EXHIBIT C-10

RTN 3-0010725, Fernald State School

Site Information			
Site Number:	3-0010725	Category:	72 HR
Site Name:	FERNALD STATE SCHOOL	Release Type:	RAO
Address:	200 TRAPELO RD	Current date:	6/21/2000
Town:	WALTHAM	Phase:	PHASE II
Zipcode:	02154	RAO class:	A2
Official notification date:	3/22/1994	Location type:	STATE
Initial status date:	3/22/1995	Source:	UST

Response Action Information	
Response Action Type:	RAO - Response Action Outcome - RAO
Status:	RAORCD - RAO Statement Received
Submittal Date:	6/21/2000
RAO class:	A2
Activity & Use Limitation:	NONE

Response Action Information	
Response Action Type:	RAM - Release Abatement Measure
Status:	PLANMD - Modified Revised or Updated Plan Received
Submittal Date:	2/7/2000
RAO class:	
Activity & Use Limitation:	

Response Action Information	
Response Action Type:	PHASII - Phase 2
Status:	NDMDRC - Notice of Delay in Meeting RA Dealine Received
Submittal Date:	7/26/1999
RAO class:	
Activity & Use Limitation:	

Response Action Information	
Response Action Type:	IRA - Immediate Response Action
Status:	CSRCVD - Completion Statement Received
Submittal Date:	6/15/1995
RAO class:	
Activity & Use Limitation:	

Response Action Information	
Response Action Type:	PHASEI - Phase 1
Status:	CSRCVD - Completion Statement Received
Submittal Date:	6/15/1995
RAO class:	
Activity & Use Limitation:	

Response Action Information	
Response Action Type:	TCLASS - Tier Classification
Status:	TIERII - Tier 2 Classification
Submittal Date:	6/15/1995
RAO class:	
Activity & Use Limitation:	

Response Action Information	
Response Action Type:	RNF - Release Notification Form Received
Status:	REPORT - Reportable Release or Threat of Release
Submittal Date:	5/13/1994
RAO class:	
Activity & Use Limitation:	

Response Action Information	
Response Action Type:	REL - Potential Release or Threat of Release
Status:	REPORT - Reportable Release or Threat of Release
Submittal Date:	3/22/1994
RAO class:	
Activity & Use Limitation:	

Chemicals		
Chemical	Amount	Units
GASOLINE		

LSPs	
LSP#	Name
2791	BAIRD, WILLIAM E
9092	OBRIEN, JAMES B

RAO Detail			
Class	Method	GW Category	Soil Category
A2	1	2	1

Tier Classification Detail							
NRS Totals	II	III	IV	V	VI	Zone 2	Imminent Hazard
132	35	47	30	20	0	N	N

Location

Open Sites Closed Sites
Closed Sites with Use Limitation

Massachusetts Department of Environmental Protection — BWSC-104
Bureau of Waste Site Cleanup

RESPONSE ACTION OUTCOME (RAO) STATEMENT & DOWNGRADIENT PROPERTY STATUS TRANSMITTAL FORM

Pursuant to 310 CMR 40.0180 (Subpart B), 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number: 3 - 10725

A. SITE OR DOWNGRADIENT PROPERTY LOCATION:

Site Name: (optional) Fernald State School

Street: 200 Trapelo Road — Location Aid:

City/Town: Waltham — ZIP Code: 02154-0000

☑ Check here if this Site location is Tier Classified.

If a Tier I Permit has been issued, state the Permit Number:

Related Release Tracking Numbers that this Form Addresses:

If submitting an RAO Statement, you must document the location of the Site or the location and boundaries of the Disposal Site subject to his Statement. If submitting an RAO Statement for a PORTION of a Disposal Site, you must document the location and boundaries for both the portion subject to this submittal and, to the extent defined, the entire Disposal Site. If submitting a Downgradient Property Status Submittal, you must provide a site plan of the property subject to the submittal and, to the extent defined, the Disposal Site.

B. THIS FORM IS BEING USED TO: (check all that apply)

☑ Submit a **Response Action Outcome (RAO) Statement** (complete Sections A, B, C, D, E, F, H, I, J and L).

☐ Check here if this is a revised RAO Statement. Date of Prior Submittal:

☐ Check here if any Response Actions remain to be taken to address conditions associated with any of the Releases whose Release Tracking Numbers are listed above. This RAO Statement will record only an RAO-Partial Statement for those Release Tracking Numbers.

Specify Affected Release Tracking Numbers:

☐ Submit an optional **Phase I Completion Statement supporting an RAO Statement or Downgradient Property Status Submittal** (complete Sections A, B, H, I, J, and L).

☐ Submit a **Downgradient Property Status Submittal** (complete Sections A, B, G, H, I, J and K).

☐ Check here if this is a revised Downgradient Property Status Submittal. Date of Prior Submittal:

☐ Submit a **Termination of a Downgradient Property Status Submittal** (complete Sections A, B, I, J and L).

☐ Submit a **Periodic Review Opinion evaluating the status of a Temporary Solution** (complete Sections A, B, H, I, J and L).

Specify one: ☐ For a Class C RAO ☐ For a Waiver Completion Statement indicating a Temporary Solution

Provide Submittal Date of RAO Statement or Waiver Completion Statement:

You must attach all supporting documentation required for each use of form indicated, including copies of any Legal Notices and Notices to Public Officials required by 310 CMR 40.1400.

C. DESCRIPTION OF RESPONSE ACTIONS: (check all that apply)

☑ Assessment and/or Monitoring Only

☑ Removal of Contaminated Soils

☑ Re-use, Recycling or Treatment

○ On Site ◉ Off Site Est. Vol.: 125 cubic yards

Describe:

☐ Landfill ○ Cover ○ Disposal Est. Vol.: _____ cubic yards

☐ Removal of Drums, Tanks or Containers

Describe:

☑ Removal of Other Contaminated Media

Specify Type and Volume: gasoline/water 1,120g

☐ Other Response Actions

Describe:

☐ Deployment of Absorbant or Contaminent Materials

☐ Temporary Covers or Caps

☐ Bioremediation

☐ Soil Vapor Extraction

☐ Structure Venting System

☐ Product or NAPL Recovery

☐ Groundwater Treatment Systems

☐ Air Sparging

☐ Temporary Water Supplies

☐ Temporary Evacuation or Relocation of Residents

☐ Fencing and Sign Posting

RECEIVED
JUN 21 2000
DEP/NORTHEAST REGION
WOBURN, MASS.

SECTION C IS CONTINUED ON THE NEXT PAGE

RESPONSE ACTION OUTCOME (RAO) STATEMENT & DOWNGRADIENT PROPERTY STATUS TRANSMITTAL FORM

Pursuant to 310 CMR 40.0180 (Subpart B), 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number: 3 - 10725

C. DESCRIPTION OF RESPONSE ACTIONS: (continued)

☐ Check here if any Response Action(s) that serve as the basis for this RAO Statement involve the use of Innovative Technologies. (DEP is interested in using this information to create an Innovative Technologies Clearinghouse.)

Describe Technologies: _____

D. TRANSPORT OF REMEDIATION WASTE: (if Remediation Waste was sent to an off-site facility, answer the following questions)

Name of Facility: AMREC/Northland Envir./Aggregate Industries

Town and State: Charleton/Stoughton/Providence/Stoughton

Quantity of Remediation Waste Transported to Date: 189 tons/900 g/220 g/105 tons

E. RESPONSE ACTION OUTCOME CLASS:

Specify the Class of Response Action Outcome that applies to the Site or Disposal Site. Select **ONLY** one Class:

☐ **Class A-1 RAO:** Specify one of the following:

○ Contamination has been reduced to background levels.

○ A Threat of Release has been eliminated.

☑ **Class A-2 RAO:** You **MUST** provide justification that reducing contamination to background levels is infeasible.

☐ **Class A-3 RAO:** You **MUST** provide both an implemented Activity and Use Limitation (AUL) and justification that reducing contamination to background levels is infeasible.

If applicable, provide the earlier of the AUL expiration date or date the design life of the remedy will end: _____

☐ **Class B-1 RAO:** Specify one of the following:

○ Contamination is consistent with background levels

○ Contamination is **NOT** consistent with background levels.

☐ **Class B-2 RAO:** You **MUST** provide an implemented AUL.

If applicable, provide the AUL expiration date : _____

☐ **Class C RAO:** ☐ Check here if you will conduct post-RAO Operation, Maintenance and Monitoring at the Site.

Specify One: ○ Passive Operation and Maintenance ○ Monitoring Only

○ Active Operation and Maintenance (defined at 310 CMR 40.0006)

F. RESPONSE ACTION OUTCOME INFORMATION:

☐ If an RAO Compliance Fee is required, check here to certify that the fee has been submitted. You **MUST** attach a photocopy of the payment.

☐ Check here if submitting one or more AULs. You must attach an AUL Transmittal Form (BWSC-113) and a copy of each implemented AUL related to this RAO Statement. Specify the type of AUL(s) below: (required for all Class A-3 RAOs and Class B-2 RAOs)

○ Notice of Activity and Use Limitation ○ Grant of Environmental Restriction Number of AULs attached: _____

Specify the Risk Characterization Method(s) used to achieve the RAO described above and all Soil and Groundwater Categories applicable to the Site.

More than one Soil Category and more than one Groundwater Category may apply at a Site.
Be sure to check off all APPLICABLE categories, even if more stringent soil and groundwater standards were met.

Risk Characterization Method(s) Used:	☑ Method 1	☐ Method 2	☐ Method 3
Soil Category(ies) Applicable:	☑ S-1	☐ S-2	☐ S-3
Groundwater Category(ies) Applicable:	☐ GW-1	☑ GW-2	☑ GW-3

> When submitting any Class A-1 RAO or a Class B-1 RAO where contamination is consistent with background levels, do NOT specify a Risk Characterization Method.

> When submitting any Class A-2 RAO or a Class B-1 RAO where contamination is NOT consistent with background levels, you cannot use an AUL to maintain a level of no significant risk. Therefore, you must meet S-1 Soil Standards, if using Risk Characterization Method 1.

RESPONSE ACTION OUTCOME (RAO) STATEMENT & DOWNGRADIENT PROPERTY STATUS TRANSMITTAL FORM

Pursuant to 310 CMR 40.0180 (Subpart B), 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number: 3 - 10725

G. DOWNGRADIENT PROPERTY STATUS SUBMITTAL:

☐ If a Downgradient Property Status Submittal Compliance Fee is required, check here to certify that the fee has been submitted. You **MUST** attach a photocopy of the payment.

☐ Check here if a Release(s) of Oil or Hazardous Material(s), other than that which is the subject of this submittal, has occurred at this property.

Release Tracking Number(s): _____

◯ Check here if the Releases identified above require further Response Actions pursuant to 310 CMR 40.0000.

Required documentation for a Downgradient Property Status Submittal includes, but is not limited to, copies of notices provided to owners and operators of both upgradient and downgradient abutting properties and of any known or suspected source properties.

H. LSP OPINION:

I attest under the pains and penalties of perjury that I have personally examined and am familiar with this transmittal form, including any and all documents accompanying this submittal. In my professional opinion and judgment based upon application of (i) the standard of care in 309 CMR 4.02(1), (ii) the applicable provisions of 309 CMR 4.02(2) and (3), and (iii) the provisions of 309 CMR 4.03(5), to the best of my knowledge, information and belief,

> *if Section B indicates that a **Downgradient Property Status Submittal** is being provided,* the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in 310 CMR 40.0183(2)(b), and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal;

> *if Section B indicates that either an **RAO Statement, Phase I Completion Statement and/or Periodic Review Opinion** is being provided,* the response action(s) that is (are) the subject of this submittal (i) has (have) been developed and implemented in accordance with the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, (ii) is (are) appropriate and reasonable to accomplish the purposes of such response action(s) as set forth in the applicable provisions of M.G.L. c. 21E and 310 CMR 40.0000, and (iii) complies(y) with the identified provisions of all orders, permits, and approvals identified in this submittal.

I am aware that significant penalties may result, including, but not limited to, possible fines and imprisonment, if I submit information which I know to be false, inaccurate or materially incomplete.

☐ Check here if the Response Action(s) on which this opinion is based, if any, are (were) subject to any order(s), permit(s) and/or approval(s) issued by DEP or EPA. If the box is checked, you MUST attach a statement identifying the applicable provisions thereof.

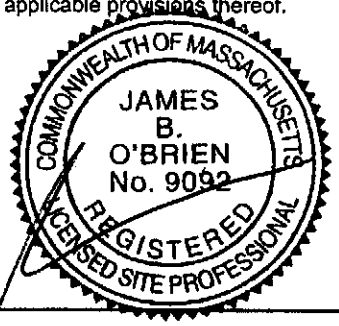
LSP Name: James B. O'Brien LSP #: 9092 Stamp:

Telephone: 781-952-6000 Ext.: _____

FAX: (optional) _____

Signature: _____

Date: 6.12-00



I. PERSON MAKING SUBMITTAL:

Name of Organization: Commonwealth of Massachusetts Department of Mental Retardation

Name of Contact: Maurice O'Connell Title: Plant Superintendant

Street: 200 Trapelo Road

City/Town: Waltham State MA ZIP Code: 02154-0000

Telephone: 781-894-3600 Ext.: 2681 FAX: (optional) _____

J. RELATIONSHIP TO SITE OF PERSON MAKING SUBMITTAL: (check one)

☑ RP or PRP Specify: ◉ Owner ◯ Operator ◯ Generator ◯ Transporter Other RP or PRP: _____

☐ Fiduciary, Secured Lender or Municipality with Exempt Status (as defined by M.G.L. c. 21E, s. 2)

☐ Agency or Public Utility on a Right of Way (as defined by M.G.L. c. 21E, s. 5(j))

☐ Any Other Person Submitting This Form Specify Relationship: _____

RESPONSE ACTION OUTCOME (RAO) STATEMENT & DOWNGRADIENT PROPERTY STATUS TRANSMITTAL FORM

Pursuant to 310 CMR 40.0180 (Subpart B), 40.0580 (Subpart E) & 40.1056 (Subpart J)

Release Tracking Number: 3 - 10725

K. CERTIFICATION OF PERSON SUBMITTING DOWNGRADIENT PROPERTY STATUS SUBMITTAL:

I, _____, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form; (ii) that, based on my inquiry of the/those individual(s) immediately responsible for obtaining the information, the material information contained herein is, to the best of my knowledge, information and belief, true, accurate and complete; (iii) that, to the best of my knowledge, information and belief, I/the person(s) or entity(ies) on whose behalf this submittal is made satisfy(ies) the criteria in 310 CMR 40.0183(2); (iv) that I/the person(s) or entity(ies) on whose behalf this submittal is made have provided notice in accordance with 310 CMR 40.0183(5); and (v) that I am fully authorized to make this attestation on behalf of the person(s) or entity(ies) legally responsible for this submittal. I/the person(s) or entity(ies) on whose behalf this submittal is made is/are aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

By: _____ Title: _____
(signature)

For: _____ Date: _____
(print name of person or entity recorded in Section I)

Enter address of the person providing certification, if different from address recorded in Section I:

Street: _____

City/Town: _____ State _____ ZIP Code: _____

Telephone: _____ Ext. _____ FAX: (optional) _____

L. CERTIFICATION OF PERSON MAKING SUBMITTAL:

If you are completing only a Downgradient Property Status Submittal, you do not need to complete this section of the form.

I, Maurice O'Connell, attest under the pains and penalties of perjury (i) that I have personally examined and am familiar with the information contained in this submittal, including any and all documents accompanying this transmittal form, (ii) that, based on my inquiry of those individuals immediately responsible for obtaining the information, the material information contained in this submittal is, to the best of my knowledge and belief, true, accurate and complete, and (iii) that I am fully authorized to make this attestation on behalf of the entity legally responsible for this submittal. I/the person or entity on whose behalf this submittal is made am/is aware that there are significant penalties, including, but not limited to, possible fines and imprisonment, for willfully submitting false, inaccurate, or incomplete information.

By: Maurice O'Connell Title: Plant Superintendant
(signature)

For: Maurice O'Connell Date: 6-14-00
(print name of person or entity recorded in Section I)

Enter address of the person providing certification, if different from address recorded in Section I:

Street: _____

City/Town: _____ State _____ ZIP Code: _____

Telephone: _____ Ext. _____ FAX: (optional) _____

YOU MUST COMPLETE ALL RELEVANT SECTIONS OF THIS FORM OR DEP MAY RETURN THE DOCUMENT AS INCOMPLETE. IF YOU SUBMIT AN INCOMPLETE FORM, YOU MAY BE PENALIZED FOR MISSING A REQUIRED DEADLINE, AND YOU MAY INCUR ADDITIONAL COMPLIANCE FEES.

Response Action Outcome

Massachusetts Department of Mental Retardation
Walter E. Fernald School – Farm and Grounds
200 Trapelo Road
Waltham, Massachusetts
RTN# 3-10725
VERTEX Project No. 0405/1003

VERTEX

Prepared For:

The Commonwealth of Massachusetts
Executive Office of Health & Human Services
Department of Mental Retardation
160 North Washington Street
Boston, Massachusetts 02114

Submitted To:

Massachusetts Department
of Environmental Protection
Bureau of Waste Site Cleanup
205a Lowell Street
Wilmington, MA 01887

Response Action Outcome

Massachusetts Department of Mental Retardation
Walter E. Fernald School – Farm and Grounds
200 Trapelo Road
Waltham, Massachusetts
RTN# 3-10725
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160 North Washington Street
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VERTEX[SM]
Engineering Services, Inc.

Massachusetts Office
400 Libbey Parkway
Weymouth, MA 02189
Office (781) 952-6000
Fax (781) 335-3543
e.mail: vertex@vertexeng.com

California Office (650) 579-7839
Colorado Office (303) 623-9116
New York Office (718) 729-9489

June 21, 2000

Massachusetts Department of Environmental Protection
Northeast Regional Office
205A Lowell Street
Wilmington, MA 01887

RE: **Response Action Outcome (RAO)**
Massachusetts Department of Mental Retardation
Walter E. Fernald School – Farm and Grounds
200 Trapelo Road
Waltham, Massachusetts
RTN# 3-10725
VERTEX Project No. 0405/1003

To whom it may concern:

VERTEX Engineering Services, Inc. (VERTEX) has been retained by the Massachusetts Department of Mental Retardation to conduct Licensed Site Professional Services at the above referenced site. This document serves as a Response Action Outcome (RAO) Statement and is submitted to the Department pursuant to 310 CMR 40.1000 as supporting documentation for a Class A-2 RAO. In addition, please find the (RAO) Statement (BWSC-104) Transmittal Form. Please do not hesitate to contact the undersigned should you have any questions or comments. Thank you.

Sincerely,

VERTEX Engineering Services, Inc.

Sean F. Healey
Project Manager

James B. O'Brien, L.S.P.
President

Amy McElroy
Senior Project Manager

cc: Mr. George Atamian, P.E. MDMR

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

systems were observed and corrected, the USTs were then re-tested and determined tight. Not all impacted soil could be removed without jeopardizing the operation of the tanks and pumping system. Consequently, further investigation was ordered by the MADEP in August 1994.

WEBB conducted IRA assessment activities in 1995, which included the installation and sampling of three groundwater monitoring wells at the site. However, it was determined by WEBB that site conditions were not consistent with an IRA status and an IRA Completion Report was submitted to the MADEP on June 15, 1995. Laboratory analytical results of soil and groundwater samples collected by WEBB revealed detectable concentrations of targeted analytes above applicable Method One S1/GW2/GW3 standards. The site was classified as a Tier II disposal site by WEBB on June 15, 1995, with a Numerical Ranking System Score (NRS) of 132.

Subsequently the USTs, pumping system, and remaining impacted soil were removed from the site under the direction of James B. O'Brien of VERTEX as L.S.P of Record. VERTEX submitted a Release Abatement Measure (RAM) Plan for the UST removal activities to the MADEP on April 18, 1997.

On May 27, 1997, VERTEX observed the removal of the two 4,000 gallon UST's from the site. During removal activities approximately 28 tons of impacted soil was excavated from the UST graves. All impacted soil was transported to a licensed disposal facility under a Bill of Lading. Results of laboratory analysis of post excavation soil sampling indicated that impacted soils within the tank graves had been remediated to concentrations below applicable Method One S1/GW2/GW3 Standards.

Between June 1997 and April 2000, VERTEX conducted remedial assessment activities at the site under the existing RAM Plan. Assessment activities included the installation and

sampling of four groundwater monitoring wells and two soil gas wells. Due to the fact that contaminant concentrations collected from monitoring well MW-3, located in the area of the former USTs, remained above Method One GW2/GW3 standards and impacted soil remained in the area of MW-4 at 10-12 feet below grade surface, VERTEX proposed a remedial excavation in the area of MW-3.

In March 2000 VERTEX performed a remedial excavation at the site in the area of the former UST's and MW-3, which included the excavation of 100 yards of impacted soil. Soil was transported off site under a bill of lading.

Results of soil and groundwater analyses subsequent to the March soil removal indicate that the site is eligible for a Class A RAO. In accordance with the Massachusetts Contingency Plan (MCP), a risk characterization has been performed which documents that a condition of "No Significant Risk" has been achieved at the site. This RAO documents site activities, investigations, analytical results and a Method One Risk Characterization as required by 310 CMR 40.1056.

2.0 RESPONSE ACTION OUTCOME (RAO) CATEGORY

The category of this RAO was determined in accordance with 310 CMR 40.1036. Class A-2 is appropriate to this site for the following reasons:

- A Permanent Solution has been achieved;

- Response actions have been employed to achieve a condition of No Significant Risk (310 CMR 40.900);

- Levels of oil/and or hazardous materials (OHM) at the site have not been reduced to background levels;

- One or more Activity and Use Limitations are not required to maintain a level of "No Significant Risk".

3.0 GENERAL DISPOSAL SITE INFORMATION

3.1 Site Description

The subject to this RAO is an approximately 13,775 square foot area located on the eastern side of the "Farm & Grounds" maintenance building situated in the south western section of the Massachusetts Department of Mental Retardation (MDMR) Walter E. Fernald School campus, located at 200 Trapelo Road in Waltham Massachusetts, herein referred to as the "site". The area pertaining to this RAO is shown on Figure 2-Site Schematic.

The site is accessed by Chapel Street, which serves as the south western entrance for the campus. The site area is used as the maintenance and grounds keeping facility for the school. It formerly served as a vehicle fueling area for maintenance and passenger vehicles owned by the MDMR.

The main garage building located adjacent to and west of the site, is aluminum sided with a concrete foundation, and is used as a garage for repair work to vehicles and machinery. The former vehicle fueling area was located approximately 100 feet to the east of the main garage building. Please reference Figure-3 Site Schematic. The location of the site is shown on the Boston North, Massachusetts USGS Topographic Quadrangle, dated 1985 with the following coordinates: 70.058.335 N and 42.351440W. Please refer to Figure 1 - Site Locus Map.

3.2 Surrounding Land Uses

3.2.1 Abutting/Adjacent Land Uses

The site is located in the southwestern portion of the Fernald School Campus. The site is bordered to the north and south by drives, parking areas and grassy areas utilized by the Fernald School employees. An access road and undeveloped land owned by the MDMR borders the site to east. Undeveloped land and the Farms and Grounds building border the site to the west.

3.2.2 Institutions within 500 Feet of Site

The site is located within The Fernald School Campus. The Fernald School is an Institution as defined in 310 CMR 40.0006 (any publicly or privately owned hospital, health care facility, orphanage, nursing home, convalescent home, educational facility, or correctional facility, where such facility in whole or in part provides overnight housing). Residential housing is utilized on the Fernald School Campus.

3.2.3 Natural Resource Areas within 500 Feet of Site

The site and surrounding properties are serviced by municipal water. There are no private water supply wells within 1000 feet of the site. There are no municipal water supplies within at least one half mile of the site. According to a December 3, 1998, MADEP-Bureau of Waste Site Cleanup (BWSC), Massachusetts Geographic Information System Map (MassGIS), the site is not located within a Current or Potential Drinking Water Source Area or within a Potentially Productive Aquifer or an Interim Wellhead Protection Area. Additionally, the site is not located in an Area of Critical Environmental Concern. A

freshwater wetland area is located southwest of the site and two small streams (Clematic Brook and an unnamed stream) border the site on the west and east. The site and surrounding properties are serviced by municipal water. Please refer to Appendix B for a copy of the MassGIS Map.

4.0 DISPOSAL SITE HISTORY

4.1 Owner/Operator and Operations History

The site parcel was purchased by the Commonwealth of Massachusetts in approximately 1930. Prior to 1930, the site was utilized as farmland. The Farm & Grounds Building was constructed in 1973 and has been utilized as a maintenance building since that time.

4.2 Release History

As previously mentioned, according to the Phase I Report and Tier Classification Submittal by WEBB dated June 15, 1995, the MADEP was notified of a threat of a release due to two (2) UST tests (2-4,000 gallon gasoline UST's) on March 22, 1994. Approximately seven (7) cubic yards of soil was excavated from the area and stockpiled. Faulty check valves and venting systems were observed and corrected, the USTs were then re-tested and determined tight. Not all impacted soil could be removed without jeopardizing the operation of the USTs and pumping system. Consequently, further investigation was ordered by the MADEP in August 1994.

5.0 SITE HYDROGEOLOGICAL CHARACTERISTICS

5.1 Soil Boring/Monitoring Well Installation

In order to assess on-site subsurface soil and groundwater conditions in the area of the former UST's, a total of 9 soil borings were completed at the site by WEBB and VERTEX.

Four soil borings (B4, MW-1, MW-2 and MW-3) were advanced by WEBB in 1995. MW1 through MW3 were completed as a groundwater monitoring wells. MW-1 and MW-2 did not prove to be water bearing and were not sampled. The location of these soil borings is shown on Figure 2-Site Schematic. A copy of WEBB's subsurface investigation report is included in Appendix C.

Between July 17, 1998 and March 15, 2000, five soil borings (MW4 through MW8) were installed at the site by VERTEX utilizing hollow stem auger and air hammer techniques. Each of these borings were completed as groundwater monitoring wells. The locations of the borings and monitoring wells are shown on Figure 3 – Site Schematic. Soil Boring/Monitoring Well Logs of soil borings completed by VERTEX may be referenced in Appendix D.

Split spoon samplers were utilized to collect subsurface soil samples every five feet. Soil types were noted and classified starting at grade. Based on visual classification of split spoon soil samples, the site is underlain by gray silty sand with brown medium to fine grained sand with gravel.

During the installation of monitoring wells MW4 through MW8 fractured bedrock was encountered between 9-11 feet below grade surface (bgs). No groundwater was encountered in these borings prior to refusal. This required the use of an air hammer to advance each boring into weathered bedrock to a depth between 15 to 35 feet below grade surface.

Monitoring wells were constructed of a bottom plugged 2-inch diameter PVC well screen (0.010 inch slot) followed by a length of 2 inch diameter PVC solid riser to grade level. The screened section was installed to intercept the groundwater table, which ranged from 7 to 20 feet bgs throughout the site. Number 2 washed sand was packed to approximately 1-2 foot above the screen followed by a 1 foot thick bentonite grout packing. The remainder of the boring was back filled with native soil and then sealed to grade with concrete. Each monitoring well was fitted with a locking cap on the riser and fitted with a water tight 4-inch diameter flush mount metal roadbox.

5.2 Hydrogeology

On November 5, 1998 and April 5, 2000, VERTEX conducted a instrument and tape surveys to locate groundwater monitoring wells and significant surficial features at the site. The depths to groundwater within site monitoring wells were measured with an electronic water level meter on the same date. Information obtained from the instrument survey and monitoring well gauging was utilized to evaluate the lateral groundwater flow direction at the site. The results of the most recent April 5, 2000, survey are depicted on Figure 2–Site Schematic. The measured monitoring well rim and groundwater elevations from the April 5, 2000 elevation survey are summarized in the following table:

Table 1 – Groundwater Elevation Data April 5, 2000			
Monitoring Well	**Rim Elevation**	**Rim Elevation**	**Groundwater Elevation**
MW-4	98.71	7.47	91.24
MW-5	98.39	19.53	78.86
MW-6	95.89	17.71	78.18
MW-7	98.96	7.90	91.06
MW-8	100.46	9.04	91.42

Groundwater elevations within monitoring well MW-5 and MW-6 are considerably lower in elevation due relative depth of productive fractures encountered within the weathered bedrock.

Based on information obtained from the April 2000 instrument survey and monitoring well gauging, groundwater beneath the site appear flows in a southwesterly direction. Results were consistent with the November 1998 survey. This flow direction generally follows the surface topography of the site.

6.0 NATURE AND EXTENT OF CONTAMINATION

6.1 Results of Soil Sampling and Laboratory Analytical Results

6.1.1 WEBB Environmental Subsurface Investigation 1995

As previously mentioned, a subsurface investigation was conducted at the site by WEBB in 1995 in an effort to determine the potential extent of downgradient impact to subsurface soil and groundwater associated with the subject threat of release.

WEBB collected soil samples at five foot intervals and submitted selected samples to a Spectrum Analytical Laboratories, Inc. (SAI) in Norwell, Massachusetts, a State of Massachusetts Certified laboratory. Soil samples were submitted for laboratory analysis of Total Petroleum Hydrocarbons (TPH) via EPA Method 8100 modified and Benzene, Toluene, Ethylbenzene and Xylene (BTEX) via EPA Method 8020. Soil analytical results are depicted in Table 2 attached.

Laboratory analysis of a soil sample collected by WEBB from MW-3 at 10-12 feet below grade revealed concentrations of Total Petroleum Hydrocarbons (TPH) at 920 mg/kg, above the site applicable Method One S-1 Standards of 800 mg/kg.

6.1.2 VERTEX- UST Removals-Post Excavation Soil Sampling Analytical Results

On May 27, 1997 VERTEX observed the removal and disposal of the two (2) 4,000 gallon steel gasoline underground storage tanks. Please see Appendix E-VERTEX

January 26, 1998 RAM Status report for a detailed account of UST removal activities.

Wastes generated during the UST removals included 900 gallons of oily water initially pumped from the UST's and 220 gallons of oily washwater. In addition, approximately 28 tons of gasoline impacted soil was removed from the UST graves and subsequently recycled at the AMREC facility located in Charlton, Massachusetts. Please see Appendix F for a copy of all Bills of Lading and Hazardous Waste Manifests. Following excavation activities, five (5) confirmatory soil samples from each were collected from each excavation field screened and analyzed for TPH and BTEX. Please see Figure 3-UST Removal-Post Excavation Schematic for a depiction of sampling locations. A summary of the field screening results are presented in Table 3 and Table 4 attached. Laboratory analytical reports of the analyses performed on the soil samples are included as Appendix G.

Laboratory analytical results of post excavation soil sampling did not reveal detectable concentrations of targeted analytes above site applicable Method One S1/GW2 soil standards and support regulatory closure.

6.1.3 Release Abatement Measure Activities-March 2000

In an effort to remove impacted soil remaining at the site above Method One standards, below the water table in the area of monitoring well MW3 (at approximately 10-12 feet below grade) and thereby reduce concentrations of contaminants within site groundwater, soil excavation, removal and disposal was conducted at the site from March 6th through March 15th 2000. VERTEX submitted RAM modifications to the MADEP on January 28th and March 6th 2000.

During this period approximately 100 yards of impacted soil was removed in the area of MW3 and in the former location of the USTs. All impacted soil was stockpiled on-site on poly and recycled at Aggregated Industries in Stoughton, Massachusetts. Please see Appendix F for a copy of the Bill of Lading.

Soil samples were collected during excavation activities and screened for the presence of headspace Total Organic Vapors (TOVs) with a PID. Excavation activities were discontinued when the PID indicated that TOV headspace levels were less than 20 parts per million (ppm) along to sidewalls of the excavation. Final post excavation field screening results are depicted on Table 5 attached. Final excavation dimensions measured approximately 45 feet long by 30 feet wide. Please see Figure 2- Site Schematic for a depiction of the RAM excavation.

Groundwater was encountered within the excavation at approximately 10.5 feet below grade. Field screening of saturated soil samples taken at the base of the excavation revealed concentrations of TOV's between 0-166. However, each sample collected at the base was within the groundwater table, saturated and contained pieces of bedrock. Therefore, these samples are not considered indicative of overburden soil conditions at the site and were not submitted for laboratory analysis.

Following post excavation sampling of the sidewalls and base of the excavation, the excavation was backfilled with clean fill material. Please see Figure 4-Sampling Locations March 2000, for a depiction of sampling locations. Soil samples were selected from above the groundwater interface along each sidewall, placed on ice and delivered to Groundwater Analytical (GAI) in Buzzards Bay, Massachusetts for laboratory analysis of Volatile Petroleum Hydrocarbons (VPH) with targeted

Volatile Organic Compounds (VOC's) by GC/PID/FID and Extractable Petroleum Hydrocarbons (EPH) with targeted Polynuclear Aromatic Hydrocarbons (PAHs) by GC/FID. Laboratory analytical results of the post excavation sampling are summarized in Table 6 attached.

Laboratory analytical results of post excavation soil sampling did not reveal detectable concentrations of targeted analytes above site applicable Method One S1/GW2 soil standards and support regulatory closure.

6.2 Soil Gas Survey Results

On May 31, 1999, in order to evaluate for the potential threat to indoor air in association with the subject release, VERTEX installed and sampled two soil gas wells SW1 and SW2 at the site east and adjacent to the nearby maintenance building. SW1 and SW2 were installed to a depth of approximately 3 feet below grade surface. Please see Figure 2-Site Schematic for soil gas well locations.

Soil gas wells were constructed with a length of bottom plugged, 2-inch diameter PVC well screen (0.010 inch slot) followed by a length of 2 inch diameter PVC riser to grade level. Number 2 washed sand was packed to approximately 1-2 foot above the screen followed by a 1 foot thick bentonite grout packing. The remainder of the boring was back filled with native soil and then sealed to grade with concrete.

On May 31, 1999, VERTEX conducted soil gas sampling. Vapors were monitored for TOVs using a Thermo Environmental OVM Model 503B PID. A measurement of vapors was taken at the sampling point following the installation of the soil gas well. A flow rate of approximately 500 ml/minute was established at the location and soil gas samples were

obtained by connecting the PID to the sampling port. Results of sampling did not reveal detectable levels of TOVs.

6.3 Groundwater Sampling and Analytical Results

6.3.1 Groundwater Sampling-May 1995 through September 1999

A subsurface investigation was conducted at the site by WEBB in 1995, which included the installation of three monitoring well (MW-1, MW-2 and MW-3). MW-1 and MW-2 did not prove to be water bearing and were not sampled. WEBB did sample monitoring well MW-3. Laboratory analysis of groundwater samples obtained by WEBB from monitoring well MW-3 revealed concentrations of Toluene, Xylenes, and TPH above site applicable Method 1 GW2/GW3 standards. Please see Appendix C for a copy of WEBB's report and analytical results.

Between June 1997 and September 1999, VERTEX conducted four groundwater sampling rounds at the site. Monitoring wells which were sampled included MW3 through MW6. Each groundwater sample was obtained by using a dedicated polyethylene bailer lowered with polyethylene string. The wells were purged of three to five volumes of water and then were allowed to recharge. The ground water samples were then placed directly into pre-cleaned and labeled laboratory supplied bottles. Samples were placed on ice and delivered to GAI for laboratory analysis of VPH with targeted VOC's by GC/PID/FID and EPH with targeted PAHs by GC/FID. Results of each groundwater sampling round are summarized in Table 7 attached. Complete Laboratory Analytical Reports are included in Appendix F.

Laboratory analytical results revealed that concentrations of VPH constituents continued to exist within groundwater samples collected from MW3 above site applicable Method One GW2/GW3 standards. Therefore, VERTEX proposed a

RAM modification, which included the removal of impacted soils below the groundwater table at approximately 10-12 feet below grade within the area of MW3, in an effort to decrease groundwater contaminant concentrations. RAM soil removal and disposal activities were conducted in March 2000 as discussed previously.

6.3.2 Groundwater Sampling-March and April 2000

On March 21st 2000, VERTEX sampled monitoring wells MW4 through MW8. On April 5th 2000, VERTEX conducted additional sampling of monitoring well MW7 and MW8. Each monitoring well was sampled utilizing dedicated polyethylene bailers lowered on polypropylene rope. The wells were purged of three to five standing volumes of water, allowed to recharge, prior to sampling. No sheen was observed during the groundwater sampling event.

Groundwater samples were placed directly into prelabeled, laboratory supplied containers and immediately placed on ice. These samples were subsequently delivered to Groundwater Analytical, Inc. for analysis of VPH with targeted VOC's and EPH with targeted PAHs and Lead.

Results of each groundwater sampling round are summarized in Table 8 attached. Results of each sampling event did not revealed concentrations above site applicable Method One GW2 and or GW3 standards.

7.0 RISK CHARACTERIZATION

This section discusses the characterization of risk of harm to health, safety, public welfare and the environment posed by residual contamination related to a release of gasoline at the site. This characterization has been conducted in accordance with the procedures outlined in 310 CMR 40.0900 of the Massachusetts Contingency Plan (MCP).

7.1 Selection of Risk Characterization Method

A Method One Risk Characterization, as described in 310 CMR 40.0970, has been selected to characterize the risk of harm to health, safety, public welfare and the environment at this site, based on the evaluation presented previously. The Method One characterization is considered applicable to this disposal site for the following reasons:

1) Oil and/or hazardous materials (OHM) have only been identified in soil and groundwater and are not likely to migrate to other environmental media.

2) All OHM detected at the site are listed in 310 CMR 40.0974 and 40.0975.

3) OHM present on-site are not known to bioaccumulate.

4) No environmental receptors have been identified that could be impacted by the disposal site.

7.2 Identification of Potential Receptors and Site Activity and Uses

This section discussed the receptors, site activities and uses, exposure points and exposure point concentrations to assess the exposure that a receptor might receive during contact with impacted media at the site.

7.2.1 Identification of Receptors

The Farms and Grounds Maintenance building is located immediately west of the site. The building is currently utilized for the storage and maintenance of vehicles and equipment utilized in the upkeep of grounds at the Fernald School. Therefore, potential human receptors include adult workers on-site.

The Fernald School is a residential school operated by the MDMR. Although there are no residential units in the immediate vicinity of the site, residential students are also considered potential human receptors.

Trespassers and workers during any future excavation activities are also considered receptors, but exposure of possible future on-site residents is considered to be the most significant exposure, and will encompass the exposure assessment of other receptors.

7.2.2 Identification of Site Activities and Uses

Most conservative site activities and uses are considered to include, but not be limited to the following: 1) use of the site for a residence; 2) the excavation of soil during construction/renovation activities and 3) recreational/leisure activities.

Potable water is supplied to the site by the municipality. There are no irrigation or other water supply wells on the MDMR property. Use of site water for drinking, watering lawns and washing is not considered applicable to this assessment.

7.2.3 Identification of Exposure Pathways

Exposure points are the points at which identified receptors would contact identified hazards during site activities/use. For the purpose of this assessment, site receptors could be exposed through dermal contact with soil, ingestion of soil, inhalation of particulate, and/or inhalation of indoor air vapors within the Farm & Grounds Building potentially impacted by site groundwater.

7.3 Determination of Applicable Soil and Groundwater Categories

The site, receptor and exposure information previously discussed has been evaluated to determine the applicable soil category for the site. The highest potential for exposure to soil has been selected as applicable to the site, for conservatism, and to demonstrate that an Activity Use Limitation (AUL) is not necessary for the site. As such, the S-1 category as defined in 310 CMR 40.0933 (5) has been selected.

The groundwater category for this site was determined pursuant to 310 CMR 40.0932, local research. The site is not located in a current or potential drinking water source area. There are no known private or public drinking water wells within ½ mile of the site. The site is not within an area containing a medium to high yield aquifer and it is not within an area classified as a Zone II or an Interim Wellhead Protection Area. Depth to groundwater at the site is less than 15 feet bgs; therefore the site groundwater is considered GW-2/GW3.

7.4 Characterization of Groundwater Contamination

Subsurface groundwater sampling and analysis at the site included the collection and analysis of groundwater samples for the presence of gasoline constituents from six monitoring wells on-site. Results of the most recent groundwater analyses indicated concentrations of VPH, VOC's and EPH (including PAHs) exist below applicable Method 1 GW2 and/or GW3 standards.

This supports VERTEX's conclusion that groundwater has been adequately characterized and does not pose a significant risk.

7.5 Characterization of Impact to Indoor Air

As previously mentioned, VERTEX conducted soil gas sampling of two soil gas wells installed immediately adjacent to the exterior of the Farm & Grounds building foundation. The soil gas sampling was conducted in an effort to characterize the potential for vapors to migrate to indoor air within the Farm & Grounds building. Results of sampling did not reveal detectable levels of Total Organic Volatiles. Therefore, VERTEX concludes the potential for migration of groundwater vapors to indoor air has been adequately characterized and support that site groundwater does not pose a significant risk.

7.6 Characterization of Soil Contamination

Subsurface soil sampling and analysis at the site included the collection and analysis of soil samples from four soil borings, eleven samples from the limits of VERTEX's UST removal remedial excavation and four samples from the limits of VERTEX's March 2000 RAM excavation. The samples were collected at depths of 5 feet and 12 feet below

ground surface. Soil samples were analyzed for TPH, BTEX, VOC's, VPH, and EPH with PAH's.

Results of soil sampling conducted during WEBB's subsurface investigation indicated impacted soil remained at the site above applicable S1/GW2 standards in the area of MW-3 at a depth of 10-12 feet below grade. This soil was removed during VERTEX's RAM excavation in March 2000.

The remaining results of soil sampling and analyses from WEBB's investigation and soil sampling and analyses from VERTEX's UST removal and RAM excavation indicate residual concentrations of petroleum constituents below Method 1 S-1/GW-2 Standards. Therefore, impacted soils remaining at the site do not pose a significant risk and are not considered to be a threat.

7.7 Exposure Point Concentrations

Groundwater monitoring wells are the only exposure points to groundwater at this site. Exposure point concentrations of OHM in groundwater were determined by analyzing groundwater samples collected from each monitoring well, with each monitoring well evaluated as a distinct exposure point.

As is shown in Table 7 and 8, no current exposure point concentrations currently exist above applicable Method One GW2/GW3 Standards for groundwater at the site, with the exception of latest groundwater samples collected from MW7.

Laboratory analysis of groundwater samples collected from monitoring well MW-7 on April 5, 2000 revealed concentrations of VPH fraction c-5 to c-8 aliphatic hydrocarbons at 1,400 ug/l, above the Method One GW2 standard of 1,000 ug/l but below the Method One

GW3 standard of 4,000 ug/l. However, monitoring well MW-7 is located approximately 50 feet from the site building. Therefore, groundwater within MW-7 is classified as GW-3.

In an effort to determine if groundwater at the site could be considered a source of vapors to indoor air within the site Farm & Grounds building, VERTEX conducted soil gas sampling at the site. Results of soil gas sampling did not reveal detectable concentrations of total organic volatiles. Therefore, no exposure point concentration were identified and volatization of site contaminants into indoor air is not a concern.

Exposure point concentrations of OHM in soil was determined by analyzing soil samples collected from WEBB's subsurface investigation, the limits of the UST removal excavation, an the limits of the RAM excavation with each soil sample location evaluated as a distinct exposure point. As was discussed previously and as shown in Tables 2, 3, 4 and 6 no exposure point concentrations currently exist above applicable Method 1 S1/GW2 standards for soil at the site.

7.8 Characterization of Risk of Harm to Safety

The risk of harm to safety, as described in 310 CMR 40.0960, was evaluated for the disposal site. The site does not contain the following items related to a release of OHM:

1) There are no rusted or corroded drums or containers, open pits or lagoons;

2) There is no threat of fire or explosion, or the presence of explosive vapors from the release of OHM; and

3) There are no uncontainerized materials exhibiting the characteristics of corrosivity, reactivity, or flammability.

Based on the above information, it was determined that the site does not pose a risk to public safety.

7.9 Characterization of Risk of Harm to the Environment

Residual concentrations of petroleum products in site soil has been significantly reduced to near background conditions. Therefore, a condition of significant risk to the environment does not exist regarding site soils.

Based on the results of groundwater analysis of downgradient monitoring wells, groundwater does not possess a condition of significant risk to the environment due to the absence of exceedances of Method one GW-3 standards.

8.0 FEASIBILITY OF RESTORATION TO BACKGROUND

The presumed background concentrations for OHM in the soil and groundwater at the site are assumed to be non-detectable concentrations.

The source of contaminants to the groundwater has been removed from the site. Therefore, further degradation of the groundwater is not anticipated.

Due to the inaccessibility of the remaining residually impacted soil and groundwater, remediation to achieve background conditions, at the depths which exhibits residual impacted soil, would likely entail removal of impacted bedrock, excavation and disposal. It is the opinion of VERTEX that the costs associated with the implementation of such remediation are substantial and disproportional to the incremental benefit of risk reduction, environmental restoration, monetary and non-pecuniary values.

Therefore, VERTEX has determined that further remediation of the subject release area is not required and this RAO is classified as a Class A-2

9.0 CONCLUSIONS

The following conclusions were made based upon the Method 1 Risk Characterization of site conditions at the subject site.

1) Current exposure point concentrations at the site are below site applicable GW2/GW3 groundwater standards and S-1/ GW-2 soil standards.

2) Response actions performed at the site resulted in the removal of the source.

3) The site does not pose a risk of harm to health, public welfare and the environment.

4) A condition of No Significant Risk as defined by 310 CMR 40.0973(7) exists at the site.

5) No Activity and Use Limitations are necessary for this site.

10.0 QUALIFICATIONS

Our professional services have been performed, our findings obtained, and our recommendations prepared in accordance with customary principles and practices in the fields of environmental science and engineering. This warranty is in lieu of all other warranties either expressed or implied. VERTEX is not responsible for the independent conclusions, opinions or recommendations made by others based on the records review, site inspection, field exploration, and laboratory test data presented in this report.

It must be recognized that environmental investigations are inherently limited in the sense that conclusions are drawn and recommendations developed from information obtained from limited research and site investigation. All site subsurface conditions were not field investigated as part of this study and may differ from the conditions implied by the limited investigation. Additionally, the passage of time may result in a change in the environmental characteristics at this site and surrounding properties. This report does not warrant against future operations or conditions, nor does this warrant operations or conditions present of a type or at a location not investigated.

The conclusions presented in this report are professional opinions based solely upon visual observations and supplemental testing of soil and/or groundwater at the site. Our interpretation of the available historical information and documents reviewed, as described in this report, were also considered in the conclusions. VERTEX relied upon but did not attempt to independently verify the validity or accuracy of the findings and conclusions noted in the documentation reviewed.

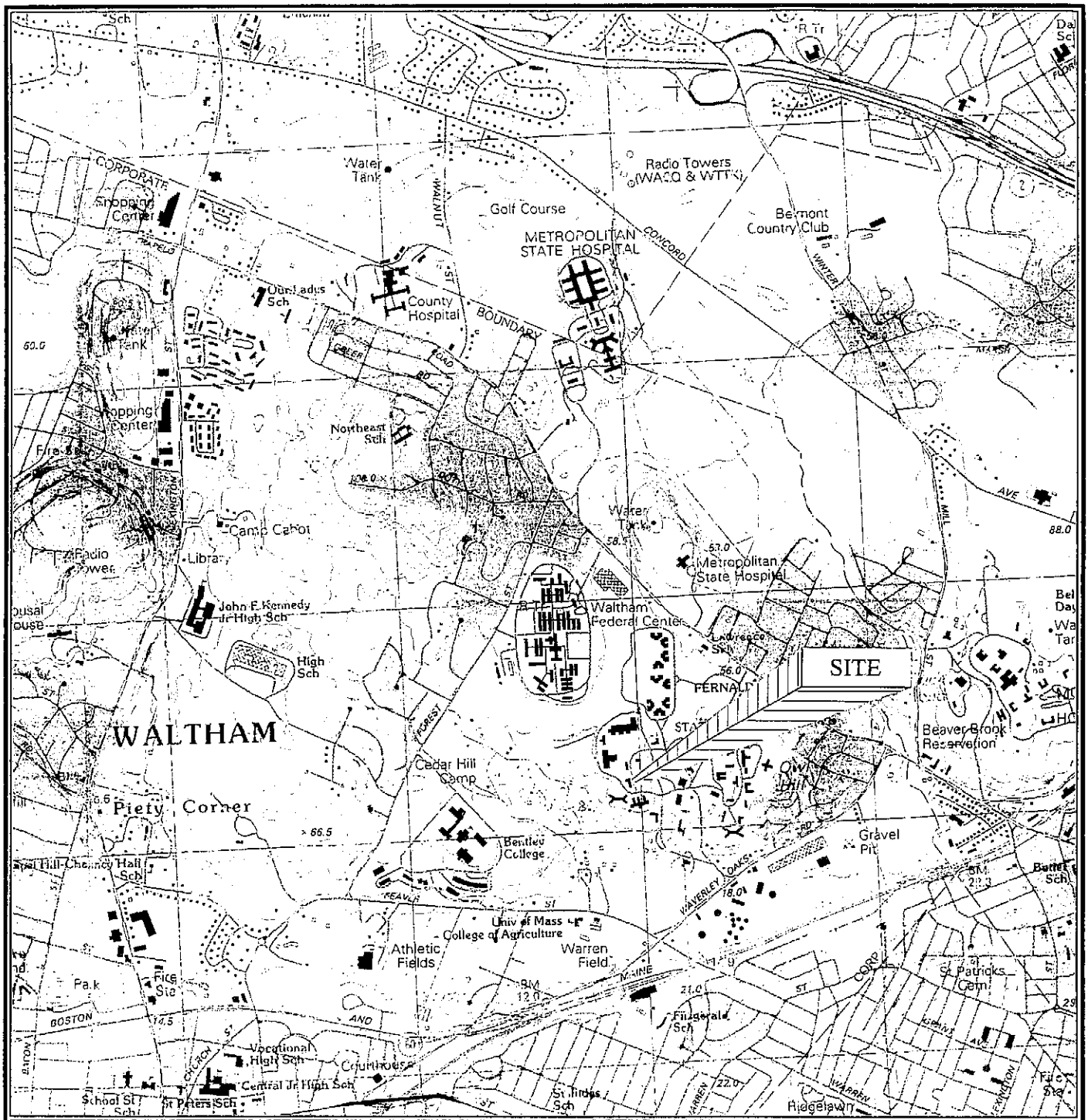
This report is intended for the sole use of the MDMR. The scope of services performed in execution of this investigation may not be appropriate to satisfy the needs of other users,

and any use or re-use of this document or the findings, conclusions, or recommendations is at the risk of said user.

It should be noted that twenty percent (20%) of Response Action Outcome Statements and supporting documentation are audited by the Massachusetts Department of Environmental Protection ("the Department"). The Department may conduct Random Audits or Targeted Audits for up to five (5) years following the submission of an RAO Statement. Under certain circumstances, as provided in 310 CMR 40.1110(3), there are no time constraints for Targeted Audits.

Due to the inherent flexibility in interpreting the applicable regulations, the Audits are often subjective and dependent on the opinion of the auditor. As a result, the auditor could require additional assessment of the site and/or remedial action. Based on these considerations, VERTEX is not and will not be responsible for costs or other possible ramifications of additional work required by the Department. Any other parties with financial or other interests in the subject property are urged to consider these facts.

FIGURES



USGS Topographic Map, 1985
Boston North, Massachusetts Quadrangle
Contour Interval: 3 meters

1/2 mi. **Graphic Scale** 1 mi.

0' 2000' 4000' 6000' 8000'

SITE LOCUS MAP

Fernald State School
Waltham, Massachusetts

SCALE: AS SHOWN

JUNE 21, 2000

VERTEX Proj. No. 1003

VERTEX

FIGURE NO. 1

LEGEND

MW-5 (78.86) — MONITORING WELLS LOCATION (GROUNDWATER ELEVATION)

Grassy Area

Parking Area

Edge of pavement

MW-1

Paved Area

Hill

Grassy Area

Maintenance Building

+ S6W2

MW-2

Approximate location of former pumps

Gravel Area

Approximate location of former UST #4

Edge of pavement

ROAD

Approximate area of March 2000 excavation

MW-3 (Former)

+ S6W1

MW-7 (91.06)

Approximate location of former UST #3

Area of RAO

MW-5 (78.86)

B-4

MW-8 (91.42)

MW-4 (91.24)

MW-6 (78.18)

Grassy Area

GRAPHIC SCALE

0 30 45 60

(IN FEET)

1 inch = 30 ft.

SITE SCHEMATIC

Fernald School
Farm & Grounds Building
200 Trapelo Road
Waltham, Massachusetts

SCALE : 1" = 30'	VERTEX Engineering Services, Inc.
DATE: April 17, 2000	
VERTEX PROJ. 1003	FIGURE NO. 2

1003SS2.dwg

LEGEND

MW-5 (78.86) — MONITORING WELLS LOCATION (GROUNDWATER ELEVATION)

Grassy Area

Parking Area

Edge of pavement

MW-1

Paved Area

Hill

Grassy Area

MW-2

+ S6W2

Maintenance Building

Approximate location of former pumps

Gravel Area

Approximate location of former UST #4

Edge of pavement

ROAD

Approximate area of March 2000 excavation

MW-3 (Former)

+ S8W1

MW-7 (91.06)

Approximate location of former UST #3

Area of RAO

MW-5 (78.86)

B-4

MW-8 (91.42)

MW-4 (91.24)

MW-6 (78.18)

Grassy Area

GRAPHIC SCALE

0 30 45 60

(IN FEET)

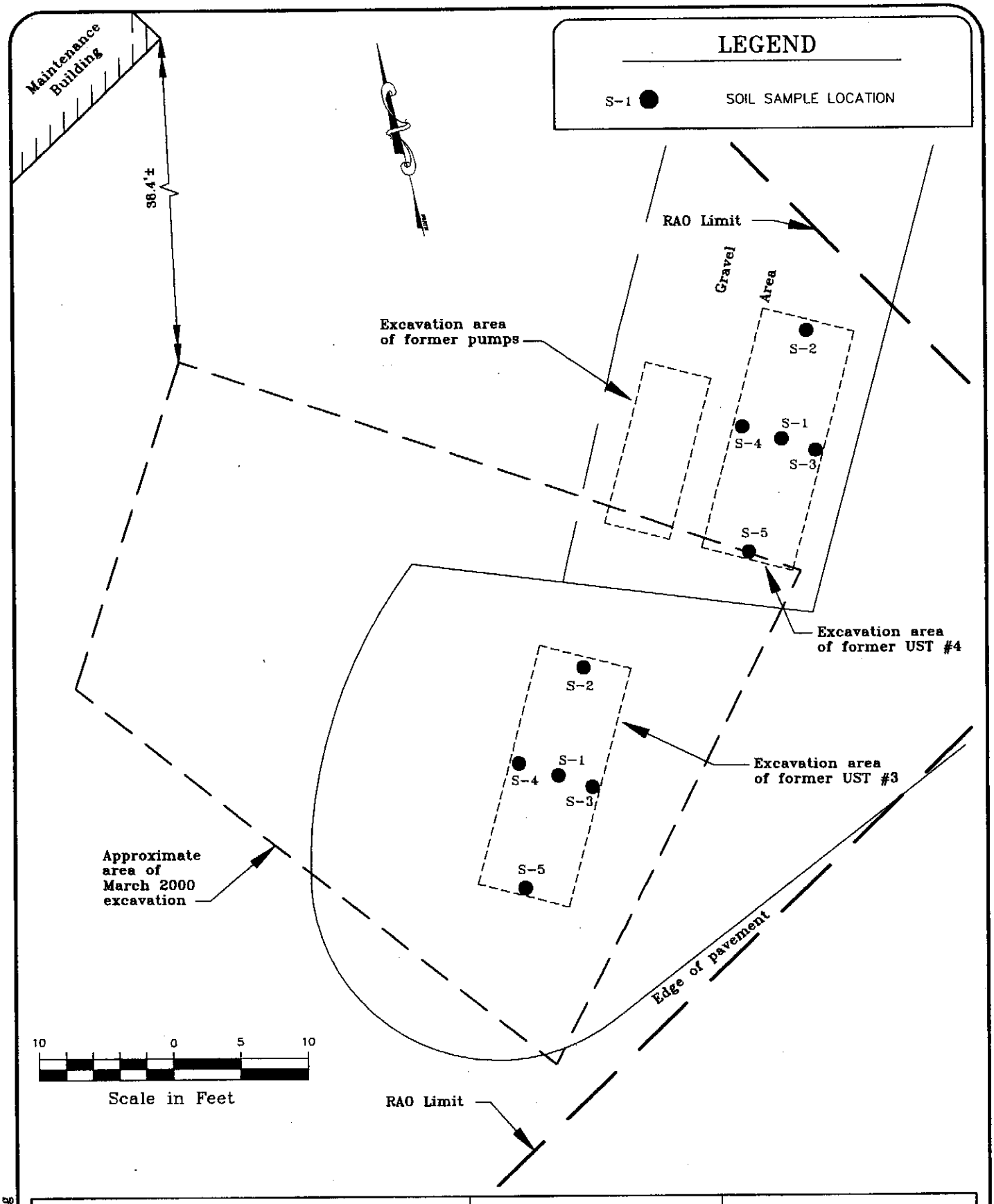
1 inch = 30 ft.

SITE SCHEMATIC

Fernald School
Farm & Grounds Building
200 Trapelo Road
Waltham, Massachusetts

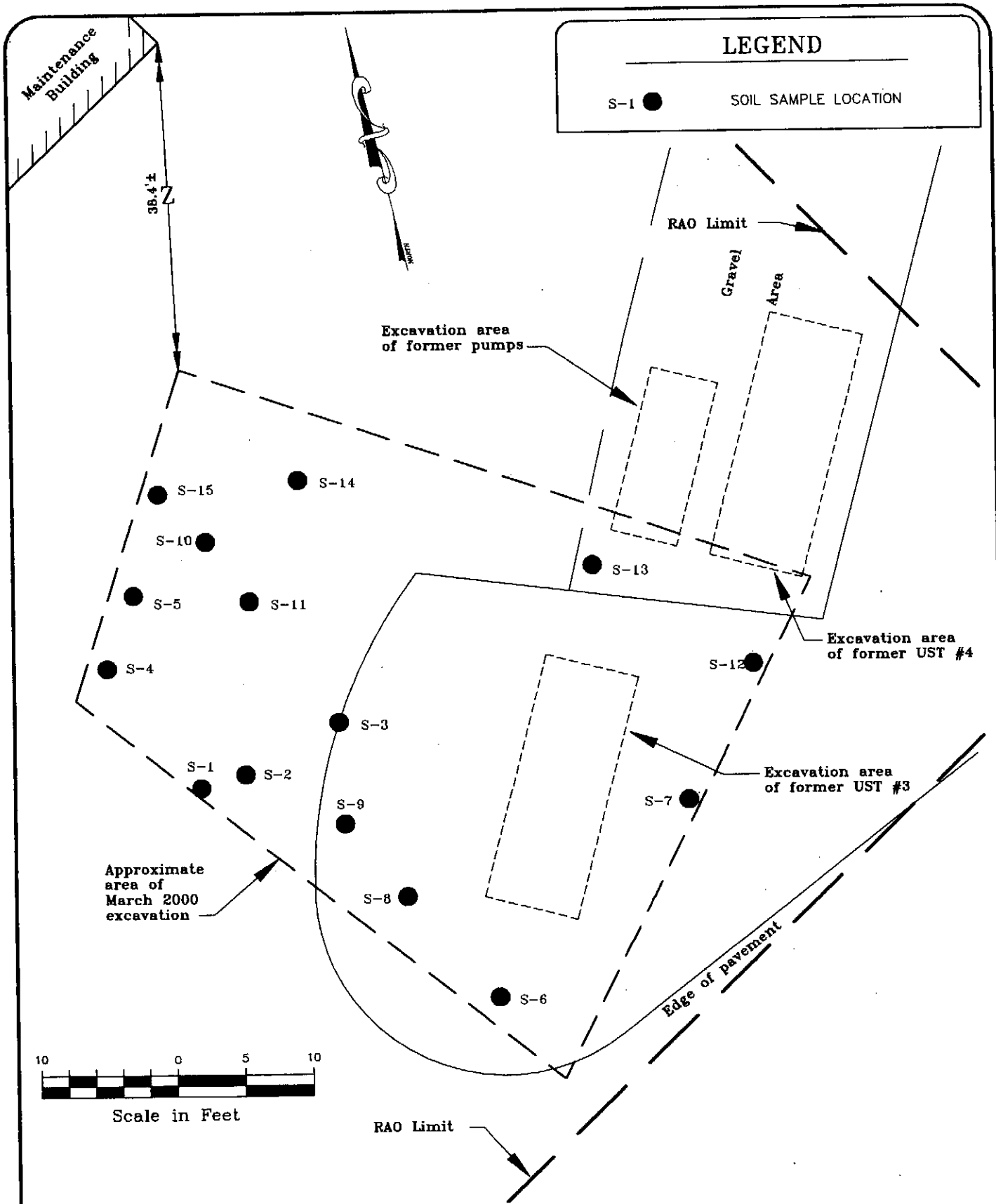
SCALE : 1" = 30'	VERTEX Engineering Services, Inc.
DATE: April 17, 2000	
VERTEX PROJ. 1003	FIGURE NO. 2

1003SS2.dwg



UST REMOVAL/POST EXCAVATION SCHEMATIC Fernald School Farm & Grounds Building 200 Trapelo Road Waltham, Massachusetts	SCALE : 1" = 10' DATE: June 8, 2000 VERTEX PROJ. 1003	VERTEX Engineering Services, Inc. FIGURE NO. 3

1003PXS.dwg



SAMPLING LOCATIONS–MARCH 2000 Fernald School Farm & Grounds Building 200 Trapelo Road Waltham, Massachusetts	SCALE : 1" = 10' DATE: June 8, 2000 VERTEX PROJ. 1003	VERTEX Engineering Services, Inc. FIGURE NO. 4

1003SL.dwg

TABLES

Table 2 MTBE Soil Results (mg/kg)						
Sample ID	MW1 5-7'	MW2 5-7'	MW3 5-7'	MW3 10-12'	B4 5-7'	Method One S1/GW2 Standard (mg/kg)
Depth (bgs)	10'	10'	10'	10'	10'	
Analyte						
TPH	ND	ND	ND	**920**	ND	**800**
BTEX						
Benzene	ND	ND	ND	ND	ND	40
Toluene	ND	ND	ND	2.4	ND	500
MTBE	ND	ND	ND	ND	ND	100
Ethylbenzene	ND	ND	ND	3.2	ND	500
Xykene	ND	ND	ND	27.5	ND	500

Mg/kg=ppm
Bold=Above Method 1 Standard
ND=Non detect

Table 3
Tank 3 Field Screening and Analytical Results
(mg/kg)

Sample ID	S1 Bottom of Excavation	S2 North Side Wall	S3 East Side Wall	S4 West Side Wall	S5 South Side Wall	Method One S1/GW2 Standard (mg/kg)
Depth (bgs)	8'	7'	7'	7'	7'	
TOV's ppm	ND	ND	ND	ND	ND	
Analyte						
TPH	17	86	20	<17	20	800
BTEX						
Benzene	0.005	0.006	0.005	0.005	0.006	40
Toluene	0.005	0.006	0.005	0.005	0.006	500
Methyl tert-butyl Ether (MTBE)	0.005	0.006	0.005	0.005	0.006	100
Ethylbenzene	0.005U	0.006U	0.005U	0.005U	0.006U	500
Xylene(total)	0.005U	0.006U	0.005U	0.005U	0.006U	500

Mg/kg=ppm
ND=Non detect
U=detected below laboratory detection limits

Table 1
Tank 1 Field Screening and Analytical Results
(mg/kg)

Sample ID	S1 Bottom of Excavation	S2 North Side Wall	S3 East Side Wall	S4 Western Side Wall	S5 South Side Wall	Pumps Pit Composite Excavation Area of Pumps	Method One SVOC W2 Standard (mg/kg)
Depth (bgs)	8'	7'	7'	7'	7'		
TOV's ppm	ND	ND	ND	ND	ND	NA	
Analyte							
TPH mg/kg	22	49	41	27	45	28	800
VOC's mg/kg							
Benzene	0.005	0.006	0.005	0.005	0.006	0.007	40
Toluene	0.005	0.006	0.005	0.005	0.006	0.007	500
Methyl tert-butyl Ether (MTBE)	0.005	0.006	0.005	0.005	0.006	0.160	100
Ethylbenzene	0.005U	0.006U	0.005U	0.005U	0.006U	0.007U	500
Xylenes	0.005U	0.006U	0.005U	0.005U	0.006U	0.007U	500

Mg/kg=ppm
ND=Non detect
U=detected below laboratory detection limits

Table 5

Field Screening Results

[illegible] March 2000

Sample ID	Location	Depth Bgs	TOV's	Sample ID	Location	Depth	TOV's
SS-1	Southeast Wall	9'10"	ND	**SS-9**	Base of Excavation Wet	11.5'	21
SS-2	Base of Excavation Wet	10'	6	**SS-10**	Base of Excavation Wet	11.5'	68
SS-3	Base of Excavation Wet	11'	1.7	**SS-11**	Base of Excavation Wet	11.5'	166
SS-4	West Wall	10'	1	**SS-12**	East Wall	12'	1
SS-5	West Wall	8'	ND	**SS-13**	North Wall	8-9'	11
SS-6	Base of Excavation Wet	8-9'	ND	**SS-14**	North Wall	9'	NA
SS-7	Base of East Wall	13'	ND	**SS-15**	East Wall	10'	ND
SS-8	South Wall	20'	ND				

ND=nondetect

Table 6 Marathon 200th Road Excavation Sampling Results (mg/kg)					
Sample ID	S7 Eastern Side Wall	S8 Southern Side Wall	S13 Southern Side Wall	S15 Western Side Wall	Method One S1/GW2 Standard (mg/kg)
Depth (bgs)	10'	10'	10'	10'	
TOV's ppm	ND	ND	11	ND	
Analyte					
EPH					
n-C9 to n-C18	BRL	BRL	BRL	BRL	1000
n-C19 to n-C36	43	BRL	BRL	BRL	2500
n-C11 to n-C22	BRL	BRL	BRL	BRL	800
PAH's	BRL	BRL	BRL	BRL	NA
VPH					
n-C5 to n-C8	BRL	BRL	2.1	BRL	100
n-C9 to n-C12	BRL	BRL	1.9	BRL	1000
n-C9 to n-C10	BRL	BRL	4.5	2.1	100
VOC's	BRL	BRL	BRL	BRL	NA

Mg/kg=parts per million
BRL= Below reportable limits
NA=Not Applicable-standard varies with compound

Table 7

Fernald School- Farms and Grounds (USTs #3 & #4)

Groundwater Sampling Results 1995 through 1999

Analyte	Method 1 GW-1	Method 1 GW-3	Sample Identification [illegible]					MW-4		MW-5	MW-6
VPHs			05/08/1995	06/06/1997	07/23/1998	16/01/1999	09/20/1999	07/21/1998	06/01/1999	06/01/1999	06/01/1999
c-5 to c-8 Aliphatics	1000	4000	NA	NA	**1,800**	**5,200**	**3,000**	39	BRL(20)	BRL(20)	BRL(20)
c-9 to c12 Aliphatics	1000	20000	NA	NA	**9,100**	**17,000**	**11,000**	82	63	BRL(20)	BRL(20)
c-9 to c10 Aromatics	5000	4000	NA	NA	3,400	**12,000**	**8,800**	54	63	BRL(20)	BRL(20)
Target Analytes											
Methyl *tert*-butyl Eth	50000	50000	NA	3,600	35	BRL(50)	BRL(25)	BRL(5)	BRL(5)	BRL(5)	BRL(5)
Benzene	2000	7000	1,000	BRL(250)	8	BRL(10)	BRL(5)	BRL(1)	BRL(1)	BRL(1)	BRL(1)
Toluene	6000	50000	**6,300**	3,200	1,900	1,300	460	BRL(5)	BRL(5)	BRL(5)	BRL(5)
Ethylbenzene	30000	4000	49	250	540	1,100	790	BRL(5)	BRL(5)	BRL(5)	BRL(5)
meta- and *para*-Xyle	6000	50000	**6,400**	3,100	4,900	**7,100**	5,200	15	BRL(5)	BRL(5)	BRL(5)
ortho-Xylene	6000	50000	**6,400**	3,100	4,900	1,400	930	15	BRL(5)	BRL(5)	BRL(5)
Naphthalene	6000	6000	20	NA	370	560	510	BRL(5)	BRL(5)	BRL(5)	BRL(5)
EPH (ug/l)											
c-9 to c-18 Aliphatics	1000	20000	NA	NA	BRL(630)	BRL(530)	NA	BRL(500	BRL(530)	BRL(500	BRL(500
c-19 to c-36 Aliphatic	NA	20000	NA	NA	BRL(630)	BRL(530)	NA	BRL(500)	BRL(530)	BRL(500)	BRL(500)
c-11 to c-22 Aromatic	50000	30000	NA	NA	230	490	NA	BRL(200)	BRL(200)	BRL(200)	BRL(200)
PAHs (ug/l)											
Naphthalene	6,000	6,000	NA	NA	NA	180	NA	NA	BRL(10)	BRL(10)	BRL(10)
2-Methylnaphthalene	10000	3000	NA	NA	NA	62	NA	NA	BRL(5)	BRL(5)	BRL(5)
Phenanthrene	50	50	NA	NA	NA	BRL(21)	NA	NA	BRL(10)	BRL(10)	BRL(10)
Acenaphthene	5000	5000	NA	NA	NA	BRL(21)	NA	NA	BRL(10)	BRL(10)	BRL(10)
TPH (ug/l)											
	1,000	20,000	**47,000**	**6,500**	NA	NA	NA	BRL(200)	NA	NA	NA

NA=Not Analyzed

ug/l=parts perbillion

BRL=Below Reportable Limits

Table 8
Fernald School - Farm and Grounds (USTs #3 + #4)
Groundwater Analytical Results-March 21, 2000 and April 5, 2000

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
c-5 to c-8 Aliphatics	1000	4000	2,200	1,400	26	BRL	140	77	BRL	BRL
c-9 to c12 Aliphatics	1000	20000	810	840	BRL	BRL	130	69	BRL	BRL
c-9 to c10 Aromatics	5000	4000	1,300	1,200	23	BRL	220	99	BRL	BRL
[illegible]										
Methyl tert-butyl Eth	50000	50000	17	15	BRL	BRL	9	BRL	11	BRL
Benzene	2000	7000	21	BRL	BRL	BRL	BRL	BRL	BRL	BRL
Toluene	6000	50000	10	8	BRL	BRL	BRL	BRL	BRL	BRL
Ethylbenzene	30000	4000	23	28	BRL	BRL	BRL	BRL	BRL	BRL
meta- and para-Xylen	6000	50000	13	19	BRL	BRL	19	BRL	BRL	BRL
ortho-Xylene	6000	50000	13	15	BRL	BRL	6	BRL	BRL	BRL
Naphthalene	6000	6000	21	22	BRL	BRL	7	BRL	BRL	BRL
[illegible]										
c-9 to c-18 Aliphatics	1000	20000	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL
c-19 to c-36 Aliphatic	NA	20000	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL
c-11 to c-22 Aromatic	50000	30000	230	BRL	BRL	BRL	BRL	BRL	BRL	BRL
[illegible]										
Naphthalene	6,000	6,000	13	21	BRL	BRL	BRL	BRL	BRL	BRL
2-Methylnaphthalene	10000	3000	14	18	BRL	BRL	BRL	BRL	BRL	BRL
Phenanthrene	50	50	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL
Acenaphthene	5000	5000	BRL	BRL	BRL	BRL	BRL	BRL	BRL	BRL
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

BRL=Below Reportable Limits
ug/l=parts per billion

APPENDIX A

RAO TRANSMITTAL FORM

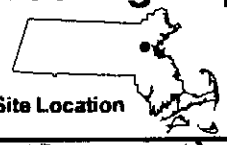
APPENDIX B

MASS GIS MAP

MA DEP - Bureau of Waste Site Cleanup

Site Scoring Map: 500 feet & 0.5 Mile Radii

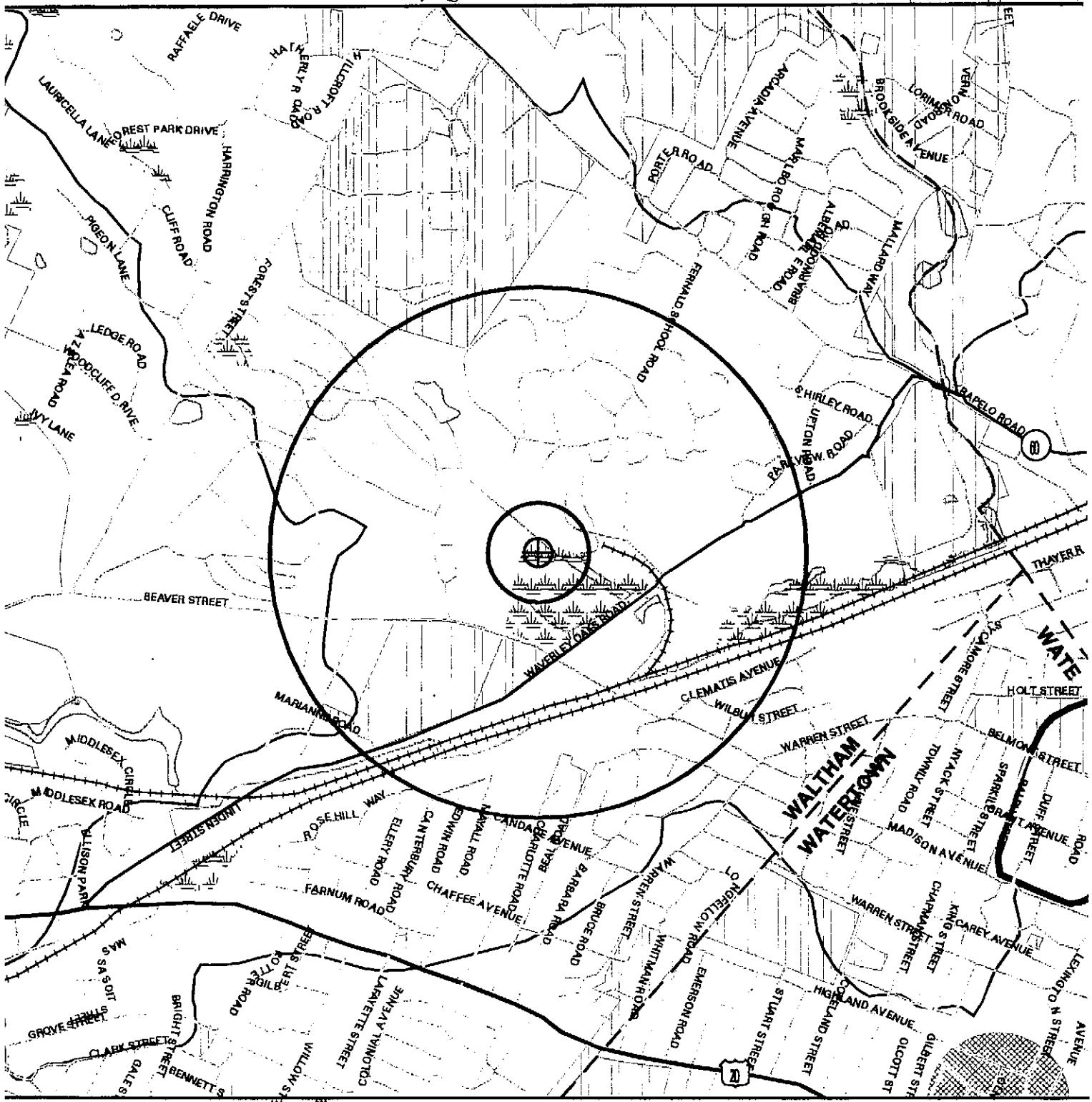
SITE NAME:
Power Plant
200 Trapello Road
Waltham, MA
4694830n 318000ew



The information shown on this map is the best available at the date of printing. Please refer to the data source descriptions document.

MASSGIS — Massachusetts Geographic Information System — Massachusetts Executive Office of Environmental Affairs - 1998

DEP



Roads: Interstate,US,State,Street,Trail — EPA Designated Sole Source Aquifer

Boundaries: Municipal,County,DEP Region — Public Water Supplies: Ground,Surface,Non Community

Train; Powerline; Pipeline — Approved Zone2; MWPA; Surface Water Supply Zone A

Drainage Basins: Major,Sub — Hydrography: Water Features,Public Surface Water Supply

Streams: Perennial,Intermittent,Aqueduct — Wetlands: Fresh,Salt,NHESP Wetlands Habitat

Potentially Productive Aquifers: Medium Yield,High Yield — Protected Open Space; ACEC

Non-Potential Drinking Water Source Area: Medium,High Yield — DEP Permitted Solid Waste Facilities; Certified Vernal Pools

N W E S

SCALE 1:15000

0 1/2 MILES

0 1/2 KILOMETERS

December 03, 1998

APPENDIX C

WEBB's TIER CLASSIFICATION
AND SUBSURFACE INVESTIGATION REPORT

PHASE I REPORT AND TIER CLASSIFICATION SUBMITTAL

PURSUANT TO MGL CHAPTER 21E AND THE MASSACHUSETTS CONTINGENCY PLAN (310 CMR 40.00 ET SEQ.)

WALTER E. FERNALD STATE SCHOOL
200 TRAPELO ROAD
WALTHAM, MA 02154

PREPARED FOR:
THE WALTER E. FERNALD STATE SCHOOL
200 TRAPELO ROAD
WALTHAM, MA 02154

PREPARED BY:
WEB ENGINEERING ASSOCIATES, INC.
106 LONGWATER DRIVE
NORWELL, MA 02061

WEB FILE NO. 94-E-021

DATE SUBMITTED:

JUNE 15, 1995

WEB ENGINEERING ASSOCIATES, INC.
106 LONGWATER DRIVE, SUITE 4
NORWELL, MASSACHUSETTS 02061
617-878-7766 • FAX 617-878-8004
1-800-273-7289

June 15, 1995

Mr. Michael Gorrasi, Environmental Analyst
Emergency Response Section
DEP/NERO
10 Commerce Way
Woburn, MA 01801

RE: Fernald State School
Waltham, MA
RTN #3-10725
Web File No. 94-E-021
Phase I/Tier Classification

Dear Mr. Gorrasi:

Web Engineering Associates, Inc. has prepared the enclosed Phase I Report and Tier Classification Submittal for the above referenced site as required by the Massachusetts Contingency Plan (310 CMR 40.00). The Massachusetts Department of Environmental Protection (MADEP) was notified of a threat of release pursuant to two failed tank tests (2-4,000 gallon unleaded gasoline tanks) on March 22, 1994. Subsequent to the notification, permission was granted on April 19, 1994 to uncover the tops of the tanks. This was verbally clarified by the MADEP on May 5, 1994 along with permission to stockpile contaminated soil.

Upon excavation, a limited amount of suspected contaminated soil (± 7 cubic yards) was stockpiled. Faulty check valves and venting systems were corrected on both tanks and the tank systems were retested and confirmed tight. However, not all the contaminated soil could be removed without jeopardizing the operation of the tanks and pumps. Further investigation was therefore ordered by the MADEP in August, 1994.

An initial IRA Plan for further investigation was submitted on March 2, 1995. A request for a revised IRA Plan was then issued by the MADEP on March 20, 1995. Web Engineering Associates, on behalf of the Fernald School responded to the March 20, 1995 letter from the MADEP and submitted the revised IRA Plan, April 3, 1995.

During the IRA activities, the year 1 deadline passed (March 22, 1995). This Phase I Report and Tier Classification will bring the site current with reporting requirements.

According to the Numerical Ranking System (NRS), the score for the site is 132. Based upon the NRS, the site is classified Tier II.

Please call if you have any questions concerning this site.

Very truly yours,

William E. Baird

William E. Baird, PE, LSP
President

R. Jeffrey Riotte
Vice President

RJR/WEB/crf

cc: Maurice O'Connell, Fernald School

1.0 GENERAL DISPOSAL SITE INFORMATION

The site (Grounds Department, Fernald School, 200 Trapelo Road, Waltham, Massachusetts) is located on the southwest edge of the Fernald School property between Clamatis Brook (on the West side) and an un-named tributary to the east of the site. The Universal Transverse Mercator (UTM) coordinants are 4, 694, 875N, 318, 075E. The building occupying the site is a grounds/maintenance building constructed in 1973. There are less than 100 workers at the site. The residential population within 1/2 mile of the site is estimated to be greater than 1,000 people. The surrounding land use is both commercial and residential with the site comprising a portion of the institution (Walter E. Fernald State School).

1.1 Natural Resource Areas and Sources

The only natural resource areas within 500 feet of the site according to the USGS Quadrangles and the Mass GIS map are freshwater wetlands located south of the site and two small streams (Clematis Brook and an un-named stream) bordering the site on the west and east, respectively. Conservation Commission files revealed areas of Rare Wetlands Wildlife Habitat and Federal, State, and local open space 1/2 mile from the site.

According to the Flood Insurance Rate Map (FIRM) for the City of Waltham, the site is located within a Zone C designating an area of minimal flooding potential and part of the Charles River Drainage Basin.

The City of Waltham has a public water supply system which is part of the Massachusetts Water Resources Authority (MWRA) which receives its water through the Quabbin Reservoir system. In addition, the DEP Water Supply Protection Atlas (last updated in 1982) indicates that the City of Waltham has no sources of water located within a one mile radius of the site (See Appendix A for complete information on the environmental setting, history, and records review of the site).

2.0 SITE HISTORY AND PRESENT USE

2.1 Owner/Operator and Operations History

The site is part of the Walter E. Fernald State School which has been owned by the Commonwealth of Massachusetts since the turn of the century. However, this parcel, most likely was added to the grounds around 1930 (See Appendix A for complete site history). Prior to the Commonwealth of Massachusetts control of the property, the site was farmland. The current grounds building was constructed in 1973 and has been utilized as such since that time.

2.2 Release History

Review of federal databases reveal no National Priorities List or RCRA TDS list sites within one mile of the waste site. State and local files indicate numerous minor spills (see Appendix A for complete listing) within 1/2 mile radius of the site. In addition, a number of Locations to be Investigated and other transition sites under the Massachusetts Contingency Plan are within a one mile radius including a power plant spill just Southeast of the site involving #6 fuel oil. Also, Conservation Commission files recorded a small oil spill occurred in 1994 which was handled by Clean Harbors.

2.3 Oil and/or Hazardous Material Use and Storage History

There is no clear record as to when the two (2) 4,000 gallon gasoline storage tanks were installed at the grounds facility. Interviews with people from the School, however, suggest that a time from between 1970-1973 is reasonable and perhaps they were installed when the building was constructed.

2.4 Waste Management History

Since the early 1970s, maintenance equipment has been supplied with gasoline supplied by the two 4,000 gallon underground storage tanks. The tanks were tested in 1994 under 527 CMR 9.00 regulations and passed after piping arrangements were modified. In addition to the two underground tanks the maintenance building contains a 250 gallon free standing oil tank containing diesel fuel as well as assorted 55 gallon drums (approximately 10) of various different weight oils and waste oils.

2.5 Environmental Permits and Compliance History

As previously mentioned, leak detection requirements for the two 4,000 gallon gasoline tanks were met within the last year as well as spill containment and overfill requirements. The tanks, according to the Waltham Fire Department, have not been registered.

3.0 SITE HYDROGEOLOGICAL CHARACTERISTICS

3.1 Subsurface Investigations

On April 26, 1995 four soil borings were advanced by Technical Drilling Services under the supervision of Web Engineering personnel. Drilling was limited due to the presence of bedrock in the storage tank area. Thus, borings were limited to approximately 7 feet below grade except for boring #3 where the drill rig was able to penetrate fractured bedrock to approximately 11 feet below grade. Wells were set in borings #1, #2, and #3. Boring #4 had no well set as refusal was encountered prior to reaching groundwater. Refusal was also encountered in borings #1 and #2, however, well screens were set as the soil was slightly damp and there was thought to be the possibility that groundwater was present. This did not materialize.

The drilling locations were selected based upon having one upgradient well and three downgradient wells around the tank location (See figure 2). Boring logs from the drilling are included in Appendix C.

3.2 Surficial Features

The regional topography slightly North of the site slopes down rather steeply on either side of an un-named stream that eventually traverses the tank area just South of the tank locations. The immediate area of the tanks is not nearly as steep and eventually levels off into a wetland area Southwest of the tanks and the maintenance building. The stream eventually intercepts with Clematis Brook which drains into Beaver Brook.

3.3 Subsurface Soils

Soil samples collected during the installation of the monitoring wells indicated that the site soils consist mainly of brown to gray silty till with gravel cobbles and fractured bedrock. At approximately 6-9 feet refusal was encountered in all borings except for monitoring well #3 where the bedrock was sufficiently fractured to allow penetration to 11 feet.

3.4 Hydrogeology

The four borings (3 monitoring wells) were installed by Technical Drilling Services and witnessed by Web Engineering on April 26, 1995. On May 8, 1995, Web personnel returned and determined that only monitoring well #3 had any groundwater. A reading as to the depth to groundwater was taken as shown in Table 1 below.

TABLE 1: MONITORING WELL DATA, MAY 8, 1995

	DEPTH TO GROUNDWATER BELOW GRADE (FEET)	PRODUCT THICKNESS
MW-1	Dry at 8.83	N/A
MW-2	Dry at 6.41	N/A
MW-3	9.77	None
B-4	No Well Set (Dry)	NA
		N/A - Not Applicable

Review of this data indicates the presence of bedrock within 7 feet of grade and above the water table. It is not clear at this time whether the water encountered in MW-3 is true groundwater or whether it represents infiltration from grade settling in a relatively impermeable bedrock area.

In addition, according to the Massachusetts GIS maps, the site does not fall within any mapped GIS category or within 500 feet of any mapped category except for some freshwater wetlands due South of the site. No public water supply wells, Class A surface water, or Interim Wellhead Protection Areas are located within one-half mile of the property.

4.0 NATURE AND EXTENT OF CONTAMINATION

4.1 Soils

4.1.1 Analysis of Stockpiled Soil Taken From the Tops of the USTs

A composite soil sample was taken from the stockpiled soil at the site on May 8, 1995. This sample was subjected to asphalt batch testing

requirements (EPA 8260, RCRA 8, TPH by GC, EPA 8080, Ignitability, Reactivity, Corrosivity and Free Liquids). Results of the testing indicated no volatiles, TPH, PCBs or free liquids present (See Appendix B for laboratory results). Accordingly, the soils meet Method 1 S-1 standards and will be reused on site.

4.1.2 Analysis of Soils from Monitoring Wells

Split spoon samples were collected at five foot intervals during the installation of three monitoring wells and one soil boring on April 26, 1995 (See Appendix C for boring logs). Samples from MW-1, MW-2 recorded no Total Organic Vapor (TOV) readings while a sample from B-4 recorded a TOV reading of 8.9 ppm at 5-7 feet. However, MW-3 did register a TOV reading of 139 ppm at 10-12 feet. The laboratory results of the soil sampling can be found in Table 2 that follows.

TABLE 2: SOIL ANALYSIS FROM MONITORING WELLS/BORING

4/26/95

Sample Location	Volatile Aromatics (ppb)				Total Petroleum Hydrocarbons (ppm)
	Benzene	Toluene	Ethyl-benzene	Xlyene	
MW-1 (5-7 feet)	ND	ND	ND	ND	ND
MW-2 (5-7 feet)	ND	ND	ND	ND	ND
MW-3 (5-7 feet)	ND	ND	ND	ND	ND
MW-3 (10-12 feet)	ND	2400	3200	27500	920
B-4 (5-7 feet)	ND	ND	ND	ND	ND

ND = Not Detected, Volatiles by EPA 602, TPH by GC/FID
See Appendix B for lab reports.

4.2 Groundwater

As previously mentioned, TOV meter readings from MW-3 indicated the presence of contamination at 10 - 12 feet. A groundwater sample was therefore taken on May 8, 1995 and analyzed for volatile aromatics (EPA Method 602) and total petroleum hydrocarbons (TPH by GC/FID). The results are shown in Table 3 below.

TABLE 3: GROUNDWATER ANALYSIS FROM MW-3

5/8/95

	Volatile Aromatics (ppb)				Total Petroleum Hydrocarbons (TPH) ppm
	Benzene	Toluene	Ethyl-benzene	Xylene	
MW-3	1000	6300	49	6400	47

No lab results for groundwater are available for MW-1, MW-2 or B-4 as refusal was encountered prior to reaching groundwater.

5.0 MIGRATION PATHWAYS AND EXPOSURE POTENTIAL

Contamination at the site is gasoline which appears to be located in a pocket of fractured bedrock southwest of the site. The Fernald State School property is a mixture of administration, education and residential buildings with this particular disposal site located at the very southern edge of the State School property. It also appears likely that groundwater flow is in a southerly direction migrating eventually towards the wetlands south of the disposal site. With this in mind, potential exposure to site contaminants are limited to concerns over possible impact to area groundwater which discharges to the wetlands southwest of the property and away from populated areas of the school.

6.0 EVALUATION FOR IMMEDIATE RESPONSE ACTIONS

The original tank tests results for both gasoline tanks indicated a possible leak and therefore a 72 hour threat of release notification was instituted. Upon further examination (uncovering of the tank tops and piping) check valve failures and improper venting were identified and corrected. A second round of testing after piping modifications indicated that the tanks were tight. Therefore, at this time there is no indication that additional contaminants are entering the ground.

Current analysis of the site has been conducted under an IRA Plan verbally accepted by the DEP on April 19, 1995. Because contamination slightly exceeds acceptable standards for groundwater (assuming a GW-2 standard for groundwater), and based upon the IRA Plan, quarterly sampling of MW-3 will be continued. An IRA Completion Report will be filed with MADEP by June 15, 1995.

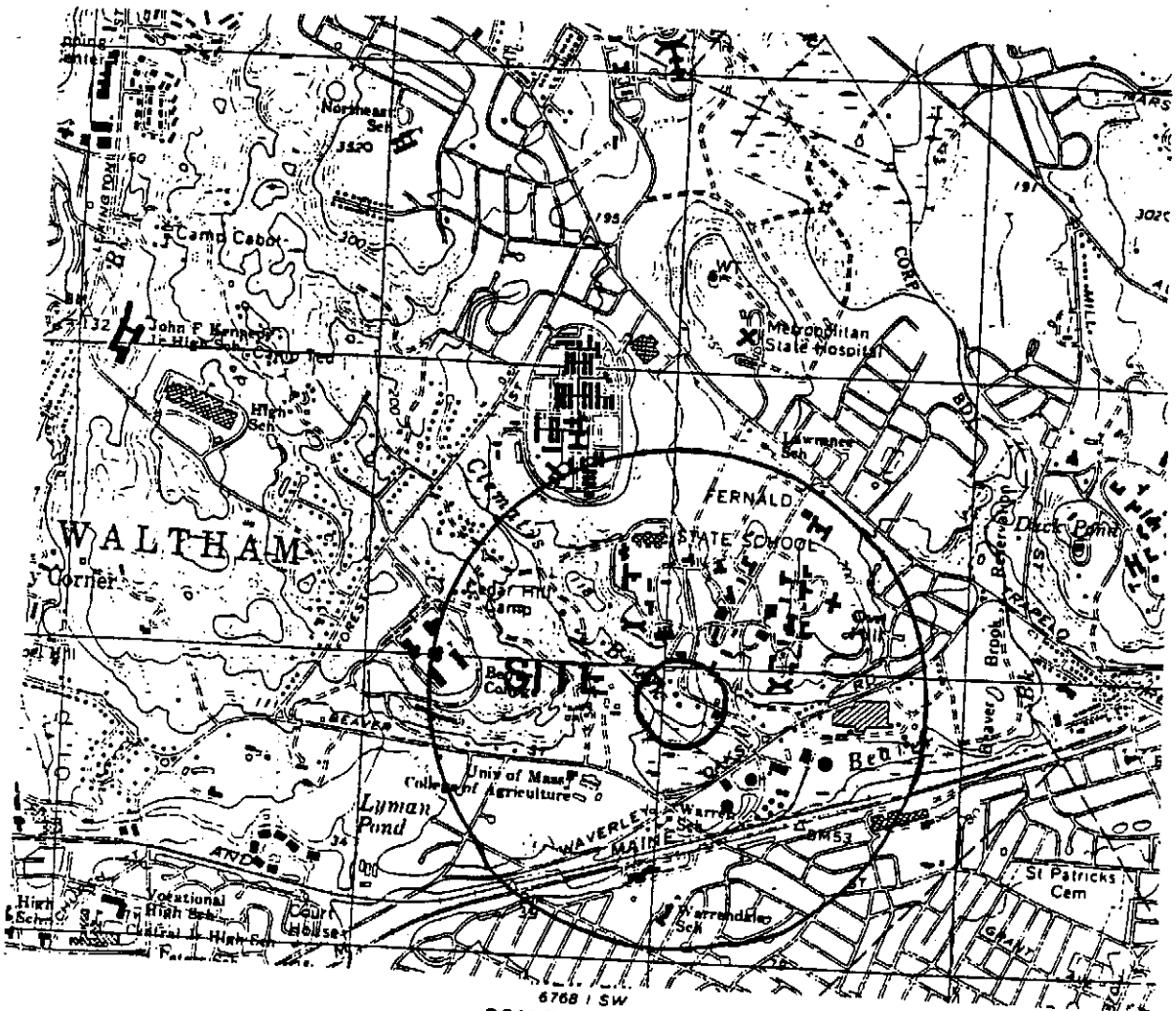
7.0 CONCLUSIONS

Based upon the findings of this assessment work, it can be concluded that a release of gasoline due to spilling and/or overfills concerning the two 4,000 gallon gasoline tanks has occurred. Because groundwater contaminants exceed Method 1 standards for the GW-2 category, MW-3 will be sampled on a quarterly basis and a decision as to whether further remediation or tank removal is most appropriate, will be made in the near future. Currently there is no reason to believe that an imminent hazard is associated with this release.

7.1 Tier Classification

The attached Numerical Ranking System (NRS) Scoresheet was completed using the results of this investigation. According to the NRS, the score for the site is 132. With this site score, the site will be classified as Tier II.

Figure 1
Site Location Map
Fernald State School



SCALE 1:25 000

1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER

CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U. S. GEOLOGICAL SURVEY, RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

WEB ENGINEERING ASSOCIATES, INC.

ESA HISTORICAL RESEARCH REPORT

For the Site known as:

Grounds Department
Fernald School
200 Trapelo Road
Waltham, MA

Prepared for:

Steve Rumba
Web Engineering
106 Longwater Drive
Norwell, MA

Prepared by:

Susan McGrath
ESA Research Services
PO Box 440
Marion, MA 02738

June 2, 1995

ESA RESEARCH SERVICES

PO BOX 440, MARION, MA 02738

June 2, 1995

Mr. Steve Rumba
Web Engineering
106 Longwater Drive
Norwell, MA

RE: ESA Historical Research Report
Grounds Department, Fernald School, 200 Trapelo Rd., Waltham, MA

Dear Mr. Rumba:

ESA Research Services is pleased to submit an ESA Historical Research Report for the above-referenced location, relative to ASTM Designation : E 1527 - 94, Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process, Section 7, Records Review, and Section 10, Interviews with Local Government Officials.

This report included a review of federal databases, state and local environmental records at state and local agencies, a review of Site history, and interviews and discussions with local officials regarding Site history and usage.

It has been a pleasure working with you on this project. If I can be of further assistance, please do not hesitate to call. I will be glad to answer any questions or comments you may have.

Sincerely,

Susan McGrath

TABLE OF CONTENTS

INTRODUCTION

Mr. Steve Rumba contracted ESA Research Services (ESA) to conduct an ESA Historical Research Report regarding the property located at the Grounds Department, Fernald School, 200 Trapelo Road, in Waltham, MA (the "Site"). The investigation was designed to conform to ASTM Designation E 1527-94, Standard Practice for Environmental Site Assessments: Phase 1 Environmental Site Assessment Process, Section 7, Records Review, and Section 10, Interviews with Local Government Officials.

ESA's investigations consisted of:

Federal database review;

Federal, State, and local environmental records review at state and local agencies, regarding the use, storage, and/or release of oil or hazardous materials at the Site or in the Site vicinity;

Historical records review;

Interviews and discussions with local officials regarding the Site history and usage;

Data reduction and summarization.

The findings of ESA's investigations are contained in the report.

ENVIRONMENTAL SETTING

Geographic Location and Identification

The Site is located on the south side of Trapelo Road Street in an area zoned as a Conservation/Recreation area in Waltham , Massachusetts. The property is a portion of a 163.05 acre parcel. The Site is shown as a portion of Lot 001-0001 on Map 45 of the Waltham Assessor's Maps.

Surface Water Features

According to the Flood Insurance Rate Map (FIRM) for the City of Waltham, MA, Community Panel Number 250222 005 B and dated 12/18/79, the Site is located within a Zone C designating an area of minimal flooding potential.

According to the regional topographic map (Lexington, MA Quadrangle), the nearest upstream surface water body is Clematis Brook, located approximately 250 feet west of the Site, and the nearest downstream surface water body is Beaver Brook, located approximately 2000 feet southeast of the Site.

There are wetlands located within a 0.5 mile radius of the Site.

According to overlay information at the MA DEP, the Site is located in the Charles River Drainage Basin, subbasin 23.

Identification of Groundwater Category

The following summary of groundwater information is extracted from information reviewed at the MA DEP regarding the Site property. The Site's groundwater :

a). **is not** within a Zone II;
b). **is not** within an Interim Wellhead Protection Area;
c). **is not** within a Potentially Productive Aquifer;
d). **is not** within the Zone A of a Class A Surface Water Body;
e). **is not** known to be located five hundred (500) feet or more from a public water distribution pipeline;
f). **is not** located within five hundred (500) feet of a private water supply well.

Abutters

North:	Fernald State School
South:	Fernald State School Power Plant
East:	Fernald State School
West:	A vacant parcel, part of Lot 1-1, Map 54, owned by the Commonwealth of Massachusetts, and listed with the assessor's office as public service property. A portion of this parcel, abutting the Site, is delineated as wetlands.

OWNERSHIP

Current Ownership

Commonwealth of Massachusetts
200 Trapelo Road
Waltham, MA 02154

Prior Ownership

According to a review conducted at the Waltham Assessor's Office and the Fernald State School Library, a Book and Page reference regarding the Site was unavailable. Several properties located along Trapelo Road, acquired by the Commonwealth of Massachusetts in the 1930's, were listed with Book and Page references and are listed below. A chain of ownership for the actual Site property was not able to be developed during this review. (See Site History for available information regarding the Site property.)

date		book & page	name
7/31/31	- present	5600 - 550	Commonwealth of Massachusetts
	- 7/31/31		City of Waltham
4/1930	- present	5460 - 286	Commonwealth of Massachusetts
7/8/03	- 4/1930		Francis Baldwin
	- 7/8//03		Phineas Lawrence
8/17/31	- present	5584 - 383	Commonwealth of Massachusetts
8/18/15	- 8/17/31		St. Elizabeth's Hospital of Boston
	- 8/18/15		Roman Catholic Archbishop of Boston
5/15/30	- present	5463 - 288	Commonwealth of Massachusetts
	- 5/15/30		Clara D. Baldwin
4/21/30	- present	5463 - 287	Commonwealth of Massachusetts
	- 4/21/30	5463 - 286	Charles F. Stone
			James R. Baldwin

SITE HISTORY

A review of available files and plans was performed at the Waltham Assessor's Office, the Building and Public Works Departments, the Fernald School Library, and the Waltham Public Library supplemented by the personal recollections of municipal officials and others familiar with the Site. The following is a summary of the information collected in this review relative to Site development:

According to a History of Fernald School, compiled and maintained by the Fernald School Library, and supplied by Ms. Bonnie Stetcher, school librarian, in 1889 the Commonwealth of Massachusetts purchased 18 acres of farm land, one house, and one barn in Waltham for the purpose of relocating the Massachusetts School for the Feeble Minded, previously located in Boston. In 1891, the original Administration Building was constructed and occupied.

A review of the 1911 Sanborn Fire Insurance Map, available at the Waltham Engineering Department, did not show the portion of the school on which the Site is located.

A review of the 1962 Sanborn Fire Insurance Map, available at the Waltham Public Library, revealed the Site as the location of the Farm House. A barn, shed, garage and slaughterer is noted to the northwest of the Farm House. No underground tanks are noted. (See Appendix C)

According to Mr. Moe O'Connell of the Fernald School, a barn and outbuildings, previously located on the Site, burned prior to the construction, in 1973, of the existing Grounds Department building. Mr. O'Connell stated that the underground tanks located on the Site were installed prior to his employment at the Fernald School, and he estimated that the two 4,000 gallon tanks had been installed for approximately 20 years.

The Site is currently the location of the Grounds Department of the Fernald School.

FEDERAL AND STATE ENVIRONMENTAL RECORDS REVIEW

Federal databases
Available records regarding releases of oil or hazardous materials were reviewed on May 30, 1995. No record of a release on the Site parcel or adjacent parcels was discovered during this review.

NPL
According to the National Priorities List, issued by the EPA, the following locations are located within a one (1) mile radius of the Site:

There are no (0) NPL sites located within a one (1) mile radius of the Site.

CERCLIS
Comprehensive Environmental Response, Compensation, and Liability Information System
The CERCLIS list is a compilation by the EPA, of known or suspected uncontrolled or abandoned hazardous waste sites, which the EPA has investigated, or is currently investigating for a release or threatened release of hazardous substances pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (Superfund Act). The following locations are within a one half (.5) mile radius of the Site:

The CERCLIS list is unavailable for review at the DEP NERO.

RCRA TSD
According to the RCRA TSD list , issued by the EPA, the following locations which are involved in the treatment, storage or disposal of hazardous materials are located within a one (1) mile radius of the Site:

There are no (0) RCRA TSD facilities within a one (1) mile radius of the Site.

RCRA

Resource Conservation and Recovery Act

The EPA's RCRA report identifies and tracks hazardous waste from the point of generation to the point of disposal, in accordance with requirements regarding the generation, storage, transportation, treatment, or disposal of hazardous waste. The following RCRA generators are located on the Site parcel or adjacent parcels.

MAD073798720	Shriver Center, 200 Trapelo Road, Waltham

Massachusetts DEP

Available records regarding releases of oil and hazardous materials were reviewed by ESA Research Services at the DEP Northeast Regional Office in Woburn on May 30, 1995. A record of a release on the Site parcel or adjacent parcels was discovered during this review.

State Files

The following locations are listed on the DEP "List of Confirmed Disposal Sites and Locations To Be Investigated" (July, 1993) and the Tier Transition Classification List (July, 1994) The following locations are within a one (1) mile radius of the Site

MA DEP ID #3-0010725, Fernald School, 200 Trapelo Road, Waltham, MA
LOCATION RELATIVE TO THE SITE: the Site
STATED GROUNDWATER FLOW: none stated

See Appendix I

MA DEP ID #3-0010367, Fernald School Power Plant, 200 Trapelo Road, Waltham, MA
LOCATION RELATIVE TO THE SITE: abutting to the southeast
STATED GROUNDWATER FLOW: not stated

See Appendix J

MA DEP ID #3-6013, Federal Center, 424 Trapelo Road, Waltham, MA
LOCATION RELATIVE TO THE SITE: 2100 feet northwest
STATED GROUNDWATER FLOW: not stated

See Appendix K

MA DEP ID #3-3078, Shell Oil, 313 Waverly Oaks Road, Waltham, MA
LOCATION RELATIVE TO THE SITE: 1400 feet southwest
STATED GROUNDWATER FLOW: not stated

See Appendix L

MA DEP ID #30011878, 200 Trapelo Road, Waltham, MA
LOCATION RELATIVE TO THE SITE: unknown
STATED GROUNDWATER FLOW: unknown

File unavailable for review

MA DEP ID # 3-3-0010717, 411 Waverly Oaks Road, Waltham, MA

MA DEP ID #3-0454, Waverly Oaks Road, Waltham, MA

MA DEP ID #3-2787, 475 Trapelo Road, Waltham, MA

State Spill Records

Available records regarding spills of and contamination by oil and hazardous materials were reviewed on May 30, 1995. A record of contamination on or adjacent to the Site parcel was found in these files. The following locations are within a one half (1/2) mile radius of the Site:

location	quantity	product	date	id#
200 Trapelo Road	200 gal.	#6 fuel oil	11/30/80	-
	-	contaminated soil	3/16/92	N92-0350
	> 1 drum	misc. oil	6/24/92	N92-0797
	200 gal.	#6 fuel oil	1/2/86	N86-0005
424 Trapelo Road	-	#4 fuel oil	1/7/93	N93-0030
	-	#4 fuel oil	12/4/85	N85-0919
	-	#2 fuel oil	11/21/85	N85-0890
	51-100 gal.	#2 fuel oil	4/17/88	N88-0549
86 Trapelo Road	10-50 cy	asbestos	3/19/90	N90-0365
313 Waverly Oaks	+50 gal.	misc. oil	10/5/85	N85-0775
	-	-	4/21/83	N83-0047
	-	waste oil	11/30/89	N89-2003
	11-50 gal.	waste oil	1/16/90	N90-0072
	-	misc. oil	1/30/90	N90-0144
	51-100 gal.	#2 fuel oil	7/25/90	N90-1206
	1-10 drums	-	1/6/92	N92-0021
	1 gal	gasoline	1/13/84	N84-0611
	1-10 gal.	gasoline	3/7/89	N89-0307
	11-50 gal.	gasoline	1/29/91	N91-0123
	100 gal.	#2 fuel oil	12/10/84	N84-0811
	-	waste oil	4/25/85	N85-0018
	-	misc. oil	2/13/85	N85-0095
411 Waverly Oaks	-	sheen	7/2/93	N93-0894
		misc. oil	6/29/88	N88-0953
	-	misc. oil	3/30/93	N93-0346
	-	misc. oil	5/27/83	N83-0120
422 Waverly Oaks	-	misc. oil	8/15/80	-
Waverly Oaks/Beaver	< 50 gal.	transformer oil	10/13/84	N84-0681
240 Beaver Street	-	gasoline	11/19/91	N91-1626

Water Supply Protection Atlas

The DEP Water Supply Protection Atlas was reviewed to determine aquifer and waste source information for the area surrounding the property. The Atlas includes the Aquifer Information Overlay, the Water Source Overlay, the Drainage Basin Overlay, and the Waste Sources Overlay.

The ***Aquifer*** Information Overlay provides details of aquifer parameters. According to the Aquifer Information Overlay, the subject Site is located within an area designated as a portion of the Charles River Estuary. The aquifer parameters were not mapped by the USGS.

The ***Waste*** Sources Overlay provides information regarding waste sources, including Surface Impoundments, Dumps and Landfills, Automobile Junkyards, Hazardous Waste Sites, Salt Storage Areas, Injection Wells and NPDES discharge locations. The Waste Sources Overlay was unavailable for review.

The ***Water*** Sources Overlay provides information about the distribution of water supply areas. The Water Sources Overlay, last updated 1982, indicates that the City of Waltham has no sources of water located within a one (1) mile radius of the Site.

The ***Drainage Basin*** Overlay maps major river basin drainage divides and their subbasins. The subject Site is located in the Charles River drainage basin, subbasin 43

BWSC Priority Resource Map

The Bureau of Waste Site Clean-up Priority Resource Map, a compilation of information from the DEP, the Executive Office of Environmental Affairs and the Massachusetts Geographic Information System, is a new source of information in 1993. It delineates areas of Medium Yield Aquifers, High Yield Aquifer, Sole Source Aquifer, DEP Approved Wellhead Protection Areas, Interim Wellhead Protection Areas, Lakes, Ponds, Surface Water Features, Freshwater Non-forested Wetlands, Salt Water Wetlands, Tidal Flats, Protected Open Space, Areas of Critical Environmental Concern, DEP Approved Landfills -post 1971, NHESP Estimated Habitats of Rare Wetland Wildlife1993, Major Drainage Basins, Sub-drainage Basin, Public Water Supply Groundwater, Public Water Supply Surface Groundwater, Public Water Supply Surface Water and Certified Vernal Pools.

Wetlands are noted abutting the Site to the west/southwest. A Stream is noted running north to south into the wetlands bordering the Site. A Surface Water Body is located approximately 1800 feet northwest of the Site. (See Appendix E)

LOCAL GOVERNMENT AGENCY RECORD REVIEW

A release of hazardous material or oil on or adjacent to the Site was revealed based upon reviews conducted at the Waltham Assessor's, Clerk, Engineering, Sewer, Water Division, Planning and Zoning, Inspectional Departments, the Conservation Commission, the Board of Health and the Fire Prevention Bureau.

Water Division
A review of available files at the Waltham Water Department concerning the Site was performed by Terry Cook. According to Department records, the original connection date to the MWRA water system was unavailable. The water source for the municipal water system is the Quabin Reservoir located in west/central Massachusetts.

Engineering Department
A review of available files concerning the Site at the Waltham Public Works/Engineering Department was performed by Russell Yashinsky. No record of a release of oil or hazardous material on or adjacent to the Site was discovered in this review of available Department files. According to Department records, the original connection to the municipal sewerage system was unavailable. Mr. Yashinsky provided access to the 1911 Sanborn Fire Insurance Map, a copy of Assessor's Map 45, and an aerial photograph flown in 1974.

Building Department
A review of available files concerning the Site at the Waltham Inspectional Department was performed by Don Cusano. No record of a release of oil or hazardous material on or adjacent to the Site was discovered during this review of available Department files. The earliest record of development at the Fernald School in Department files is 1983. According to Inspectional Department files, no permits are listed regarding the Grounds Department. (See Appendix G)

Conservation Commission
A review of available files at the Waltham Conservation Commission concerning the Site was performed by Gloria Champion. A record of a release of oil or hazardous material on or adjacent to the Site was discovered in this review of available Conservation Commission files. According to Ms. Champion, a small oil spill occurred last year, which was handled by Clean Harbors. Ms. Champion stated that the only filing with her department was regarding wetlands near the new food service building. According to the 1995 Estimated Habitat of Rare Wetlands Wildlife and Certified Vernal Pools; wetlands are located to the southwest of the Site; a Rare Wetlands Wildlife Habitat is located 1/2 mile northwest of the Site; Federal, State, or County Open Space is located 1/2 mile east of the Site; five (5) Certified Vernal Pools are located one (1) mile north of the Site.

Municipal Clerk's Office

A review of available files at the Waltham, MA Municipal Clerk's Office concerning the Site was performed by Henry Hoover. The following record of the installation or removal of an underground fuel oil storage tank at or near the Site was discovered in this review of available Clerk's Office files. The following locations are within a one half (1/2) mile radius of the Site:

location	capacity	product	permitted	removed
Shriver Ctr., 200 Trapelo Road	395 gals	-	3/28/95	-
Shell oil Co., 255 Waverly Oaks Rd.	30,000	gasoline	3/13/95	-

Public Health Department

A review of available files concerning the Site at the Waltham Board of Health was performed by Walter Sweder. A record of a release of oil or hazardous material on or adjacent to the Site was discovered in this review of available files. Information regarding 424 Trapelo Road and 200 Trapelo Road noted releases #N93-0030, RTN# 3-0006013, RTN# 3-10725 (the Site), and RTN# 3-10367. According to Mr. Sweder, he is unaware of any private wells located in the Site vicinity. (See Appendix H for copies of BOH file information)

Fire Department

A review of available files at the Waltham Fire Department concerning the Site was performed by Lt. Galvin. No records were available for review at the time of this investigation. According to Lt. Galvin, a ongoing computer problem in this department prevented access to all records regarding underground storage and spill records. At the time of this review, Lt. Galvin was unsure if records in the system had been permanently damaged, or would become accessible after June 5, 1995. Should additional information become available, an addendum to this report will be immediately forwarded.

REFERENCES

Record of Communication

DATE	NAME	AGENCY
5/30/95	Don Cusano	Building Department
5/30/95	Terry Cook	Water Department
5/30/95	Walter Sweder	Board of Health
5/31/95	Lt. Galvin	Fire Department
5/31/95	Henry Hoover	Municial Clerk's Office
5/31/95	Gloria Champion	Conservation Commission
5/31/95	Russell Yashinsky	Engineering Department
5/31/95	Moe O'Connell	Fernald School
5/31/95	Bonnie Stetcher	Fernald School Librarian

Published References

1). Lexington, Topographic Quadrangle, 7.5 x 15 Minute Series

2). Flood Insurance Rate Map (FIRM) for the City of Waltham, MA, Community Panel Number 250222 0005 B, dated 12/18/79

3). Sanborn Fire Insurance Maps; 1911, 1962, Waltham Engineering, Waltham Public Library

4). History of Fernald School, Fernald School Library, Waltham, MA

Regulatory Records and Public Documents

1). State files, #s3-3078, 3-6013, 3-0010725, 3-0010367, DEP NERO, Woburn,MA.

2). CERCLIS, RCRA, Spills and General Files regarding the City of Waltham, DEP NERO, Woburn, MA

3). MA DEP Groundwater Overlay Atlases; Lexington Quad, DEP NERO, Woburn, MA

4). BWSC Map, DEP NERO, Woburn, MA

5). Landfill Inventory, DEP NERO, Woburn, MA

6). Aerial Photograph, 1974, Engineering, Waltham, MA

7). Assessor's Map 45, Waltham Assessor's, Waltham, MA

8). Water Resources Inventory, Conservation Commission, Waltham, MA

9). 1995 EHRWW & CVP Map, Conservation Commission, Waltham, MA

10). File Components, Board of Health, Waltham, MA

11). File Components, Building Department, Waltham, MA

12). Zoning Map, Engineering, Waltham, MA

DISCLAIMER

I have prepared an ESA Historical Research Report in Conformance with the scope and limitations of ASTM Practice E 1527-94 of the Grounds Department, Fernald School, 200 Trapelo Road, Waltham, MA., the "Site".
Documentation of each source is included within the text and also listed in the reference section of the report. All sources, including those that reveal no findings, are documented to facilitate reconstruction of the research. Accuracy and completeness of record information may vary among sources. In preparing this report, publicly available and practically reviewable record information from standard sources was obtained and reviewed. No other warranties, expressed or implied, are made.

Susan McGrath

Susan McGrath

June 2, 1995

date

LIST OF APPENDICES

Release Abatement Measure Status Report
Massachusetts Department of Mental Retardation
Walter E. Fernald School-Farm and Grounds
200 Trapelo Road
Waltham, Massachusetts
Release Tracking Number 3-10725
VERTEX Project No. 0405

Prepared For:

Massachusetts Department of
Environmental Protection
Bureau of Waste Site Cleanup
10 Commerce Way
Woburn, MA 01801

January 26, 1998

January 26, 1998

Massachusetts Department of Environmental Protection
10 Commerce Way
Woburn, MA 01801

Re: **Massachusetts Department of Mental Retardation**
Walter E. Fernald School-Farm and Grounds
200 Trapelo Road
Waltham, Massachusetts
Release Tracking Number 3-10725
VERTEX Project No. 0405

To Whom It May Concern:

This letter constitutes a Release Abatement Measure (RAM) Status Report, as required by 310 CMR § 40.0445, for the above referenced property. The RAM Plan in affect at this site was submitted to the Massachusetts Department of Environmental Protection (MADEP) on April 18, 1997. The work to date has been performed in accordance with the RAM Plan.

Work Completed

The following activities have been performed since the filing of the Ram Plan.

On May 27, 1997 VERTEX observed the removal and disposal, by Keystone Environmental Services Inc. of 77 Accord Park Drive, Norwell Massachusetts, of two (2) 4,000 gallon gasoline underground storage tanks (UST's) "Tank –3 and Tank-4" including piping, gasoline pumps and appurtenances, residual fluids and sludges at the Farm and Grounds Building. Contaminated soils were excavated from the graves of the UST's and stockpiled. Following excavation activities, five (5) confirmatory soil samples from each were collected from each excavation field screened and analyzed for TPH and BTEX. The results of the analyses performed on the soil samples are included as Appendix A. A summary of these results is presented below in Table 1.

Table 1 - Screening and Analytical Results				
Sample I.D.	Sample Location	OVs (ppm)	TPH (mg/kg)	BTEX + MTBE (ppm)
Tank-3 (S-1)	Bottom of Excavation (8' below grade)	ND	17	Benzene 0.005 U Toluene 0.005 U Ethylbenzene 0.005 U Xylene (Total) 0.005 U MTBE 0.005 U
Tank-3(S-2)	Side Wall Up Gradient (7' below grade)	ND	86	Benzene 0.006 U Toluene 0.006 U Ethylbenzene 0.006 U Xylene (Total) 0.006 U MTBE 0.006 U
Tank-3(S-3)	Side Wall Toward Street (7' below grade)	ND	20	Benzene 0.005 U Toluene 0.005 U Ethylbenzene 0.005 U Xylene (Total) 0.005 U MTBE 0.005 U
Tank-3 (S-4)	Side Wall Toward Building (7' below grade)	ND	<17	Benzene 0.005 U Toluene 0.005 U Ethylbenzene 0.005 U Xylene (Total) 0.005 U MTBE 0.005 U
Tank-3 (S-5)	Side Wall Down Gradient (7' below grade)	ND	20	Benzene 0.006 U Toluene 0.006 U Ethylbenzene 0.006 U Xylene (Total) 0.006 U MTBE 0.006 U

Notes:
ND = Not Detected Above Detection Limit
N/A= Not Applicable
PPM = Parts Per Million
PPB = Parts Per Billion
U = Analyzed but not found
J = Estimated value, below quantitation limit

Table 1 – Screening and Analytical Results (continued)					
Sample I.D.	Sample Location	TOVs (ppm)	TPH (mg/kg)	BTEX + MTBE (ppm)	
Tank-4 (S-1)	Bottom of Excavation (8' below grade)	ND	22	Benzene	0.006 U
				Toluene	0.006 U
				Ethylbenzene	0.006 U
				Xylene (Total)	0.006 U
				MTBE	0.006 U
Tank-4(S-2)	Side Wall Up Gradient (7' below grade)	ND	49	Benzene	0.006 U
				Toluene	0.006 U
				Ethylbenzene	0.006 U
				Xylene (Total)	0.006 U
				MTBE	0.006 U
Tank-4(S-3)	Side Wall Toward Street (7' below grade)	ND	41	Benzene	0.005 U
				Toluene	0.005 U
				Ethylbenzene	0.005 U
				Xylene (Total)	0.005 U
				MTBE	0.005 U
Tank-4 (S-4)	Side Wall Toward Building (7' below grade)	ND	27	Benzene	0.005 U
				Toluene	0.005 U
				Ethylbenzene	0.005 U
				Xylene (Total)	0.005 U
				MTBE	0.005 U
Tank-4 (S-5)	Side Wall Down Gradient (7' below grade)	ND	45	Benzene	0.005 U
				Toluene	0.005 U
				Ethylbenzene	0.005 U
				Xylene (Total)	0.005 U
				MTBE	0.005 U
Pumps-C	Excavation in Area of Gasoline Pumps (composite)	N/A	28	Benzene	0.007 U
				Toluene	0.007 U
				Ethylbenzene	0.007 U
				Xylene (Total)	0.007 U
				MTBE	0.160

Notes:
ND = Not Detected Above Detection Limit
N/A= Not Applicable
PPM = Parts Per Million
PPB = Parts Per Billion
U = Analyzed but not found
J = Estimated value, below quantitation limit

As the above table shows, analytical results of the samples collected from the excavations do not indicate a significant impact of gasoline to soil.

In addition to soil sampling, VERTEX also obtain a groundwater sample from an existing on-site groundwater monitoring well. The sample was obtained by using a new polyethylene bailer lowered with polyethylene string. The well was purged until no water remained and then was allowed to recharge. The water samples were then bailed directly into pre-cleaned and labeled

laboratory supplied bottles. Samples were placed directly on ice in a cooler and hand delivered to Woods Hole Laboratories for analysis. Samples were analyzed for TPH by EPA Method 8100 Modified, BTEX and MTBE. Results of this sampling round on June 6, 1997 and that of Web Engineering's on May 8, 1995 are summarized below in Table-2. The results of analyses performed on the groundwater collected by VERTEX are included as Appendix B.

Table 2 - Groundwater Analytical Results

Sample ID	Sample Location	TPH (ug/l)	BTEX + MTBE (ppb)	
MW-3 Web Engineering (5/8/95)	MW-3 (Near South Side of Tank-3)	22000	Benzene	1,000
			Toluene	6,300
			Ethylbenzene	490
			Xylene (Total)	6,400
			MTBE	N/A
MW-3 Vertex Engineering (6/6/97)	MW-3 (Near South Side of Tank-3)	6500	Benzene	250 U
			Toluene	3,200
			Ethylbenzene	250
			Xylene (Total)	3,100
			MTBE	3,600

Notes:
ND = Not Detected Above Detection Limit
N/A= Not Applicable
PPM = Parts Per Million
PPB = Parts Per Billion
U = Analyzed but not found
J = Estimated value, below quantitation limit

Analytical results of the samples collected from MW-3 show a significant decrease in groundwater contamination over time and presently do not indicate a significant impact of gasoline to groundwater.

Tasks Remaining

Tasks remaining under the RAM Plan include the installation of an on-site downgradient monitoring well to further assess the groundwater quality conditions on-site.

Site Status

The analytical results from the soil samples collected during the excavation do not indicate a significant impact of gasoline to the soil.

The analytical results from the MW-3 groundwater samples collected indicate a decrease of contaminants over time. Installation of a downgradient monitoring well to further assess groundwater quality conditions is planned.

Sincerely,

VERTEX Engineering Services, Inc.

Russell Fitzpatrick
Division Manager

James O'Brien, LSP
President

APPENDIX E:

SOIL BORING/MONITORING WELL LOGS

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

BORING NO.: MW-4
Mon Well

VERTEX
Engineering Services, Inc.

PROJECT: 200 Trapello Road
LOCATION: Waltham, MA
DATE: 07/17/1998

PROJ. NO.: 1003
Driller: Geosearch
Inspector: j. Friedan

	SAMPLER	CASING	CORE
TYPE	Split spoon	HAS	–
SIZE (ID)	2"	–	–
HAMMER (LB.)	140lb	–	N/A
FALL (IN.)	30"	–	N/A

GROUNDWATER DEPTH MEASURMENTS

RIM ELEV.=

DATE:				
TIME:				
DEPTH:				

SAMPLE					SOIL CLASSIFICATION	PID
DEPTH	NO.	DEPTH	PEN/REC	BLOWS/6"		(ppm)
0	MW4	5-7'	5-11-28-28	12/24"	Grey silty sand withgravel and cobbles	NA
	MW4	9-11	11-50-50/5	8/24"	Brown/gray med-fine sand with gravel	ND
10'					Wet @ 9'	
					Refusal @ 10'	
					Air Hammer to 15'	
					Water @ 13.5'	
15'					Well Set @ 15'	
20'						
25'						
30'						
35'						
40'						

MONITORING WELL CONSTRUCTION LOG

DEPTH (FT.):	15'	SCREEN INTERVAL:.	5-15'	BACKFILL OVER SEAL:	Native
DIA. (IN.):	2"	LENGTH OF RISER:	5'	SURFACE SEAL:	NA
MATERIAL:	PVC	DEPTH/TYPE PACK:	3-15'	ROADBOX DESC.:	NA
SLOT SIZE:	10	DEPTH/TYPE SEAL:	2-3' bent	SHEET 1	OF 1

SOIL BORING/MONITORING WELL CONSTRUCTION LOG			BORING NO.: MW-5 Mon Well
VERTEX **Engineering Services, Inc.**	PROJECT: 200 Trapello Road LOCATION: Waltham, MA DATE: 03/31/1999		PROJ. NO.: 1003 Driller: American Inspector: Bob Murphy

	SAMPLER	CASING	CORE	GROUNDWATER DEPTH MEASURMENTS				
TYPE	Split spoon	HAS	–	RIM ELEV.=				
SIZE (ID)	2"	--	--	DATE:				
HAMMER (LB.)	140lb	--	N/A	TIME:				
FALL (IN.)	30"	--	N/A	DEPTH:				

SAMPLE					SOIL CLASSIFICATION	PID
DEPTH	NO.	DEPTH	PEN/REC	BLOWS/6"		(ppm)
0					Auger to 13'	
					dark brown fine silty sand with cobbles	
5'						
10'					Auger refusal @13' switch to Air Hammer	
					Weathered Bedrock	
15'					Air Hammer to 35'	
20'					Well set at 35'	
25'						
30'						

MONITORING WELL CONSTRUCTION LOG					
DEPTH (FT.):	35'	SCREEN INTERVAL:	10-35'	BACKFILL OVER SEAL:	Native
DIA. (IN.):	2"	LENGTH OF RISER:	10'	SURFACE SEAL:	Concrete
MATERIAL:	PVC	DEPTH/TYPE PACK:	9-35'	ROADBOX DESC.6" diam. Cl. Roadbox	
SLOT SIZE:	0.1	DEPTH/TYPE SEAL:	0-9' bent	SHEET 1 OF 1	

SOIL BORING/MONITORING WELL CONSTRUCTION LOG		BORING NO.: MW6 Mon Well
VERTEX Engineering Services, Inc.	PROJECT: 200 Trapello Road LOCATION: Waltham, MA DATE: 03/31/1999	PROJ. NO.: 1003 Driller: American Inspector: S. Healey

	SAMPLER	CASING		GROUNDWATER DEPTH MEASURMENTS				
TYPE	Split spoon	HAS	--	RIM ELEV.=				
SIZE (ID)	2"	--	--	DATE:				
HAMMER (LB.)	140lb	--	N/A	TIME:				
FALL (IN.)	30"	--	N/A	DEPTH:				

SAMPLE					SOIL CLASSIFICATION	PID
DEPTH	NO.	DEPTH	PEN/REC	BLOWS/6"		(ppm)
0					Auger to 11'	
5'					Dry medium brown fine silty sand with cobbles	
					Brown grey moist silty sand with cobbles	
10'						
					Auger refusal begin to air hammer	
					Weathered Bedrock	
15'					Water encountered	
20'						
25'					Well set at 27'	
30'						
35'						

MONITORING WELL CONSTRUCTION LOG					
DEPTH (FT.):	27'	SCREEN INTERVAL:	17-27'	BACKFILL OVER SEAL:	Native
DIA. (IN.):	2"	LENGTH OF RISER:	17'	SURFACE SEAL:	Concrete
MATERIAL:	PVC	DEPTH/TYPE PACK:	14-27'	ROADBOX DESC.6" diam. Cl. Roadbox	
SLOT SIZE:	0.1	DEPTH/TYPE SEAL:	0-14' bent	SHEET 1 OF 1	

SOIL BORING/MONITORING WELL CONSTRUCTION LOG

BORING NO.: B-2
Mon Well MW-7

VERTEX
Engineering Services, Inc.

PROJECT: 200 Trapello Road
LOCATION: Waltham, MA
DATE: 03/15/2000

PROJ. NO.: 1003
Driller: Geosearch
Inspector: S. Healey

	SAMPLER	CASING	CORE	GROUNDWATER DEPTH MEASURMENTS				
TYPE	Split spoon	HAS	--	RIM ELEV.=				
SIZE (ID)	2"	--	--	DATE:				
HAMMER (LB.)	140lb	--	N/A	TIME:				
FALL (IN.)	30"	--	N/A	DEPTH:				

SAMPLE					SOIL CLASSIFICATION	PID
DEPTH	NO.	DEPTH	PEN/REC	BLOWS/6"		(ppm)
0	MW-7	0-5'	NA	NA	Auger to 11'	NA
5'	MW-7	5-7'	NA	NA	Auger to 11'	NA
11'	MW-7	11-13'			Auger refusal @13' switch to Air Hammer	NA
15'	MW-7	13-20'			Air Hammer to 20'	NA
20'					Well st at 20' Bottom of boring at 20'	

MONITORING WELL CONSTRUCTION LOG

DEPTH (FT.):	20'	SCREEN INTERVAL:	20-5'	BACKFILL OVER SEAL:	Native
DIA. (IN.):	2"	LENGTH OF RISER:	5'	SURFACE SEAL:	Concrete
MATERIAL:	PVC	DEPTH/TYPE PACK:	20-4'	ROADBOX DESC.:	6" diam. Cl. Roadbox
SLOT SIZE:	0.1	DEPTH/TYPE SEAL:	20-3'	SHEET 1 OF 1	

SOIL BORING/MONITORING WELL CONSTRUCTION LOG		BORING NO.: B-3 Mon Well MW-8
VERTEX **Engineering Services, Inc.**	PROJECT: 200 Trapello Road LOCATION: Waltham, MA DATE: 03/15/2000	PROJ. NO.: 1003 Driller: Geosearch Inspector: S. Healey

	SAMPLER	CASING	CORE	GROUNDWATER DEPTH MEASURMENTS				
TYPE	Split spoon	HAS	--	RIM ELEV.=				
SIZE (ID)	2"	--	--	DATE:				
HAMMER (LB.)	140lb	--	N/A	TIME:				
FALL (IN.)	30"	--	N/A	DEPTH:				

SAMPLE					SOIL CLASSIFICATION	PID
DEPTH	NO.	DEPTH	PEN/REC	BLOWS/6"		(ppm)
0	MW-8	0-8'	NA	NA	Auger to 8'	NA
8'	MW-8	8-10'	12/24"	5-19-36-50/2	Brown to grey fine to med sand with pebbles and broken cobbles	NA
10'					Wet at 10' Auger refusal at 10' begin Air Hammer	
15'	MW-8	13-20'			Air Hammer to 15' Set well at 15' Bottom of boring at 15'	NA

MONITORING WELL CONSTRUCTION LOG					
DEPTH (FT.):	15"	SCREEN INTERVAL:	15-5'	BACKFILL OVER SEAL:	Native
DIA. (IN.):	2"	LENGTH OF RISER:	5'	SURFACE SEAL:	Concrete
MATERIAL:	PVC	DEPTH/TYPE PACK:	15-4'	ROADBOX DESC.:	6" diam. Cl. Roadbox
SLOT SIZE:	0.1	DEPTH/TYPE SEAL:	15-3'	SHEET 1 OF 1	

APPENDIX F

BILL OF LADING AND HAZARDOUS WASTE MANIFESTS

Make application to local Fire Department.
Fire Department retains original application and issues duplicate as Permit. Farm and Grounds

One Commonwealth of Massachusetts

Department of Fire Services – Board of Fire Prevention

APPLICATION and PERMIT

Fee: 50.00

for storage tank removal and transportation to approved tank disposal yard in accordance with the provisions of M.G.L. Chapter 148, Section 38A, 527 CMR 9.00, application is hereby made by:

Tank Owner

Tank Owner Name (please print) Comm of Mass DMR X _____ Signature (if applying for permit)

Address 160 No Washington St (Street) Boston (City) MA 02114 (State, Zip)

Removal Contractor

Company Name Keystone Environmental (Print)

Address 7 Access Road Drive Norwell MA 02061 (Print)

Signature (if applying for permit)

Ken Sotto

☐ IFCI Certified Other _____

Contamination Assessment

Co. or Individual Vertex (Print)

Address 410 Lebby Parkway Weymouth, MA (Print)

Signature (if applying for permit)

☐ IFCI Certified ☑ LSP # _____ Other _____

Tank Information

Tank Location 200 Trapello Rd (Carroll School) Waltham (Street Address, City)

Tank Capacity (gallons) 4000 G. Substance Last Stored Gasoline

Tank Dimensions (diameter x length) _____

Remarks: _____

Disposal Information

Firm transporting waste Western Environmental State Lic. # MA416

Hazardous waste manifest# MAG298033 E.P.A. # MA5000000305

Approved tank disposal yard Basco Baker/Brockton Dead Tank yard # 010

Type of inert gas Dry Ice Tank yard address 45 Freight St Brockton, MA 02402

Approvals

City or Town WALTHAM FDID# 17308 Permit# 485

Date of issue 5/19/97 Date of expiration _____

Dig safe approval number: _____ Dig Safe Toll Free Tel. Number - 800-322-4844

Signature / Title of Officer granting permit [signature] LSP Rep on Site 5/22/97

After removal(s) send Form FP-290R signed by Local Fire Dept. to UST Regulatory Compliance Unit, One Ashburton Place, Room 1310, Boston, MA 02108-1618.