UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
1 CONGRESS STREET, SUITE 1100
BOSTON, MASSACHUSETTS 02114-2023

Superfund Records Cent
SITE: Army Mat. Tec
BREAK: 8.3
OTHER: 303246

March 7, 2002

Mr. Robert Chase
United States Army
Research Laboratory
Attn: AMSRL-CS-CC-RK(Chase)
Aberdeen Proving Ground, MD 21005

Re: Five-Year Review
Army Materials Technology Laboratory
Watertown, Massachusetts

Dear Mr. Chase:

The United States Environmental Protection Agency (EPA) has reviewed the first Five-Year Review Report for the Army Materials Technology Laboratory (AMTL) in Watertown, Massachusetts. This Five-Year Review Report was submitted by the Department of the Army (Army) as the lead agency for the site.

The report includes five-year reviews for the three operable units (OUs) that make up the AMTL site pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). These OUs include: the Soil and Groundwater OU (OU1); the Charles River OU (OU2); and Area I (OU3). The Five-Year Review Report evaluated the protectiveness of each OU as required by EPA guidance. EPA concurs with the Army's findings as presented in the Report and outlined below.

According to the Five-Year Review Report, OU1, with the exception of Area E, was determined to be protective of human health and the environment. Since the completion of the remedial action in 1997, Excavation Area E was disturbed during development activities. This resulted in a limited amount of soil in Area E exceeding the applicable cleanup goals. The Massachusetts Department of Environmental Protection (MDEP) approved a work plan prepared by the Charles River Business Center Associates (CRBCA) for the excavation and off-site disposal of the soil in question. MDEP has notified EPA that the necessary excavation and disposal, as outlined in the above-referenced work plan, has been completed. MDEP has been told by CRBCA that confirmation samples show that all remaining soil in Excavation Area E is below the pertinent ROD clean-up levels. No written information related to this work has been received to date. Upon confirmation that all work has been satisfactorily completed, the remedy for OU1 in its entirety will be protective. Since the protectiveness of the remedy for OU1 is dependent on the completion of this additional excavation, EPA expects the Army to monitor the progress of the

work. The Army should notify EPA in writing once the work has been completed and confirmation of results has been received.

The protectiveness of OU2 cannot be fully determined as this time because the ecological risk assessment is ongoing. However, earlier risk assessment work does show that there is no unacceptable risk to human receptors at OU2.

The remedy for OU3 remains protective of human health and the environment.

EPA reminds the Army that the long-term protectiveness of the selected remedies for OU1 and OU3 depend on the effectiveness of land use and other institutional controls. These institutional controls for the site, with the exception of the Charles River Park Parcel, have been developed and implemented through a Grant of Environmental Restriction and Easement. It is anticipated that a second Grant of Environmental Restriction and Easement for the Charles River Park Parcel will be drafted and recorded over the next several months. The completion of this effort, in addition to the monitoring, reporting, and enforcement of all land use/institutional controls remains paramount to the continued protectiveness of the AMTL remedies. EPA urges the Army to take all necessary steps to ensure that its enforcement and monitoring efforts are effective in order to ensure that the remedies remain protective.

Consistent with Section 121(c) of CERCLA and EPA's Comprehensive Five-Year Review guidance, the next five-year review for this site must be finalized on or before March 1, 2007.

Sincerely,

Patricia L. Meaney, Director
Office of Site Remediation and Restoration

cc: Craig Durrett/MDEP
Randy Godfrey/US COE
Ed Cayous/EPA HQ
Mary Sanderson/EPA
John Beling/EPA
Meghan Cassidy/EPA
RAB Members

DEPARTMENT OF THE ARMY
UNITED STATES ARMY RESEARCH LABORATORY
ABERDEEN PROVING GROUND, MARYLAND 21005-5066

REPLY TO THE ATTENTION OF

8 February 2002

BRAC Environmental
Coordinator

U.S. Environmental Protection Agency, Region 1
Office of Site Remediation and Restoration
ATTN: Meghan Cassidy, Remedial Project Manager
One Congress Street
Suite 1100 (HBT)
Boston, MA 02114-2023

Re: Revised Final Five-Year Review
U.S. Army Materials Technology Laboratory
Watertown, Massachusetts
EPA ID: MAD213820939

Dear Ms. Cassidy,

Enclosed please find one copy of the Revised Final Five-Year Review for the U.S. Army Materials Technology Laboratory in Watertown, Massachusetts. This Report has been prepared by the U.S. Army Corps of Engineers, New England District, on behalf of the Department of the Army, as a statutory requirement in accordance with the Comprehensive Environmental Response Compensation and Liability Act. The report represents site conditions that were current as of 30 November 2001.

Since 30 November 2001, the missing benchmark at Area 1.4. which is cited in the enclosed report, has been replaced by the town of Watertown. In addition, a limited soil removal was performed by Charles River Business Center Associates in December 2001 at Area E at the location of benzo(a)pyrene soil exceedances (which are discussed in the enclosed report). The evacuation sidewalls and bottom met the site cleanup goals and the area has been backfilled and regraded. The stockpiled soils are being characterized for off-site disposal at an appropriate receiving facility.

Additional updates concerning the site conditions will be provided in the next Annual Institutional Control Report.

Please do not hesitate to contact me at (410) 278-6346 should have any questions concerning this submittal.

Sincerely,

Robert E. Chase
MTL BRAC Environment Coordinator

Encl
as

U.S. Army Corps of Engineers

New England District
Concord, Massachusetts

Revised Final Five-Year Review Report

U.S. Army Materials Technology Laboratory Watertown, Massachusetts

DCN: 2SITES-013002-AABA

JANUARY 2002

Contract No. DACA31-00-D-0023
Task Order No. 0007

01M-0007

WESTON
MANAGERS DESIGNERS/CONSULTANTS

REVISED FINAL

FIVE-YEAR REVIEW REPORT
U.S. ARMY MATERIALS TECHNOLOGY LABORATORY
WATERTOWN, MASSACHUSETTS

Contract No. DACA31-00-D-0023
TASK ORDER NO.: 0007
DCN: 2SITES-013002-AABA

Prepared For:

U.S. ARMY CORPS OF ENGINEERS
NEW ENGLAND DISTRICT
696 Virginia Road
Concord, Massachusetts 01742-2751

Prepared By:

ROY F. WESTON, INC.
One Wall Street
Manchester, New Hampshire 03101-1501

January 2002

W.O. Number 03886.518.007

Five-Year Review Summary Form

SITE IDENTIFICATION		
Site name *(from WasteLAN)*: **U.S. Army Materials Technology Laboratory**		
EPA ID *(from WasteLAN)*: **MAD213820939**		
Region: 1	**State: MA**	**City/County: Watertown, Middlesex County**

SITE STATUS	
NPL status: [Final] Deleted Other (specify) A parcel of the site has been deleted from the NPL based on the partial deletion process	
Remediation status (choose all that apply): *Under Construction* *Operating* [Complete]	
Multiple OUs?* [YES] NO	**Construction completion date:** N/A
Has site been put into reuse? [YES] NO	

REVIEW STATUS	
Lead agency: EPA State Tribe [*Other Federal Agency*] Department of Army	
Author name: Randy Godfrey	
Author title: Project_Manager	Author affiliation CENAE
Review period:** 05 /01 /2001 to 09 /30 /2001	
Date(s) of site inspection: 05 /30 /2001	
Type of review: [*Post-SARA*] Pre-SARA NPL-Removal only Non-NPL Remedial Action Site NPL State/Tribe-lead Regional Discretion	
Review number: [1 (first)] 2 (second) 3 (third) Other (specify)	
Triggering action: Actual RA Onsite Construction at OU #____ Actual RA Start at OU#_3___ Construction Completion Previous Five-Year Review Report Other (specify)	
Triggering action date *(from WasteLAN)*: 08 /26 /1996	
Due date *(five years after triggering action date)*: 08 /26 /2001	

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the Five-Year Review in WasteLAN.]

Five-Year Review Summary Form, cont'd.

Issues:

This report was complied from information obtained during the May to September 2001 review period. The report actually contains information that is current through 30 November 2001. This report has identified deficiencies at Excavation Areas E, G, and L4 that are violations of the Grant of Environmental Restriction and Easement for the MTL Site for OU1.

On 13 June 2001, the Massachusetts Department of Environmental Protection (MDEP) and the U.S. Army issued a Request for Information (RFI) to Charles River Business Center Associates (CRBCA) to determine the cause for missing Excavation Area E benchmarks. On 25 June 2001 CRBCA responded to the RFI and stated that regrading and landscaping activities had occurred in Excavation Area E. Because of missing benchmarks and the regrading of Excavation Area E, a total of 60 soil samples have been collected from Area E, and the regraded area adjacent to Area E, during sampling events in June and September 2001. Soil samples were collected from 0 to 3 inches in depth and from 12 to 15 inches in depth and were analyzed for polynuclear aromatic hydrocarbons (PAHs). All sample results have been submitted to MDEP. All PAH results for the samples collected from the 12 to 15 inch depth met the Record of Decision (ROD) cleanup goals. Three soil samples collected from the top 3 inch layer outside the boundary of Area E exhibited benzo(a)pyrene concentrations above ROD cleanup goals.

Three Grant violations were also noted for Excavation Area G, and were due to an excavation by CRBCA in July 1999. During the excavation to install utilities, a steam tunnel was discovered, cut open and was partially removed. The area was backfilled with the soil that was originally excavated, and additional clean backfill was placed on top to bring the surface back to grade. During a survey it was determined that there was a six inch to eight inch surface grade reduction on the southeast side of Excavation Area G resulting from this work, which was a violation of the Grant relating to the required amount of clean cover material (one foot) over the area. CRBCA later demonstrated that the current grade actually represents more than one foot of cover because of filling in the steam tunnel. However, CRBCA did not submit a written determination of the restored grade of all affected benchmarks (second Grant violation) certified in writing by a registered surveyor. In addition, benchmarks are currently missing at Excavation Area G, which is another Grant violation.

One of the four benchmarks is currently missing at Excavation Area L4.

The violations of the Grant at Excavation Areas G and E are being addressed by CRBCA under the oversight of MDEP. A Work Plan for Excavation Area E was prepared by CRBCA to conduct limited sampling and excavation of potentially contaminated soils outside of the restricted area. MDEP reviewed the Work Plan and issued CRBCA verbal approval in November 2001 to proceed with the work. Following completion of any excavation activities, new benchmarks will be installed and surveyed. Excavation Area G violations will be corrected by replacing the benchmarks and resurveying the elevation of the benchmarks.

Five-Year Review Summary Form, cont'd.

An amendment to the Grant documenting the changes in benchmark locations and elevations at Excavation Areas E and G will be prepared by CRBCA and submitted for approval by MDEP and subsequent recording at the Registry of Deeds.

The Town of Watertown has obtained spare benchmarks and is making arrangements to replace the missing benchmark at Excavation Area L4.

All replacement benchmarks will be installed in accordance with the revised benchmark specification proposal (8 August 2001) prepared by CRBCA and approved by MDEP.

Recommendations and Follow-up Actions:

It is recommended that Annual Institutional Control Reports and five-year reviews continue. The next Annual Institutional Control Report will provide a status update of the Grant Violations. All areas that remain in the Grant that have any land use restrictions and still have some contamination that results in the prohibition of unrestricted use are the subject of future statutory reviews. The next five-year review should include all of OU1, including the Charles River Park parcel and the Charles River.

Protectiveness Statement(s):

OU1, with the exception of Area E, has been determined to be protective of human health and the environment. A limited amount of soil in Area E exceeding the applicable cleanup goals are slated to be removed by CRBCA; this will ensure that Area E is protective of human health and the environment.

The protectiveness of OU2 cannot be determined because an Ecological Risk Assessment is ongoing.

OU3 remedies have been found to be protective of human health and the environment.

Next Review:

The next five-year review of the Army Materials Technology Laboratory will be completed on 30 September 2006.

Signature of U.S. Department of the Army.

Robert Chase, MTL BRAC Environmental Coordinator

8 FEB 2002

Date

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LIST OF ACRONYMS

µg/kg	micrograms per kilogram
ARARS	Applicable Relevant and Appropriate Requirement(s)
BCT	Base Closure Team
bgs	below ground surface
CENAE	U.S. Army Corps of Engineers, New England District
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
COCs	Contaminants of Concern
CRBCA	Charles River Business Center Associates
DDD	1,1-Bis(4-Chlorophenyl)-2,2 Dichloroethane
DDE	1,2-dichloro-2,2-bis(4-chlorophenyl)ethane
DDT	dichlorodiphenyltrichloroethane
DERP-FUDS Sites	Defense Environmental Restoration Program, Formerly Used Defense
ERA	Ecological Risk Assessment
ESD's	Explanations of Significant Difference
FFA	Federal Facilities Agreement
FS	Feasibility Study
ft	foot/feet
ft2	square feet
GSA	General Services Administration
HQ/HI	Hazard Quotient/ Hazard Index
LSP	Licensed Site Professional
MCP	Massachusetts Contingency Plan
MDC	Metropolitan District Commission
MDEP	Massachusetts Department of Environmental Protection
mg/kg	milligrams per kilograms
MOA	Memorandum of Agreement
MTL	U.S. Army Materials Technology Laboratory
NPL	National Priorities List
OU1	Operable Unit

LIST OF ACRONYMS
(continued)

PAH	polynuclear aromatic hydrocarbons
PAL	Public Archaeology Laboratory, Inc.
PCBs	polychlorinated biphenyls
poly	polyethylene sheeting
PVC	polyvinyl chloride
RFI	Request for Information
RI	Remedial Investigation
ROD	Record of Decision
SERA	Screening Level Ecological Risk Assessment
TBCs	To Be Considered
TRC	TRC Environmental Corporation
URS	URS Corporation
USATHAMA	U.S. Army Toxic and Hazardous Materials Agency
USEPA	U.S. Environmental Protection Agency
WADC	Watertown Arsenal Development Corporation
WCC	Watertown Conservation Commission
WESTON	Roy F. Weston, Inc.
WYC	Watertown Yacht Club
yd2	square yards
yd3	cubic yards

EXECUTIVE SUMMARY

The Department of the Army, through the U.S. Army Corps of Engineers, New England District (CENAE) has conducted a five-year review of the remedial actions implemented at the U.S. Army Materials Technology Laboratory (MTL) site in Watertown, Massachusetts. This review was conducted from April 2001 through September 2001.

This is the first five-year review for the MTL site. The triggering action for the statutory review is the date of the initiation of remedial action at Area I as shown in the U.S. Environmental Protection Agency (USEPA's) WasteLAN database: 26 August 1996. This review addresses remedial actions taken to date in the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Soil and Groundwater Operable Unit (OU1), Charles River (OU2), and Soil Remediation in Area I (OU3). The remediation of building interiors was performed under the Massachusetts Contingency Plan (MCP) and is not addressed in this five-year review.

Site investigations conducted to identify potential contamination at the site were completed in the Spring of 1994. The MTL site was placed on the USEPA's National Priorities List (NPL) in May 1994 pursuant to CERCLA, commonly known as the Superfund Program. The Federal Facilities Agreement (FFA), requiring a Record of Decision (ROD) and establishing the ROD schedule, was signed by the U.S. Army and USEPA in 1995.

The ROD for the Soil and Groundwater Operable Unit (OU1) was signed in September 1996 and called for the remediation of soil at this site with the selected remedy being excavation and off-site disposal/reuse of contaminated soil. In the September 1996 ROD for OU1, MTL was divided into five zones based on intended future reuse. These zones, identified as Zones 1 through 4 and Charles River Park as Zone 5, contained the ROD areas of contamination. Specific locations covered under the September 1996 ROD are referred to as Areas A, B, C, D, E, F, G, H, J, K, L, M, N, O, P, Q, and T. Area I located in Zone 3, whose remediation is the trigger action for this five-year review, was addressed in a separate ROD dated June 1996. Soil cleanup goals in each zone were based on the intended future reuse plan for the zone. One distinction was made: Area T, though physically located in commercially-designated

Zone 2, was assigned cleanup standards as if it was in Zone 4 (open space designation). This change was made based on the specific nature of this area and its planned future reuse.

Two Explanations of Significant Difference (ESD's) have been signed for this site. The revised polynuclear aromatic hydrocarbons (PAH) cleanup goals, which were established in the ESDs, were applied at Excavation Areas B, E, G, and L4 as stated in the first ESD, (WESTON, 1998). These revised cleanup goals were developed to address a construction worker exposure scenario. These cleanup goals were also applied to the Charles River Park as stated in the second ESD, (Foster Wheeler, 2001).

The first remedial action work was performed by Roy F. Weston, Inc. (WESTON®) at Area I (OU3), in August 1996.

The second remedial action work was performed by WESTON between November 1996 and December 1997 in response to the ROD for OU1, signed under CERCLA. As discussed in the ROD, groundwater was determined not to be a media of concern and no action was required for the groundwater located below the site.

Areas M, N, O, P, and Q are located in Charles River Park. Areas N and O were remediated by WESTON. during the Summer of 1997. The other Charles River Park work was temporarily suspended in August 1997. Areas P and Q were remediated by Foster Wheeler in September through November 2000. Area M and the areas along the riverbank were remediated in July 2001 by Foster-Wheeler.

Operable Unit 2 is made up of the Charles River in the area adjacent to the MTL property. This operable unit is in the remedial investigation/ feasibility study phase of the process. No remedy has been selected or implemented for this operable unit at this time. Based on information provided in the remedial investigation there is no unacceptable risk to human health as a result of OU2 (WESTON 1994 and Plexus Scientific Corp 1998). Relative to the CERCLA process, CENAE is currently following the iterative Eight-step Ecological Risk Assessment Process for Superfund in *Ecological Risk Assessment (ERA) for Superfund: Process for Designing and Conducting Ecological Risk Assessments* (June 1997; EPA 540-R-97-006).

In August 1998, 36.5 acres of the 48-acre CERCLA site were transferred from the ownership of United States Army. At that time, the Watertown Arsenal Development Corporation (WADC) acquired 29.44 acres of the site. The Town of Watertown took ownership of 7.21 acres. At the time of transfer, the United States of America, acting by and through the Secretary of the Army, granted the Massachusetts Department of Environmental Protection (MDEP) a Grant of Environmental Restriction and Easement for the MTL site on 11 August 1998. The purpose of this Grant was to provide a mechanism for the creation and enforcement of the necessary land use controls as required by the CERCLA Records of Decision (RODs) for the site (August and September 1996). The Grant redesignated areas into lots for property transfer and future deed tracking. Environmental Zones 1, 2, and 3 (the parcel that was initially transferred to WADC) were designated Lot 1. Lot 1 was sold to Charles River Business Center Associates (CRBCA) in December 1998. CRBCA sold the Lot 1 property to President and Fellows of Harvard College (Harvard) in May 2001. Environmental Zone 4 (the parcel transferred to the Town of Watertown) was designated as Lot 2.

The 36.5-acre parcel, which included Zones 1-4, was deleted from the NPL through the partial deletion process 22 November 1999.

This report has identified deficiencies at Excavation Areas E, G, and L4 that are violations of the Grant of Environmental Restriction and Easement for the MTL Site for OU1.

On 13 June 2001 MDEP and the Army issued a Request for Information (RFI) to CRBCA to determine the cause for the missing Excavation Area E benchmarks. On 25 June 2001 CRBCA responded to the RFI and stated that regrading and landscaping activities had occurred in Excavation Area E. Because of missing benchmarks and the regrading of Excavation Area E, a total of 60 soil samples have been collected from Area E, and the regraded area adjacent to Area E, during sampling events in June and September 2001. Soil samples were collected from 0 to 3 inches in depth and from 12 to 15 inches in depth and were analyzed for PAHs. All sample results have been submitted to MDEP. All PAH results for the samples collected from the 12 to 15 inch depth met the ROD cleanup goals. Three soil samples collected from the top 3 inch layer outside the boundary of Area E exhibited benzo(a)pyrene concentrations above ROD cleanup goals.

Three Grant violations were also noted for Excavation Area G, and were due to an excavation by the CRBCA in July 1999. During the excavation to install utilities, a steam tunnel was discovered, cut open and was partially removed. The area was backfilled with the soil that was originally excavated, and additional clean backfill was placed on top to bring the surface back to grade. During a survey it was determined that there was a six inch to eight inch surface grade reduction on the southeast side of Excavation Area G resulting from this work, which was a violation of the Grant relating to the required amount of clean cover material (one foot) over the area. CRBCA later demonstrated that the current grade actually represents more than one foot of cover because of filling in the steam tunnel. However, CRBCA did not submit a written determination of the restored grade of all affected benchmarks (second Grant violation) certified in writing by a registered surveyor. In addition, benchmarks are currently missing at Excavation Area G, which is another Grant violation.

One of the four benchmarks is currently missing at Excavation Area L4.

The violations of the Grant at Excavation Areas G and E are being addressed by CRBCA under the oversight of MDEP. A Work Plan for Excavation Area E was prepared by CRBCA to conduct limited sampling and excavation of potentially contaminated soils outside of the restricted area. MDEP reviewed the Work Plan and issued CRBCA verbal approval in November 2001 to proceed with the work. Following completion of any excavation activities, new benchmarks will be installed and surveyed. Excavation Area G violations will be corrected by replacing the benchmarks and resurveying the elevation of the benchmarks. An amendment to the Grant documenting the changes in benchmark locations and elevations at Excavation Areas E and G will be prepared by CRBCA and submitted for approval by MDEP and subsequent recording at the Registry of Deeds.

The Town of Watertown has obtained spare benchmarks and is making arrangements to replace the missing benchmark at Excavation Area L4.

All replacement benchmarks will be installed in accordance with the revised benchmark specification proposal (8 August 2001) prepared by CRBCA and approved by MDEP.

It is recommended that Annual Institutional Control Reports and five-year reviews continue. The next Annual Institutional Control Report will provide a status update of the grant violations. All areas that remain in the Grant that have any land use restrictions and still have some contamination that results in the prohibition of unrestricted use are the subject of future statutory reviews. The next five-year review should include all of OU1, including the Charles River Park parcel and the Charles River.

OU1, with the exception of Area E, has been determined to be protective of human health and the environment. A limited amount of soil in Area E exceeding the applicable cleanup goals are slated to be removed by CRBCA; this will ensure that Area E is protective of human health and the environment.

The protectiveness of OU2 cannot be determined because an Ecological Risk Assessment is ongoing.

OU3 remedies have been found to be protective of human health and the environment.

1. INTRODUCTION

The Department of the Army, through the U.S. Army Corps of Engineers, New England District (CENAE) has conducted a five-year review of the remedial actions implemented at the U.S. Army Materials Technology Laboratory (MTL) site in Watertown, Massachusetts. This review was conducted from April 2001 through September 2001.

The purpose of five-year reviews is to determine whether the remedy at a site is still protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in five-year review reports. In addition, five-year review reports identify deficiencies found during the review, if any, and recommendations to address them.

This five-year review is required by statute. The Army must implement five-year reviews in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), whenever contamination is left in place.

This is the first five-year review for the MTL site. The triggering action for the statutory review is the date of the initiation of remedial action at Area I as shown in USEPA's WasteLAN database: 26 August 1996. This review addresses remedial actions taken to date in the CERCLA Soil and Groundwater Operable Unit (OU1), Charles River (OU2), and Soil Remediation in Area I (OU3). The remediation of building interiors was performed under the Massachusetts Contingency Plan (MCP) and is not addressed in this five-year review.

1.1 PHYSICAL CHARACTERISTICS

The MTL site consists of 48 acres of land located in Watertown, Massachusetts. The property is bordered by Arsenal Street and a commercial area to the north; commercial and residential properties to the west; Talcott Avenue to the east; and the Charles River to the south. A public park and a yacht club are located on an 11-acre easement granted by the U.S. Army to the Commonwealth of Massachusetts Metropolitan District Commission (MDC). The western third of the MDC property is permitted to the Watertown Yacht Club (WYC) by the MDC. This 11-acre parcel is known as Zone 5. The other 36.5 acres represent the final footprint of the MTL

physical plant; this property was divided into Zones 1, 2, 3, and 4 for the purposes of environmental remediation and re-use.

1.2 BACKGROUND

The MTL facility was established in 1816 by President James Madison, and was originally used for the storage, cleaning, repair, and issuance of small arms. During the mid-1800s, the mission was expanded to include ammunition and pyrotechnics production; materials testing and experimentation with paints, lubricants, and cartridges; and the manufacture of breech loading steel guns and cartridges for field and siege guns. The mission, staff, and facilities continued to expand until after World War II, at which time the facility encompassed 131 acres, including 53 buildings and structures, and employed 10,000 people. Arms manufacturing continued until an operational phasedown was initiated in 1967. At the time of the operational phasedown, much of the Watertown Arsenal property was transferred to General Services Administration (GSA). In 1968, GSA sold approximately 55 acres to the Town of Watertown. This property was subsequently used for the construction of apartment buildings, the Arsenal Mall, and a public park and playground. MTL contained 15 major buildings and 15 associated structures. In 1960, the Army's first material research nuclear reactor was completed at MTL. The reactor was used actively in molecular and atomic structure research activities until 1970, when it was deactivated. The research reactor was decommissioned under the jurisdiction of the Nuclear Regulatory Commission in 1992 and the structure was demolished in 1994. In 1987, the U.S. Army Toxic and Hazardous Material Agency (USATHAMA) initiated preliminary site studies, the first stage of the facility's closure plan. In late 1988, Congress officially recommended the closure of the facility. On 29 September 1995, MTL was officially closed and reverted to a caretaker status.

In August 1998, 36.5 acres of the 48-acre CERCLA site were transferred from the ownership of United States Army. At that time, the WADC acquired 29.44 acres of the site. The Town of Watertown took ownership of 7.21 acres. At the time of transfer, the United States of America, acting by and through the Secretary of the Army, granted the MDEP a Grant of Environmental Restriction and Easement for the MTL site on 11 August 1998. The purpose of this Grant was to provide a mechanism for the creation and enforcement of the necessary land use controls as required by the CERCLA RODs for the site (August and September 1996). The Grant

redesignated areas into lots for property transfer and future deed tracking. Environmental Zones 1, 2, and 3 (the parcel that was initially transferred to WADC) were designated Lot 1. Lot 1 was sold to the Charles River Business Center Associates (CRBCA) in December 1998. CRBCA sold the Lot 1 property to President and Fellows of Harvard College (Harvard) in May 2001. Environmental Zone 4 (the parcel transferred to the Town of Watertown) was designated as Lot 2.

Annual Institutional Control Reports are required by the Memorandum of Agreement (MOA) that was signed on 7 August 1998 by the U.S. Environmental Protection Agency (USEPA), MDEP and the Army. The purpose of the reports is to document the condition of the institutional controls. The MOA recognizes that these Annual Reports are the responsibility of the Army, Currently, the Army has an agreement in place with the WADC to develop the reports each year. The WADC hired T.S. Alving & Associates, Inc. to perform the Annual Institutional Control Reports. The reports were completed in August 1999, August 2000, and August 2001. The Third Annual Institutional Control Report noted that there were violations of the Grant at Areas E, G, and L4. The report also stated that two benchmarks in Excavation Area B have been scraped by a snow plow, but that there has not been a reduction in elevation.

The 36.5-acre parcel, which included Zones 1-4, was deleted from the NPL through the partial deletion process 22 November 1999.

Building 111, the former Commander's Quarters, and the Olmsted Landscape Area (as designed by the Olmsted firm) are listed on the National Historic Register, these buildings are located in the Environmental Zone 4 (Lot 2) and is part of the Town of Watertown property. Most of the larger structures, currently associated with Watertown Arsenal's Historic District, and Lot 1 were designated as an historic site in 1994.

1.3 LAND AND RESOURCE USE

There is a private drinking well located 2 miles northwest of the property. The municipal drinking water within 4 miles of the site is supplied by surface water sources located to the west of MTL and is unaffected by the site. The Charles River is used for recreational boating. As previously stated, MTL closed in the Fall of 1995. Since its transfer to WADC and CRBCA, the

property has been developed for commercial and open space uses, as outlined in Subsections 2.1.3, 2.2.3, 2.3.3 and 2.4.3. A list of current tenants of the MTL property (Lot 1) is included in Table 1-1.

1.4 SITE CHRONOLOGY

Site investigations conducted to identify potential contamination at the site were completed in the Spring of 1994. The MTL site was placed on the USEPA's NPL in May 1994 pursuant to the CERCLA, commonly known as the Superfund Program. The Federal Facilities Agreement (FFA), requiring a ROD and establishing the ROD schedule, was signed by the U.S. Army and USEPA in 1995.

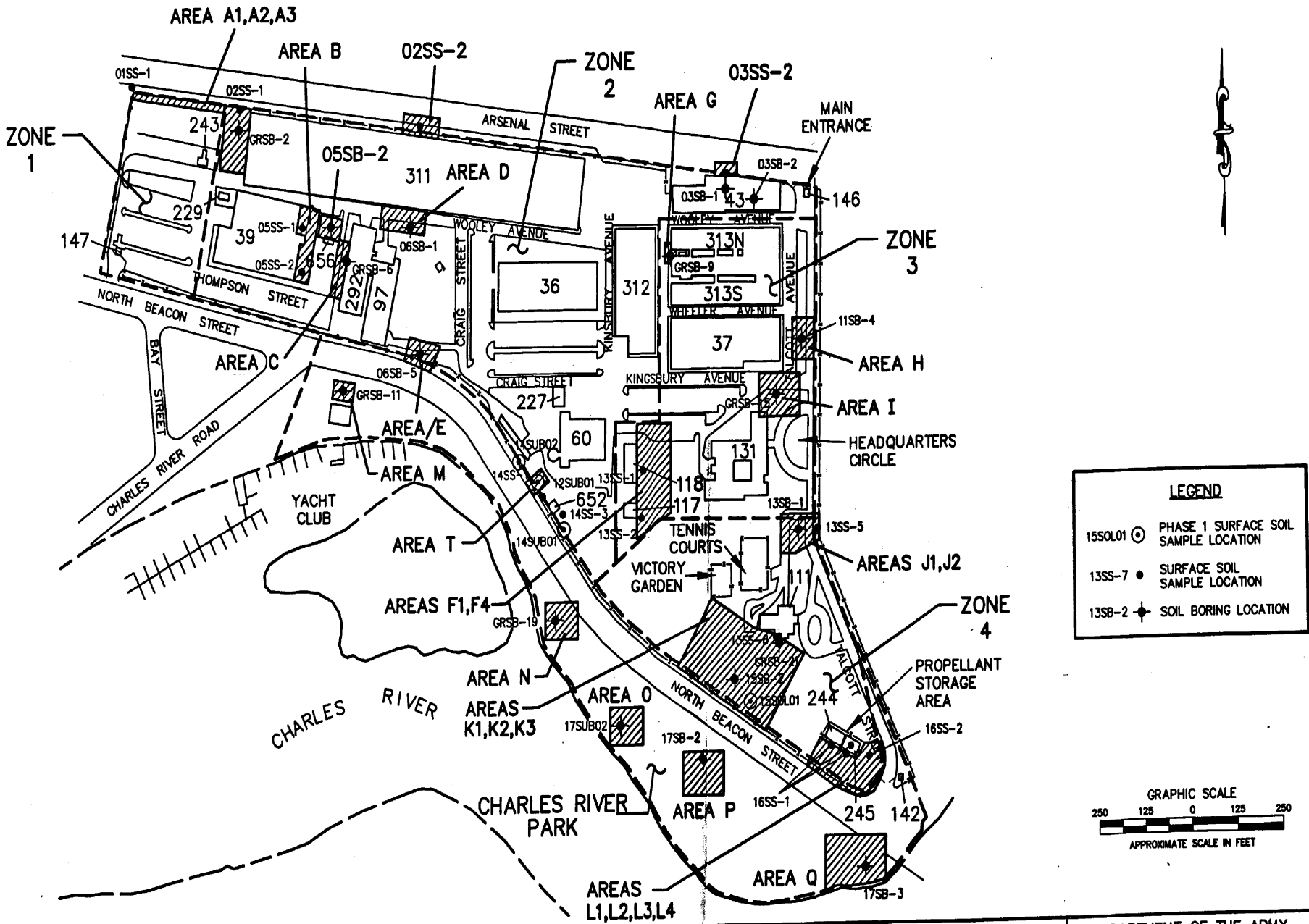
The ROD for the Soil and Groundwater Operable Unit (OU1) was signed in September 1996 and called for the remediation of soil at this site with the selected remedy being excavation and off-site disposal/reuse of contaminated soil. In the September 1996 ROD for OU1, MTL was divided into five zones based on intended future reuse. These zones, identified as Zones 1 through 4 and Charles River Park as Zone 5, contained the ROD areas of contamination. Specific locations covered under the September 1996 ROD are referred to as Areas A, B, C, D, E, F, G, H, J, K, L, M, N, O, P, Q, and T (See Figure 1-1). Area I located in Zone 3, whose remediation is the trigger action for this five-year review, was addressed in a separate ROD dated June 1996. Soil cleanup goals in each zone were based on the intended future reuse plan for the zone. One distinction was made: Area T, though physically located in commercially-designated Zone 2, was assigned cleanup standards as if it was in Zone 4 (open space designation). This change was made based on the specific nature of this area and its planned future reuse. Two Explanations of Significant Difference (ESD's) have been signed for this site. The revised PAH cleanup goals, which were established in the ESDs, were applied at Excavation Areas B, E, G, and L4 as stated in the first ESD, (WESTON, 1998). These cleanup goals were set to construction worker cleanup goals. These cleanup goals were also applied to the Charles River Park as stated in the second ESD, (Foster Wheeler, 2001).

The first remedial action work was performed by WESTON at Area I (OU3), in August 1996.

Table 1-1
List of Current Tenants of the MTL Property (Lot 1)
Watertown, Massachusetts
November 2001

Lot	Zone	Building	Address	Tenant	Use
1	2	39	300 North Beacon Street	Harvard Business School Publishing	Executive and general offices, publishing, warehouse and distribution
		43	343 Arsenal Street	Naked Fish Restaurant	Restaurant
				Molecular, Inc.	Executive and general offices, ancillary sales
		97	400 North Beacon Street	Harvard Business School Publishing	Executive and general offices, publishing, warehouse and distribution
		311	311 Arsenal Street	Arthur D. Little	
				Subtenants	
				Primix	Commercial
				MediaMap	Commercial
				Lavastorm	Commercial
				High Wired	Commercial
				Event Zero	Commercial
				Sterling and Hager	Commercial
		312	321 Arsenal Street	Concours Group	Executive and general offices
				Oxigen, Inc,	Executive and general offices
				Watertown Savings Bank	Retail banking, offices
				Boston Bread, LLC (Panera Bread)	Retail coffee shop, bakery and café
	3	37	200 Talcott Avenue	Bright Horizons Family Solutions	Executive and general offices
		117	3 Kingsbury Avenue	Management Office	Executive and general offices
		131	400 Talcott Avenue	Babson-United, Inc.	Executive and general offices, mail distribution center
				Bright Horizons Child Care Center	Child Care Center/ Commercial
				Financial Fusion	Executive and general offices
		313	100 Talcott Avenue	Molecular, Inc.	Executive and general offices, ancillary sales

Information from The Beal Companies, LLP, the current property management company for the current owner, President and Fellows of Harvard College. Information is current as of November 2001.



OUTDOOR SOIL REMOVAL
ARMY MATERIALS TECHNOLOGY LABORATORY
WATERTOWN, MASSACHUSETTS

DEPARTMENT OF THE ARMY
NEW ENGLAND DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

SITE MAP
BEFORE REMEDIAL ACTION

WESTON
MANAGERS MANCHESTER
DESIGNERS/CONSULTANTS NEW HAMPSHIRE

DRAWN BEG
DATE JUNE 2001
FIGURE NO. 1-1

The second remedial action work was performed by WESTON between November 1996 and December 1997 in response to the ROD for OU1, signed under CERCLA. As discussed in the ROD, groundwater was determined not to be a media of concern and no action was required for the groundwater located below the site.

Areas M, N, O, P, and Q are located in Charles River Park. Areas N and O were remediated by WESTON. during the Summer of 1997. Work at the other areas was temporarily suspended in August 1997. Areas P and Q were remediated by Foster Wheeler in September through November 2000. Area M and the areas along the riverbank were remediated in July 2001 by Foster-Wheeler. This action is discussed in Subsection 3.3.

Other remedial actions in Lot 1, including sampling, risk assessments, and additional soil removal undertaken by CRBCA since property transfer is outlined in Section 2.