
XYLENE (TOTAL)	ug/L	NA	63.3	51.6	23.8	48.1	1.1	2.3	1.0 U	NA	1.0 U	1.0 U	1.0 U	1.00 U	1.00 U	1.0 U	1.0 U
SVOCs																	
2-METHYLNAPHTHALENE	ug/L	NA	122	31.7	48.1	45.2	10.9	1.8	0.55	NA	5.5 U	5.3 U	5.4 U	5.4 U	0.22 U	1.9	0.10 U
ACENAPHTHENE	ug/L	21.4	37.8	20.8	24.5	17.6	10.8	3.3	0.10 U	2.5 J	5.5	5.3 U	5.4 U	5.4 U	0.11 U	0.95	0.10 U
ACENAPHTHYLENE	ug/L	2.6 J	5.3 U	2.0 J	2.4 J	2.3	0.88	0.25	0.10 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.11 U	0.39	0.10 U
ANTHRACENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.1 U	0.11 U	0.050 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.11 U	0.11 U	0.050 U
BENZO(A)ANTHRACENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.051 U	0.054 U	0.10 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.054 U	0.054 U	0.10 U
BENZO(A)PYRENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.1 U	0.11 U	0.076	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.11 U	0.11 U	0.062
BENZO(B)FLUORANTHENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.051 U	0.054 U	0.10 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.054 U	0.054 U	0.10 U
BENZO(G,H,I)PERYLENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.3	0.11 U	0.10 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.32	0.11 U	0.10 U
BENZO(K)FLOURANTHENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.1 U	0.11 U	0.10 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.11 U	0.11 U	0.10 U
CHRYSENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.1 U	0.11 U	0.10 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.11 U	0.11 U	0.10 U
DIBENZO(A,H)ANTHRACENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.1 U	0.11 U	0.10 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.11 U	0.11 U	0.10 U
FLUORANTHENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.1 U	0.11 U	0.10 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.11 U	0.11 U	0.10 U
FLUORENE	ug/L	2.3 J	5.3 U	1.3 J	5.3 U	1.1	0.68	0.18	0.10 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.11 U	0.15	0.10 U
INDENO(1,2,3-CD)PYRENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.1 U	0.11 U	0.41	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.11 U	0.11 U	0.20 U
NAPHTHALENE	ug/L	691 D	1630	861	924	820	292 D	54.3	12.3	75.1	188	10.3	5.4	1.7	0.11 U	33.1	0.10 U
PHENANTHRENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.079	0.054 U	0.050 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.054 U	0.054 U	0.050 U
PYRENE	ug/L	5.0 U	5.3 U	5.0 U	5.3 U	5.3 U	0.1 U	0.11 U	0.10 U	5.0 U	5.5 U	5.3 U	5.4 U	5.4 U	0.11 U	0.11 U	0.10 U

NOTES:

ug/L - Micrograms per liter.

J - The compound was positively identified; however, the associated numerical value is an estimated concentration only.

U - The compound was analyzed for but not detected. The associated numerical value is the practical quantitation limit.

D - The compound concentration was determined after sample dilution.

TABLE B-3: MLC-5S/D and MLC-6S/D Concentrations 2013 (No Exceedances)

Well ID: Sample Date:	Interim Groundwater Cleanup Levels	MLC-5S 1/3/2013	MLC-5S 11/11/2013	MLC-5D 1/3/2013	MLC-5D 11/11/2013	MLC-6S 1/3/2013	MLC-6S 11/12/2013	MLC-6D 1/3/2013	MLC-6D 11/12/2013
VOCs:									
Benzene	5	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U	0.50 U
Toluene	1,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Ethylbenzene	700	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
Xylene (Total)	10,000	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U	1.0 U
SVOCs:									
Acenaphthene	2,200	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U
Acenaphthylene	-	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U
Anthracene	11,000	0.046 J	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U
Benzo(a)anthracene	-	0.054 U	0.029 J	0.056 U	0.023 J	0.053 U	0.051 U	0.054 U	0.051 U
Benzo(a)pyrene	0.2	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U
Benzo(b)fluoranthene	-	0.054 U	0.051 U	0.056 U	0.050 U	0.053 U	0.051 U	0.054 U	0.051 U
Benzo(g,h,i)perylene	-	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U
Benzo(k)fluoranthene	-	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U
Chrysene	-	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U
Dibenzo(a,h)anthracene	-	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U
Fluoranthene	1,500	0.049 J	0.27	0.11 U	0.35	0.11 U	0.18	0.11 U	0.22
Fluorene	1,500	0.11 U	0.10 U	0.11 U	0.10 U	0.065 J	0.10 U	0.11 U	0.10 U
Indeno(1,2,3-cd)pyrene	-	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U	0.11 U	0.10 U
2-Methylnaphthalene	-	0.22 U	0.20 U	0.22 U	0.20 U	0.21 U	0.20 U	0.22 U	0.20 U
Naphthalene	1,500	0.058 J	0.10 U	0.10 J	0.054 J	2.0	0.10 U	0.11 U	0.10 U
Phenanthrene	-	0.17	0.32	0.062	0.53	0.073	0.12	0.032 J	0.21
Pyrene	1,100	0.11 U	0.17	0.11 U	0.22	0.11 U	0.12	0.11 U	0.13

TABLE B-4: Recent DNAPL Recovery Volumes

				April 2, 2014			April 7, 2014			April 17, 2014			April 22, 2014			Month
Well ID	Well Casing Volume	DNAPL Removal Threshold [1]	Depth to Bottom	Depth to Water	DNAPL Thickness	DNAPL Removed[3]	Depth to Water	DNAPL Thickness	DNAPL Removed	Depth to Water	DNAPL Thickness	DNAPL Removed	Depth to Water	DNAPL Thickness	DNAPL Removed	DNAPL Removed[3]
	(gal/ft)		(ft)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(gal)
DRW-1	2.61	4 ft	131.40	38.26	1.43	0.00	38.02	2.36	0.00	37.94	3.14	0.00	37.90	3.14	0.00	0.00
DRW-2	2.61	4 ft	146.00	38.74	3.81	0.00	38.49	4.02	20.00	38.32	2.93	0.00	38.25	2.93	7.65	27.65
DRW-3	2.61	4 ft	97.15	31.26	1.24	0.00	31.09	2.65	0.00	31.08	3.32	0.00	33.98	3.32	0.00	0.00
DRW-4 [2]	1.47	4 ft	132.31	39.45	8.10	14.00	39.19	0.25	0.00	39.04	2.81	0.00	38.98	3.60	0.00	14.00
A-2	1.47	4 ft	NM	NM	NM	6.00	NM	NM	0.00	NM	NM	0.00	NM	NM	0.00	6.00
A-4	1.47	4 ft	147.00	38.40	0.89	0.00	38.18	0.91	0.00	38.13	3.81	0.00	38.02	4.65	10.85	10.85
A-6	0.16	4 ft	147.20	36.46	0.05*	0.00	36.21	0.13	0.00	36.17	0.03*	0.00	36.00	0.03	0.00	0.00
A-10	1.47	4 ft	71.80	21.21	0.04	0.00	21.14	0.58	0.00	21.14	0.40*	0.00	21.09	0.40	0.00	0.00
BMW-4	2.61	4 ft	49.50	3.64	0.03	0.00	3.56	0.03	0.00	3.56	0.04	0.00	3.48	0.05	0.00	0.00
BMW-6	0.16	4 ft	71.20	13.57	0.97	0.00	13.49	2.11	0.00	13.54	2.25	0.00	13.48	2.25	0.00	0.00
BRW-4	2.61	4 ft	72.55	9.55	0.00	0.00	9.73	0.03	0.00	9.71	0.00*	0.00	9.63	0.00	0.00	0.00
BRW-5	2.61	4 ft	65.25	8.49	0.09	0.00	8.57	0.21	0.00	8.60	0.58	0.00	8.58	0.60	0.00	0.00
M-11D	0.16	1 ft	43.65	8.82	0.03	0.00	8.69	0.03	0.00	8.69	0.07	0.00	8.68	0.07	0.00	0.00
M-12S	0.16	1 ft	27.95	10.34	0.03	0.00	10.55	0.06	0.00	10.63	0.04*	0.00	10.69	0.04	0.00	0.00
				Total Removed		20.00	Total Removed		20.00	Total Removed		0.00	Total Removed		18.50	58.50

				May 1, 2014			May 7, 2014 [1]			May 14, 2014			May 21, 2014			May 30, 2014			Month
Well ID	Well Casing Volume	DNAPL Removal Threshold [1]	Depth to Bottom	Depth to Water	DNAPL Thickness	DNAPL Removed	Depth to Water	DNAPL Thickness	DNAPL Removed[3]	Depth to Water	DNAPL Thickness	DNAPL Removed	Depth to Water	DNAPL Thickness	DNAPL Removed	Depth to Water	DNAPL Thickness	DNAPL Removed	DNAPL Removed[3]
	(gal/ft)		(ft)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(gal)
DRW-1	2.61	4 ft	131.40	37.68	3.89	0.00	37.97	4.39	18.50	37.78	0.94	0.00	37.84	0.98	0.00	37.93	2.13	0.00	18.50
DRW-2	2.61	4 ft	146.00	38.21	2.21	0.00	38.29	4.03	17.25	38.09	1.69	0.00	38.18	1.78	0.00	38.29	3.08	0.00	17.25
DRW-3	2.61	4 ft	97.15	30.97	3.29*	0.00	31.11	3.19*	4.00	30.96	1.32	0.00	31.00	1.48	0.00	31.16	2.48	0.00	4.00
DRW-4 [2]	1.47	4 ft	132.31	38.96	0.68*	0.00	39.00	2.44	7.00	38.09	1.01	0.00	38.90	0.81*	0.00	39.94	1.92	0.00	7.00
A-2	1.47	4 ft	NM	NM	NM	0.00	NM	NM	5.00	NM	NM	0.00	NM	NM	0.00	NM	NM	0.00	5.00
A-4	1.47	4 ft	147.00	38.03	0.51	0.00	38.19	1.06	5.00	38.01	0.03	0.00	38.01	0.11	0.00	38.16	0.91	0.00	5.00
A-6	0.16	4 ft	147.20	35.89	0.03	0.00	36.08	0.03	0.00	36.01	0.03	0.00	35.08	0.03	0.00	38.16	0.03	0.00	0.00
A-10	1.47	4 ft	71.80	21.05	0.04*	0.00	21.24	0.06	0.00	21.19	0.04*	0.00	21.22	0.13	0.00	21.34	0.17	0.00	0.00
BMW-4	2.61	4 ft	49.50	3.45	0.03*	0.00	3.69	0.03	0.00	3.67	0.03	0.00	3.70	0.04	0.00	3.89	0.03*	0.00	0.00
BMW-6	0.16	4 ft	71.20	13.48	1.82*	0.00	13.63	2.14	0.75	13.52	0.99	0.00	13.55	2.03	0.00	13.71	2.63	0.00	0.75
BRW-4	2.61	4 ft	72.55	9.62	0.00	0.00	9.91	0.00	0.00	10.87	0.00	0.00	9.91	0.00	0.00	10.05	0.00	0.00	0.00
BRW-5	2.61	4 ft	65.25	8.41	0.03*	0.00	8.76	0.43	2.50	8.69	0.01	0.00	8.75	0.04	0.00	9.00	0.05	0.00	2.50
M-11D	0.16	1 ft	43.65	8.79	0.02*	0.00	9.06	0.12	0.00	9.03	0.03*	0.00	9.07	0.03	0.00	9.21	0.03	0.00	0.00
M-12S	0.16	1 ft	27.95	10.50	0.03*	0.00	10.65	0.06	0.00	10.96	0.03*	0.00	11.03	0.05	0.00	11.26	0.05	0.00	0.00
				Total Removed		0.00	Total Removed		60.00	Total Removed		0.00	Total Removed		0.00	Total Removed		0.00	60.00

				June 4, 2014			June 13, 2014			June 19, 2014			June 23, 2014			June 30, 2014			Month
Well ID	Well Casing Volume	DNAPL Removal Threshold [1]	Depth to Bottom	Depth to Water	DNAPL Thickness	DNAPL Removed	Depth to Water	DNAPL Thickness	DNAPL Removed[3]	Depth to Water	DNAPL Thickness	DNAPL Removed	Depth to Water	DNAPL Thickness	DNAPL Removed	Depth to Water	DNAPL Thickness	DNAPL Removed	DNAPL Removed[3]
	(gal/ft)		(ft)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(ft)	(ft)	(gal)	(gal)
DRW-1	2.61	4 ft	131.40	37.30	2.67	0.00	38.25	2.87	0.00	38.41	4.01	12.00	39.56	0.05	0.00	38.62	0.09	0.00	12.00
DRW-2	2.61	4 ft	146.00	29.23	3.42	0.00	38.56	6.21	18.50	38.69	1.89	0.00	38.68	1.62*	0.00	38.96	2.74	10.00	28.50
DRW-3	2.61	4 ft	97.15	31.01	2.82	0.00	32.53	2.56*	0.00	31.61	3.12	0.00	31.78	3.37	0.00	31.85	3.04*	0.00	0.00
DRW-4 [2]	1.47	4 ft	132.31	38.95	2.31	0.00	39.30	3.29	0.00	39.39	3.03*	0.00	39.60	3.28	0.00	39.68	3.52	0.00	0.00
A-2	1.47	4 ft	NM	NM	NM	0.00	NM	NM	6.00	NM	NM	0.00	NM	NM	0.00	NM	NM	0.00	6.00
A-4	1.47	4 ft	147.00	38.04	1.31	0.00	38.36	2.38	0.00	38.61	2.79	0.00	38.74	3.13	0.00	38.79	5.62	14.00	14.00
A-6	0.16	4 ft	147.20	36.10	0.05	0.00	36.43	0.05	0.00	36.65	0.05	0.00	36.68	0.05	0.00	36.93	0.03*	0.00	0.00
A-10	1.47	4 ft	71.80	21.38	0.05*	0.00	21.73	0.05	0.00	21.84	0.05	0.00	22.08	0.05	0.00	22.21	0.32	0.00	0.00
BMW-4	2.61	4 ft	49.50	3.86	0.02*	0.00	4.21	0.03	0.00	4.40	0.03	0.00	4.59	0.05	0.00	4.71	0.06	0.00	0.00
BMW-6	0.16	4 ft	71.20	13.60	2.49*	0.00	13.98	1.92*	0.00	14.23	2.31	0.00	14.37	2.71	0.00	14.43	2.29*	0.00	0.00
BRW-4	2.61	4 ft	72.55	9.99	0.00	0.00	10.38	0.00	0.00	10.57	0.00	0.00	10.73	0.00	0.00	10.78	0.00	0.00	0.00
BRW-5	2.61	4 ft	65.25	8.63	0.06	0.00	9.22	0.04*	0.00	9.39	0.07	0.00	9.59	0.61	0.00	9.65	0.62	0.00	0.00
M-11D	0.16	1 ft	43.65	9.20	0.04	0.00	9.53	0.03*	0.00	9.71	0.05	0.00	9.81	0.06*	0.00	9.97	0.00*	0.00	0.00
M-12S	0.16	1 ft	27.95	11.34	0.04*	0.00	11.65	0.05	0.00	11.88	0.04*	0.00	12.03	0.05	0.00	12.23	0.14	0.00	0.00
				Total Removed		0.00	Total Removed		24.50	Total Removed		12.00	Total Removed		0.00	Total Removed		24.00	60.50

Notes:

(1) = Product removed quarterly from all wells with a measured DNAPL thickness greater than 0.3 feet.

(2) = DRW-4 installed in November 2012. DNAPL measurements began January 24, 2013.

(3) = The volume of DNAPL removed appears to be greater than the volume present in the well (well casing volume x product thickness) due to entrainment of water and emulsified product during removal.

NM = Not Measured. Well A-2 has an area within the well that, when a probe or tape is inserted, it becomes stuck and is not easily removed. As a result, this well has been pumped out periodically (approximately monthly) without collecting water level or DNAPL thickness measurements, as there is a working pump installed in the well. In the second quarter of 2014, 17.0 gallons of DNAPL was removed from well A-2.

* = Measured accumulated DNAPL demonstrates a reduced amount since previous measurement. Measurements of DNAPL are interpreted by both the audible DNAPL noted by the interface probe, and by visual observations of DNAPL staining on the interface probe tape. The slight variations in observed DNAPL thickness can be attributed to operator interpretation of the two measured data points (audible and visual). Additionally, the visual measurement may sometimes be exaggerated due to DNAPL smearing on the tape of the interface probe while tripping tooling in/out of the well.

TABLE B-5: Summary of Sediment Results

		SED-DSHP (HP)	SED-1 (T1-DS) (T1)	SED-2 (T2-DS) (T2)	SED-3-4 (T3-DS)** (REF2 T3-T4)	SED-1A	SED-2A
Silt/Clay	Dec-98	NA	19.5	4.3	6.7	--	--
	Oct-00	7.9	9.6	4.3	7.1	--	--
	May-01	2.8	17.4	6.3	4.2	--	--
	Nov-01	7.5	17.3	5.5	7.2	--	--
	May-02	19.4	31.9	6.6	7.1	--	--
	Oct-02	0.7	10.5	10.1	4.7	--	--
	May-03	11	14.8	12.1	11.9	--	--
	Oct-03	3.6	11.9	7.4	3.7	--	--
	May-04	13.3	14.9	8.6	7.0	--	--
	Oct-04	10.7	14.4	5.9	4.5	--	--
	May-05	12.55	16.8	8.4	5.6	--	--
	Jul-09	22.8	4.8	6.3	5.7	--	--
	Aug-09	2.25	--	--	--	--	--
	Jun-10	2.2	2.7	8.2	10.0	18.2	2.5
	May-11	8.7	12.1	6.7	9.8	15.8	5.6
	May-12	12.5	8.8	10.2	8.1	11.7	8.3
	Jun-13	--	25.7	7.3	--	12.8	9.8
Total PAH* (mg/kg)	Dec-98	NA	105	32.6	1.18 J	--	--
	Oct-00	0.0 U	90.8	13.2	0.0 U	--	--
	May-01	0.14	69.0	15.6	0.07	--	--
	Nov-01	0.0 U	21.5	14.8	0.18	--	--
	May-02	0.16	143.9	22.95	0.204	--	--
	Oct-02	0.0 U	51.0	8.9	0.0 U	--	--
	May-03	0.0 U	52.1	35.6	0.0 U	--	--
	Oct-03	0.0 U	60.1	18.1	0.04	--	--
	May-04	0.86 J	51.6 J	32.5 J	0.07 J	--	--
	Oct-04	0.59 J	67.5	24.7	0.0 U	--	--
	May-05	0.57 J	78.2 J	34.2 J	0.04 J	--	--
	Jul-09	21.25 J	9.8	13.8	0.0 U	--	--
	Aug-09	0.0 U	--	--	--	--	--
	Jun-10	0.04	13.95	14.575	0.0785	58.7	41.4
	May-11	0.18	107.2	30.0	1.30	54.2	51.0
	May-12	0.64	49.0	28.8	0.10	19.7	27.1
	Jun-13	--	161.1	10.5	--	77	37
Phenanthrene (mg/kg)	Dec-98	NA	9.60	4.30 U	0.20 J	--	--
	Oct-00	0.42 U	3.90	0.43 J	0.42 U	--	--
	May-01	0.40 U	3.90	1.00	0.41 U	--	--
	Nov-01	0.42 U	1.70	1.02	0.43 U	--	--
	May-02	0.62 U	9.30	2.25	0.53 U	--	--
	Oct-02	0.41 U	7.00	0.66	0.42 U	--	--
	May-03	0.43 U	4.15	2.30	0.42 U	--	--
	Oct-03	0.38 U	6.00	1.20	0.40 U	--	--
	May-04	0.13 J	7.30	2.65	0.40 U	--	--
	Oct-04	0.06 J	8.3 D	2.2	0.4 U	--	--
	May-05	0.12 J	4.20	2.30	0.42 U	--	--
	Jul-09	0.57 J	1.4 U	1.4	0.42 U	--	--
	Aug-09	0.39 U	--	--	--	--	--
	Jun-10	0.015 U	2.3	0.86	0.0048 J	1.07	3.7
	May-11	0.042 U	17	2.9	0.11	8.2	5.95
	May-12	0.06 J	9.7	2.65	0.0053 J	3.8	3.3
	Jun-13	--	25	0.775	--	6.3	4.0

Notes:

* Assumes non-detects are equal to zero for Total PAH.

** SED-3 was actually taken equidistant between T3 and T4

U Not detected; value for phenanthrene is reporting limit.

J Estimated concentration

NA Not available

Photos Taken on July 31, 2014

Former Groundwater Treatment Plant

Former Lagoon Area Cap

RCRA Landfill Cap

Wooded Area Overlooking Pond

APPENDIX C

INTERVIEWS

INTERVIEW RECORD			
Site Name: Hocomonco Pond Superfund Site (Westboro, MA)		EPA ID No.: MAD980732341	
Subject: 3rd Five Year Review		Time:	Date: 7/31/2014
Type: ☐ Telephone ■ Visit ☐ Other Location of Visit: Hocomonco Pond site		☐ Incoming	☐ Outgoing
Contact Made By:			
Name: Jim DiLorenzo	Title: Remedial Project Manager	Organization: EPA Region 1	
Individual Contacted:			
Name: Jay Naparstek	Title: Deputy Director, Bureau of Waste Cleanup	Organization: Mass. Dept. of Environmental Protection	
Telephone No: 617-292-5697 Fax No: E-Mail Address: jay.naparstek@state.ma.us	Street Address: One Winter Street Boston, MA		

1.A. What is your overall impression of the project? (general sentiment)

Since the previous five-year review, the project is operating as expected and there are no major issues or problems.

2.A. What effects have site operations had on the surrounding community?

None, other than the property not being available for reuse.

3.A. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

None, other than the pending redevelopment of the property.

4.A. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

None.

5.A. Do you feel well informed about the site's activities and progress?

I do.

6.A. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

None.

INTERVIEW RECORD			
Site Name: Hocomonco Pond Superfund Site (Westboro, MA)		EPA ID No.: MAD980732341	
Subject: 3rd Five Year Review		Time:	Date: 7/31/2014
Type: ☐ Telephone ■ Visit ☐ Other Location of Visit: Hocomonco Pond site		☐ Incoming ☐ Outgoing	
Contact Made By:			
Name: Jim DiLorenzo	Title: Remedial Project Manager	Organization: EPA Region 1	
Individual Contacted:			
Name: Mike Bollinger	Title: Project Manager	Organization: Beazer East, Inc.	
Telephone No: 412-208-8864 Fax No: E-Mail Address: Mike.Bollinger@hanson.biz	Street Address: Manor Oak One, Suite 200 1910 Cochran Road Pittsburgh, PA 15220		

1.A. What is your overall impression of the project? (general sentiment)

The project is going well. The passive recovery is working well, and good progress is being made.

2.A. What effects have site operations had on the surrounding community?

Site operations appear to have little to no effect on the surrounding community, other than the lack of the property to be available for reuse. However, the 3rd ESD will reduce the site's "footprint" and make reuse viable.

3.A. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

None, beyond how to best reuse the property.

4.A. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

None observed.

5.A. Do you feel well informed about the site's activities and progress?

Yes.

6.A. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

None.

INTERVIEW RECORD			
Site Name: Hocomonco Pond Superfund Site (Westboro, MA)		EPA ID No.: MAD980732341	
Subject: 3rd Five Year Review		Time:	Date: 7/31/2014
Type: ☐ Telephone ■ Visit ☐ Other Location of Visit: Hocomonco Pond site		☐ Incoming	☐ Outgoing
Contact Made By:			
Name: Jim DiLorenzo	Title: Remedial Project Manager	Organization: EPA Region 1	
Individual Contacted:			
Name: James Malloy	Title: Town Manager	Organization: Town of Westboro	
Telephone No: (508) 366-3030 Fax No: (508) 366-3099 E-Mail Address: jmalloy@town.Westboro.ma.us	Street Address: 34 W. Main Street, Westboro, MA 01581		

1.A. What is your overall impression of the project? (general sentiment)
That it has been managed responsibly by Beazer as the responsible party and that EPA and DEP have done a good job overseeing the remediation over a long period of time.

2.A. What effects have site operations had on the surrounding community?
The immediately surrounding area is industrial, so it has had little impact. Residents of the community know that it exists as a Superfund site, overall site operations appears to have had little impact on the greater community.

3.A. Are you aware of any community concerns regarding the site or its operation and administration? If so, please give details.

No.

4.A. Are you aware of any events, incidents, or activities at the site such as vandalism, trespassing, or emergency responses from local authorities? If so, please give details.

No.

5.A. Do you feel well informed about the site's activities and progress?

Yes, I receive regular reports from Beazer (cc'd from notices sent to EPA) and EPA has always been very responsive to any questions we have.

6.A. Do you have any comments, suggestions, or recommendations regarding the site's management or operation?

No.