

**REPORT ON
PHASE II AND III ENVIRONMENTAL INVESTIGATIONS
ROCHFORD FIELD AND MILL ROCK PARK
HAMDEN, CONNECTICUT**

by

**Haley & Aldrich, Inc.
Glastonbury, Connecticut**

for

**Town of Hamden
Hamden, Connecticut**

**File No. 27892-411
December 2002**



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9 December 2002
File No. 27892-411

Hamden Government Center – Office of the Mayor
2750 Dixwell Avenue
Hamden, Connecticut 06518

Attention: Mr. Don Proto

Subject: Report on Phase II and III Environmental Investigations
Rochford Field and Mill Rock Park
Hamden, Connecticut

Ladies and Gentlemen:

This letter summarizes the results of Phase II & III Environmental Investigations of publicly owned properties located east of Newhall Street in Hamden Connecticut. Specifically, these include the contiguous Rochford Field and Mill Rock Park properties. Haley & Aldrich, Inc. performed the investigation in accordance with our 8 August 2002 Work Plan and with our 1 August 2001 Agreement with the Town of Hamden, as amended through 10 July 2002.

Please call if you have questions or require additional information on this project.

Sincerely yours,

HALEY & ALDRICH, INC.

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Enclosures

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EXECUTIVE SUMMARY

This report presents the results of a Phase II and III Environmental Investigations of publicly owned properties located east of Newhall Street in Hamden Connecticut. Specifically, these include the contiguous Rochford Field and Mill Rock Park properties. Haley & Aldrich performed the investigation in accordance our 8 August 2002 Investigation Work Plan and the terms and conditions of our 1 August 2001 Agreement with the Town of Hamden, as amended through 10 July 2002.

The objective of the subsurface investigation was to determine the existence of environmental site impacts related to former filling activities. Project explorations included the installation of 22 test borings, six test pits and seven monitoring wells. Groundwater and/or soil samples were tested for Extractable Total Petroleum Hydrocarbons (ETPH), volatile organic compounds (VOCs), total and leachable metals, semivolatile organic compounds (SVOCs), Polychlorinated Biphenyls (PCBs), pesticides, and cyanide.

The following is a summary of significant findings of the subsurface investigation:

- Shallow groundwater beneath the site is flowing in a westerly direction, generally following the path of a historic stream and associated wetland that was filled in the early 1900s. The flow gradient decreases from east to west with the steepest gradient measured beneath Mill Rock Park.
- Results of field observations and chemical testing generally confirm historical information encountered during the Phase I ESA as well as results of previous environmental sampling conducted by others.
- Based on the results of the field explorations, Rochford Field is generally underlain by up to approximately 8.5 ft. of fill deposits, including slag-rich “industrial waste fill” and “miscellaneous fill.” The industrial waste fill layer typically contained layers of slag, ash, cinders, wood, box fragments, sawdust, Winchester-related scrap metal gun products with some demolition debris (concrete and brick), furnace brick, copper fragments and batteries. The miscellaneous fill layer typically contained industrial waste fill mixed with organic material and demolition debris such as; sand, wood, fabric, paper, glass, cinders and cardboard. Generally, the industrial waste fill was encountered above the miscellaneous material although industrial waste fill only was encountered in explorations in the northwest and southeast portions of the site.

Results of chemical testing of soil from Rochford Field detected widespread impacts from petroleum volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (ETPH) and metals within the fill material at concentrations in excess of the Connecticut Department of Environmental Protection (CTDEP) Residential Direct Exposure Criteria (RDEC) and/or Pollutant Mobility Criteria (PMC). Chlorinated pesticides were detected in shallow soil samples from eight of the test borings, none of which were in excess of regulatory criteria.

Results of chemical testing of groundwater detected the VOC naphthalene, several SVOCs and ETPH in downgradient monitoring wells at Rochford Field. Concentrations of two SVOCs (acenaphthalene and phenanthrene) and EPTH

exceeded regulatory criteria. ETPH was also detected in another monitoring well located in the northeastern corner of the site. Chemical testing also detected the nickel and zinc at concentrations in excess of regulatory criteria, in groundwater samples from two or more of the wells.

- Based on the results of the Phase II and III explorations, Mill Rock Park is generally underlain by approximately 5 to greater than 6.5 ft. of domestic refuse fill. The fill deposits appear to increase in depth and thickness from east to west. Although explorations were not located immediately adjacent to the sewer pump station, domestic refuse fill was observed to depths of 8 and 7.5 ft. below grade in explorations located approximately 50 and 100 ft. to the south and west. As such, it is likely that domestic refuse fill is present beneath the pump station parcel.

Results of chemical testing of soil samples from Mill Rock detected SVOCs and lead within the domestic refuse fill at concentrations in excess of RDEC and/or PMC. Generally, the concentrations detected were lower than those in the fill from Rochford Field. The number of SVOCs (18) detected was also slightly less than the number (24) encountered in the Rochford Field samples. ETPH and metals were detected in several locations at concentrations below RSR criteria. The chlorinated pesticide 4,4-DDE was detected below RSR criteria in one shallow soil sample collected from the earthen fill material that overlies the refuse. VOCs and PCBs were not detected. No regulatory exceedences were encountered in the underlying alluvial deposit layer. Results of chemical testing of groundwater samples from three wells at the Mill Rock Park site did not detect VOCs, SVOCs, ETPH, pesticides, PCBs, cyanide or metals.

The scope and findings of the subsurface investigation are summarized in this report. Supporting documentation is included in Appendices A through H.

TABLE OF CONTENTS

	Page
EXECUTIVE SUMMARY	i
LIST OF TABLES	v
LIST OF FIGURES	v
I. INTRODUCTION	1
1.01 Introduction	1
1.02 Background	1
A. Rochford Field	1
B. Sewer Pump Station	1
C. Mill Rock Park	3
1.03 Previous and Ongoing Environmental Assessments	3
A. Rochford Field	3
B. Sewer Pump Station	5
C. Mill Rock Park	5
1.04 Work Scope	6
1.05 Limitations	6
II. PHASE II ENVIRONMENTAL SITE ASSESSMENT	9
2.01 General	9
2.02 Phase II Explorations	10
A. Rochford Field	10
B. Mill Rock Park	11
C. Soil Sampling and Laboratory Submittal	11
D. Groundwater Sampling	13
E. Groundwater Measurements and Elevation Contouring	13
2.03 Discussion of Soil and Groundwater Sampling Results	14
A. CTDEP Remediation Standard Criteria	14
B. Results of Laboratory Analysis of Soil Samples	14
C. Results of Laboratory Analysis of Groundwater	19
D. Summary of Findings	20
III. CONCLUSIONS	22

TABLE OF CONTENTS

TABLES

FIGURES

APPENDIX A – Investigation Work Plan

APPENDIX B - Results of Laboratory Analysis of Soil Samples

APPENDIX C - Results of Laboratory Analysis of Groundwater Samples

APPENDIX D – Test Boring, Monitoring Well Installation Reports, and Test Pit Logs for Rochford Field

APPENDIX E – Test Boring, Monitoring Well Installation Reports, and Test Pit Logs for Mill Rock Park

APPENDIX F - Groundwater Monitoring Reports

APPENDIX G - Potentiometric Surface for September 12, 2002, Former New Haven Water Company Properties, prepared by Leggette, Brashears & Graham

APPENDIX H - Photographs

LIST OF TABLES

Table No.	Title
I	Summary of Analytical Data – Soil, Rochford Field
II	Summary of Analytical Data – Soil, Mill Rock Park
III	Summary of Analytical Data – Groundwater, Rochford Field
IV	Summary of Analytical Data – Groundwater, Mill Rock Park

LIST OF FIGURES

Figure No.	Title
1	Site Locus
2	Exploration Location Plan
3	Subsurface Profiles A-A and B-B
4	Contour Map of Unconsolidated Material Covering Fill (Depth to Fill)
5	Contour Map of Fill Thickness at Site
6	Soil Quality Results for Extractable Petroleum Hydrocarbon (ETPH)
7	Soil Quality Results for Volatile Organic Compounds (VOCs)
8	Soil Quality Results for Semi-volatile Organic Compounds (SVOCs)
9	Soil Quality Results for Pesticides
10	Soil Quality Results for Lead
11	Soil Quality Results for Arsenic
12	Water Quality Results for VOCs, SVOCs, Pesticides, PCBs, Cyanide and Metals

I. INTRODUCTION

1.01 Introduction

This report summarizes results of Phase II and III Environmental Investigations of publicly owned properties located east of Newhall Street in Hamden Connecticut. Specifically, these include the contiguous Rochford Field and Mill Rock Park properties. Haley & Aldrich performed the investigation in accordance our 8 August 2002 Investigation Work Plan and the terms and conditions of our 1 August 2001 Agreement with the Town of Hamden, as amended through 10 July 2002. A copy of the Work Plan is included as Appendix A. Haley & Aldrich developed the work scope for the Phase II & III investigations based on the findings of a 2001 Phase I Environmental Site Assessment (ESA) of the Newhall Neighborhood.

1.02 Background

The study area is a former wetland that was filled during the early to mid 1900s with a mixture of domestic and industrial waste materials mixed with soil. The underlying natural sediments at the site consist of organic material overlying glaciodeltaic deposits composed of interbedded layers of primarily silt and sand sized particles. The CTDEP has classified local groundwater as GAA, indicating that it is within a public water supply watershed. Regional surface and groundwater flow is generally towards the north. The study area includes publicly owned properties on the east side of Newhall Street, including Rochford Field, the Winchester Avenue sewer pump station and Mill Rock Park (also known as Rochford Field Annex).

A. Rochford Field

The 4.84 acre Rochford Field is a large grassy area that occupies the block bordered by Newhall and Newbury Streets to the west and south, respectively; Winchester Avenue to the east and Mill Rock Road to the north. A chain link fence surrounds the recreational facility, which includes baseball fields, backstops, bleachers and a toilet facility. During the Phase I ESA, Haley & Aldrich observed several large trees on the site, other trees were reportedly felled by the 1989 tornado. During the Phase I ESA, Haley & Aldrich did not observe stained soil, unusual odors, stressed vegetation or evidence of chemical handling, storage or release at Rochford Field.

B. Sewer Pump Station

The 0.12-acre Sewer Pump Station property contains a windowless, one-story brick building surrounded by a grassy lawn area and chain link fence. A natural gas meter is attached to the south wall of the building and large sewer manholes are mounted in a concrete pad on the north side of the building. The ground floor of the building houses two electric pump motors and a natural gas powered emergency generator. The pump impellers, control valves, and an overflow alarm mechanism are in the basement. During the Phase I ESA, Haley & Aldrich did not observe evidence of underground storage tanks, including tank fill or vent pipes on the ground or on the side of the pump station building. Haley & Aldrich did not observe stained soils, drains, odors, stressed vegetation or other evidence of chemical spillage outside of the building.

C. Mill Rock Park

The 2.94 acre Mill Rock Park includes a large open, grassy field on the west side of the property, and a playground and tennis courts, on the east side of the property. The playground includes swing sets and other playground equipment, benches and basketball hoops. A sidewalk surrounds the property and well-maintained trees run along Mill Rock Road, on the north side of the site, and Wadsworth Street to the east. Residential properties are located to the north and east across Mill Rock Road and Wadsworth Street. A tree-lined chain link fence runs along the southern site boundary, separating the park from adjacent homes on Bryden Terrace. During the Phase I ESA, Haley & Aldrich did not observe stained soil, unusual odors, stressed vegetation or evidence of chemical handling, storage or release at Mill Rock Park.

1.03 Previous and Ongoing Environmental Assessments

In addition to the 2001 Haley & Aldrich Phase I ESA, the Rochford Field and Mill Rock Park properties have been the subject of several previous subsurface environmental investigations. Metcalf & Eddy (M&E) conducted environmental evaluations of Rochford Field under contract from the Town of Hamden. CTDEP has conducted environmental investigations at both Rochford Field and Mill Rock Park. The previous assessments are described in the Haley & Aldrich Phase I report and briefly summarized below. Locations of the previous explorations are shown on Figure 3 in Appendix A. Leggette, Brashears & Graham (LBG), the environmental consultant retained by the South Central Regional Water Authority (SCRWA) conducted subsurface investigations during the summer and fall of 2002 at the adjacent Hamden Middle School and Newhall Street Field site to the west.

A. Rochford Field

On 28 December 2000 CTDEP drilled 14 geoprobe explorations (SS-21 through SS-34) to depths ranging from 4 to 12 ft. below grade at Rochford Field. Explorations found 2.75 ft. to 8.5 ft. deep fill deposits containing a mixture of soil, slag, brick, cinders, wood, coal, rubber, cloth, clinkers, concrete and metal pellets. An "odor" associated with a layer of black sand and cinders was recorded at SS-26. Fill layer thickness generally increased from southeast to northwest. The fill layer overlies swamp and glacial meltwater deposits. CTDEP installed temporary microwells in four of the explorations (SS-21, SS-24, SS-27, and SS-30). Locations of the explorations are shown on Figure 3 in Appendix A.; exploration logs are included in Appendix A.

Composite soil samples collected from depths of 0 to 4 ft. were submitted for chemical analysis for extractable total petroleum hydrocarbons (ETPH), total lead, arsenic, thallium and mercury, leachable metals (by Synthetic Precipitation Leaching Procedure [SPLP]) and semi-volatile organic hydrocarbons (SVOCs). Results of chemical testing of the soil samples detected ETPH concentrations exceeding CTDEP Remediation Standard Regulation (RSR) RDEC and PMC in 3 of 14 samples with concentrations ranging up to 1,509.68 mg/kg. Chemical testing also detected lead (up to 2,229 mg/kg in 6 of 14 samples), arsenic (up to 164 mg/kg in 11 of 14 samples), and mercury (39.2 mg/kg) in excess of RSR criteria. Results of the soil analysis also detected SVOCs in excess of RSR criteria, including benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, chrysene, fluoranthene, indeno(1,2,3-cd)pyrene and isophorone.

On 28 December, CTDEP collected groundwater grab samples from microwells SS-21 and SS-27. Samples were tested for cyanide, VOCs, SVOCs, and metals. Results of the chemical testing detected the VOCs chloroform (2.6 ug/l) and dichloromethane (5.0 ug/l) in the samples at concentrations below RSR criteria. Results of chemical testing of groundwater from SS-21 detected 2.59 ug/l of the SVOC bis (2-ethylhexyl) phthalate, in excess of the RSR GWPC. Results of chemical testing of the groundwater sample from SS-27 detected 12 SVOCs at concentrations ranging from 2.6 to 35.29 ug/l.; concentrations of acenaphthylene, benzo(a)anthracene, benzo(b)fluoranthene and benzo(k)fluoranthene exceeded RSR SWPC, concentrations of benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene and indeno(123-cd)pyrene exceeded RSR GWPC. Metals (including beryllium, cadmium, chromium, copper, lead, nickel, zinc and mercury) were detected in both samples at concentrations in excess of RSR GWPC, SWPC or both; cyanide was not detected (331).

On 24 and 25 January 2001, CTDEP collected 14 additional soil samples from a depth of 0 to 6 inches at Rochford Field. The samples, which were designated RF-21 through RF-34, were collected from the same locations as SS-21 to SS-34 (28 December 2000). Results of the chemical testing of the soil samples detected arsenic in excess of RSR RDEC criteria of 10 mg/kg. Concentrations detected ranged up to 59.74 mg/kg.

CTDEP conducted additional soil testing in March 2001 to confirm the presence of the arsenic. At that time, CTDEP sampled the bare dirt infields of the two baseball diamonds in Rochford Field. Soil samples, designated RF-35 through RF-44 (Figure 3), were collected from depths of 0 to 0.5 ft. and were analyzed for total arsenic. Results of the analyses did not detect arsenic at concentrations greater than 1.3 mg/kg. The levels of arsenic detected did not exceed RSR RDEC.

On 29 March 2001, CTDEP conducted grid sampling of Rochford Field to evaluate the potential presence of arsenic and collect soil samples for health risk assessment purposes. CTDEP collected shallow soil samples (0 to 2 inches and 2 to 6 inches depth) from 20 locations, designated RF-45 to RF-64 on Figure 3. CTDEP analyzed soil samples in the field using XRF. Samples collected from 0 to 2 inch depths were also submitted for confirmatory laboratory testing for total arsenic. Results of both the XRF and laboratory testing (0 to 2 inch samples) detected relatively uniform, elevated concentrations of arsenic, ranging up to 40 mg/kg, throughout the field.

In April 2001, CTDEP contracted with M&E to perform sampling of bare dirt and sparsely vegetated areas at Rochford Field where CTDEP had previously observed evidence of coal "clinkers" and slag on the ground surface. In June 2001, under the direction of CTDEP, M&E collected and analyzed 37 soil samples from 15 areas of concern at Rochford Field for SVOCs and 8 RCRA metals. Two of the soil samples were also tested for disposal characterization (including ignitability/flashpoint, corrosivity, VOCs, ETPH, leachable metals (by TCLP analysis), pesticides, herbicides, cyanide, and polychlorinated biphenyls (PCBs)). CTDEP, Connecticut Department Health Services, and M&E had previously identified the 15 areas of concern. Soil samples were collected from 0-0.25 ft. below grade. Locations of the M&E explorations (designated T-1 through T-37) are shown on Figure 3. Results of the laboratory analyses detected the following:

- Concentrations of arsenic ranging up to 44.2 mg/kg. With the exception of one sample (T-9), the levels of arsenic detected exceeded RSR RDEC criteria.
- Concentrations of lead ranged from 36.6 mg/kg to 940 mg/kg. The RDEC is 400 mg/kg.
- Polycyclic aromatic hydrocarbons (PAHs) were detected in all samples tested except T-9. Concentrations of total PAHs ranged from < 1 to 95.2 mg/Kg.
- Results of the disposal characterization detected trace levels of the VOCs chloromethane and methylene chloride, cyanide (.26 mg/kg) in one sample tested and low levels of the pesticides 4,4'-DDD, 4,4'-DDE and 4,4'-DDT. An elevated concentration of leachable lead (by TCLP) detected in one sample (10.3 mg/kg) exceeding the hazardous waste criterion of 5 mg/L for lead and indicating that materials excavated from the site may require management as hazardous waste. PCBs or herbicides were not detected in either sample and neither sample was found to be ignitable or corrosive.

Based on the results of the assessment, M&E recommended additional interim remedial actions at high traffic areas such as park entrance gates, baseball dugout benches, and the water fountain.

In July 2001, M&E monitored the placement of asphalt pavement or concrete on several unvegetated, high traffic areas at Rochford Field. The areas that were paved included: locations near the entrance gate, around the dugout areas, under the bleachers and adjacent to the water fountain. M&E reportedly encountered “old batteries” during remedial efforts for the southern dugout area. M&E also supervised the placement of sod in the area of sprinkler lines and the placement of grass seed in the vicinity of sprinkler system manifolds and along the fenceline.

B. Sewer Pump Station

To date, no subsurface investigation of the Sewer Pump Station has been undertaken.

C. Mill Rock Park

On 27 December 2000 CTDEP drilled 15 geoprobe explorations to depths ranging from 4 to 12 ft. below grade in Mill Rock Park (Rochford Field Annex). Explorations encountered 4.5 ft. to 9.0 ft. of deep fill deposits containing a mixture of soil, slag, brick, cinders, glass, paper, wood, coal, ceramic, clinkers and metal. An “oil odor” associated with a black sand and cinder layer was encountered in SS-06 and SS-07. Fill layer thickness generally increases from east to west. The fill layer overlies swamp and glacial meltwater deposits. Exploration locations (SS-01 through SS-13, SS-16, and SS-17) are shown on Figure 2; exploration logs are included in Appendix A.

CTDEP also installed temporary microwells in five of the explorations (SS-01, SS-04, SS-07, SS-09, and SS-11) to collect groundwater “grab samples”. According to CTDEP field notes, groundwater was encountered at a depth of approximately 6-ft. below grade in SS-01.

Results of chemical analyses of soil samples detected ETPH at concentrations ranging up to 4,000 mg/kg, in excess of RSR RDEC and PMC of 500 mg/kg, in 3 of 17 samples tested.

Arsenic exceeded RSR RDEC in one sample with a concentration of 29 mg/kg. Leachable concentrations of lead and antimony exceeded GA/GAA PMC in 13 of 17 and 3 of 17 samples respectively, with concentrations up to 0.07 mg/L and 0.014 mg/kg respectively. Several PAHs exceeded RDEC and/or PMC.

On 28 December, CTDEP collected groundwater samples from microwells SS-01, SS-04, SS-07, SS-09, and SS-11 for chemical analysis for metals, VOCs, SVOCs, and cyanide. Results of the analyses detected metals in all the samples tested. Low levels of the VOCs dichloromethane and chloroform were detected in the water sample from SS-11. Trace to low levels (less than 4 ug/l) of SVOCs were detected in groundwater samples from SS-01 and SS-09; SVOCs (2.5 to 15.45 ug/l) were also detected in the groundwater sample from SS-11. Cyanide was not detected in the groundwater samples tested.

On 17 and 24 January 2001 CTDEP collected 15 additional shallow soil samples from a depth of 0 to 6 inches at Mill Rock Park. Locations of the soil samples (designated RFA-01 through RFA-13, RFA-16 and RFA-20) are shown on Figure 3. Results of chemical testing of soil samples for ETPH, SVOCs, PCBs, pesticides, metals, and cyanide detected arsenic in three samples with concentrations up to 28.85 mg/kg, in excess of RSR RDEC. The chemical testing also detected several SVOCs in the soil samples, including benzo(a)anthracene, benzo(a)pyrene, and benzo(b)fluoranthene and indeno (1,2,3-cd) pyrene. Concentrations of one or more SVOCs detected exceeded RSR RDEC.

On 15 March 2001, CTDEP collected samples of playground sand from depths of 0 to .5 ft. below grade at 10 locations in Mill Rock Park. Sample locations are designated as RFA-18 to RFA-27 in Figure 3. The sand samples were analyzed for total arsenic to address concerns relative to the potential presence of arsenic in the shallow soils. Previous analyses of surficial soils in Rochford Field and Mill Rock Park had detected elevated levels of arsenic. Results of the analyses did not detect elevated concentrations of arsenic in the playground sand.

1.04 Work Scope

The scope of the Phase II/III investigation was developed based on the results of the previous Phase I ESA which was performed by Haley & Aldrich and included an evaluation of previous environmental assessments of the site. The purpose of the Phase II and Phase III investigation was to determine the existence of environmental impacts related to former filling activities at the site and generally evaluate the extent of the fill deposits. Work conducted during this assessment included the installation of 22 test borings, three of which were completed as observation wells, the excavation of five test pits, and chemical testing of soil and groundwater. Project work was conducted in accordance with the Investigation Work Plan, included as Appendix A. The findings of the subsurface investigation are summarized in this report. Supporting documentation is in Appendices B through G.

1.05 Limitations

This report has been prepared for the exclusive use of the Town of Hamden, in connection with an evaluation of on-site environmental conditions. The conclusions provided by Haley and Aldrich, Inc., are based solely on the scope of work conducted and the sources of information referenced in this report. Any additional information that becomes available should be provided to Haley and Aldrich, Inc., so that our conclusions may be reviewed and modified as necessary.

The work performed by Haley and Aldrich, Inc., is subject to the terms and conditions stated in our Agreement with the Town of Hamden dated, 1 August 2001, as amended through 10 July 2002. The work has been undertaken in accordance with generally accepted consulting practices.

We understand that this report is to be used and distributed exclusively for purposes connected with an evaluation of environmental conditions. This report may not be circulated or conveyed, in whole or in part, to any other party, nor used by any other party, without the prior written permission of Haley & Aldrich, Inc. Such other parties must agree that they will not rely on the information provided in the report, recognizing the work was not performed for them, nor was it done with their specific needs, interest, risk tolerance, or expectations in mind.

II. PHASE II ENVIRONMENTAL SITE ASSESSMENT

2.01 General

During the period from 9 to 28 August 2002, Haley & Aldrich conducted explorations and chemical testing to evaluate environmental site impacts related to former filling activities at the site. The explorations included the drilling of test borings, installation of groundwater monitoring wells in selected borings, excavation of test pits and the chemical testing of soil and groundwater. At Rochford Field, Haley & Aldrich monitored the excavation of five test pits, and the drilling of 15 test borings, four of which were completed as monitoring wells. At Mill Rock Park, Haley & Aldrich monitored the excavation of one test pit, and the drilling of seven test borings, three of which were completed as monitoring wells. Locations of the explorations are shown on Figure 2. Subsurface profiles are shown on Figure 3. Results of chemical testing of soil samples are summarized in Tables I and II and in Appendix B. Results of chemical testing of groundwater samples are summarized in Tables III and IV and in Appendix C. Exploration boring, test pit and well logs are included in Appendices D and E. Results of groundwater elevation measurements are included on the Groundwater Monitoring Reports in Appendix F. Photographs taken during the investigation can be found in Appendix H.

Site fill materials and natural deposits were generally defined as follows:

- Earthen Fill: Soil fill, including topsoil which typically does not contain man-made artifacts but at some locations may contain variable amounts of root matter, cobbles, boulders and construction/demolition debris such as concrete, asphalt and brick.
- Domestic Refuse Fill: Soil intermixed with products associated with household and/or on-site burning of paper/wood/coal (ash/cinders), intermixed with rusted metal cans and numerous whole bottles and broken glass, various broken ceramic items and brick.
- Industrial Waste Fill: Black silt and sand sized particles of slag, with cinders and ash intermixed primarily with wood box fragments, sawdust and/or wood chips, batteries, Winchester-related scrap metal gun parts, shell casings and furnace bricks.
- Miscellaneous Fill: Earthen Fill and/or Domestic Refuse Fill mixed with variable amounts of Industrial Waste Fill
- Alluvial Deposits: Organic rich deposits associated with former intermittent watercourse and wetlands.
- Glaciodeltaic Deposits: Glacial meltwater deposits consisting primarily of sand and silt.

2.02 Phase II Explorations

A. Rochford Field

On 13, 14 and 23 August 2002, Soiltesting, Inc. of Oxford, Connecticut, used a truck-mounted auger rig to drill 15 test borings (RF-HA108, RF-HA109, RF-HA110, RF-HA111, RF-HA112, RF-HA-113, RF-HA114, RF-HA115, RF-HA116, RF-HA117, RF-HA118, RF-HA119, RF-HA121, RF-HA123 and RF-HA124) at Rochford Field. Four of the test borings (RF-HA108-MW, RF-HA110, RF-HA115-MW, and RF-HA123-MW) were completed as monitoring wells. The test borings were drilled to depths of 8 to 22 ft. below grade.

On 15 August 2002, Haley & Aldrich monitored the excavation of five test pits at Rochford Field (RF-HATP-1, RF-HATP-2, RF-HATP-3, RF-HATP-4, and RF-HATP-5). The test pits were excavated to depths of 3 to 6 ft. below grade.

During the explorations, Haley & Aldrich generally encountered 0.5 to 3.5 ft. of earthen fill, overlying up to 8.5 ft. of industrial waste fill or miscellaneous fill materials. At most locations, the industrial waste fill overlay the miscellaneous material. However, the miscellaneous fill was encountered above the industrial waste fill in test pits RF-HATP2 and RF-HATP3 and borings RF-HA111, RF-HA115, RF-HA117, and RF-HA119.

The industrial waste fill appeared to increase in thickness to the southeast and northwest; the greatest thickness of this material were observed in RF-HA124, near Winchester Avenue and RF-HA108-MW, near the intersection of Newhall Street and Mill Rock Road. The thickness of earthen fill covering the industrial waste fill and miscellaneous fill is shown on Figure 4. The combined fill thickness is shown on Figure 5.

The fill materials overlay alluvial deposits and/or glaciodeltaic sediments. Bedrock outcrops were not observed on the site, and bedrock was not encountered during the explorations. Haley & Aldrich encountered groundwater at depths ranging from approximately 7 to 10 ft. below grade.

During the drilling of boring RF-HA108-MW, Haley & Aldrich encountered an oily sheen and petroleum odor in samples collected from 5 to 7 ft. and 7 to 9 ft. below grade. Organic odors were also noted in samples of alluvial sediments collected from several borings. With the exception of boring RF-HA108-MW, Haley & Aldrich did not note unusual odors or evidence of impacts from petroleum products. In boring RF-HA119, Haley & Aldrich noted slag interbedded with an unidentified, white, waxy, crystalline substance, pieces of wood with a creosote odor, and pieces of concrete in fill material between 2.5 and 4.5 ft. below grade. The unidentified white material was also observed within a decomposed metal bucket at a depth of 3.5 ft. below grade in test pit RF-HATP-5 but was not encountered in other explorations at the site.

B. Mill Rock Park

On 9 and 12 August 2002, Soiltesting, Inc. used a truck-mounted auger-drilling rig to drill seven test borings (MRP-HA101, MRP-HA-102, MRP-HA103, MRP-HA104, MRP-HA105, MRP-HA106, and MRP-HA107) at Mill Rock Park; three of the borings were completed as monitoring wells (MRP-HA101-MW, MRP-HA103-MW, and MRP-HA107-MW). The test borings completed in Mill Rock Park were drilled to depths of 17 to 22 ft. below grade.

On 15 August 2002, Haley & Aldrich monitored the excavation of one test pit, MRP-HATP-1, in the southwestern portion of the Mill Rock Park site. The test pit was excavated to a depth of 7.2 ft. below grade.

During the explorations, Haley & Aldrich generally encountered 0.5 to 1.5 ft. of earthen fill overlying 5 to greater than 6.5 ft. of domestic refuse fill. The fill, which was encountered in explorations MRP-HATP-1, MRP-HA101-MRP-HA106, increased in thickness from east to west across the site. Fill was encountered to depths of 6.5 ft. below grade in MRP-HA104, MRP-HA106, MRP-HA103, and MRP-HA105. Test pit MRP-HATP-1 was terminated in fill material at a depth of 7.2 ft. below grade. Although borings were not located immediately adjacent to the sewer pump station, domestic refuse fill was observed to depths of 8 and 7.5 ft. below grade in explorations MRP-HA101 and MRP-HA102, located on the south and west side of the site, approximately 50 and 100 ft., respectively from the pump station parcel. The thickness of earthen fill covering the industrial waste fill and miscellaneous fill is shown on Figure 4. The combined fill thickness is shown on Figure 5.

The refuse material overlay silty, clay-rich alluvial sediments and sandy glaciodeltaic deposits. At exploration location MRP-HA107-MW, the earthen fill was 4.5 ft. thick and domestic refuse fill was not encountered above the natural alluvial and glaciodeltaic deposits. Bedrock outcrops were not observed on the site, and bedrock was not encountered during the explorations. Haley & Aldrich encountered groundwater at depths ranging from 6.5 to 7.5 ft. below grade at Mill Rock Park.

With the exception of an organic odor in the alluvial sediments, Haley & Aldrich did not note unusual odors or evidence of chemical staining or releases, in the Mill Rock Park explorations.

C. Soil Sampling and Laboratory Submittal

Soil samples collected from test borings at Rochford Field and Mill Rock Park were submitted to Complete Environmental Testing (CET), a State-certified laboratory in Stratford, Connecticut, for chemical analysis. Soil samples were tested for the following parameters:

- ETPH (CTDEP Method);
- VOCs (EPA Method 8021);
- SVOCs (EPA Method 8270);
- Chlorinated Pesticides (EPA Method 8081);
- PCBs (EPA Method 8082);

- Total Metals (13 priority pollutant metals plus hexavalent chromium);
- Leachable Metals (SPLP) (13 priority pollutant metals);
- Total Cyanide.

Chemical parameters were selected based on potential site contaminants of concern (COCs) which were identified during the Phase I ESA and the results of previous environmental testing conducted by others. Laboratory test results are summarized in Tables I and II and Appendix B.

D. Groundwater Sampling

During the period from 26 to 28 August 2002, Haley & Aldrich visited the site to collect groundwater samples from observation wells MRP-HAB101-MW, MRP-HAB103-MW, MRP-HAB107-MW, RF-HAB108-MW, RF-HAB110-MW and RF-HAB123-MW. Haley & Aldrich used low flow sampling techniques. Groundwater samples were collected in laboratory prepared glassware and were kept chilled prior to delivery to the chemical testing laboratory. Groundwater samples were tested for the following parameters:

- ETPH (CTDEP ETPH Method);
- VOCs (EPA Method 8021);
- Total Metals (13 priority pollutant metals plus hexavalent chromium);
- Total Cyanide,
- SVOCs (EPA Method 8270);
- Chlorinated Pesticides (EPA Method 8081);
- PCBs (EPA Method 8082).

Laboratory parameters were selected based on COCs identified during the Phase I, and results of previous environmental testing conducted by others. Results of the laboratory analyses are included in Tables III and IV and Appendix C.

During groundwater sampling, Haley & Aldrich did not note unusual odors, oily sheens or free phase petroleum product in all wells except RF-HA108-OW. At RF-HA108-OW, Haley & Aldrich personnel noted a petroleum odor and observed an oily sheen on water removed from the well.

E. Groundwater Measurements and Elevation Contouring

Prior to sampling the monitoring wells, Haley & Aldrich measured depth to groundwater in each of the wells. Results of the elevation measurements, corresponding surveyed well elevations and calculated groundwater elevations are summarized in Appendix F. Groundwater elevation contours are shown in Appendix G. Based on the measurements, the inferred direction of overburden groundwater flow in the vicinity of Rochford Field and Mill Rock Park is to the west, towards Newhall Street.

On 6, 12 and 23 September and 4 October 2002, LBG, the consultant for the SCRWA, measured depth to groundwater in widespread site wells, including wells installed by LBG and Haley & Aldrich. Results of the LBG water level measurements are included on the Groundwater Monitoring Reports in Appendix F. A groundwater

elevation contour map (potentiometric surface map), prepared by LBG, based on results of water levels collected on 12 September 2002, is included in Appendix G. The LBG map includes the site, as well as portions of the adjacent Newhall Neighborhood, Hamden Middle School and Newhall Athletic Fields. Based on a review of the LBG data and elevation contour map, shallow groundwater in the site area is flowing to the west. The hydraulic gradient decreases from east to west; the steepest gradient was measured in the Mill Rock Park wells.

2.03 Discussion of Soil and Groundwater Sampling Results

A. CTDEP Remediation Standard Criteria

The CTDEP has published Remediation Standard Regulation (RSR) criteria for a number of compounds for use in determining the need for remediation or additional investigation. Properties, which fall within one of the state regulatory programs such as the Transfer Act Program, Underground Storage Tank regulations, or Voluntary Remediation Program, are required to demonstrate compliance with the RSRs. In addition, sites subject to an order are also subject to the RSRs. Where applicable, the CTDEP RSR Residential Direct Exposure Criteria (RDEC) and the GA/GAA Pollutant Mobility Critical (PMC) are shown on Tables I and II. The criteria listed apply to soils in "GAA" areas such as the site and residential type use. Outdoor recreational use falls under the residential use definition in the RSRs. Applicable CTDEP RSR Groundwater Protection Criteria (GWPC), Surface Water Protection Criteria (SWPC) and Residential Volatilization Criteria (VC) are shown on Tables III and IV. Figure 6 through 11 show which soil samples detected contaminants analyzed for and which soil samples exceeded the RDEC and PMC. Figure 12 summarizes which groundwater samples detected contaminants analyzed for and which samples exceeded the GWPC.

B. Results of Laboratory Analysis of Soil Samples

1. Rochford Field

Results of chemical testing of soil samples collected from Rochford Field are summarized in Table I.

- Aromatic VOCs were detected in soil samples, collected at and below the water table (7 to 9 ft. below grade), in RF-HA108-MW. The concentration of naphthalene (7,400 ug/L) detected in the 7 to 8.4 ft. sample, near the base of the apparent industrial waste fill layer, exceeded the PMC. Lower levels of naphthalene (12 to 190 ug/L) were detected in industrial waste fill samples from three other borings. Several other aromatic VOCs, including ethylbenzene, xylenes, trimethylbenzene, isopropylbenzene, n-propylbenzene and 4-isopropyltoluene, were detected at concentrations below RSR criteria in industrial waste fill and miscellaneous waste samples from RF-HA111. Generally, the VOCs were associated with elevated concentrations of SVOCs, as discussed below.

VOCs were not detected in samples collected from explorations RF-HA110, RF-HA112, RF-HA114, RF-HA115, RF-HA116 and RF-HA123. The samples collected from explorations RF-HA119, RF-HA121 and RF-HA124 were Phase III samples, intended to evaluate data gaps in metal and SVOC testing and as such, were not tested for VOCs.

- One or more SVOCs were detected in soil samples from each of the Rochford Field borings. The SVOCs detected included 24 different compounds, including: naphthalene, fluorene, phenanthrene, acenaphthalene and acenaphthylene, carbazole, n-nitrosodiphenylamine, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene and indeno(1,2,3-cd)pyrene. The highest concentrations of SVOCs were detected in samples from within the industrial waste fill layers in RF-HA108, RF-HA113, and RF-HA119.

Results of SVOC analyses detected polynuclear aromatic compounds (PAHs) at concentrations in excess of RDEC and PMC in 15 soil samples collected from Rochford Field. Of the samples with RSR exceedences, 80% were collected in the industrial waste fill; the remaining 20% were miscellaneous fill samples. Additionally, chemical testing of one industrial waste fill sample (RF-HA111, 7 to 8.5 ft.) detected the phenolic compound, 3+ 4 methyl phenol at a concentration in excess of the PMC. The analyses did not detect SVOCs at concentrations in excess of RSR criteria in samples collected from the earthen fill or alluvial deposits sampled.

- One or more of the chlorinated pesticides 4,4-DDD, 4,4-DDE and 4,4-DDT were detected below RSR criteria in eight soil samples from Rochford Field. The pesticide 4,4-Methoxychlor was also detected in one of the soil samples, below the RSR criteria. All but one of the eight pesticide-containing samples was collected from the earthen fill layer. The remaining sample (RF-HA111, 1 to 2 ft.) was collected from the top of the miscellaneous fill layer, immediately below the earthen fill. Pesticides were not detected in the industrial waste fill material.
- ETPH were detected in one or more samples collected from each of the Rochford Field borings except for RF-HA124. Concentrations of ETPH, in excess RDEC and PMC were detected in 17 soil samples. Approximately 60% of the samples with ETPH exceedences were collected from the industrial waste fill, 30% of the samples were from the miscellaneous fill. The remaining sample with an ETPH exceedence was collected from the top of the underlying alluvial sediments (8.4 to 9 ft.) in RF-HA108. Generally, the ETPH impacts appear to be associated with PAH compounds.

- Results of total metals testing detected one or more of the following metals, at concentrations in excess of RDEC, in each of the soil borings sampled: antimony, arsenic, beryllium, cadmium, copper, lead, selenium, and thallium. Chemical testing for leachable metals, by SPLP, was conducted on selected soil samples with the highest concentrations of total metals. One or more of the following metals were detected above PMC in the samples tested: antimony, copper, lead, nickel, and zinc.

Samples where concentrations of total or leachable metals were detected in excess of RSR criteria were primarily confined to the industrial waste fill or miscellaneous fill layers. With the exception of arsenic and beryllium, metal RDEC or PMC exceedences were not detected in the earthen fill. Metals were not detected in samples from the alluvial or glaciodeltaic sediments in excess of RSR criteria.

Antimony was detected in seven samples at concentrations above RDEC; 70% of the samples were from the industrial waste fill, the remaining 30% were miscellaneous fill samples. Concentrations of antimony, in excess of the PMC, were detected in two of the industrial waste fill samples and two of the miscellaneous fill samples tested.

Arsenic was detected above RDEC in 40 samples, approximately 60% of the samples were industrial waste fill, 23% were miscellaneous fill and the remaining 7% were earthen fill.

Copper was detected in ten soil samples at concentrations in excess of RDEC; 60% of the samples were miscellaneous fill, the remaining 30% were industrial waste fill.

Cadmium was detected in excess of RDEC in one sample of miscellaneous fill.

Lead was detected in excess of the RDEC in 23 soil samples, 56% of the samples were industrial waste fill, and the remaining samples were miscellaneous fill. In two of the industrial waste fill and three of the miscellaneous fill samples, the concentration of lead also exceeded PMC. Lead was also detected above PMC and below RDEC in one industrial waste fill sample (RF-HA115, 2 to 4 ft.).

Selenium was detected in three samples in excess of RDEC, two of the samples were from the industrial waste fill, the other from the miscellaneous fill.

Beryllium was detected in two samples above RDEC, one from the industrial waste fill, the other from the earthen fill.

Thallium was detected above RDEC in one industrial waste fill sample.

Nickel and zinc were detected above the PMC in one industrial waste fill and one miscellaneous fill soil sample. Nickel and zinc were not detected above RDEC in any of the samples tested.

- Results of chemical testing of the Rochford Field soil samples did not detect PCBs.
- Laboratory testing detected 23 mg/kg cyanide in a soil sample collected from a depth of 2 to 4 ft. below grade in RF-HA109 (23 mg/kg), within the suspected industrial waste fill. The concentration of cyanide detected did not exceed RSR criteria.

2. Mill Rock Park

Results of chemical testing of soil samples collected from Mill Rock Park are summarized in Table II.

- Results of chemical testing did not detect VOCs, PCBs or cyanide in soil samples from Mill Rock Park.
- The chlorinated pesticide 4,4-DDE was detected below RSR criteria in a soil sample collected from 0 to 2 ft. below grade in boring MRP-HA103-MW. The sample was collected within the earthen fill material that overlay the domestic refuse fill. Results of chemical testing of the underlying 2-4 ft. sample did not detect 4,4-DDE. Chlorinated pesticides were not detected in the other soil samples tested.
- SVOCs were detected in one or more samples of domestic refuse fill material collected from each of the Mill Rock Park borings. Samples contained up to 18 different SVOCs; primarily: phenanthrene, fluoranthene, pyrene, benzo(a)anthracene, chrysene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(a)pyrene and indeno(1,2,3-cd)pyrene. SVOCs were not detected in samples collected from MRP-HA107; domestic refuse fill was not encountered in this boring. The highest concentrations of SVOCs were detected in samples from MRP-H101 and MRP-HA104.

Results of SVOC analyses detected PAHs at concentrations in excess of RDEC and PMC in 14 soil samples collected from Mill Rock Park. Of the samples with RSR exceedences, 85% were collected in the domestic refuse fill, the remaining 15% were earthen fill samples. The phthalate, bis(2-ethylhexyl)phthalate was detected above PMC in one of the earthen fill samples (MRP-HA102, 0 to 2 ft.), that compound was not detected in the other samples tested.

- ETPH were detected in one or more domestic refuse fill samples from five test borings. ETPH concentrations in two of the samples exceeded RDEC and PMC. ETPH was not detected at concentrations above RSR criteria in the earthen fill samples tested.

- Results of chemical testing for total metals detected one or more of the following in the samples tested: antimony, arsenic, beryllium, copper, hexavalent chromium, lead, nickel, mercury, selenium, silver and zinc. Arsenic was detected above RDEC in five samples of domestic refuse fill. Lead was detected above RDEC in six samples of domestic refuse fill and one earthen fill sample. The two soil samples with the highest concentrations of total metals (MRF-HA103, 5 to 6.5 ft. and MRF-HA105, 2 to 4 ft.) were tested for leachable metals by SPLP. The results of the SPLP testing did not detect leachable metals at concentrations above laboratory detection limits.

C. Results of Laboratory Analysis of Groundwater

1. Rochford Field

Results of chemical testing of groundwater samples collected from Rochford Field monitoring wells are summarized in Table III.

- Results of chemical testing of groundwater from the four observation wells Rochford School did not detect PCBs, cyanide or chlorinated pesticides.
- Results of chemical testing of groundwater for VOCs, detected 32 micrograms per liter (ug/l) of naphthalene in the sample from RF-HAB108-MW. The concentration of naphthalene detected did not exceed applicable RSR criteria. VOCs were not detected in the other three wells sampled.
- Laboratory testing detected the following SVOCs in the groundwater sample from RF-HAB108-MW: acenaphthene, acenaphthalene, anthracene, carbazole, fluoranthene, fluorene, naphthalene, phenanthrene and pyrene. The concentrations of acenaphthalene (.5 ug/l) and phenanthrene (8.2 ug/l) exceed RSR SWPC. SVOCs were not detected in groundwater collected from the other three Rochford Field wells.
- ETPH were detected in groundwater samples from RF-HAB108-MW (.29 mg/L) and RF-HAB110-MW (.14 mg/L). The concentrations of ETPH detected exceed RSR GWPC. TPH were not detected in groundwater samples from RF-HAB115-MW or RF-HAB123-MW.
- Results of chemical analyses detected concentrations of nickel in groundwater samples from RF-HAB110-MW (.19 mg/L) and RF-HAB123-MW (.086 mg/L). Zinc was detected in groundwater samples from each of the four wells at concentrations ranging from .07 mg/L to 2.4 mg/L. The concentration of nickel detected in RF-HAB110-MW exceeds the RSR GWPC. The concentration of zinc detected in RF-HAB110-MW and in RF-HAB123-MW exceeds the RSR SWPC.

2. Mill Rock Park

Results of chemical testing of groundwater samples from Mill Rock Park monitoring wells are summarized in Table IV.

- Results of chemical analysis of groundwater samples from HA-B101-MW, HA-B103-MW and HA-B107-MW did not detect concentration of VOCs, SVOCs, chlorinated pesticides, PCBs, EPTH, total metals or cyanide above the laboratory detection limits.

D. Summary of Findings

1. Rochford Field

Results of chemical testing of soil and groundwater samples from Rochford Field detected widespread impacts from petroleum volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), total petroleum hydrocarbons (ETPH) and metals within the fill material at concentrations in excess of regulatory RDEC and/or PMC. Greater than 50 percent of the samples exceeding regulatory criteria were from the industrial waste fill layer. The remaining samples were generally collected from the miscellaneous fill samples. With the exception of arsenic, beryllium, and in one case ETPH, RSR exceedences were not detected in samples collected within the earthen fill or alluvial sediments.

Chlorinated pesticides were detected in shallow soil samples from eight of the test borings at Rochford Field. The concentrations of 4,4-DDD, 4-DDE, and 4,4-DDT detected did not exceed regulatory criteria. The samples containing the pesticide compounds were collected from depths of less than 1.5 ft. below grade, generally within earthen fill material. The pesticides did not appear to be associated with the industrial waste fill material.

Results of groundwater testing detected the VOC naphthalene, SVOC, and ETPH in downgradient monitoring well RF-HA108-MW. Concentrations of two SVOCs (acenaphthalene and phenanthrene) and EPTH exceeded RSR SWPC. ETPH was also detected in monitoring well RF-HA110-MW, located in the northeastern corner of Rochford Field. Chemical testing also detected the metals nickel and zinc in groundwater samples from two or more of the wells. The concentration of nickel detected in RF-HA110-MW exceeded the RSR GWPC; the level of zinc detected in that well and in RF-HA123-MW exceeded the RSR SWPC.

2. Mill Rock Park

Results of chemical testing of soil samples from Mill Rock detected SVOCs and lead within the domestic refuse fill at concentrations in excess of RDEC and/or PMC. Generally, the concentrations detected were lower than those in the fill from Rochford Field. The number of SVOCs (18) detected was also slightly less than the number (24) encountered in the Rochford Field samples. ETPH and metals were detected in several locations at

concentrations below RSR criteria. The chlorinated pesticide 4,4-DDE was detected below RSR criteria in one shallow soil sample, collected from the earthen fill material that overlies the refuse. VOCs and PCBs were not detected. No regulatory exceedences were encountered in the underlying alluvial deposit layer.

Results of chemical testing of groundwater samples from three wells at the Mill Rock Park site did not detect VOCs, SVOCs, ETPH, pesticides, PCBs, cyanide or metals.

III. CONCLUSIONS

Results of field observations and chemical testing generally confirm historical information encountered during the Phase I ESA as well as results of previous environmental sampling conducted by CTDEP and M&E. Shallow groundwater beneath the site is flowing in a westerly direction, generally following the path of a historic stream and associated wetland that was filled in the early 1900s. Results of groundwater elevation measurements conducted by LBG indicated that the direction of shallow groundwater flow in the site vicinity is also westerly. The flow gradient decreases from east to west with the steepest gradient measured beneath Mill Rock Park.

Rochford Field

Based on the results of the field explorations, Rochford Field is generally underlain by up to approximately 8.5 ft. of fill deposits, including slag-rich “industrial waste fill” and “miscellaneous fill.” The industrial waste fill layer typically contained layers of slag, ash, cinders, wood, box fragments, sawdust, Winchester-related scrap metal gun products with some demolition debris (concrete and brick), furnace brick, copper fragments and batteries. The miscellaneous fill layer typically contained industrial waste fill mixed with earthen fill containing organic material and construction/demolition debris such as; sand, wood, fabric, paper, glass, cinders and cardboard. Generally, the industrial waste fill was encountered above the miscellaneous material although industrial waste fill only was encountered in explorations in the northwest and southeast portions of the site. The miscellaneous fill layer observed at Rochford Field did not contain domestic refuse fill.

Results of chemical testing of soil from Rochford Field detected widespread aromatic VOCs, SVOCs, ETPH and metals within the fill material at concentrations in excess of RSR criteria. The pesticides did not appear to be associated with the industrial waste fill material and may have resulted from either historic pesticide use or residual compounds that were present in the fill when it was placed on the site.

Results of chemical testing of groundwater at Rochford Field detected nickel, zinc, naphthalene, SVOCs, and ETPH that exceeded RSR SWPC and/or GWPC.

Mill Rock Park

Based on the results of the field explorations, Mill Rock Park is generally underlain by approximately 5 to greater than 6.5 ft. of domestic refuse fill. The fill deposits appear to increase in depth and thickness from east to west. Although explorations were not located immediately adjacent to the sewer pump station, domestic refuse fill was observed to depths of 8 and 7.5 ft. below grade in explorations located approximately 50 and 100 ft. to the south and west. As such, it is likely that domestic refuse fill is present beneath the pump station parcel.

Results of chemical testing of soil from Mill Rock Park detected SVOCs and lead within the domestic refuse fill at concentrations in excess of RSR and/or PMC. Results of chemical testing of groundwater samples did not detect sought analytes. In general, concentrations of sample results in Mill Rock Park were significantly less than those encountered at Rochford Field.

TABLE I
SUMMARY OF ANALYTICAL DATA - SOIL
ROCHFORD FIELD
HAMDEN, CONNECTICUT

PARAMETER	Sample ID: Sample Location: Sample Date: Sample Depth (ft.bgs): Sample Type	Residential Direct Exposure Criteria	GA/GAA Pollutant Mobility Criteria	RF-HA108-MW-S1 RF-HA108-MW 14-Aug-02 0-2 EF	RF-HA108-MW-S2 RF-HA108-MW 14-Aug-02 2-4 IWF	RF-HA108-MW-S3 RF-HA108-MW 14-Aug-02 5-7 IWF	RF-HA108-MW-S4 RF-HA108-MW 14-Aug-02 7-8.4 IWF	RF-HA108-MW-S4A RF-HA108-MW 14-Aug-02 8.4-9 AD	RF-HA109-S1 RF-HA109 14-Aug-02 0-2 IWF	RF-HA109-S2 RF-HA109 14-Aug-02 2-4 IWF	RF-HA109-S3 RF-HA109 14-Aug-02 5-7 MF	RF-HA109-S4 RF-HA109 14-Aug-02 7.8-9 AD	RF-HAB110-MW-S1 RF-HAB110-MW 13-Aug-02 0-2 EF	RF-HAB110-MW-S2 RF-HAB110-MW 13-Aug-02 2-4 IWF	RF-HAB110-MW-S3 RF-HAB110-MW 13-Aug-02 5-7 MF	RF-HAB110-MW-S4 RF-HAB110-MW 13-Aug-02 7-9 GD	RF-HA111-S1 RF-HA111 14-Aug-02 1-2 MF	RF-HA111-S2 RF-HA111 14-Aug-02 2-3 MF	RF-HA111-S2A RF-HA111 14-Aug-02 3-3.5 MF	
VOLATILE ORGANIC COMPOUNDS (ug/kg):																				
Ethylbenzene		500,000	10,100	ND	ND	ND	31	5.8	ND	ND	ND	---	ND	ND	ND	---	ND	7.4	ND	
m+p Xylenes		500,000	19,500	ND	ND	ND	26	12	ND	ND	ND	---	ND	ND	ND	---	ND	31	ND	
o-Xylene		500,000	19,500	ND	ND	ND	27	22	ND	ND	ND	---	ND	ND	ND	---	ND	13	ND	
Isopropylbenzene		500,000	600	ND	ND	ND	13	6.6	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	
n-Propylbenzene		500,000	1,400	ND	ND	ND	6.1	ND	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	
1,3,5-Trimethylbenzene		500,000	700	ND	ND	ND	250	55	ND	ND	ND	---	ND	ND	ND	---	ND	41	ND	
1,2,4-Trimethylbenzene		500,000	700	ND	ND	ND	190	67	ND	ND	ND	---	ND	ND	ND	---	ND	87	ND	
4-Isopropyltoluene		500,000	600	ND	ND	ND	48	7.6	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	
Naphthalene		1,000,000	5,600	ND	ND	ND	7400	3100	190	23	ND	---	ND	ND	ND	---	ND	ND	ND	
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg):																				
n-Nitroso-dimethylamine		NE	NE	ND	ND	ND	ND	ND	ND	ND	3000	---	ND	ND	ND	---	ND	ND	ND	
3+4 Methyl Phenol		340,000	1,000	ND	ND	400	300	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	
1,2,4-Trichlorobenzene		680,000	1,400	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	
Naphthalene		1,000,000	5,600	ND	ND	ND	49000	1400	ND	ND	ND	ND	ND	ND	320	---	ND	ND	ND	
Acenaphthylene		1,000,000	8,400	ND	ND	510	3400	ND	ND	ND	ND	ND	ND	ND	270	---	ND	ND	ND	
Acenaphthene		1,000,000	8,400	ND	ND	ND	34000	ND	ND	ND	510	ND	ND	ND	360	---	ND	ND	ND	
Fluorene		1,000,000	5,600	ND	ND	220	41000	210	ND	ND	830	ND	ND	ND	450	---	ND	ND	ND	
n-Nitrosodiphenylamine		130,000	1,000	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	2500	---	ND	ND	ND	
Phenanthrene		1,000,000	4,000	ND	290	890	120000	530	510	760	9400	ND	ND	320	4800	---	ND	340	ND	
Anthracene		1,000,000	40,000	ND	ND	350	25000	ND	ND	250	2300	ND	ND	ND	660	---	ND	ND	ND	
Carbazole		31,000	1,000	ND	ND	ND	7500	ND	ND	220	2100	---	ND	ND	ND	---	ND	ND	ND	
Di-n-butylphthalate		1,000,000	14,000	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	
Fluoranthene		1,000,000	5,600	ND	ND	2600	48000	240	910	2600	10000	ND	ND	420	3300	---	310	ND	ND	
Pyrene		1,000,000	4,000	ND	ND	2800	47000	270	720	3300	9100	ND	ND	370	1900	---	270	ND	ND	
Butylbenzylphthalate		1,000,000	20,000	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	
Benzo[a]anthracene		1,000	1,000	ND	ND	1300	17000	ND	310	3400	8800	---	ND	340	1700	---	ND	ND	ND	
Chrysene		84,000	1,000	ND	220	1700	16000	ND	490	3700	8200	ND	ND	710	1600	---	ND	450	ND	
bis(2-Ethylhexyl)phthalate		44,000	1,000	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	
Benzo[b]fluoranthene		1,000	1,000	ND	ND	2100	11000	ND	540	4300	8200	ND	ND	2100	2700	---	220	220	ND	
Benzo[k]fluoranthene		8,400	1,000	ND	ND	1200	5200	ND	ND	1700	3300	ND	ND	1200	1700	---	ND	ND	ND	
Benzo[a]pyrene		1,000	1,000	ND	ND	1200	10000	ND	230	3600	5500	ND	ND	660	2500	---	ND	ND	ND	
Indeno[1,2,3-cd]pyrene		1,000	1,000	ND	ND	540	2300	ND	330	3300	4300	ND	ND	450	830	---	ND	ND	ND	
Dibenz[a,h]anthracene		1,000	1,000	ND	ND	ND	880	ND	ND	540	600	ND	ND	ND	310	---	ND	ND	ND	
Benzo[g,h,i]perylene		1,000,000	4,200	ND	ND	440	1600	ND	330	3300	3200	ND	ND	380	660	---	ND	ND	ND	
CHLORINATED PESTICIDES (ug/kg):																				
4,4-DDD		2,600	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	
4,4-DDE		1,800	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND	79	ND	ND	---	57	ND	ND	
4,4-DDT		1,800	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	
4,4-Methoxychlor		340,000	NE	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	
POLYCHLORINATED BIPHENYLS (mg/kg):																				
		1	0.0005	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	
TOTAL PETROLEUM HYDROCARBONS (mg/kg):																				
		500	500	ND	ND	43000	9200	670	200	1300	620	---	ND	4200	1900	---	ND	120	660	
TOTAL METALS (mg/kg):																				
Antimony		27	--	ND	ND	12	4.5	ND	5.5	120	33	ND	ND	2.5	22	ND	ND	ND	13	
Arsenic		10	--	1.1	16	23	8.7	ND	51	16	33	1.7	13	31	14	ND	29	17	11	
Beryllium		2	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.6	ND	ND	ND	ND	ND	
Cadmium		34	--	ND	ND	ND	5.1	ND	1.2	ND	8.3	ND	ND	2.7	ND	ND	ND	ND	ND	
Chromium		2500	--	8.6	5	120	16	2.7	25	15	49	---	ND	ND	0.77	---	13	4.6	19	
Copper		1400	--	11	32	480	3000	9	180	1500	5600	4.1	33	270	1200	3.9	37	18	320	
Hexavalent Chromium		100	--	---	---	---	---	---	---	---	---	ND	---	---	---	ND	---	---	---	
Lead		400	--	16	5.4	1800	290	5.3	410	2100	2300	4.3	91	50	54	3.7	77	7.2	1400	
Nickel		1400	--	6.6	7.1	240	61	2	30	30	380	17	8.5	15	180	4.6	9.4	9.4	96	
Selenium		340	--	ND	1.6	1.2	ND	ND	26	2.1	26	ND	54	71	1800	ND	54	2.1	ND	
Silver		340	--	ND	ND	ND	ND	ND	5.1	ND	16	ND	ND	ND	ND	ND	ND	ND	ND	
Thallium		5.4	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total Mercury		20	--	ND	ND	2.3	4.2	0.32	1.7	2.9	2.2	ND	ND	ND	ND	0.2	0.35	0.81	0.81	
Zinc		20000	--	25	8	790	2600	33	680	440	11000	240	45	75	2800	150	52	12	43	
SPLP METALS (mg/l):																				
Antimony		---	0.006	---	---	---	---	---	---	0.014	---	---	---	---	---	---	---	---	---	
Arsenic		---	0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Beryllium		---	0.004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Cadmium		---	0.005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Chromium		---	0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Copper		---	1.3	---	---	---	---	---	---	---	0.27	---	---	---	---	---	---	---	---	
Lead		---	0.015	---	---	---	---	---	---	---	0.065	---	---	---	---	---	---	---	---	
Mercury		---	0.002	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Nickel		---	0.1	---	---	---	---	---	---	---	0.15	---	---	---	---	---	---	---	---	
Selenium		---	0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Silver		---	0.036	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Thallium		---	0.005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Zinc		---	5	---	---	---	---	---	---	---	5.3	---	---	---	---	---	---	---	---	
TOTAL CYANIDE (mg/kg):																				
		---	---	ND	ND	ND	ND	ND	ND	23	ND	---	ND	ND	ND	---	ND	ND	ND	

See Notes on Page 5

TABLE I
SUMMARY OF ANALYTICAL DATA - SOIL
ROCHFORD FIELD
HAMDEN, CONNECTICUT

PARAMETER	Sample ID: Sample Location: Sample Date: Sample Depth (ft.bgs): Sample Type	Residential Direct Exposure Criteria	GA/GAA Pollutant Mobility Criteria	RF-HA111-S2B RF-HA111 14-Aug-02 3.5-4 IWF	RF-HA111-S3 RF-HA111 14-Aug-02 5-7 IWF	RF-HA111-S4 RF-HA111 14-Aug-02 7-8.5 IWF	RF-HA111-S5 RF-HA111 14-Aug-02 10-12 AD	RF-HA112-S1 RF-HA112 14-Aug-02 3.5-1.1 EF	RF-HA112-S2 RF-HA112 14-Aug-02 2-3.5 EF	RF-HA112-S2A RF-HA112 14-Aug-02 3.5-4 IWF	RF-HA112-S4 RF-HA112 14-Aug-02 4-6 AD	RF-HA113-S1 RF-HA113 14-Aug-02 1-2 IWF	RF-HA113-S2 RF-HA113 14-Aug-02 2-3.5 IWF	RF-HA113-S2A RF-HA113 14-Aug-02 3.5-4 IWF	RF-HA113-S3 RF-HA113 14-Aug-02 5-6.5 IWF	RF-HA113-S4 RF-HA113 14-Aug-02 7-9 GD	RF-HA114-S1 RF-HA114 14-Aug-02 0.8-1.5 EF	RF-HA114-S2 RF-HA114 14-Aug-02 2-4 IWF	RF-HA114-S3 RF-HA114 14-Aug-02 5-7 IWF	RF-HA114-S4 RF-HA114 14-Aug-02 7-8.5 MF	
VOLATILE ORGANIC COMPOUNDS (ug/kg):																					
Ethylbenzene		500,000	10,100	ND	ND	17	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
m+p Xylenes		500,000	19,500	ND	ND	20	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
o-Xylene		500,000	19,500	ND	ND	22	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
Isopropylbenzene		500,000	600	ND	ND	6.1	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
n-Propylbenzene		500,000	1,400	ND	ND	40	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
1,3,5-Trimethylbenzene		500,000	700	19	ND	320	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
1,2,4-Trimethylbenzene		500,000	700	18	22	710	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
4-Isopropyltoluene		500,000	600	ND	ND	28	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
Naphthalene		1,000,000	5,600	ND	ND	150	---	ND	ND	ND	---	ND	12	ND	ND	---	ND	ND	ND	ND	
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg):																					
n-Nitroso-dimethylamine		NE	NE	ND	300	ND	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
3+4 Methyl Phenol		340,000	1,000	ND	ND	1200	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
1,2,4-Trichlorobenzene		680,000	1,400	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
Naphthalene		1,000,000	5,600	ND	ND	ND	---	ND	ND	450	---	ND	5900	520	1500	---	ND	ND	ND	ND	
Acenaphthylene		1,000,000	8,400	ND	ND	ND	---	ND	ND	ND	---	ND	35000	ND	ND	---	ND	ND	ND	ND	
Acenaphthene		1,000,000	8,400	ND	ND	ND	---	ND	ND	ND	---	ND	5000	250	ND	---	ND	ND	ND	ND	
Fluorene		1,000,000	5,600	ND	ND	260	---	ND	ND	ND	---	ND	18000	280	ND	---	ND	ND	ND	ND	
n-Nitrosodiphenylamine		130,000	1,000	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
Phenanthrene		1,000,000	4,000	ND	ND	340	---	270	ND	800	---	ND	290000	3800	2000	---	ND	590	3800	230	
Anthracene		1,000,000	40,000	ND	ND	ND	---	ND	ND	ND	---	ND	58000	750	400	---	ND	ND	ND	ND	
Carbazole		31,000	1,000	ND	ND	ND	---	ND	ND	ND	---	ND	36000	660	ND	---	ND	ND	ND	ND	
Di-n-butylphthalate		1,000,000	14,000	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	1600	---	ND	ND	ND	ND	
Fluoranthene		1,000,000	5,600	ND	250	ND	---	540	ND	1300	---	ND	240000	3900	1600	---	ND	870	2300	ND	
Pyrene		1,000,000	4,000	ND	ND	ND	---	460	ND	1100	---	ND	190000	3300	1100	---	ND	710	4900	200	
Butylbenzylphthalate		1,000,000	20,000	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
Benzo[a]anthracene		1,000	1,000	ND	ND	ND	---	230	ND	500	---	ND	95000	1600	680	---	ND	430	4300	ND	
Chrysene		84,000	1,000	ND	ND	ND	---	310	ND	880	---	ND	86000	1800	1000	---	ND	770	8000	ND	
bis(2-Ethylhexyl)phthalate		44,000	1,000	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
Benzo[b]fluoranthene		1,000	1,000	ND	ND	ND	---	360	ND	1300	---	ND	160000	2100	1400	---	ND	1100	1700	ND	
Benzo[k]fluoranthene		8,400	1,000	ND	ND	ND	---	ND	ND	370	---	ND	76000	840	480	---	ND	350	ND	ND	
Benzo[a]pyrene		1,000	1,000	ND	ND	ND	---	240	ND	220	---	ND	110000	1600	690	---	ND	540	ND	ND	
Indeno[1,2,3-cd]pyrene		1,000	1,000	ND	ND	ND	---	230	ND	710	---	ND	39000	1100	680	---	ND	610	ND	ND	
Dibenzo[a,h]anthracene		1,000	1,000	ND	ND	ND	---	ND	ND	ND	---	ND	9200	270	220	---	ND	ND	ND	ND	
Benzo[g,h,i]perylene		1,000,000	4,200	ND	ND	ND	---	210	ND	570	---	ND	31000	1000	600	---	ND	580	ND	ND	
CHLORINATED PESTICIDES (ug/kg):																					
4,4-DDD		2,600	NE	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	ND	---	53	ND	ND	ND	
4,4-DDE		1,800	NE	ND	ND	ND	---	340	ND	ND	---	ND	ND	ND	ND	---	340	ND	ND	ND	
4,4-DDT		1,800	NE	ND	ND	ND	---	140	ND	ND	---	ND	ND	ND	ND	---	55	ND	ND	ND	
4,4-Methoxychlor		340,000	NE	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
POLYCHLORINATED BIPHENYLS (mg/kg):																					
		1	0.0005	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	
TOTAL PETROLEUM HYDROCARBONS (mg/kg):																					
		500	500	ND	ND	ND	---	ND	ND	1000	---	ND	3700	290	370	---	ND	260	11000	930	
TOTAL METALS (mg/kg):																					
Antimony		27	--	3.3	240	4.3	ND	2.5	ND	17	ND	ND	3.3	170	4.6	ND	ND	12	7.2	ND	
Arsenic		10	--	60	63	8.3	ND	40	5.4	13	ND	38	6.9	28	32	ND	33	19	26	2.7	
Beryllium		2	--	1	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Cadmium		34	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.71	40	
Chromium		2500	--	11	ND	3.4	---	19	7.4	16	---	8.2	30	42	11	---	16	11	23	4	
Copper		1400	--	510	1100	85	9.1	37	8.8	450	6.6	11	92	730	630	7.1	26	140	630	730	
Hexavalent Chromium		100	--	---	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	
Lead		400	--	62	14000	21	8	150	12	370	4.3	25	480	760	170	3.7	130	500	400	16	
Nickel		1400	--	32	62	110	4.1	9.1	4.6	150	7.2	5.1	76	74	36	4.8	7.6	41	160	75	
Selenium		340	--	3.9	ND	ND	ND	ND	ND	1.7	ND	ND	ND	2.6	ND	ND	ND	ND	1.2	ND	
Silver		340	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Thallium		5.4	--	ND	ND	ND	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	
Total Mercury		20	--	2.9	3	0.54	ND	0.46	ND	1.5	ND	ND	2.5	2.7	2.1	ND	0.34	0.31	0.67	0.21	
Zinc		20000	--	51	770	440	19	59	22	98	26	15	590	390	1000	18	52	310	1400	6000	
SPLP METALS (mg/l):																					
Antimony		---	0.006	---	0.012	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Arsenic		---	0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Beryllium		---	0.004	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Cadmium		---	0.005	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Chromium		---	0.05	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Copper		---	1.3	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Lead		---	0.015	---	0.53	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Mercury		---	0.002	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Nickel		---	0.1	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Selenium		---	0.05	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Silver		---	0.036	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Thallium		---	0.005	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
Zinc		---	5	---	0.36	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	
TOTAL CYANIDE (mg/kg):																					
		---	---	ND	ND	ND	---	ND	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	

See Notes on Page 5

PARAMETER	Sample ID: Sample Location: Sample Date: Sample Depth (ft.bgs): Sample Type	Residential Direct Exposure Criteria	GA/GAA Pollutant Mobility Criteria	RF-HA114-S5 RF-HA114 14-Aug-02 10-12 GD	RF-HAB115-MW-S1 RF-HA115-MW 13-Aug-02 0-2 MF	RF-HAB115-MW-S2 RF-HA115-MW 13-Aug-02 2-4 IWF	RF-HAB115-MW-S3 RF-HA115-MW 13-Aug-02 5-7 GD	RF-HA116-S1A RF-HA116 14-Aug-02 0.3-1 EF	RF-HA116-S1B RF-HA116 14-Aug-02 1-2 IWF	RF-HA116-S2 RF-HA116 14-Aug-02 2-4 IWF	RF-HA116-S3A RF-HA116 14-Aug-02 5-5.8 IWF	RF-HA116-S3B RF-HA116 14-Aug-02 5.8-7 GD	RF-HA117-S1 RF-HA117 23-Aug-02 0-0.5 EF	RF-HA117-S1A RF-HA117 23-Aug-02 0.5-1.8 MF	RF-HA117-S2 RF-HA117 23-Aug-02 2-4 IWF	RF-HA117-S3 RF-HA117 23-Aug-02 5-7 MF	RF-HA117-S4 RF-HA117 23-Aug-02 8-9 AD	RF-HA118-S1 RF-HA118 23-Aug-02 0-0.8 EF	RF-HA118-S2 RF-HA118 23-Aug-02 2-3.8 IWF	RF-HA118-S2A RF-HA118 23-Aug-02 3.8-4 MF	
VOLATILE ORGANIC COMPOUNDS (ug/kg):																					
Ethylbenzene		500,000	10,100	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	---	---	---
m+p Xylenes		500,000	19,500	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	---	---	---
o-Xylene		500,000	19,500	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	---	---	---
Isopropylbenzene		500,000	600	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	---	---	---
n-Propylbenzene		500,000	1,400	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	---	---	---
1,3,5-Trimethylbenzene		500,000	700	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	---	---	---
1,2,4-Trimethylbenzene		500,000	700	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	---	---	---
4-Isopropyltoluene		500,000	600	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	---	---	---
Naphthalene		1,000,000	5,600	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	---	---	---
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg):																					
n-Nitroso-dimethylamine		NE	NE	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
3+4 Methyl Phenol		340,000	1,000	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
1,2,4-Trichlorobenzene		680,000	1,400	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
Naphthalene		1,000,000	5,600	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	250	ND
Acenaphthylene		1,000,000	8,400	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
Acenaphthene		1,000,000	8,400	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
Fluorene		1,000,000	5,600	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
n-Nitrosodiphenylamine		130,000	1,000	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
Phenanthrene		1,000,000	4,000	---	ND	230	---	ND	ND	ND	ND	---	ND	ND	1200	1000	ND	---	ND	320	ND
Anthracene		1,000,000	40,000	---	ND	ND	---	330	520	ND	ND	---	ND	ND	220	220	ND	---	ND	ND	ND
Carbazole		31,000	1,000	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
Di-n-butylphthalate		1,000,000	14,000	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
Fluoranthene		1,000,000	5,600	---	ND	240	---	ND	ND	ND	ND	---	ND	ND	1400	2000	ND	---	ND	ND	220
Pyrene		1,000,000	4,000	---	ND	230	---	520	760	ND	ND	---	240	ND	1200	1600	ND	---	ND	ND	300
Butylbenzylphthalate		1,000,000	20,000	---	ND	ND	---	440	690	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
Benzo[a]anthracene		1,000	1,000	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	760	910	ND	---	ND	ND	360
Chrysene		84,000	1,000	---	ND	200	---	200	410	ND	ND	---	ND	ND	850	990	ND	---	ND	ND	460
bis(2-Ethylhexyl)phthalate		44,000	1,000	---	ND	ND	---	260	530	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
Benzo[b]fluoranthene		1,000	1,000	---	ND	310	---	ND	ND	ND	ND	---	240	ND	990	1400	ND	---	ND	ND	600
Benzo[k]fluoranthene		8,400	1,000	---	ND	ND	---	400	800	ND	ND	---	ND	ND	370	590	ND	---	ND	ND	320
Benzo[a]pyrene		1,000	1,000	---	ND	ND	---	ND	310	ND	ND	---	ND	ND	710	1100	ND	---	ND	ND	300
Indeno[1,2,3-cd]pyrene		1,000	1,000	---	ND	ND	---	270	330	ND	ND	---	ND	ND	510	850	ND	---	ND	ND	ND
Dibenzo[a,h]anthracene		1,000	1,000	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
Benzo[g,h,i]perylene		1,000,000	4,200	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	470	830	ND	---	ND	ND	ND
CHLORINATED PESTICIDES (ug/kg):																					
4,4-DDD		2,600	NE	---	ND	ND	---	ND	ND	ND	ND	---	ND	---	---	---	---	---	54	---	---
4,4-DDE		1,800	NE	---	ND	ND	---	ND	ND	ND	ND	---	330	---	---	---	---	---	550	---	---
4,4-DDT		1,800	NE	---	ND	ND	---	310	ND	ND	ND	---	140	---	---	---	---	---	240	---	---
4,4-Methoxychlor		340,000	NE	---	ND	ND	---	180	ND	ND	ND	---	ND	---	---	---	---	---	ND	---	---
POLYCHLORINATED BIPHENYLS (mg/kg):																					
		1	0.0005	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND
TOTAL PETROLEUM HYDROCARBONS (mg/kg):																					
		500	500	---	ND	110	---	74	440	210	130	---	ND	ND	150	130	ND	---	ND	71	47000
TOTAL METALS (mg/kg):																					
Antimony		27	--	ND	2.2	26	ND	ND	ND	46	17	ND	ND	ND	4.3	20	ND	---	ND	23	54
Arsenic		10	--	ND	3.1	26	1.1	20	56	59	23	ND	31	1	19	30	ND	---	38	19	6.1
Beryllium		2	--	ND	ND	ND	ND	85	1400	ND	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND
Cadmium		34	--	ND	4.4	ND	ND	2.9	ND	ND	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND
Chromium		2500	--	ND	ND	ND	---	ND	ND	140	61	---	---	---	---	---	---	---	3.4	---	---
Copper		1400	--	10	53	10000	8.3	ND	ND	1100	520	6	65	11	300	760	6.6	---	38	450	12000
Hexavalent Chromium		100	--	ND	---	---	---	---	---	ND	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	12
Lead		400	--	2.6	93	77	3.6	96	88	2100	1200	3.8	140	6.4	170	1800	6.5	---	140	780	3300
Nickel		1400	--	6.9	11	65	13	45	780	460	590	4	10	3.7	35	110	18	---	7.5	84	160
Selenium		340	--	ND	61	420	ND	120	880	6.7	6.5	ND	ND	ND	2.1	5.2	ND	---	ND	1.1	ND
Silver		340	--	ND	ND	ND	ND	26	31	ND	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND
Thallium		5.4	--	ND	ND	ND	ND	ND	140	ND	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND
Total Mercury		20	--	ND	ND	ND	ND	ND	ND	2.7	3.2	ND	0.92	ND	ND	0.95	ND	---	0.51	20	10
Zinc		20000	--	80	88	620	110	9.5	150	1300	680	8.5	77	9.9	190	2500	400	---	42	280	700
SPLP METALS (mg/l):																					
Antimony		---	0.006	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.027
Arsenic		---	0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Beryllium		---	0.004	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium		---	0.005	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium		---	0.05	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper		---	1.3	---	---	0.12	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lead		---	0.015	---	---	0.089	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.41
Mercury		---	0.002	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nickel		---	0.1	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Selenium		---	0.05	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Silver		---	0.036	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Thallium		---	0.005	---	---	ND	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc		---	5	---	---	0.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL CYANIDE (mg/kg):																					
		---	---	---	ND	ND	---	ND	ND	ND	ND	---	ND	ND	ND	ND	---	---	ND	ND	ND

See Notes on Page

TABLE I
SUMMARY OF ANALYTICAL DATA - SOIL
ROCHFORD FIELD
HAMDEN, CONNECTICUT

PARAMETER	Sample ID: Sample Location: Sample Date: Sample Depth (ft.bgs): Sample Type	Residential Direct Exposure Criteria	GA/GAA Pollutant Mobility Criteria	RF-HA118-S3 RF-HA118 23-Aug-02 5-7 MF	RF-HA118-S4A RF-HA118 23-Aug-02 7-8.9 MF	RF-HA119-S1 RF-HA119 23-Aug-02 4-6 IWF	RF-HA119-S2 RF-HA119 23-Aug-02 6-7.9 IWF	RF-HA119-S2A RF-HA119 (2) 23-Aug-02 6-7.9 IWF	RF-HA121-S1 RF-HA121 23-Aug-02 4-6 IWF	RF-HA121-S2 RF-HA121 23-Aug-02 6-8 MF	RF-HA121-S3 RF-HA121 23-Aug-02 8-10 AD	RF-HA123-MW-S1 RF-HA123-MW 23-Aug-02 0-1 EF	RF-HA123-MW-S1A RF-HA123-MW 23-Aug-02 1-1.5 EF	RF-HA123-MW-S2 RF-HA123-MW 23-Aug-02 2-3.8 IWF	RF-HA123-MW-S2A RF-HA123-MW 23-Aug-02 3.8-4 MF	RF-HA123-MW-S3 RF-HA123-MW 23-Aug-02 5-7 MF	RF-HA123-MW-S4 RF-HA123-MW 23-Aug-02 8.5-9 MF	RF-HA124-S1 RF-HA124 23-Aug-02 4-6 IWF	RF-HA124-S2 RF-HA124 23-Aug-02 6-7.9 IWF	
VOLATILE ORGANIC COMPOUNDS (ug/kg):																				
Ethylbenzene		500,000	10,100	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
m+p Xylenes		500,000	19,500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
o-Xylene		500,000	19,500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Isopropylbenzene		500,000	600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
n-Propylbenzene		500,000	1,400	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,3,5-Trimethylbenzene		500,000	700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
1,2,4-Trimethylbenzene		500,000	700	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
4-Isopropyltoluene		500,000	600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Naphthalene		1,000,000	5,600	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg):																				
n-Nitroso-dimethylamine		NE	NE	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
3+4 Methyl Phenol		340,000	1,000	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
1,2,4-Trichlorobenzene		680,000	1,400	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	300	ND
Naphthalene		1,000,000	5,600	ND	---	ND	660	ND	ND	ND	---	ND	ND	ND	ND	380	ND	ND	ND	ND
Acenaphthylene		1,000,000	8,400	ND	---	ND	ND	ND	ND	ND	---	ND	ND	310	ND	220	ND	ND	ND	ND
Acenaphthene		1,000,000	8,400	ND	---	ND	6200	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluorene		1,000,000	5,600	ND	---	ND	8600	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
n-Nitrosodiphenylamine		130,000	1,000	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
Phenanthrene		1,000,000	4,000	220	---	ND	93000	950	ND	210	---	ND	ND	1000	830	710	ND	ND	ND	ND
Anthracene		1,000,000	40,000	ND	---	ND	21000	ND	ND	ND	---	ND	ND	250	210	260	ND	ND	ND	ND
Carbazole		31,000	1,000	ND	---	ND	26000	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
Di-n-butylphthalate		1,000,000	14,000	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
Fluoranthene		1,000,000	5,600	380	---	ND	100000	900	ND	350	---	250	ND	1500	1900	1000	ND	ND	ND	ND
Pyrene		1,000,000	4,000	330	---	ND	77000	670	ND	420	---	220	ND	1300	1700	970	ND	ND	ND	ND
Butylbenzylphthalate		1,000,000	20,000	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo[a]anthracene		1,000	1,000	200	---	ND	35000	430	ND	ND	---	ND	ND	770	850	610	ND	ND	ND	ND
Chrysene		84,000	1,000	240	---	ND	31000	400	ND	260	---	ND	ND	950	900	820	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate		44,000	1,000	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo[b]fluoranthene		1,000	1,000	320	---	ND	62000	450	ND	320	---	ND	ND	1400	1000	830	ND	ND	ND	ND
Benzo[k]fluoranthene		8,400	1,000	ND	---	ND	20000	220	ND	ND	---	ND	ND	540	480	270	ND	ND	ND	ND
Benzo[a]pyrene		1,000	1,000	ND	---	ND	46000	410	ND	380	---	ND	ND	910	860	620	ND	ND	ND	ND
Indeno[1,2,3-cd]pyrene		1,000	1,000	ND	---	ND	13000	ND	ND	ND	---	ND	ND	560	770	770	ND	ND	ND	ND
Dibenz[a,h]anthracene		1,000	1,000	ND	---	ND	6000	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
Benzo[g,h,i]perylene		1,000,000	4,200	ND	---	ND	8700	ND	ND	ND	---	ND	ND	460	690	750	ND	ND	ND	ND
CHLORINATED PESTICIDES (ug/kg):																				
4,4-DDD		2,600	NE	---	---	---	---	---	---	---	---	ND	---	---	---	---	---	---	---	---
4,4-DDE		1,800	NE	---	---	---	---	---	---	---	---	460	---	---	---	---	---	---	---	---
4,4-DDT		1,800	NE	---	---	---	---	---	---	---	---	140	---	---	---	---	---	---	---	---
4,4-Methoxychlor		340,000	NE	---	---	---	---	---	---	---	---	ND	---	---	---	---	---	---	---	---
POLYCHLORINATED BIPHENYLS (mg/kg):																				
		1	0.0005	ND	---	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND
TOTAL PETROLEUM HYDROCARBONS (mg/kg):																				
		500	500	490	3,500	2600	2800	88	680	9500	ND	ND	ND	390	99	440	ND	ND	ND	ND
TOTAL METALS (mg/kg):																				
Antimony		27	--	6.9	16	140	4.6	ND	23	26	ND	ND	ND	9.7	6	24	ND	ND	ND	6
Arsenic		10	--	31	26	21	4.7	ND	42	8.4	ND	37	1.3	17	25	18	ND	ND	88	28
Beryllium		2	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.1	ND	ND	ND	ND	ND	ND
Cadmium		34	--	2.7	0.51	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Chromium		2500	--	---	40	---	---	---	---	---	8	---	---	---	---	---	---	---	---	---
Copper		1400	--	1700	2,800	2600	580	36	1400	9700	4.4	32	13	170	1100	7500	43	29	300	300
Hexavalent Chromium		100	--	8.8	---	8.4	ND	ND	16	16	---	ND	ND	ND	ND	17	ND	ND	ND	ND
Lead		400	--	560	1,400	1000	400	26	2100	1100	5.2	150	9.1	620	3100	1400	4.9	25	48	48
Nickel		1400	--	26	41	340	29	8.1	400	300	ND	6.3	3.9	98	48	38	24	19	41	41
Selenium		340	--	ND	ND	2	5.2	ND	5.3	2.8	ND	ND	ND	2.9	1.8	1.7	ND	2.7	3	3
Silver		340	--	ND	ND	ND	ND	ND	2.6	2.5	ND	ND	ND	ND	6.3	ND	ND	ND	ND	ND
Thallium		5.4	--	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Total Mercury		20	--	3.9	0.4	14	ND	ND	0.9	2.1	ND	0.24	ND	4.7	1.8	0.94	ND	ND	1.6	1.6
Zinc		20000	--	330	540	3800	4700	290	2400	2700	5.3	55	14	160	1300	700	150	480	220	220
SPLP METALS (mg/l):																				
Antimony		---	0.006	---	---	0.0095	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Arsenic		---	0.05	---	---	---	---	---	ND	---	---	---	---	---	---	---	---	---	ND	---
Beryllium		---	0.004	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Cadmium		---	0.005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Chromium		---	0.05	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Copper		---	1.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Lead		---	0.015	---	---	4.7	---	---	---	---	---	---	---	---	---	0.086	---	---	---	---
Mercury		---	0.002	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Nickel		---	0.1	---	---	---	---	---	0.28	---	---	---	---	---	---	---	---	---	---	---
Selenium		---	0.05	---	---	---	---	---	ND	---	---	---	---	---	---	---	---	---	---	---
Silver		---	0.036	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Thallium		---	0.005	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
Zinc		---	5	---	---	81	---	---	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL CYANIDE (mg/kg):																				
		---	---	ND	ND	ND	ND	ND	ND	ND	---	ND	ND	ND	ND	ND	ND	ND	ND	ND

See Notes on Page 5

TABLE I
 SUMMARY OF ANALYTICAL DATA - SOIL
 ROCHFORD FIELD
 HAMDEN, CONNECTICUT

NOTES:

1. This table includes only those compounds which were detected.
2. RSR criteria means Remedial Standard Regulation criteria established by the Connecticut Department of Environmental Protection (CTDEP)
3. ND means the compound was not detected above the normal minimum laboratory detection limit.
4. NE means no criteria established by CTDEP for listed compound.
5. NA means not applicable.
6. -- indicates analysis not conducted
7. ug/kg means micrograms per kilogram
8. mg/kg means milligrams per kilogram
9. mg/L means milligram per litre.
10. The RSR DEC for lead (400 mg/kg) is based on a proposed revision to the current criterion of 500 mg/kg.
11. Analytical results as reported above the GAPMC are presented in bold type. Values in a box exceed RDEC.
12. The 'Sample Type' strata was described by Haley & Aldrich, Inc. as the following:
 - EF:** Soil fill, including topsoil which typically does not contain man-made artifacts but at some locations may contain variable amounts of root matter, cobbles, boulders and construction/demolition debris such as concrete, asphalt and brick.
 - DRF:** Domestic Refuse Fill: Soil intermixed with products associated with household and/or on-site burning of paper/wood/coal (ash/cinders), intermixed with rusted metal cans and numerous whole bottles and broken glass, various broken ceramic items and
 - IWF:** Industrial Waste Fill: Black silt and sand sized particles of slag , with cinders and ash intermixed primarily with wood box fragments, sawdust and/or wood chips, batteries, Winchester-related products, shell casings and furnace bricks.
 - MF:** Earthen Fill and/or Domestic Refuse Fill mixed with variable amounts of Industrial Waste Fill
 - AD:** Alluvial Deposits: Organic rich deposits associated with former intermittent watercourse and wetlands.
 - GD:** Glaciodeltaic Deposits: Glacial meltwater deposits consisting primarily of sand and silt.

TABLE II
SUMMARY OF ANALYTICAL DATA - SOIL
MILL ROCK PARK
HAMDEN, CONNECTICUT

PARAMETER	Sample ID: Sample Location: Sample Date: Sample Depth(ft.bgs): Sample Type	Residential Direct Exposure Criteria	GA/GAA Pollutant Mobility Criteria	MRP-HA101-MW-S1 MRP-HA101-MW 9-Aug-02 0-2 EF	MRP-HA101-MW-S2 MRP-HA101-MW 9-Aug-02 2-4 DRF	MRP-HA101-MW-S3 MRP-HA101-MW 9-Aug-02 5-7 DRF	MRP-HA101-MW-S4A MRP-HA101-MW 9-Aug-02 7-8 DRF	MRP-HA101-MW-S4B MRP-HA101-MW 9-Aug-02 8-8.8 AD	MRP-HA102-S1 MRP-HA102 12-Aug-02 0-2 EF	MRP-HA102-S2 MRP-HA102 12-Aug-02 2-4 DRF
VOLATILE ORGANIC COMPOUNDS (ug/kg):				ND	ND	ND	ND	---	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg):										
Naphthalene	1000000	5600	ND	1000	290	ND	ND	780	ND	
Acenaphthylene	1000000	8400	330	450	1000	280	ND	310	ND	
Acenaphthene	1000000	8400	ND	1500	ND	ND	ND	ND	ND	
Fluorene	1000000	5600	ND	1600	300	ND	ND	ND	ND	
Phenanthrene	1000000	4000	1200	15000	4500	1400	ND	780	2600	
Anthracene	1000000	40000	340	3100	1300	350	ND	250	330	
Carbazole	31000	1000	230	4700	760	ND	---	ND	360	
Fluoranthene	1000000	5600	2300	17000	8400	3200	ND	2100	3100	
Pyrene	1000000	4000	2200	15000	7500	2900	ND	1800	3400	
Benzo[a]anthracene	1000	1000	1100	8100	3700	1300	ND	1100	1300	
Chrysene	84000	1000	1300	8800	3800	1300	ND	1200	1800	
bis(2-Ethylhexyl)phthalate	44000	1000	ND	ND	ND	ND	---	1400	ND	
Benzo[b]fluoranthene	1000	1000	1800	12000	5500	1800	ND	1800	1900	
Benzo[k]fluoranthene	8400	1000	740	4700	2300	810	ND	740	760	
Benzo[a]pyrene	1000	1000	1400	8500	4500	1500	ND	1400	1600	
Indeno[1,2,3-cd]pyrene	1000	1000	980	5400	3100	1000	ND	910	910	
Dibenz[a,h]anthracene	1000	1000	230	1400	690	ND	ND	210	220	
Benzo[g,h,i]perylene	1000000	4200	810	4200	2600	830	ND	730	780	
CHLORINATED PESTICIDES (ug/kg):										
4,4-DDE	1800	NE	ND	ND	ND	ND	---	ND	ND	
POLYCHLORINATED BIPHENYLS (ug/kg):	1	0.0005	ND	ND	ND	ND	---	ND	ND	
TOTAL PETROLEUM HYDROCARBONS (mg/kg):	500	500	120	330	ND	230	---	110	ND	
TOTAL METALS (mg/kg):										
Antimony	27	--	ND	2.7	ND	9.7	---	ND	4	
Arsenic	10	--	5	7.8	5.5	9.7	1.4	ND	11	
Beryllium	2	--	ND	ND	ND	ND	---	4.7	ND	
Cadmium	34	--	ND	ND	ND	ND	---	ND	ND	
Copper	2500	--	40	400	32	260	---	12	97	
Cyanide	1400	--	ND	ND	ND	ND	---	ND	ND	
Hexavalent Chromium	100	--	ND	ND	ND	ND	---	ND	ND	
Lead	400	--	130	390	29	870	23	580	910	
Nickel	1400	--	8	9.2	8.9	13	---	790	11	
Selenium	340	--	ND	ND	ND	3	---	1.5	ND	
Silver	340	--	ND	5.4	ND	ND	---	88	ND	
Thallium	5.4	--	ND	ND	ND	ND	---	ND	ND	
Mercury	20	--	0.53	0.22	ND	0.23	---	0.82	ND	
Zinc	20000	--	110	320	120	560	---	ND	570	
SPLP METALS (mg/l):										
Arsenic	--	0.05	---	---	---	---	---	---	---	
Lead	--	0.015	---	---	---	---	---	---	---	
TOTAL CYANIDE (mg/kg):	1400	NE	ND	ND	ND	ND	---	ND	ND	

See notes on page 5

TABLE II
SUMMARY OF ANALYTICAL DATA - SOIL
MILL ROCK PARK
HAMDEN, CONNECTICUT

PARAMETER	Sample ID: Sample Location: Sample Date: Sample Depth(ft.bgs): Sample Type	Residential Direct Exposure Criteria	GA/GAA Pollutant Mobility Criteria	MRP-HA102-S3 MRP-HA102 12-Aug-02 5-7 DRF	MRP-HA102-S4 MRP-HA102 12-Aug-02 7.5-9 GD	MRP-HA103-MW-S1 MRP-HA103-MW 12-Aug-02 0-2 EF	MRP-HA103-MW-S2 MRP-HA103-MW 12-Aug-02 2-4 DRF	MRP-HA103-MW-S3 MRP-HA103-MW 12-Aug-02 5-6.5 DRF	MRP-HA103-MW-S4 MRP-HA103-MW 9-Aug-02 7-9 AD	MRP-HA104-S1 MRP-HA104 12-Aug-02 0.5-2 DRF
VOLATILE ORGANIC COMPOUNDS (ug/kg):				ND	---	ND	ND	ND	---	ND
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg):										
Naphthalene		1000000	5600	ND	ND	ND	ND	ND	---	ND
Acenaphthylene		1000000	8400	360	ND	ND	ND	ND	---	260
Acenaphthene		1000000	8400	ND	ND	ND	ND	ND	---	ND
Fluorene		1000000	5600	ND	ND	ND	ND	ND	---	ND
Phenanthrene		1000000	4000	1000	ND	380	480	ND	---	1000
Anthracene		1000000	40000	370	ND	200	ND	ND	---	310
Carbazole		31000	1000	ND	---	ND	ND	ND	---	ND
Fluoranthene		1000000	5600	2800	ND	880	1000	210	---	2200
Pyrene		1000000	4000	2600	ND	830	950	220	---	1900
Benzo[a]anthracene		1000	1000	1400	ND	470	460	ND	---	1100
Chrysene		84000	1000	1600	ND	550	550	ND	---	1200
bis(2-Ethylhexyl)phthalate		44000	1000	ND	---	ND	ND	ND	---	ND
Benzo[b]fluoranthene		1000	1000	2400	ND	960	840	220	---	1600
Benzo[k]fluoranthene		8400	1000	950	ND	360	390	ND	---	690
Benzo[a]pyrene		1000	1000	1800	ND	720	650	ND	---	1200
Indeno[1,2,3-cd]pyrene		1000	1000	1200	ND	640	470	ND	---	790
Dibenz[a,h]anthracene		1000	1000	260	ND	ND	ND	ND	---	ND
Benzo[g,h,i]perylene		1000000	4200	930	ND	550	410	ND	---	640
CHLORINATED PESTICIDES (ug/kg):										
4,4-DDE		1800	NE	ND	---	73	ND	ND	---	ND
POLYCHLORINATED BIPHENYLS (ug/kg):		1	0.0005	ND	---	ND	ND	ND	---	ND
TOTAL PETROLEUM HYDROCARBONS (mg/kg):		500	500	210	---	ND	ND	ND	---	110
TOTAL METALS (mg/kg):										
Antimony		27	--	2	---	ND	ND	10	---	ND
Arsenic		10	--	6.8	ND	7.5	12	20	ND	1.3
Beryllium		2	--	ND	---	ND	ND	ND	---	ND
Cadmium		34	--	ND	---	ND	ND	ND	---	ND
Copper		2500	--	40	---	22	8.8	96	---	17
Cyanide		1400	--	ND	---	ND	ND	ND	---	ND
Hexavalent Chromium		100	--	ND	---	ND	ND	ND	---	ND
Lead		400	--	340	3.9	33	21	580	6	29
Nickel		1400	--	13	---	10	3.4	23	---	4.9
Selenium		340	--	ND	---	ND	ND	5.1	---	ND
Silver		340	--	ND	---	ND	ND	2.3	---	ND
Thallium		5.4	--	ND	---	ND	ND	ND	---	ND
Mercury		20	--	0.44	---	ND	0.31	0.26	---	ND
Zinc		20000	--	450	---	43	120	2500	---	49
SPLP METALS (mg/l):										
Arsenic		--	0.05	---	---	---	---	ND	---	---
Lead		--	0.015	---	---	---	---	ND	---	---
TOTAL CYANIDE (mg/kg):		1400	NE	ND	---	ND	ND	ND	---	ND

See notes on page 5

TABLE II
SUMMARY OF ANALYTICAL DATA - SOIL
MILL ROCK PARK
HAMDEN, CONNECTICUT

PARAMETER	Sample ID: Sample Location: Sample Date: Sample Depth(ft.bgs): Sample Type	Residential Direct Exposure Criteria	GA/GAA Pollutant Mobility Criteria	MRP-HA104-S2 MRP-HA104 12-Aug-02 2-4 DRF	MRP-HA104-S3 MRP-HA104 12-Aug-02 5-6.5 DRF	MRP-HA104-S4 MRP-HA104 12-Aug-02 7-9 AD	MRP-HA105-S1 MRP-HA105 12-Aug-02 1-2 DRF	MRP-HA105-S2 MRP-HA105 12-Aug-02 2-4 DRF	MRP-HA105-S3 MRP-HA105 12-Aug-02 5-7 DRF	MRP-HA105-S4 MRP-HA105 12-Aug-02 7-9 AD
VOLATILE ORGANIC COMPOUNDS (ug/kg):				ND	ND	---	ND	ND	ND	---
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg):										
Naphthalene	1000000	5600	510	210	ND	ND	270	ND	ND	---
Acenaphthylene	1000000	8400	1900	360	ND	ND	530	920	ND	---
Acenaphthene	1000000	8400	730	ND	ND	ND	ND	ND	ND	---
Fluorene	1000000	5600	1700	ND	ND	ND	270	ND	ND	---
Phenanthrene	1000000	4000	9500	570	ND	ND	660	5300	ND	---
Anthracene	1000000	40000	3200	320	ND	ND	400	980	ND	---
Carbazole	31000	1000	490	ND	---	ND	740	ND	ND	---
Fluoranthene	1000000	5600	9300	1600	ND	2000	9500	250	---	---
Pyrene	1000000	4000	14000	1800	ND	2300	8400	220	---	---
Benzo[a]anthracene	1000	1000	5700	890	ND	1300	4300	ND	---	---
Chrysene	84000	1000	6300	1100	ND	1600	4500	ND	---	---
bis(2-Ethylhexyl)phthalate	44000	1000	ND	ND	---	ND	ND	ND	---	---
Benzo[b]fluoranthene	1000	1000	6800	1700	ND	2400	8200	ND	---	---
Benzo[k]fluoranthene	8400	1000	2700	720	ND	980	3300	ND	---	---
Benzo[a]pyrene	1000	1000	6500	1400	ND	1800	6200	ND	---	---
Indeno[1,2,3-cd]pyrene	1000	1000	2800	850	ND	1100	3800	ND	---	---
Dibenz[a,h]anthracene	1000	1000	640	ND	ND	270	1100	ND	---	---
Benzo[g,h,i]perylene	1000000	4200	2400	720	ND	990	3300	ND	---	---
CHLORINATED PESTICIDES (ug/kg):										
4,4-DDE	1800	NE	ND	ND	---	ND	ND	ND	---	---
POLYCHLORINATED BIPHENYLS (ug/kg):	1	0.0005	ND	ND	---	ND	ND	ND	---	---
TOTAL PETROLEUM HYDROCARBONS (mg/kg):	500	500	260	ND	---	390	690	ND	---	---
TOTAL METALS (mg/kg):										
Antimony	27	--	4.9	ND	---	5.8	7.4	2.6	---	---
Arsenic	10	--	13	ND	---	7.3	17	7.7	1.1	---
Beryllium	2	--	ND	ND	---	ND	ND	ND	---	---
Cadmium	34	--	ND	ND	---	ND	ND	26	---	---
Copper	2500	--	110	5.4	---	61	140	85	---	---
Cyanide	1400	--	ND	ND	---	ND	ND	ND	---	---
Hexavalent Chromium	100	--	ND	ND	---	ND	ND	ND	---	---
Lead	400	--	650	7.5	---	140	1300	160	6.7	---
Nickel	1400	--	11	2.1	---	7.8	30	7.5	---	---
Selenium	340	--	1.9	ND	---	4.9	8.9	2.3	---	---
Silver	340	--	ND	ND	---	ND	ND	ND	---	---
Thallium	5.4	--	ND	ND	---	ND	ND	ND	---	---
Mercury	20	--	ND	ND	---	0.33	1	ND	---	---
Zinc	20000	--	510	6.8	---	310	580	2000	---	---
SPLP METALS (mg/l):										
Arsenic	--	0.05	---	---	---	---	ND	---	---	---
Lead	--	0.015	---	---	---	---	ND	---	---	---
TOTAL CYANIDE (mg/kg):	1400	NE	ND	ND	---	ND	ND	ND	---	---

See notes on page 5

TABLE II
SUMMARY OF ANALYTICAL DATA - SOIL
MILL ROCK PARK
HAMDEN, CONNECTICUT

PARAMETER	Sample ID: Sample Location: Sample Date: Sample Depth(ft.bgs): Sample Type	Residential Direct Exposure Criteria	GA/GAA Pollutant Mobility Criteria	MRP-HA106-S1 MRP-HA106 12-Aug-02 0-2 DRF	MRP-HA106-S2 MRP-HA106 12-Aug-02 2-4 DRF	MRP-HA106-S3 MRP-HA106 12-Aug-02 5-6.5 DRF	MRP-HA107-MW-S1 MRP-HA107-MW 9-Aug-02 0-2 EF	MRP-HA107-MW-S2 MRP-HA107-MW 9-Aug-02 2-4 EF
VOLATILE ORGANIC COMPOUNDS (ug/kg):				ND	ND	ND	ND	ND
SEMI-VOLATILE ORGANIC COMPOUNDS (ug/kg):								
Naphthalene	1000000	5600	ND	ND	ND	ND	ND	ND
Acenaphthylene	1000000	8400	ND	670	ND	ND	ND	ND
Acenaphthene	1000000	8400	ND	ND	ND	ND	ND	ND
Fluorene	1000000	5600	ND	270	ND	ND	ND	ND
Phenanthrene	1000000	4000	1100	4000	ND	ND	ND	ND
Anthracene	1000000	40000	240	820	ND	ND	ND	ND
Carbazole	31000	1000	ND	430	ND	ND	ND	ND
Fluoranthene	1000000	5600	1600	6100	ND	ND	ND	ND
Pyrene	1000000	4000	1400	5000	ND	ND	ND	ND
Benzo[a]anthracene	1000	1000	710	2600	ND	ND	ND	ND
Chrysene	84000	1000	780	2700	ND	ND	ND	ND
bis(2-Ethylhexyl)phthalate	44000	1000	ND	ND	ND	ND	ND	ND
Benzo[b]fluoranthene	1000	1000	1300	4500	ND	ND	ND	ND
Benzo[k]fluoranthene	8400	1000	570	2100	ND	ND	ND	ND
Benzo[a]pyrene	1000	1000	1000	3500	ND	ND	ND	ND
Indeno[1,2,3-cd]pyrene	1000	1000	650	2100	ND	ND	ND	ND
Dibenz[a,h]anthracene	1000	1000	ND	620	ND	ND	ND	ND
Benzo[g,h,i]perylene	1000000	4200	570	1700	ND	ND	ND	ND
CHLORINATED PESTICIDES (ug/kg):								
4,4-DDE	1800	NE	ND	ND	ND	ND	ND	ND
POLYCHLORINATED BIPHENYLS (ug/kg):	1	0.0005	ND	ND	ND	ND	ND	ND
TOTAL PETROLEUM HYDROCARBONS (mg/kg):	500	500	350	2300	240	ND	ND	ND
TOTAL METALS (mg/kg):								
Antimony	27	--	ND	6.4	ND	ND	ND	ND
Arsenic	10	--	3.4	7.3	3.1	ND	ND	ND
Beryllium	2	--	ND	ND	ND	ND	ND	ND
Cadmium	34	--	ND	ND	ND	ND	ND	ND
Copper	2500	--	29	210	29	14	4.6	
Cyanide	1400	--	ND	ND	ND	ND	ND	ND
Hexavalent Chromium	100	--	ND	ND	40	ND	ND	ND
Lead	400	--	120	620	100	6.9	9.8	
Nickel	1400	--	6	13	7.3	3.3	2.2	
Selenium	340	--	ND	1.6	ND	ND	ND	ND
Silver	340	--	ND	ND	ND	ND	ND	ND
Thallium	5.4	--	ND	ND	ND	ND	ND	ND
Mercury	20	--	0.98	0.45	0.21	ND	ND	ND
Zinc	20000	--	99	1300	91	11	7.9	
SPLP METALS (mg/l):								
Arsenic	--	0.05	---	---	---	---	---	---
Lead	--	0.015	---	---	---	---	---	---
TOTAL CYANIDE (mg/kg):	1400	NE	ND	ND	ND	ND	ND	ND

See notes on page 5

TABLE II
SUMMARY OF ANALYTICAL DATA - SOIL
MILL ROCK PARK
HAMDEN, CONNECTICUT

NOTES:

1. This table includes only those compounds which were detected.
2. RSR criteria means Remedial Standard Regulation criteria established by the Connecticut Department of Environmental Protection (CTDEP)
3. ND means the compound was not detected above the normal minimum laboratory detection limit.
4. NE means no criteria established by CTDEP for listed compound.
5. NA means not applicable.
6. -- indicates analysis not conducted
7. ug/kg means micrograms per kilogram
8. mg/kg means milligrams per kilogram
9. mg/L means milligram per litre.
10. Analytical results as reported above the GAPMC are presented in bold type. Values in a box exceed RDEC.
11. The RSR DEC for lead (400 mg/kg) is based on a proposed revision to the current 500 mg/kg DEC for lead.
12. The above 'Sample Type' was described by Haley & Aldrich, Inc. as the following:

EF: Earthen Fill: Soil fill, including topsoil which typically does not contain man-made artifacts but at some locations may contain variable amounts of root matter, cobbles, boulders and construction/demolition debris such as concrete, asphalt and brick

DRF: Domestic Refuse Fill: Soil intermixed with products associated with household and/or on-site burning of paper/wood/coal (ash/cinders), intermixed with rusted metal cans and numerous whole bottles and broken glass, various broken ceramic items

MF: Miscellaneous Fill: Earthen Fill and/or Domestic Refuse Fill mixed with variable amounts of Industrial Waste Fill

IWF: Industrial Waste Fill: Black silt and sand sized particles of slag , with cinders and ash intermixed primarily with wood box fragments, sawdust and/or wood chips, batteries, Winchester-related products, shell casings and furnace bricks.

AD: Alluvial Deposits: Organic rich deposits associated with former intermittent watercourse and wetlands.

GD: Glaciodeltaic Deposits: Glacial meltwater deposits consisting primarily of sand and silt.

TABLE III
SUMMARY OF ANALYTICAL DATA - GROUNDWATER
ROCHFORD FIELD
HAMDEN, CONNECTICUT

PARAMETER	Sample ID:	GA/GAA	Surface Water	Residential	RF-HAB108-MW	RF-HAB110-MW	RF-HAB115-MW	RF-HAB123-MW
	Sample Date:	Groundwater Protection Criteria	Protection Criteria	Volatilization Criteria	26-Aug-02	26-Aug-02	27-Aug-02	28-Aug-02
Volatile Organic Compounds (ug/L):								
Naphthalene		280	NE	NE	32	ND	ND	ND
Semi-Volatile Organic Compounds (ug/L):								
Acenaphthene		420	NE	NE	9.3	ND	ND	ND
Acenaphthylene		420	0.3	NE	0.5	ND	ND	ND
Anthracene		2,000	1,100,000	NE	1.8	ND	ND	ND
Carbazole		10	NE	NE	8	ND	ND	ND
Fluoranthene		280	3,700	NE	2.3	ND	ND	ND
Fluorene		280	140,000	NE	12	ND	ND	ND
Naphthalene		280	NE	NE	20	ND	ND	ND
Phenanthrene		200	0.077	NE	8.2	ND	ND	ND
Pyrene		200	110,000	NE	1.4	ND	ND	ND
Chlorinated Pesticides (ug/l):								
		---	---	---	ND	ND	ND	ND
Polychlorinated Biphenyls (ug/L):								
		0.5	0.5	NE	ND	ND	ND	ND
Total Petroleum Hydrocarbons (mg/L):								
		0.1	NE	NE	0.29	0.14	ND	ND
Total Metals (mg/L):								
Nickel		0.1	0.88	NE	ND	0.19	ND	0.086
Zinc		5	0.123	NE	0.07	2.4	0.026	0.75
Total Cyanide (mg/L):								
		NE	NE	NE	ND	ND	ND	ND

NOTES:

1. This table includes only those compounds detected.
2. RSR criteria means Remedial Standard Regulation criteria established by the Connecticut Department of Environmental Protection (CTDEP)
3. NE means numeric RSR criteria not established by CTDEP.
4. ND means that the compound was not detected above laboratory detection limit.
5. ug/L means micrograms per liter.
6. mg/L means milligrams per liter.

TABLE IV
SUMMARY OF ANALYTICAL DATA - GROUNDWATER
MILL ROCK PARK
HAMDEN, CONNECTICUT

PARAMETERS	Sample ID:	GA/GAA	Surface	Residential	MRP-HAB101-MW	MRP-HAB103-MW	MRP-HAB107-MW
	Sample Date:	Protection	Water	Volatilization	27-Aug-02	27-Aug-02	27-Aug-02
		Criteria	Criteria	Criteria			
Volatile Organic Compounds (ug/L):		---	---	---	ND	ND	ND
Semi-Volatile Organic Compounds (ug/L):		---	---	---	ND	ND	ND
Chlorinated Pesticides (ug/l):		---	---	---	ND	ND	ND
Polychlorinated Biphenyls (ug/L):		0.5	0.5	NE	ND	ND	ND
Total Petroleum Hydrocarbons (mg/L):		0.1	NE	NE	ND	ND	ND
Total Metals (mg/L):		---	---	---	ND	ND	ND
Total Cyanide (mg/L):		NE	NE	NE	ND	ND	ND

NOTES:

1. This table includes only those compounds detected.
2. RSR criteria means Remedial Standard Regulation criteria established by the Connecticut Department of Environmental Protection (CTDEP)
3. NE means numeric RSR criteria not established by CTDEP.
4. ND means that the compound was not detected above laboratory detection limit.
5. ug/L means micrograms per liter.
6. mg/L means milligrams per liter.

**27892-411 PHASE II AND III ENVIRONMENTAL INVESTIGATIONS
ROCHFORD FIELD AND MILL ROCK PARK**

FIGURES

- Figure 1 - Site Locus
- Figure 2 - Exploration Location Plan
- Figure 3 - Subsurface Profiles A-A and B-B
- Figure 4 - Contour Map of Unconsolidated Material Covering Fill (Depth to Fill)
- Figure 5 - Contour Map of Fill Thickness at Site
- Figure 6 - Soil Quality Results for Extractable Petroleum Hydrocarbon (ETPH)
- Figure 7 - Soil Quality Results for Volatile Organic Compounds (VOCs)
- Figure 8 - Soil Quality Results for Semi-volatile Organic Compounds (SVOCs)
- Figure 9 - Soil Quality Results for Pesticides
- Figure 10 - Soil Quality Results for Lead
- Figure 11 - Soil Quality Results for Arsenic
- Figure 12 - Water Quality Results for VOCs, SVOCs, Pesticides, PCBs, Cyanide and Metals

These figures are provided as separate PDF files from main document.

APPENDIX A

**Investigation Work Plan for Rochford Field and Mill Rock Park
8 August 2002**

APPENDIX B

Results of Laboratory Analysis of Soil Samples

APPENDIX C

Results of Laboratory Analysis of Groundwater Samples

APPENDIX D

**Test Boring Logs, Monitoring Well Installation Reports,
and Test Pit Logs for Rochford Field**

APPENDIX E

**Test Boring Reports, Monitoring Well Installation Reports
and Test Pit for Mill Rock Park**

APPENDIX F

Groundwater Monitoring Reports

APPENDIX G

**Potentiometric Surface for September 12, 2002,
Former New Haven Water Company Properties, Hamden, Connecticut
Prepared by Leggette, Brashears & Graham, Inc.**

APPENDIX H

Photographs