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REMEDIAL INVESTIGATION REPORT
AND REMEDIAL ACTION PLAN
UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Prepared For:

Unisys Corporation

September 2008

Deleted: August 2007

Prepared By:

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LETTER OF TRANSMITTAL

Date: September 30, 2008 **Job No.:**

Attention: Mr. Martin Beskind

RE: Draft, RI/RAP - Former Remington Rand Site
Middletown, Connecticut

TO: Connecticut Department of Environmental Protection
Remediation Division
Bureau of Water Protection and Land Reuse
79 Elm Street
Hartford, CT 06106

WE ARE SENDING YOU ■ Attached ☐ Under separate cover via ________________ the following items.

☐ Shop drawings ☐ Prints ☐ Plans ☐ Samples ☐ Specifications

☐ Copy of letter ☐ Change order ☐ ________________

Copies	Date	No.	Description
1	9/30/08		Revised Text, Tables, Figures, Plates and Appendix XII

ƎSE ARE TRANSMITTED as checked below:

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REMARKS Please find attached for your review and approval the above-referenced revisions to the Draft, Remedial Investigation Report and Remedial Action Plan for the Former Remington Rand Site, located at 180 Johnson Street in Middletown, CT. Please contact myself or Marty Howe of Unisys Corporation with any questions you may have.

COPY TO: M. Howe

SIGNED: John Zbell

DOCUMENT CERTIFICATION

I have personally examined and am familiar with the information submitted in this document and all attachments, and certify that based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief and I understand that any false statement made in this document or its attachments may be punishable as a criminal offense.

Martin R. Howe | 9-29-08

Unisys Corporation
Mr. Martin R. Howe
Manger Regional Site Services ES&H

Date

Robert F. Good Jr. | 9/30/08

Leggette, Brashears & Graham, Inc.
Mr. Robert F. Good, Jr.
Principal

Date

**REMEDIAL INVESTIGATION REPORT
AND REMEDIAL ACTION PLAN
UNISYS CORPORATION
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MIDDLETOWN, CONNECTICUT**

1.0 INTRODUCTION

This Remedial Investigation Report and Remedial Action Plan (RI/RAP) documents the environmental site investigations completed by Leggette, Brashears & Graham, Inc. (LBG) on behalf of Unisys Corporation (Unisys) at the former Remington Rand site located at 180 Johnson Street in Middletown, Connecticut. A series of phased investigations were undertaken between October 2002 and July 2007 under Consent Order No. SRD-135 (Order) between the State of Connecticut Department of Environmental Protection (CTDEP) and Unisys. Although Unisys never occupied the site, Unisys predecessor companies owned or occupied the site and conducted various industrial operations at the site from 1909 to 1971.

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The investigations conducted by LBG on behalf of Unisys built upon previous environmental investigations conducted at the site by others on behalf of the City of Middletown. A scope of work for each LBG phase of investigation was reviewed and approved by CTDEP.

This RI/RAP presents an overview of site historical activities, including previous environmental investigations conducted by others, followed by a description of the LBG investigations and results to provide a comprehensive assessment of environmental conditions at the site. This RI/RAP is organized as follows:

Section 2 provides site background information, such as a description of the site and its development over time, and a chronology of site ownership, occupants and industrial/commercial activities.

Section 3 describes the regulatory framework that pertains to this RI/RAP, including applicable details from the Consent Order, ground water and surface-water classifications and regulatory standards applicable to the site.

Section 4 provides an overview of the previous Phase I, Phase II and Phase III investigations conducted by others and a Remedial Action Plan prepared for the City of Middletown in response to those findings. This section also includes a summary of the previous investigation findings and remedial cost estimates.

of the Main Building. These two structures are flanked by two interior courtyards. A loading dock is present on the east side of the structure at the northern corner of Building No. 1B.

Other structures at the site include two sets of large, concrete tank cradles near the southern corner of the property, adjacent to an abandoned onsite railroad spur. A review of historical information for the site indicates that the tank cradles once supported two large propane tanks (circa 1940's). Four stanchion-mounted transformers are located throughout the property, including one of the previously referenced courtyards (Figure 2). Another stanchion with no transformer is also present.

Aside from the buildings and structures, the site is primarily covered by paved driveways and parking areas, areas of undeveloped land and comparatively limited areas of lawn between several of the buildings. Chain-link fences are present along the majority of the perimeter of the property with the exception of the areas northeast of the Quonset Building and Boiler Building. The site topography is generally flat, with the exception of abrupt slopes along the eastern and southern property lines that transition between the developed portion of the property and bordering woodland and wetland areas. Numerous catch basins are located in the lawn areas adjacent to the buildings and within the paved driveways. A right-of-way for Northeast Utilities overhead power lines crosses the eastern corner of the property. It is not known if there are other rights-of-way or easements across the property.

The site is reportedly provided with City water, natural gas, telephone and electrical utilities. A Phase I Environmental Site Assessment indicated that the site was provided with sanitary sewers and may also utilize onsite disposal systems. The use of onsite disposal systems was evaluated during dye-tracer tests completed by LBG in August 2005. The dye tests indicated that portions of the facility's sewage disposal system drain to the backwaters of the Mattabesset River. In June 2007, the City undertook the installation of a sanitary sewer line and upgrades to the existing water supply system.

The building was formerly heated by two large steam furnaces (boilers) located in the Boiler Building at the eastern end of the property. The boilers were reportedly first fired by coal, but later by fuel oil as evidenced by a large *aboveground storage tank* (AST) located proximate to the boiler room. Another AST is located adjacent to the southeast corner of the boiler room, and based on its contents (No. 2/No.4 fuel oil), as reported by a contractor for the City, was associated with a building heating system. Three *underground storage tanks* (USTs) are known to exist at the property, while historical Sanborn maps have depicted several other USTs at various locations throughout the property. The historical use of these USTs, whether for heating, vehicle fueling or other purposes, is unknown. Currently, the northwestern section of the building is reportedly heated by natural gas, while several other smaller areas of the building may utilize alternate sources, including electric heat or wood burning. The majority of the building, according to the current property manager, remains unheated.

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2.2 Site History

For the purposes of this section, the historical site ownership, building history and facility operations information were compiled from a Phase I ESA, completed by Soil Science and Environmental Services, Inc. (SSESI), historical maps and aerial photographs. Table 1 presents a chronological listing of the site ownership and development history, Table 2 presents a history of the site buildings and their reported use, and Figure 3 presents a graphical depiction of the historical building construction and expansion. Historical Sanborn maps and aerial photographs are presented in Appendix I.

U.S. Geological Society (USGS) topographical mapping shows that, prior to 1897, the site was comprised of undeveloped wetlands and wooded areas (Figure 4). Initial site development began in 1897 when the Main Building (Building No. 1) was erected for the Keating Wheel and Automobile Company (Keating). Based on a review of topographic maps, it appears that during the occupation of the site by Keating (1897 to 1900), fill material was placed in the southeastern and eastern portions of the site and additional construction was completed, including the expansion of Building No. 1 to include Building Nos. 2 through 5, and the addition of Building Nos. 6 and 7 (the boiler room). The historical uses of these buildings are described in detail on Table 2. Keating reportedly manufactured motorized bicycles and, later, automobiles at the subject site.

The Eisenhuth Horseless Vehicle Company (Eisenhuth), a manufacturer of automobiles, owned the property from 1900 to approximately 1909. In addition to the presence of Building Nos. 1 through 7, two Sanborn maps completed during the occupation of the site by Eisenhuth (1901 and 1907) depict an oil house located southeast of the Main Building (only 1901 map), a storage house located northwest of Building No. 2 and a "cleaning castings" building located adjacent to the northern corner of Building No. 5. The existing railroad spur is shown to enter the southern corner of the property and to terminate at the southeast corner of the boiler room.

In 1909 the site was purchased by the Noiseless Typewriter Company (Noiseless). Noiseless manufactured typewriters and typewriter parts. In the mid-1920s the name of the business at the subject site was changed to Remington Noiseless Typewriter Corporation, and in the latter 1920s, the name changed to Remington Rand, Incorporated. Sanborn maps completed during the occupation of the site by the above companies (1913 and 1924) depict the original seven buildings, the cleaning castings building (converted to storage by 1913) and several new features including two storage sheds, a 260-gallon gasoline UST northwest of Building No. 1 (only 1913), and a crude oil tank, several transformers and a switch room located northeast of Building No. 4. The storage house, located northwest of Building No. 2 in 1907, was no longer present, according to the 1913 Sanborn map. Further additions to the Main Building were constructed in the 1920s and 1930s, including Building Nos. 8, 9, 10 and 11. A review of historical information indicates that, sometime in the 1940s, Andover Kent Aviation was utilizing the site to manufacture metal goods and munitions in support of U.S. efforts in World War II.

A 1950 Sanborn map shows the addition of Building No. 12, Building No. 15, the Quonset Building, an oil reclaiming building north of Building No. 8, a sawdust house southwest of Building No. 6, a structure located southeast of Building No. 15 (referred to by the City as the Former Waste Storage Building (FWSB)), and a gasoline tank northeast of Building No. 8. Absent from the 1950 Sanborn are the former castings-cleaning building/shed, and the crude-oil tank, several transformers and a switch room located northeast of Building No. 4, which are assumed to have been removed. In about 1951, Remington Rand Office Machines began using the subject site to manufacture office supplies including plaster plates, typewriter ribbon, carbon paper, 'Uniac' ribbon and microfilm. Remington Rand's operations continued until 1970-1971, when operations at the property ceased.

Forest City Realty Company (Forest City) purchased the site in 1970-1971 and leased space to E.I.S. Automotive Company for storage. Space in Building No. 9 was also leased to the Schwartz family to house their car collection.

In 1978, Parker Hannifin Corporation (parent company of E.I.S. Brake Parts) purchased the property from Forest City. A history of Parker Hannifin's operations at the subject site is not documented. Sanborn coverage for 1979 indicates that, by this time, the railroad spur was shortened to its present length. Parker Hannifin's occupation at the site continued until May 1984 when the property was sold to Anthony J. Sessa.

Mr. Sessa sold the site to Ronald R. Johnson in September 1984. In 1987, Mr. Johnson leased space to Depot Distributors of New England, a wholesale manufacturer of kitchen cabinets and in 1988 leased space to Newtown Manufacturing & Building Supply Corporation, a manufacturer of windows. In December 1990, Depot Distributors purchased the property and, in March 1993, filed for bankruptcy. At the time of the SSESI investigation, the property was occupied by Stone Container Corporation (first floor of main building - storage of corrugated box containers); All American Moving and Storage, Inc. (Building No. 9 - office space and storage of furniture); Ronald E. Foose Company (Building No. 6 - painting and wall paper contractor); and David A. Lenz Landscape Service (Quonset Building).

The City of Middletown acquired the property in 2000 and continues to own the property, as of the writing of this report. During the City's ownership, tenants have included: a tradeshow company (Building Nos. 1A, B and C); several landscapers (Building Nos. 4, 11B and C, and the Quonset Building); a direct mail company (Building No. 2 and 2nd floor of Building No. 1); a manufacturer of outdoor lawn furniture (Building Nos. 3, 9A, 9B, 9C, 12, portions of Building No. 1B and the northern half of Building No 8); a hardwood flooring installer (Building No. 5 and 15); an electrical contractor (Building No. 11D); and a heating, ventilation and air conditioning service company (Building No. 11A). Several buildings have also been leased to various individuals for the storage of appliances, miscellaneous house wares and vehicles. Auto-body work has been observed being conducted in Building Nos. 10 and 15, the rear portion of Building No. 5 and the Boiler Building.

3.0 REGULATORY FRAMEWORK

3.1 Consent Order

Consent Order No. SRD-135, between the CTDEP and Unisys was issued on March 11, 2002. The order required Unisys to, among other things, retain a qualified consultant, prepare and implement an environmental investigation of its previous operations, prepare an investigation report and a remedial action plan, prepare a ground water monitoring plan, implement approved remedial actions, and report progress to the CTDEP. A copy of the Order is included in Appendix II.

It should be noted that the requirements for Unisys to investigate and remediate the site, as detailed in the Order (paragraph B2.a.), are limited to those conditions that arise from activities conducted by Remington Rand Corporation at the site.

The Order alleges that solid wastes were disposed of at the site in quantities in excess of 10 *cubic yards* (CY), thereby constituting a Solid Waste Disposal Area.

3.2 Ground Water Classification

Ground water throughout the State of Connecticut is classified by various criteria pertaining to its known or presumed quality, uses and to the environmental and anthropomorphic setting under which it lays. The ground water classification, in part, affects the remediation criteria applied to the site. The site is located in an area where the CTDEP has classified the ground water as 'GB'. The 'GB' water-quality classification is assigned to areas of historically, highly urbanized activity and areas of industrial activity where public water is available. Because of the possibility of spills, leaks, discharges and land-use impacts, owing to the areas' history of commercial and industrial use, it is presumed by the State that ground water in GB areas may not be suitable for human consumption without treatment.

Designated uses of GB waters include industrial processes and non-contact cooling, and as base flow for hydraulically connected surface-water bodies. There are no known existing uses of ground water on or in the immediate area of the site.

Historical figures prepared by Vanasse Hangen Brustlin, Inc. (VHB), the environmental consultant for the City of Middletown, depict a structure labeled "artesian well", located just off the northern corner of Building No. 8. The construction and potential uses of this structure have not been confirmed.

The GB classification in the area of the site extends to the south (upgradient of the site) to encompass the center of Middletown, to the west to the Coginchaug River (and beyond in some areas), to the east to the Connecticut River, and to the north to the Mattabessett River.

3.3 Surface-Water Classification

The site is located within the Connecticut River major drainage basin and the Mattabesset River regional drainage basin. The western portion of the site is located within the Coginchaug River subbasin of the Mattabessett River regional drainage basin.

The site is bordered to the north by the Mattabessett River and wetland areas associated with the Mattabessett River and to the west by the Coginchaug River and wetlands associated with the Coginchaug River (Figure 1). The confluence of the Mattabessett and the Coginchaug rivers is located approximately 1,800 feet to the northwest of the site. The Mattabessett River discharges to the Connecticut River approximately 1,200 feet northeast of the site.

The Coginchaug River in the area of the site is designated by the CTDEP as a Class 'B' surface-water body. The 'B' classification presumes some level of degradation (designated below 'AA' and 'A'), but is still adequate to provide habitat to fish and other aquatic life and wildlife, and is suitable for recreation, navigation, and industrial and agricultural water supply. There are specific aesthetic, chemical and biological criteria that apply to class 'B' waters.

The Mattabessett and Connecticut rivers are both designated by the CTDEP Class C/B or D/B surface-water bodies. These designations indicate that one or more criteria or designated uses that apply to Class B waters are not being met (currently 'C' or 'D' quality), but the goal is to meet the Class B requirements.

3.4 Applicable Remediation Standards

The applicable regulatory standards for soil and ground water remediation are contained in Connecticut's Remediation Standard Regulations (RSR), as promulgated under Section-22a-133k-1 through 22a-133k-3 of the Regulations of Connecticut State Agencies (RCSA). The standards for soil remediation are based upon ground water classification and land use. The standards for ground water remediation are based upon land use, ground water classification and a potential for impacts to surface water.

Given that the site is located in an area of GB ground water classification and the water table is above the bedrock, the applicable clean-up standards for soil at the site include the GB Pollutant Mobility Criteria (GB PMC) and the Residential and Industrial/Commercial Direct Exposure Criteria (RDEC and I/C DEC).

Applicable criteria for ground water remediation at the site are the residential and industrial/commercial Ground Water Volatilization Criteria (RGWVC and I/CGWVC), the Surface Water Protection Criteria (SWPC), Chronic Aquatic Life Criteria (CALC) published by the CTDEP in their Water Quality Standards (WQS) or other published screening/benchmark values acceptable to CTDEP. The CALC or alternative benchmark may be the appropriate clean-up criteria, given that the ground water likely discharges directly to the wetlands located to the northeast and east of the site. The residential and industrial/commercial Soil Vapor Volatilization Criteria (SVVC) can be used as an alternative to the GWVC below a building. In addition, ground water in a GB area must be remediated to an extent that its quality does not interfere with existing uses. The Ground Water Protection Criteria (GWPC) do not apply to this site, given its location in a GB area.

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3.4.1 Soil Remediation Standards

3.4.1.1 Pollutant Mobility Criteria

The GB PMC apply to soil above the seasonal high water table and are intended to prevent the degradation of ground water quality as a result of compounds leaching from overlying soil. The GB PMC, in general, do not apply to soils meeting the regulatory definition of 'widespread polluted fill' (under Section 133k-2(f) of the RSRs, with CTDEP approval), or under certain circumstances, fill that is polluted only with coal ash, wood ash, coal fragments and/or asphalt paving fragments (under Section 133k-2(c)(4)(C) of the RSRs).

Compliance with the GB PMC is determined using mass analysis for most organic compounds and by Toxicity Characteristic Leaching Procedure (TCLP) or Synthetic Precipitation Leaching Procedure (SPLP) leaching tests for metals, cyanides and *polychlorinated biphenyls* (PCBs). As an alternative, compliance with the GB PMC can be demonstrated (for analytes other than total petroleum hydrocarbons) by comparing the results of leaching tests to 10 times the GWPC. The regulations also include provisions for calculation of site-specific dilution and site-specific dilution-attenuation factors to demonstrate compliance, as long as certain provisions are met.

Compliance with the GB PMC is demonstrated when, prior to remediation by excavation, analyte concentrations of no single sample exceed the GB PMC or, given a minimum of 20 samples, when the 95% upper confidence limit (95% UCL) of all samples from a release area does not exceed the GB PMC and the result of no single sample exceeds twice the GB PMC. Following remediation by excavation, the analyte concentrations of all samples must be below the GB PMC.

The GB PMC do not apply to environmentally isolated soil. 'Environmentally isolated' is defined in Section 22a-133k-1(a)(15) of the RSRs as soil below a building or other permanent structure that is not acting as a continuing source of pollution and is not polluted by volatile organic substances (unless the concentrations of volatile organic substances have been reduced to the maximum extent prudent). The exemption from the GB PMC requires that an *environmental land use restriction* (ELUR) is in place to prevent the soil being exposed to infiltration due to removal of the overlying building or structure.

3.4.1.2 Direct Exposure Criteria

The DEC apply to all soil within 15 feet of grade at a release area, and are intended to prevent human contact with unacceptable levels of contaminants in soil. The Industrial/Commercial DEC (I/C DEC) can be used in lieu of the Residential DEC (RDEC) when access to the parcel is limited to workers and temporary visitors and an ELUR is in place to prohibit residential activities (note that there are additional restrictions for use of the I/C DEC for PCBs).

Compliance with the DEC is based upon the results of mass analysis of samples. Compliance is demonstrated when the results of all samples from a release area do not exceed the criteria or the 95% UCL of all samples from a release area does not exceed the DEC and the analyte concentrations of no single sample exceed twice the DEC.

The DEC do not apply to 'inaccessible soil', which is defined in Section 22a-133k-1(a)(28) of the RSR as soil more than four feet below grade, more than two feet below a qualifying paved surface or below a building or permanent structure. Under those circumstances, soil can be rendered inaccessible with the institution of an ELUR that will ensure that the soils will not be exposed.

3.4.2 Ground Water Remediation Standards

3.4.2.1 Volatilization Criteria

The GWVC apply to ground water impacted by volatile organic substances within 15 vertical feet of the ground surface or a building. As an alternative, remediation of ground water below a building is not required if the concentrations of *volatile organic compounds* (VOCs) in soil vapor are less than the SVVC. The I/C GWVC and SVVC can be used if an ELUR is in place that will prohibit residential activities on the site.

The GWVC do not apply if measures acceptable to the CTDEP are put in place to prevent migration of vapors into an overlying building, a monitoring and maintenance plan is implemented, and the required notification is provided to the CTDEP. The GWVC also do not apply if no building exists over the area of impacted ground water and if best efforts have been made to ensure that any affected property owners have recorded an ELUR to prevent building construction, or if the CTDEP agrees that no building can reasonably be expected to be built over the area, or that natural attenuation or other remediation will reduce the concentrations to below the applicable criteria within five years.

Compliance with the GWVC and SVVC are demonstrated when analyte concentrations within samples collected to document conditions within these environments do not exceed their respective cleanup criteria or the 95% UCL of all samples does not exceed the criteria for four consecutive quarters and no single result exceeds two times the criteria.

Note that the GWVC and SVVC referenced in this report are the criteria proposed by CTDEP in March 2003. Although the proposed criteria are not officially incorporated into the RSRs, the CTDEP has directed environmental professionals to utilize these criteria as they are considered protective of human health and the environment. Some of these proposed criteria are lower than those in the RSRs, and some are higher.

3.4.2.2 Surface Water Protection Criteria

The SWPC apply to ground water that discharges to a surface water body. Compliance with the SWPC is demonstrated when the average constituent concentration does not exceed the SWPC, based upon mass analysis of samples that are representative of the impacted ground water. If the areal extent of impacted ground water is not increasing over time, compliance can be demonstrated by meeting the SWPC at the point of ground water discharge to surface water.

An exception to the SWPC is when impacted ground water discharges to an intermittent stream or wetland or when the area of impacted ground water occupies more than 0.5% of the

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upstream drainage basin, the concentrations within the area of impacted ground water must not exceed the aquatic life criteria published by CTDEP in their WQS document.

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Based on the available hydrogeologic data for the site, it appears that ground water may discharge directly to the wetlands located along the eastern and northeastern property boundaries. Therefore, the ground-water quality results have also been compared to the CALC contained in Appendix D of the CTDEP WQS. In cases where CALC have not been established for a particular analyte, primarily VOCs and *semi-volatile organic compound* (SVOCs), the ground water quality results have been compared to CTDEP-approved screening/benchmark values (referred to herein as *alternative aquatic life criteria* (AALC)). The AALC have been compiled from numerous sources obtained from and/or approved by Ms. Traci Iott of the CTDEP Planning & Standards Division, Bureau of Water Protection and Land Reuse. The sources include the U.S. Environmental Protection Agency (EPA) Great Lakes Initiative Toxicity Data Clearinghouse website, the EPA Region 5, Resource Conservation and Recovery Act (RCRA) Ecological Screening Levels (ESLs), EPA-published criteria for *methyl tertiary-butyl ether* (MTBE), recently derived CTDEP Tier II Chronic Aquatic Life Criteria (currently unpublished), and the U.S. Department of Energy (DOE) Tier II Secondary Chronic Values. Although the CTDEP Tier II Criteria have not been published, the CTDEP has directed that they be utilized in this report as they are considered protective of human health and the environment. It should be noted that these values may be subject to change and that the final, promulgated values shall be used for comparison.

3.4.2.3 Existing Use of Ground Water

RCSA Section 22a-133k-3(a)(3) specifics that ground water quality in GB areas must not interfere with existing ground water uses. Although there is a well onsite, it is not known to be in use. Public water is supplied to the property. There are no other known existing uses of ground water on or in the vicinity of the site. The areas directly downgradient of the site to the north and east are undeveloped parcels owned by the City of Middletown.

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4.0 PREVIOUS ENVIRONMENTAL INVESTIGATIONS

The following section provides a brief discussion of previous environmental investigations completed at the site. Because of the voluminous nature of these documents, they are not included with this submission. Copies of the individual reports have previously been provided to the CTDEP and should be available upon request.

4.1 1993 Phase I ESA

An April 3, 1993 report titled "*Phase I Environmental Site Assessment*" was prepared by SSESI for the City of Middletown as part of the Middletown North End Industrial Area Redevelopment Project. The report documents the site setting and history, the results of an environmental database search, a local and state file search, historical site ownership and occupancy, historical map review, and a site inspection.

The *environmental site assessment* (ESA) identified a history of manufacturing operations at the site dating back to 1897. Historical onsite activities included manufacturing of bicycles, motorized bicycles, automobiles, typewriters, ink, munitions, office supplies, and window assemblies; plating, painting, woodworking, metal machining/grinding/hardening and storage of many different items. Associated features observed at the site included aboveground and underground petroleum storage tanks, a fill/dump area located northeast of the boiler room building and electrical transformers.

The Phase I investigation did not list individual areas of environmental concern at the site, but implied that areas of historical site manufacturing activities, a fill/dump area, areas of stained soil and stressed vegetation, floor drains, improperly stored chemicals, and several building-interior issues were potential areas of concern. With respect to nearby, offsite activities, the presence of the Middletown Municipal Landfill to the north of the site was also noted as a concern. SSESI recommended that a Phase II investigation be conducted to determine the nature and extent of possible environmental impacts at the site.

4.2 VHB Phase II and Phase III Investigations

A June 1997 report titled "*Phase II Environmental Site Assessment, Former Remington Rand Facility, 180 Johnson Street, Middletown, Connecticut*" was prepared by VHB to document Phase II investigations conducted for the City of Middletown through the City's Economic Development Committee. The purpose of the Phase II investigation was to determine the potential for environmental impacts related to areas identified in the Phase I ESA. The investigative activities included the completion of a series of test pits and soil borings in the following areas:

- the right-of-way disposal area;
- suspect UST-1 area
- suspect UST-2 area;
- UST-4 area;
- suspect UST-5 area;
- electrical transformers (4) and former transformer (1)
- AST-1 and -2 area;
- the railroad spur waste disposal area; and
- two areas of surficial stained soil.

The investigation also included the installation and sampling of ground water monitoring wells within and downgradient of these areas. The VHB exploration locations are shown on Plate 1.

The report documented the Phase II investigative activities, outlined areas of soil and ground water impacts where concentrations of COCs were found to exceed applicable soil and ground water criteria and identified regulated building materials that require management. The Phase II report also presented a preliminary cost for remediation of $1.4 million, and stated that this figure could be reduced by the institution of an ELUR prohibiting residential use of the site.

As a follow-up to recommendations presented in the Phase II investigation report and prior to the initiation of the Phase III investigation, VHB supervised the installation and sampling of ground water monitoring wells along the western and southwestern property lines to determine if there were offsite sources or contributions to the *chlorinated VOCs* (CVOCs) detected in onsite ground water. The CVOCs detected in the site ground water were alleged in that investigation to be attributed to an onsite source possibly located beneath the Main Building.

VHB performed a follow-up, Phase III investigation that was documented in a January 1999 report titled "*Environmental Site Assessment and Consulting Services, Former Remington-Rand Facility, Middletown, Connecticut*". The purposes of the Phase III investigation were to determine the nature and extent of soil and ground water impacts identified during the Phase II investigation and provide more accurate estimates of remediation costs. The investigative activities included the completion of a series of test pits, soil borings and the installation and sampling of ground water monitoring wells. The report documented the Phase III investigative activities, outlined the extents of soil and ground water impacts that were found to exceed applicable CTDEP criteria and provided revised remediation cost estimates.

The VHB Phase II and Phase III investigations focused on 15 *areas of environmental investigation* (AEI) (designated by LBG as AEI Nos. 1 through 15 on Table 3 and Plate 1). The VHB investigation results are summarized below by AEI. The findings and interpretations for each AEI are presented in greater detail in Section 6.0 of this report.

4.2.1 AEI No. 1: Right-of-Way (ROW) Disposal Area

A filled area was identified in the eastern portion of the site. Exploration indicated the presence of fill material consisting of ash, metal, glass, brick and slag. Petroleum odors, solvent odors and petroleum staining were observed at some locations within the fill material. The investigations detected *total petroleum hydrocarbons* (TPH) and lead at concentrations above the GB PMC, RDEC and I/C DEC and copper and arsenic at concentrations above the RDEC and/or I/C DEC. Zinc was detected in the ground water within this area at concentrations above the SWPC, but the report also indicated that zinc was detected in upgradient wells, and thus may not result from the fill.

Three remedial options are presented in Section 8 for this area including excavation and offsite disposal, an engineered control, and application for a Solid Waste Permit followed by regulated landfill closure under applicable CTDEP regulations, or some combination thereof.

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4.2.2 AEI No. 2: Suspect UST-1

UST-1 area was reported by SSESI to be located northwest of Building No. 1, presumably at the location of a 260-gallon gasoline tank that was noted on a 1913 Sanborn map of the property (Appendix I). Three test pits were excavated and one boring was drilled during the Phase II investigation. No UST was identified in two of the test pits. The third test pit was terminated after encountering a previously unidentified two-inch diameter pipe. The single soil sample collected from test boring B-13 contained a very low concentration of TPH. As no UST or evidence of a release was discovered, no further investigation was recommended or conducted.

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4.2.3 AEI No. 3: Suspect UST-2 and Switching Station

The VHB Phase II investigation did not identify an UST in this area, although a two-inch diameter steel pipe was identified 2 *feet below grade* (ft bg) in a test pit completed in the suspect area for UST-2. Petroleum impacts to soil (gasoline odors) were noted during the investigation. Additional test pits and borings completed in this area during the Phase III investigation confirmed the presence of TPH in the soil at concentrations above the RDEC, I/C DEC and GB PMC. TPH was detected in ground water, but petroleum-related VOCs were not detected in nearby monitoring well B-7/MW-2.

With regard to the former transformer switching station, the VHB Phase III report indicates that "*PCBs were not detected in any of the surficial test pit samples*".

The proposed remedial action proposed by VHB for the UST-2 release area was excavation and offsite disposal/recycling combined with installation of an ELUR prohibiting residential use to reduce the volume of soil requiring treatment.

4.2.4 AEI No. 4: Suspect UST-3

The VHB Phase II investigation of UST-3 included excavation of three test pits. An UST was not identified in the test pits. "Tar" odors and solidified tar were noted in one test pit. A sample of metal- and slag-containing fill contained several metals at concentrations that exceeded the RDEC, I/C DEC and GB PMC. A deeper soil sample contained TPH at a concentration above the RDEC and some *polynuclear aromatic hydrocarbons* (PAHs), a subset of the SVOC list at concentrations above the RDEC, I/C DEC and GB PMC.

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No remedial actions were recommended by VHB.

4.2.5 AEI No. 5: UST-4

A 500-gallon, single-walled steel UST was identified by VHB in an exploratory test pit near an apparent fill pipe during their Phase II investigation. The UST, according to VHB, was full of water that was free of petroleum odors or visual evidence of petroleum impact. Petroleum impacts (gasoline and solvent odors) were identified in soil and ground water near UST-4. Soil samples from this area contained TPH and *aromatic volatile organic compounds* (AVOCs). Additional soil borings completed in this area during the Phase III investigation confirmed the presence of TPH in soil at concentrations above the RDEC, I/C DEC and GB PMC, as well as the presence of CVOCs in some soil samples.

CVOCs were identified in the ground water in this area at concentrations above the RGWVC and I/C GWVC. CVOCs would not typically be associated with petroleum heating or motor fuels, but are associated with metal degreasers and cleaners. Consequently, VHB concluded that the findings likely represented two separate releases. VHB conducted additional investigations to identify a solvent source area (presented below in the discussion of AEI No. 13). Zinc was also identified in the ground water within this area at concentrations above the SWPC, but was attributed to a potential offsite source due to its occurrence in upgradient monitoring wells.

The remediation options presented in Section 8 for this area included soil excavation with offsite disposal/recycling and/or onsite treatment.

4.2.6 AEI No. 6: Transformers

The VHB Phase II Investigation included collection of one composite soil sample from beneath each of the five pole-mounted transformers. The composite soil samples collected from beneath Transformer 2 and Transformer 4 contained PCBs at concentrations above the RDEC. The transformers were owned by Northeast Utilities and, therefore, were determined to be the responsibility of the utility.

4.2.7 AEI No. 7: AST-1

AST-1 was inspected and found to contain residual petroleum and/or petroleum sludge. Surficial soil samples collected near AST-1 did not exhibit petroleum impacts. A sample was not collected for analysis. No remedial action was proposed by VHB for AST-1.

4.2.8 AEI No. 8: AST-2

AST-2 was inspected by VHB and found to contain remedial petroleum and/or petroleum sludge. The VHB Phase II investigation identified visible evidence of petroleum-impacted soil beneath AST-2. Soil borings completed in this area during VHB's Phase III investigation identified TPH in the soil at 8 to 12 ft bg at concentrations above the RDEC, I/C DEC and GB PMC. Due to the depth of the TPH impacts, the source was attributed to subsurface piping or a nearby abandoned UST (see discussion of UST-7 below), not direct releases from the AST. Arsenic was also identified in soil at concentrations above the RDEC and I/C DEC. The arsenic was attributed to the fill material that underlies this area of the site. None of the applicable remediation criteria for ground water were exceeded downgradient of the AST 2 area.

The remedial actions proposed by VHB for this area included soil excavation and offsite disposal/recycling.

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4.2.9 AEI No. 9: Surficial Stained Area 1

Surficial soil samples collected during VHB's Phase II investigation contained arsenic and several SVOCs at concentrations above the CTDEP remediation standards. Additional soil borings and a test pit completed in the vicinity of Surficial Stained Area 1 during VHB's Phase III investigation confirmed the presence of TPH, some SVOCs and arsenic in soils at concentrations above the RDEC. The concentrations of some SVOCs and arsenic also exceeded the I/C DEC. No ground water impacts were attributed to this release area.

Surficial soil impacts covered an area of about 1,500 square feet with a maximum depth of 2 ft bg. The impacts were attributed to storage of railroad ties and historical spillage from oil-filled equipment or other sources. Remediation proposed by VHB for this area included soil excavation and offsite disposal/recycling.

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4.2.10 AEI No. 10: Surficial Stained Area 2

Surficial soil samples collected during VHB's Phase II investigation contained arsenic and several SVOCs at concentrations above the applicable CTDEP remediation standards. An additional shallow soil boring completed during VHB's Phase III investigation did not confirm the presence of arsenic and SVOCs in the soils at concentrations above the applicable remediation standards. No ground water impacts were attributed to this release area.

The area of surficial soil impacts in Surficial Stained Area 2 covered an area of approximately 250 square feet with a maximum depth of 2 ft bg. Remediation proposed by VHB for this area included soil excavation and offsite disposal/recycling.

4.2.11 AEI No. 11: Railroad Spur Disposal Area

An area of fill material was identified in the southeastern portion of the site during the VHB Phase II investigation. Additional soil borings and a test pit completed in the vicinity of this area during VHB's Phase III investigation characterized the fill material as consisting of slag, brick, reinforcing bar, ceramics, metal, asphalt, pieces of tar, typewriter pieces, and grinding wheels. Samples of fill and soil from this area contained TPH, SVOCs, lead and zinc at concentrations above the RDEC, I/C DEC and GB PMC. Fill and soil samples also contained arsenic at concentrations above the RDEC and I/C DEC and copper at concentrations above the RDEC. Copper and zinc were identified in the ground water in this area at concentrations above the SWPC.

The remedial actions proposed by VHB for this area included soil excavation and offsite disposal, an engineered control, or application for a Solid Waste Permit with landfill closure under applicable CTDEP regulations.

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4.2.12 AEI No. 12: Suspect UST-5

The VHB Phase II investigation of Suspect UST-5 identified visual evidence of petroleum impacts and TPH in shallow soils at concentrations above the applicable CTDEP remediation standards. A magnetometer survey north of Building No. 2 did not locate evidence of a buried UST. Additional soil borings completed during VHB's Phase III investigation confirmed the presence of TPH in the soil at concentrations above the RDEC, I/C DEC and GB PMC. Ground water samples from this area contained zinc at concentrations above the SWPC and vinyl chloride at concentrations above the RGWVC and I/C GWVC. The zinc and vinyl chloride occurrences were not attributed to this area.

Two remedial options were proposed by VHB for this area: soil excavation with offsite disposal/recycling or in-situ treatment.

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4.2.13 AEI No. 13: Solvent Release Area

During the VHB Phase II ground water investigation associated with UST-4 (AEI No. 5, above), *trichloroethylene* (TCE), *1,1-dichloroethylene* (1,1-DCE), vinyl chloride and zinc were detected in the ground water at concentrations above the applicable CTDEP remediation standards. The concentration of several CVOCs in ground water exceeded the RGWVC and I/C GWVC. Additional soil borings completed inside Building Nos. 8 and 12 identified low concentrations of VOCs in soil beneath floor drains centrally located within the building. The source for the VOC impacts was thought to be related to releases from the above-referenced floor drains directly to ground water.

No remedial options were proposed by VHB for this area.

4.2.14 AEI No. 14: UST-6

A previously undocumented UST was identified by VHB in the vicinity of UST-4 (AEI No. 5, above). The UST was reported by VHB to be 550 to 1,000 gallons in capacity and was believed to contain a mixture of waste oil and water. Soil from below the water table near the UST contained TPH at concentrations above the RDEC, I/C DEC and GB PMC.

Removal of the UST was proposed by VHB as the remedial option for this area.

4.2.15 AEI No. 15: UST-7

A previously undocumented UST of unknown capacity, reportedly filled with cement, was identified by VHB outside the southwestern corner of the Boiler Room. Soil from below the water table near the UST contained TPH at concentrations above the RDEC. Removal of the UST was proposed by VHB as the remedial option for this area.

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4.3 VHB Remedial Action Plan

The VHB Phase III report presented remedial cost estimates for the individual release areas. The total preliminary cost estimate for remediation was placed between $760,000 and $1,550,000, assuming no ground water remediation at the site. Subsequently, VHB, on behalf of the Middletown Development Office, prepared a Remedial Action Plan (RAP) for the site, dated October 2000. The RAP summarized the site history and the results of previous investigations, and reported the results of post-Phase III ground water monitoring in the area of UST-4.

The RAP identified three 'operable units' that exceed applicable standards, including:

- The solid waste disposal areas, including the Right-of-Way Disposal Area (AEI No. 1) and the Railroad Spur Disposal Area (AEI No. 11);
- Soils impacted with petroleum and inorganic constituents, including UST release areas (AEI Nos. 3, 12, 14 and 15), AST release area (AEI No. 8) and stained surface soil (AEI Nos. 9 and 10); and

- Site ground water (not specific to a designated AEI).

Several possible remediation technologies were screened by VHB for effectiveness, implementability and cost, to determine a list of technically practical alternatives. The alternatives for the disposal areas included excavation and offsite disposal/recycling (three alternative approaches to this), and capping the materials in place. Cost estimates were provided for the alternative approaches that ranged from $250,000 to $1,000,000, based upon an estimated volume for soil excavation and disposal of 1,900 cubic yards. The recommended remedial alternative was consolidation and capping with excavation and offsite disposal of lead-impacted soil only.

The remediation alternatives proposed by VHB for the UST areas and surficial stained areas included excavation and either offsite disposal (landfill), offsite thermal treatment, onsite biological treatment or offsite asphalt batch treatment. Preliminary remediation cost estimates ranged from $300,000 to $1,300,000, based upon an estimated volume for soil excavation and disposal of 7,105 CY. Excavation and onsite bioremediation was the preferred remediation approach recommended by VHB.

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Remedial alternatives for ground water were not included in the RAP, as investigation was ongoing at the time. It was anticipated by VHB, however, that ground water remediation would not be required.

5.0 UNISYS FIELD INVESTIGATION ACTIVITIES

5.1 Introduction

Unisys requirements under the Consent Order were to define the existing and potential extent of soil, surface-water and ground water impacts potentially resulting from Unisys predecessor operations at the site. It should be noted however that many areas of the site were also subject to operations by others both prior to and following Unisys predecessor operations. The *scopes of work* (SOWs) for each phase of LBG investigation between October 2002 and July 2007 were designed in close consultation with CTDEP and implemented subsequent to CTDEP approval. These investigations focus primarily on addressing data gaps following previous VHB investigations (Phase II and III) and LBG investigations. A list of the LBG scope of work

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documents submitted and associated data deliverables provided to CTDEP is presented as Table 4.

The initial SOW for LBG's investigation (approved August 18, 2002) was derived from a previously approved SOW, prepared by VHB, and meetings and written correspondence between Unisys, LBG, VHB and the CTDEP. The SOW focused primarily on the investigation of potential release areas not previously investigated and further characterization of the nature and extent of specific release areas identified during previous investigations. The data developed during the initial LBG investigation were presented in a comprehensive report entitled "*Data Report, Former Remington Rand Facility, Middletown, Connecticut*", dated October 2003.

The initial LBG investigation identified several new potential release areas and additional data gaps requiring a more thorough investigation prior to the formulation of a comprehensive RI/RAP. These additional data gaps were addressed through a series of investigations completed between February 2004 and July 2007, with associated SOWs prepared by LBG and reviewed and approved by the CTDEP. Each SOW included a phased investigative approach to allow for focused investigation in a particular potential release area, while allowing for modifications to the sampling plans as dictated by the previous data (viz., a "dynamic" work plan). Following the completion of each phase of investigation, the data were compiled by LBG, submitted for internal Unisys review and a data package was presented to the CTDEP. Subsequent to a review of the data with the CTDEP, modifications were made to the scope and the next phase of investigation was completed. Each area was addressed by additional investigation until such time that the CTDEP and Unisys had agreed that sufficient investigation had been completed in support of an RI/RAP.

5.2 Areas of LBG Investigation

The following section details those specific areas covered by the LBG investigations, and presents a brief discussion of the rational for the investigations and the investigative methods. These investigations targeted select AEIs; some that were identified by the VHB Phase II/III investigations and others that were identified during the LBG investigations. All references in this section to "investigation" refer to work completed by LBG, unless otherwise specified.

The location of each AEI is shown on Plate 2. The LBG investigations did not include building-related constituents, such as asbestos, lead-based paint, interior dust, mercury- or

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PCB-containing fixtures or containerized wastes, which are not subjects of Unisys Consent Order with CTDEP.

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5.2.1 AEI No. 11: Railroad Spur Disposal Area

This fill-placement area was identified in the southeastern area of the site during the VHB Phase II investigation. Environmental concerns with respect to the fill material are the possible presence of total and leachable metals. PAHs and/or petroleum hydrocarbons were also detected in some areas of the fill material.

LBG completed soil and ground water sampling to determine the nature and extent of lead, arsenic, cadmium, copper, nickel and zinc in soil and ground water at concentrations above the applicable remediation standards.

5.2.2 AEI No. 13: Solvent Release Area

LBG completed *ground-penetrating radar* (GPR) surveys, visual reconnaissance and soil, soil-vapor and ground water sampling within, upgradient and downgradient of Building Nos. 8, 12 and 1C to determine the potential source for TCE and associated daughter products initially identified in ground water downgradient of Building No. 8. The investigation also provided information on the extent of TCE in ground water.

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5.2.3 AEI No. 16: Loading Dock Area/Building No. 1A

LBG completed GPR surveys, visual reconnaissance and soil, soil-vapor and ground water sampling within this area to attempt to locate a potential source for odors initially identified by the CTDEP within a catch basin at the southwestern end of the loading dock driveway. These odors were later attributed to TCE-impacted ground water intercepted by the basin.

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5.2.4 AEI No. 17: Boiler Room

LBG completed GPR surveys, visual reconnaissance of, and soil and ground water sampling in, the Boiler Room area to evaluate a potential for releases of fuel oil from the structure.

5.2.5 AEI No. 18: Potential Former Septic Field

The possible presence of a former septic system was mentioned in the Phase I investigation report, but its existence and location were not confirmed. A historical site map included a vague reference to a possible in-ground septic system located north of Building No. 6 and east of the Quonset Building. COCs evaluated included primarily liquid wastes that could have been produced by historical operations, such as petroleum hydrocarbons, metals in plating or cleaning wastes, and solvents.

LBG completed GPR surveys, test pits and visual reconnaissance in an attempt to confirm the location of and potential impacts from the former septic system.

5.2.6 AEI No. 19: Former Waste Storage Building

This structure was referred to by CTDEP as a former waste storage building based on the findings of the SSESI Phase I ESA that identified several unmarked containers of grease, oil and other chemicals within the structure.

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LBG completed GPR surveys, visual reconnaissance and soil and ground water sampling within the area of this structure to determine potential impacts related to the storage and/or handling of hazardous materials or petroleum products within and around this building.

5.2.7 AEI No. 20: Floor Drains

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Floor drains are speculated to have been collection points for liquids spilled on the building floors, floor wash waters, et cetera. Environmental impacts to soil were suspect via potential leakage from the drain piping and/or the drain sumps, collectively drainage systems.

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During Phase II, floor drains and inlet structures in Buildings 2, 5, 7, 9, 10, 11A,11B, 11C, 11D, 12, and the Quonset building were inspected. Limited sampling was performed.

LBG completed GPR surveys, visual reconnaissance and soil and ground water sampling to determine the potential for both interior and exterior drainage structures to impact downgradient soil and ground water quality.

5.2.8 AEI No. 21: Building No. 5

LBG completed GPR surveys, visual reconnaissance and soil, soil-vapor and ground water sampling within Building No. 5 to determine a potential source for TCE-impacted ground water identified downgradient of the building.

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5.2.9 Other Areas of Investigation

Although not targeted specifically, data developed by the LBG investigations were also used to further characterize AEIs previously investigated by VHB including the ROW Disposal Area (AEI No. 1), AST 2 (AEI No. 8) and Surficial Stained Soil Area 1 (AEI No. 9).

To facilitate site utility work, LBG, at the request of the CTDEP, completed a soil and ground water investigation in the area of Suspect UST-5 (AEI No. 12). The UST-5 investigation data were provided to the CTDEP and the City of Middletown and used to evaluate the possible extent of petroleum-impacted soil and ground water that could potentially be encountered during the then-proposed water-line improvements.

Also, at the request of the CTDEP, LBG completed a dye-tracer test and sampling program to evaluate potential outfalls associated with an onsite sanitary disposal system. Dye-tracer and sampling results were provided to the CTDEP Bureau of Water Management.

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5.3 Investigation Activities

Standard methodologies utilized for these investigations are described in the sections presented below. Tables 5A and 5B summarize the analytical results for soil and ground water samples collected for laboratory analyses and those analyses requested from all phases of investigation.

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5.3.1 Subsurface Geophysical Surveys

Geophysical surveys were completed by Sub-Surface Informational Surveys, Inc. (Sub-Surface) and included GPR, beacon tracing, induction and signal-broadcast methods. GPR surveys were conducted to identify potential pathways for the migration of COCs to the subsurface from floor drains and other surface features, and to locate potential anomalies that could be interpreted as USTs or other sub-surface structures. Buried pipes were located using beacon tracing, induction and signal-broadcast methods. Copies of both Sub-Surface reports, with discussion of methodologies and results, are provided in Appendix III.

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5.3.2 Test Pits

On March 4, 2004, three test pits (LBGTP-1, LBGTP-2 and LBGTP-3) were excavated in the area of the Potential Former Septic Field (AEI No. 18) by AES Remedial Contracting, LLC using a rubber-tired backhoe. An LBG hydrogeologist supervised the excavation activities and conducted environmental monitoring. Monitoring activities included field screening excavated soils for ionizable VOCs using a *photoionization detector* (PID). Materials in the test pits were inspected and logged by an LBG hydrogeologist.

The test pits were excavated to depths between 6 and 7.5 ft bg, corresponding to the depth the water table was encountered. Using the bucket of the excavator, soil-quality samples were collected from the bottom of the test pits, then removed and placed in laboratory-supplied glassware. The samples collected from test pits LBGTP-1 and LBGTP-2 were submitted for laboratory analysis for VOCs, PAHs, Connecticut *extractable total petroleum hydrocarbons* (ETPH), and total RCRA metals (referred to herein as 'RCRA 8 metals'). A sample was not collected from the third test pit (LBGTP-3) due to the similarity of the materials encountered to those encountered in LBGTP-1.

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The majority of the soils removed from the test pits were used to backfill the completed excavations and the areas were backfilled to match the surrounding grade. Approximately 3 CY of material exhibiting PID readings greater than 10 *parts per million* (ppm) were removed from test pit LBGTP-2, stockpiled on and under plastic, characterized by laboratory analysis and disposed of offsite.

Copies of the geologic logs from the LBG test pits are presented in Appendix IV.

5.3.3 Sampling of Identified Surface Drainage and Dye-Tracer Study

On July 11, 2005, LBG personnel collected fluid samples at five drainage locations for laboratory analysis for VOCs, PAHs, and the 13 Priority Pollutant Metals (13 PPM). The drainage locations included manhole-accessible piping and ground-level, open-pipe outfalls.

Following the drainage sampling, LBG personnel conducted a dye-tracer test to identify sanitary discharge pathways. Prior to initiating the dye tests, LBG made a visual inspection of the first floor of the main site buildings to determine the locations of active lavatories. Non-toxic dye tablets were introduced into functioning toilets and sinks located throughout the facility.

LBG personnel then made regular observations at six drainage outfalls and in three manways, located throughout the eastern portion of the property, for a period of approximately one hour.

A summary of the field testing procedures, dye tracer and laboratory analytical results was presented to the CTDEP in a November 30, 2005 LBG letter report titled, "*Sampling of Identified Surface Drainage and Dye-Tracer Test*".

5.3.4 Soil Borings

Soil borings were drilled using a direct-push method (e.g., Geoprobe®) or the *hollow-stem auger* (HSA) drilling method. Samples from some locations were collected using a pre-cleaned stainless steel hand auger. All soil borings, unless otherwise noted, were terminated in the top of the clay layer that is continuous beneath the site.

The majority of soil samples were collected using a direct-push method. For each discrete sample depth, a clean Macro Core sampler was fitted with a new acetate liner, and the sampler was driven to the desired depth using hammering and/or hydraulic-push techniques. Following retrieval of the sampler, the acetate liner was removed and opened. The contents were screened with a PID, samples were collected for laboratory analysis as necessary, then a geological description of the sample was recorded. Prior to reuse, the Macro Core sampler was washed with Alconox and water and rinsed with deionized water.

A clean stainless-steel split-spoon sampler was used to collect soil samples from continuous intervals in advance of the hollow-stem augers. The sampler was retrieved and opened, the contents were screened with a PID, laboratory samples were collected as necessary, then a geological description of the sample was recorded. The sampler was washed with Alconox and water and rinsed with deionized water.

Unless otherwise noted, soil samples were collected for laboratory analysis from the unsaturated zone in each test boring corresponding to the interval exhibiting the highest PID reading or, in the absence of PID readings, from just above the water table. In some cases, soil samples were also collected from the saturated zone corresponding to the interval exhibiting the highest PID reading. Often the zone sampled was just above the clay layer, when the objective was investigating for the presence of *dense, non-aqueous phase liquids* (DNAPL). During one phase of soil sampling in the Railroad Spur Disposal Area when lead was the COC, samples were selected based upon screening with a field X-ray fluorescence spectrometer. Laboratory parameter lists for soil samples included one or more of the following:

- VOCs;
- PAHs;
- ETPH;
- total metals; and/or
- leachable metals.

Soil samples from the Macro Core liner or the split-spoon sampler selected for VOC analysis were collected using U.S. Environmental Protection Agency (EPA) Method 5035 (as modified by CTDEP). The samples were collected directly into five-gram Encore samplers and resealed in individual foil bags.

Soil samples collected for analysis for non-volatile parameters (dry weight, ETPH, PAHs, and/or metals) were placed directly into laboratory-supplied glassware. All samples were placed in coolers with ice in the field for transport to the laboratory.

Borings were backfilled either with native materials or clean sand and completed at the surface to match existing conditions. Soils removed from borings that exhibited elevated PID readings and/or soils removed from areas of previously identified impacts were containerized or stockpiled on and under plastic, characterized by laboratory analysis and disposed of off site. Liquid wastes generated during decontamination processes were also containerized, characterized by laboratory analysis and disposed of off site.

Copies of the geologic boring logs for all LBG soil borings are included as Appendix IV.

5.3.5 Ground Water Grab Samples

At select locations, ground water grab samples were collected from direct-push and HSA borings. Upon completion of the direct-push borings, either a 3.5-foot, stainless-steel well screen attached to the drilling equipment or a disposable, 5-foot, schedule 40 PVC well screen attached to a PVC riser pipe was temporarily installed in the borehole such that the bottom of the well screen was set at the top of the clay. A peristaltic pump was utilized to purge the well and collect a ground water sample. The ground water samples were submitted for laboratory analysis for VOCs by either EPA Method 8021B or EPA Method 8260. The temporary well assemblies were removed following sampling, and the borings were backfilled using either clean sand or native material removed from the boring. All purge water removed from the temporary wells was containerized, characterized by laboratory analyses and disposed of off site.

Ground water grab samples were collected from two HSA borings (LDCB-1 and LDCB-2) in the loading dock area. The augers were drilled to the clay surface. Approximately one hour after drilling was completed (allowing for settling of suspended solids in ground water inside the augers), plastic tubing was lowered into ground water inside the auger and connected to a peristaltic pump. Water samples were collected in laboratory-supplied containers directly from the discharge of the pump tubing. The samples were submitted for laboratory analysis for VOCs, PAHs and dissolved RCRA 8 metals.

5.3.6 Soil-Vapor Sampling

Procedures for collection of soil-vapor samples were modified throughout the investigation and are described in chronological order of their collection below.

5.3.6.1 Soil-Vapor Samples - October 2002

Prior to sample collection, the flooring at each sample location (wood or concrete) was pre-cored using an electric coring machine and sealed with a thin coat of concrete. A clean, stainless-steel sampling probe fitted with a stainless-steel perforated sample tip connected to *low-density polyethylene* (LDPE) tubing was driven through the sealed opening in the floor to a depth of approximately 3 ft bg. The perforated sampling tip in the probe was exposed by pulling back on the sample probe. The annular space between the floor and the probe wall was packed with aluminum foil. The LDPE tubing from the sample tip was connected to Tygon® tubing that passed through a peristaltic pump. The discharge end of the Tygon® tubing was connected to a Tedlar sample bag. The peristaltic pump was used to purge 1 liter of soil vapor from the subsurface to ensure that the vapor sample was representative of the natural soil-vapor condition. The purge air was field screened for VOCs with a PID.

After the purge-air sample was collected, a second, dedicated 1-liter Tedlar bag was connected to the sample tubing and a soil-vapor sample was collected for analysis. This second vapor sample was introduced into a mobile *gas chromatograph* (GC) for analysis for VOCs. After the GC sample was removed, the remaining soil vapor in the Tedlar sample bag was screened for VOCs with the PID.

The sample probe was then removed and the sample point was filled with cement to grade.

5.3.6.2 Soil-Vapor Samples - January 2003

An additional seven soil-vapor samples were collected using similar sample collection procedures as described above. Changes to the above procedures were limited to the replacement of the peristaltic pump with a vacuum pump and vacuum box for sample collection. The soil-vapor samples were submitted for laboratory analysis for VOCs by EPA Method TO-14.

5.3.6.3 Soil-Vapor Samples - March 2004 through February 2006

Modifications to the collection method for soil-vapor samples included, but were not limited to, the use of *isopropyl alcohol* (IPA) as a tracer gas to evaluate the potential for leakage of atmospheric air into the soil-vapor sample, precisely calculated purge volumes and the use of 400-*cubic centimeter* (cc) Summa canisters (minicans) with flow regulators. The modified sample procedure is described in detail below.

Step 1: The sampling probe was installed by first drilling a 1.5-inch diameter hole through the concrete floor using an electric hammer drill. The steel sampling probe was then driven to 1.5 ft bg in the underlying soil using a slam bar or sledge hammer (note that point VP-30D was installed to a depth of 3 ft bg for the purpose of vertical profiling). Once the probe was driven to the desired depth, the probe tip was exposed by retracting the probe approximately 0.75-inches.

Step 2: A coupling fitted to the end of the probe and the upper flange on the sampling tip provided a seal to inhibit downward migration of ambient air from (1) the annulus between the borehole and the sampling probe and (2) inside the sampling probe to the vapor-intake portion of the sampling tip. In addition, water-activated bentonite clay was placed around the sampling probe where it penetrated the floor and where the sample tubing entered the sampling probe to prevent atmospheric air from entering the sampling train.

Step 3: A three-way valve was connected to the above-grade end of the sample tubing to ensure that no atmospheric air was introduced to the sample tubing during purging. One of the open ends of the valve was connected to a disposable 60 cc syringe and the other to a 400 cc minican with flow regulator.

Step 4: A rag moistened with IPA was placed around the sampling probe where it entered the floor and around the sample tubing where it entered the sampling probe to evaluate the potential for leakage of atmospheric air into the soil-vapor sample.

Step 5: The purge valve was opened and 60 cc of vapor was purged from the tubing using the syringe. The valve was then closed and the syringe disconnected and purged. The syringe was then reconnected, the valve opened and the process repeated until a total of 160 cc of vapor had been purged from the tubing. Following purging, the valve was closed and the syringe was discarded.

Step 6: The flow regulator on the minican was opened and a soil-vapor sample was collected at the rate of 0.20 liters per minute. At the end of the sampling period, the sample valve on the minican was closed and the minican was disconnected from the sample tubing.

Step 7: The sampling equipment was removed from the borehole and the borehole was filled with cement.

Step 8: The samples were delivered to the laboratory for analysis for VOCs by EPA Method TO-14. The samples were also analyzed for IPA to determine whether or not atmospheric air had been introduced into the sample.

5.3.7 Installation of Ground Water Monitoring Wells

With the exception of two interior monitoring wells (LBGMW-29 and LBGMW-37), monitoring wells were installed in borings drilled using a HSA drill rig. Borings for wells LBGMW-29 and LBGMW-37 were drilled using a track-mounted Geoprobe® direct-push rig, due to their placement inside of buildings with limited access. Similar to the test borings, the borings for all monitoring wells were drilled to the top of the clay layer that is continuous beneath the site, unless otherwise noted. Soil sampling and logging methods were as described above for soil borings.

Monitoring wells installed in HSA borings were constructed using two-inch diameter, PVC well screen and PVC riser pipe components. Monitoring wells installed in direct-push borings were constructed using one-inch diameter, PVC screen and PVC riser pipe components or 1.5-inch diameter, pre-packaged screen, riser and filter pack assemblies. The screen slot size was 0.01-inch (10-slot).

The well screens were installed, where possible, from approximately one to three feet above the seasonal high water table to the top of the clay. The placement of the top of the well screen was set to allow for the installation of an adequate bentonite seal (minimum 0.5-feet thick). The annulus between the borehole and well screen was filled with No. 2 sand to approximately 2 feet above the top of the well screen (modified as necessary to accommodate the bentonite seal). A minimum 0.5 foot bentonite seal was installed over the sand pack. The annulus above the seal was backfilled with clean sand or clean soil removed from the borehole. Monitoring wells were completed at the surface with a flush-mounted road box or steel protective pipe and locking water-tight cap.

Following installation and prior to the collection of ground water samples, all monitoring wells were developed to ensure proper hydraulic connection with the surrounding aquifer. Wells were developed by hand surging and pumping until the discharge water was relatively sediment-free. No less than three well volumes of water were removed from each well during development. All purge water generated during development of the wells was containerized, characterized by laboratory analyses and disposed of off site.

The well locations, top-of-casing and grade elevations for all soil borings and monitoring wells were surveyed by Dymar, Inc., a Connecticut-licensed surveyor, to the site datum. Survey elevations were referenced to the nearest United States Geological Survey (USGS) datum.

Copies of the boring logs, including well construction details, are included in Appendix IV. Table 6 provides a summary of all well-completion details.

5.3.8 Ground Water Samples

Prior to each ground water sampling event, the depth to water in each monitoring well was measured and recorded. Ground water samples were collected in accordance with the EPA, Region 1, "*Low Stress Purging and Sampling Procedure for Collection of Ground Water Samples from Monitoring Wells*", July 30, 1996, Revision 2.

A peristaltic pump with dedicated Tygon® and LDPE tubing was used for the evacuation and sampling of each well. Sample tubing was installed in the well with the bottom of the tubing set in the middle of the saturated portion of the screen. The sample tubing was connected to a peristaltic pump. Dedicated tubing connected to the pump discharge port was connected to a water-quality meter that in turn discharged to a 5-gallon bucket. Prior to sampling, the ground water purged from each well was monitored continuously for water-quality parameters including temperature, pH, conductivity, turbidity, oxidation-reduction potential and concentrations of dissolved oxygen.

When the water-quality parameters in the purge water stabilized to within recommended limits, the meter was removed and ground water samples were collected for laboratory analysis directed from the pump-discharge tubing. The samples were collected into laboratory containers, labeled and packaged in coolers with ice. Depending on the well location, samples were submitted for laboratory analysis for VOCs, PAHs and/or dissolved metals (samples were field filtered and preserved).

For each day of sampling, a trip blank, supplied by the laboratory, accompanied the samples during their transport to assess sample handling conditions, and a field/equipment blank, prepared by rinsing deionized water through the sampling equipment, was collected to assess the cleanliness of the sampling equipment. The daily trip and field blanks were submitted for laboratory analysis for VOCs.

All purge water evacuated from the wells during sampling and water generated during decontamination procedures was containerized, characterized by laboratory analyses and disposed off-site.

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The March 2004 sampling event included additional analysis for evaluation of monitored natural attenuation processes. Ground water samples collected from select monitoring wells in the Solvent Release Area (AEI No. 13), the Loading Dock Area/Building No. 1A (AEI No. 16), and the FWSB (AEI No.19) were field-screened for nitrate, sulfate, sulfite, carbon dioxide (CO^2) and ferrous iron (Fe^{2+}). Water samples from these wells were also submitted to Microseeps, Inc. for laboratory analysis for several of the field-screening parameters and methane, ethane and ethene. A copy of the Microseeps, Inc. (Microseeps) *monitor natural attenuation* (MNA) report titled, "*The Evaluation of Chlorinated Aliphatic Hydrocarbons (CAH) Biodegradation as a Component of Monitoring Natural Attenuation*", dated April 13, 2004 is included as Appendix VI.

5.4 Interim Remedial Measures Completed During Remedial Investigations

Certain activities completed during the period of remedial investigation removed CVOC-, petroleum hydrocarbon- and/or metals-impacted media from the site and are, therefore, considered to be interim remedial measures.

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5.4.1 Sub-Slab Depressurization System

The concentration of TCE and vinyl chloride in ground water grab samples collected below Building 1A during LBG investigations exceeded the Significant Environmental Hazard (SEH) Condition Notification Threshold Concentrations (under Public Act 98-134, as amended). In response to those findings, LBG, on behalf of Unisys, provided the City of Middletown with written notification of a potential SEH on December 23, 2005. In February 2006, LBG conducted a sub-slab vapor sampling program to assess and define the limits of the potential hazard. TCE was detected in sub-slab vapor at concentrations above the I/C SVVC. Based upon the results, the CTDEP directed Unisys to install a *sub-slab depressurization system* (SSDS) in Building Nos. 1A and 1B as an interim vapor-intrusion control measure.

5.4.1.1 Field Diagnostic Tests

On March 8, 2006, LBG conducted qualitative field diagnostic tests at two locations in Building No. 1A to determine the configuration and sizing for the SSDS. The qualitative tests were conducted according to the following procedures:

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Step 1: Several 0.25-inch diameter holes (monitoring points) were drilled through the floor at distances of 1, 15, 17, 28 and 42 feet from the pre-designated location for the diagnostic test suction point. The selection of locations was partially influenced by access limitations. Concrete dust generated during drilling was vacuumed from around the monitoring points and each monitoring point was sealed with inert caulk.

Step 2: A digital micromanometer was turned on and equilibrated to ambient temperature. One end of a section of flexible tubing was connected to the positive (+) port on the micromanometer and the other end was placed in the monitoring point. Caulk was used to seal the annulus of the hole.

Step 3: The pre-test differential pressure across the concrete slab was measured using the micromanometer. The tubing was removed from the monitoring point and the hole was resealed with caulk.

Step 4: A 1.25-inch diameter hole was drilled through the floor at the diagnostic test suction point location. Concrete dust generated during drilling was vacuumed from around the suction point.

Step 5: The test manifold was placed in the suction-point hole and the annulus was sealed with caulk. A vacuum pump was connected to the test manifold. A flexible hose was connected to the exhaust of the vacuum pump and routed to the exterior of the building.

Step 6: The vacuum pump was turned on and operated at variable rates. The differential pressure at each monitoring point was measured for each vacuum rate using the procedures described above. A measurement of greater than 0.015 inches of *water-column* (WC) corrected for the pre-test differential pressure, was considered the "minimum acceptable" differential pressure measurement for proper sub-slab depressurization during cold-weather conditions.

Step 7: When testing was completed all suction and monitoring holes were repaired using hydraulic cement.

The field diagnostic test was conducted initially with a standard radon-mitigation fan that produces a maximum vacuum of 0.08 inches of WC. This fan was not able to induce sufficient vacuum at the closest monitoring point, which indicated the material beneath the slab has a relatively low vapor permeability. An industrial vacuum pump capable of producing a maximum vacuum of 4 inches of WC, was used for the remainder of the tests.

The test results indicated that applying 4 inches of vacuum at the suction point would create an approximately 20-foot radius of influence where the measured vacuum was greater than 0.015 inches of WC, the EPA-recommended "minimum acceptable" vacuum for proper depressurization.

A second suction hole was drilled on the opposite side of the interior space to determine if the observed radius of influence would be noted on both sides of the building. The measurements recorded during the second test indicated the radius of influence at the second suction point was slightly less (a radius of influence of approximately 15 feet).

A summary of the field testing procedures, monitoring results and the proposed SSDS was presented to the CTDEP in an April 7, 2006 LBG letter report titled, "*Proposed Scope of Work, Sub-Slab Depressurization System*".

5.4.1.2 System Construction and Operation

Based on the results of the field diagnostic test, it was determined that five suction points would be needed for the SSDS. Suction points were installed near the existing structural columns to limit the interference with current activities occurring in the area and to prevent damage to the piping. Steel and PVC piping was routed from the suction points through the southern exterior wall of Building No. 1A to the SSDS located outside Building 1A. Pipes were equipped with individual valves and vacuum measuring ports prior to being connected at the manifold inside the SSDS shed.

Blower sizing was accomplished by conducting additional field tests using a vacuum blower and the permanent suction points. Based upon the results of those tests, a five-horsepower blower was selected for the SSDS. A *soil-vapor extraction* (SVE) blower package containing a skid-mounted blower, a moisture-separator tank and a vacuum-relief safety valve was installed and connected to the manifold. The system was equipped with an electric control panel that monitors the system and provides notification if a system operational parameter drifts outside of prescribed limits (an alarm condition). The exhaust of the blower was vented to the atmosphere above the roof line and at a location removed from heating, ventilation and air conditioning equipment for the building.

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On August 14, 2006, immediately following the completion of the electrical inspection by the City of Middletown Building Department, the SSDS was turned on. The flow-control valves were adjusted to optimize the system, based on the vacuum and flow-rate measurements recorded during the pilot test. Initially, the system experienced several alarms due to water accumulation in the moisture-separator tank, but the alarm frequency decreased within the first month of operation.

LBG conducted sub-slab vacuum monitoring on September 14 and 19, 2006 with the SSDS in operation and confirmed that the sub-slab vacuum levels met or exceeded the "minimum acceptable" sub-slab depressurization (0.025 to 0.035 inches of WC) recommended by the EPA for a building of similar construction.

System monitoring, currently conducted on a weekly basis, includes a general inspection of system components to ensure the blower is operating and to record system vacuum and air-flow measurements. Sub-slab vacuum monitoring, currently conducted monthly, consists of measuring the differential vacuum across the slab to ensure proper depressurization is maintained beneath the area of concern. System maintenance consists of restarting the system following alarms, draining the moisture separator and, when needed, repairing or replacing SSDS components.

A summary of the system construction and operation was presented to the CTDEP in a November 30, 2006 LBG letter report titled, "*Sub-Slab Depressurization System Construction and Monitoring Report*".

5.4.2 Sewer and Water Pipe Excavation

In June 2007, the City initiated upgrades to the site utilities consisting of the installation of buried sewer and water pipes. Excavations for utility piping completed in areas of known environmental impact were monitored by LBG, on behalf of Unisys. Materials removed during these excavations were characterized by laboratory analyses and transported offsite for disposal, as necessary. A summary of the volume of soil removed from specific areas of environmental investigation and the waste classifications of these soils is presented in the following table:

Area of Environmental Investigation	Approximate Volume of Material Removed (cubic yards)	Waste Classification
AEI No. 11: Railroad Spur Disposal Area	35	Non-Hazardous
	150-160	Hazardous
AEI No. 12: Suspect UST 5	90	Non-Hazardous
AEI No. 16: Loading Dock/Building No. 1A	200-250	Non-Hazardous

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The 150 to 160 CY (approximate) of material removed from AEI No. 11 were determined to be hazardous based on leachable lead at concentrations of 5.7 milligrams per liter (mg/L) and 171 mg/L. All other materials removed from known AEIs did not exhibit characteristics of hazardous wastes.

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6.0 CONCEPTUAL SITE MODEL

The following section provides an analysis of historical information, previous investigation results and LBG's investigation results to formulate an understanding of the nature and extent of environmental impacts in the various AEIs. This analysis includes a comparison of sample analytical data from each AEI to applicable regulatory standards and, where applicable, an assessment of the historical nature of the source.

6.1 Physical Characteristics of Study Area

6.1.1 Site Topography/Drainage

The general topography and drainage features of the study area were reviewed using historical topographic mapping and the recently completed aerial survey of the site. The earliest available publicized topographic map was produced in 1893 by the USGS. The 1893 map

(Figure 4) was compared to USGS topographic maps produced in 1945, 1952, and 1992 to determine land-use history and general changes in topography.

The surveys used to produce the 1893 and 1945 USGS topographic maps were completed in 1890 and the 1942, respectively. The maps depict the site conditions and general land development within the general area, specifically showing the site prior to and after occupancy by Noiseless/Remington Rand.

6.1.1.1 1893 Topographic Map

The site is located along a peninsula-like landform extending northeast of the railroad tracks and located east of the Coginchaug River and south of the Mattabessett River; the confluence of the Mattabessett River and the Connecticut River is located to the east of the site. The map shows the site as vacant with railroad tracks running southeast to northwest through the area. The areas to the north and northeast are primarily wetlands associated with the Mattabessett River and the Coginchaug River. A small section of wetlands is depicted to the southeast of the site across (south of) the railroad tracks.

The regional topography within the study area is divided along the northeast axis of a drumlin feature located to the southwest of the site. The site north of the railroad tracks is relatively flat, sloping slightly to the northeast.

Based upon topography, surface water and ground water within the study area discharged locally to the Coginchaug River and Mattabessett River and regionally to the Connecticut River.

6.1.1.2 1945 Topographic Map

The 1945 USGS topographic map (Figure 5) reflects the development of the City of Middletown as an industrial and commercial area. Several structures and roadways were constructed in the area between 1890 and 1945, including those structures constructed on the site.

The Main Building and the Boiler Building are depicted on the 1945 topographic map. Two outlying structures are shown southeast of the Main Building and are likely the FWSB and the present-day location of two sets of concrete tank saddles, depicted on a City of Middletown water department map, circa 1940, may have supported propane tanks.

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The railroad tracks run southeast to northwest along the southern boundary of the property, as observed in the 1893 topographic map, with the addition of the railroad spur located in the southeast corner of the property and running north from the tracks to just east of the boiler room.

The overall site topography is flat lying with a gradual slope to the northeast toward the Mattabessett River. The peninsula-like landform of the site that was observed in 1893 topographic map appears extended north and east into the previously depicted wetland areas. The extension of the landmass was likely due to filling along the edges of the landform (presumably into the wetland areas) to allow construction of the Boiler Building and railroad spur. Currently, the areas in the northeast and eastern portion of the parcel that have been characterized as fill areas appear to be within the wetland areas observed in the 1893 map.

The general area surrounding the site became more developed between 1893 and 1945. Saint John's Cemetery, located southeast of the site, had been established by this point in time; the wetland area observed to the southeast of the site had been filled and is now Pease Street; the wetland area to the northwest had been filled and is where the municipal landfill will be located beginning in 1950.

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The regional topography slopes to the northeast from the southern drumlin draining to the Coginchaug River and Mattabessett River and eventually discharging into the Connecticut River.

There are no discernible differences in the depiction of the site on the 1945 and 1952 topographic maps. The 1952 topographic map is included in Appendix I.

6.1.1.3 1992 Topographic Map

The 1992 topographic map is the current USGS map for the City of Middletown (Figure 1). The features depicted in the vicinity of the site are similar to the 1945 map with the exception of the municipal landfill area to the northwest of the site, the removal of the outlying structures in the southeast corner of the site, an addition to the northwestern corner of the Boiler Building, and the addition of the Quonset Building.

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The wetlands to the northwest of the site have been extensively filled in the general area of the municipal landfill. Previously this area was depicted primarily as wetland area with a small upland area protruding out to the northwest from the site. The border of the fill area is depicted up to the confluence of the Coginchaug River and the Mattabessett River.

The regional topography remains similar to the 1945 map with the landscape sloping northeast from the southern drumlin. The site is relatively flat, sloping slightly to the northeast. Surface water and ground water discharges locally to the Coginchaug River and the Mattabessett River and regionally to the Connecticut River.

6.1.2 Regional Geology/Hydrogeology

The bedrock within the study area is mapped as Portland Arkose, a reddish-brown sandstone and conglomerate (Rodgers, 1985), which has historically been quarried locally as building stone. Thick till overlies bedrock in the site area. The till thickness varies due to depositional differences and post-depositional erosion (Rodgers, 1985). The till is thicker below a drumlin feature to the south of the site, and is expected to be thinner below the site. A map depicting surficial geology in the site area is presented as Figure 6.

A large post-glacial lake (Lake Middletown) covered areas to the north and east of the site (CTDEP, 2007). The lake produced fine-grained lake-bottom deposits that are described as reddish brown, mostly varied silt and clay in couplets ranging from four inches to 75 feet thick. These lake-bottom deposits overlie the till. Delta and beach deposits associated with the lake may be present in some areas. More-recent alluvial deposits and swamp deposits overlie these lake deposits. Anthropomorphic fill deposits associated with roads, bridges, railroads, and building construction can overlie any of the above deposits.

General ground water flow in the area would be expected to follow the topography, to the north-northeast discharging to the Coginchaug River and the Mattabessett River. Surface water not captured by drainage systems would be expected to follow the topography and drain locally to the Coginchaug River and Mattabessett River. The Mattabessett River discharges to the Connecticut River to the northeast of the site.

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6.1.3 Site Geology/Hydrogeology

Fill materials were encountered during the VHB and LBG site investigations at depths ranging from near grade to 10 ft bg. The fill was comprised of cinders, brick fragments, glass, metal, ash and coal, with bulky wastes such as fencing and auto parts present at some locations. The thickest accumulations of fill materials were encountered northeast and southeast of the Main Building (AEI Nos. 1 and 11). Based upon review of the available historical topographic maps and aerial photographs, the majority of the fill material appears to have been placed between the late 1890s to the 1970s, with additional filling occurring since that time.

Presumably native soils existing at grade and below the fill materials encountered by test pits and borings consisted of very fine to medium sand with varying amounts of silt and coarse sand to the top of a clay unit encountered from 7.5 to greater than 18 ft bg. The sand deposits below the site may originate as alluvium, delta deposits at the edge of Lake Middletown, or shoreline deposits. Plate 3 presents a geologic cross section of the site and surrounding area from west to east.

The thickness of the underlying clay unit, believed to originate as lake-bottom deposits, has not been determined. In test borings LDCB-1 and LDCB-2, located near the catch basin outside and northwest of Building No. 2, the clay unit was encountered from 8 ft bg to the bottom of the boring at 15 ft bg. The deepest the clay layer was encountered was 17 ft bg in test boring GP-58, which is located to the southwest of Building 1A. The other test borings, with the exception of those drilled in the railroad right-of-way, were terminated in the upper 2 feet of the clay unit. The clay unit was shown to be extensive beneath the site. The clay appears to have an irregular surface, with a general slope to the northerly and easterly directions. Plate 4 depicts the interpreted contours of the clay surface based upon boring and test pit data collected from the site investigations.

Borings advanced on adjacent properties to the west of the site did not encounter the lake-bottom clay and are believed to be outside of the paleo-lake area and on the flank of the till drumlin. Wetland and alluvial deposits are present to the north of the site in the floodplains of the Coginchaug and Mattabessett Rivers and are expected to overly lake-bottom and older alluvial deposits.

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Ground water exists under phreatic, water-table conditions in the shallow fill and sandy sediments. Locally, ground water may be partially confined within deeper stratified sediments. The ground water beneath the clay unit is presumed to exist under confined conditions with upward vertical hydraulic gradients.

Plate 4 shows the water-table configurations under seasonal low water conditions (November 2004) and seasonal high water conditions (April 2007), based upon the available data. Table 7 presents a summary of ground water level measurements made at monitoring wells during all phases of the remedial investigation. Ground water elevations beneath the site ranged from approximately 13.6 to 21.8 ft feet above mean sea level (ft msl) during the April 2007 ground water sampling event. The direction of ground water flow during seasonal high conditions is to the northeast, toward the Mattabesset River, with an average hydraulic gradient across the site of 0.02 ft/ft. In the northern portion of the site, the ground water flow direction is more to the north and the gradient is generally flatter. In the southern portion of the site, the ground water flow direction is more toward the east. This inflection in ground water flow direction occurs in the area south of Building No. 11D. The hydraulic gradient is steeper east of Building No. 9C. Under seasonal low water conditions, the hydraulic gradients are somewhat lower along the downgradient sides of the site. In addition, the ground water flow direction below the east-central part of the site (below the area of the Quonset Building) shifts more easterly. Based on likely ground water flow direction, it is probable that ground water beneath the site discharges directly to the wetlands located to the east and northeast of the Site.

The average estimated ground water velocity is 0.04 to 0.4 feet per day below and downgradient of the northern portion of Building No. 1A, and 0.01 to 0.1 feet per day below and downgradient of Building No. 5. These estimates assume a hydraulic conductivity for fine sand of 1 to 10 ft^3/day (Freeze and Cherry, 1979), a porosity of 0.25 ft^3/ft^3 and average hydraulic gradients of 0.01 ft/ft and 0.025 ft/ft, respectively.

6.2 AEIs Investigated by LBG

The additional site investigations completed by LBG at AEI Nos. 11, 12, 13, and 16 through 21 provided additional information on the nature and extent of COCs in those areas. Presented below is a summation of the *conceptual site model* (CSM) for these areas based upon all available investigative data gathered to date (VHB and LBG), including possible modes of release, chemical constituents, migration pathways, and a comparison to applicable remediation standards for soil, soil vapor and ground water. The analytical results for COCs detected in soil samples are presented for each AEI on Tables 8 through 26. Summaries of the analytical results for soil samples by constituents, including detection limits, are presented on Tables 1 through 4 in Appendix VI. The analytical results for ground water samples are summarized on Tables 27 (VOCs), 28 (SVOCs and TPH), and 29 (metals). The analytical results for soil-vapor samples are summarized on Table 30. The tables include VHB data taken from summary tables in VHB reports. Adobe® Portable Document Format (PDF) copies of all laboratory analytical data and

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where applicable RCP narratives for LBG soil, soil-vapor and ground water samples are included on a CD included as Appendix VII. Boring, well, test pit and soil-vapor sampling locations (inclusive of VHB and LBG investigations) are shown on Plate 2. Logs for LBG test pits and borings, and well construction details are presented in Appendix IV; available VHB test pit logs and soil boring reports are presented in Appendix VIII.

6.2.1 AEI No. 11: Railroad Spur Disposal Area

The Railroad Spur Disposal Area is located in the southern portion of the site; south and southeast of the Boiler Building, along the former section of the railroad spur and primarily to the east of the existing and former sections of the spur (Plate 5). This disposal/fill area was originally identified in the VHB Phase II investigation when a ground water sample from a monitoring well installed in this area identified copper and zinc at concentrations above the SWPC and soil samples identified metals, TPH and SVOCs at concentrations above applicable remediation standards. Subsequent VHB sampling expanded the known aerial extent of the disposal area and described the presence of several types of fill.

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The fill in this area can be differentiated into several types:

Cinder Fill: A cinder-fill, with ash at some locations, extends over a large area from borings B-39, B-40 and B-41 to the northeast, to borings B-43 and B-38 to the south, and an isolated area near test pit TP-35, located to the west (within AEI No. 3: Suspect UST-2 and Switching Station). The majority of the cinder fill exists beneath and adjacent to the former section of the railroad spur, which, based on a review of the Sanborn maps, was removed between 1950 and 1979. In some areas near and west of the railroad spur (e.g., B-59, B-44) where the cinder layer is a foot or less thick at the surface, cinders may have been used to create a driving or working surface and/or appear mixed with sand (B-45 and B-46).

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Brick Fill: Boring B-41 at the northern end of the Railroad Spur Disposal Area encountered brick and other material over the ash and cinder fill. This may represent the southern extent of the ROW Disposal Area overlapping the Railroad Spur Disposal Area.

Industrial Fill: There is a defined area that contains industrial fill/debris such as metal, metal filings, wire, grinding wheels, piping and/or ceramic. This area includes test pits UST3/TP-1, TP-28, TP-29, TP-36, TP-37, STLP-2 and SLTP-3. Typewriter parts were observed in test pits TP-36 and TP-37 and connecting rods (presumably associated with automobile engines) were observed in TP-28. A thin layer of metal turnings was observed at the surface at test pits SLTP-2 and SLTP-3, at the south end of this area. The industrial fill in this area was found to extend as deep as 8.5 ft bg (at TP-36), and a macadam layer was noted at a depth of 7 ft bg in TP-28. It should be noted that several borings drilled within the area did not encounter identifiable industrial debris, but many in and around the area encountered slag. Notably, large masses of slag or fused metal were visible at the edges of the slope adjacent to the test borings in some areas. It is not known if the industrial fill is discontinuous or if the boring observations were influenced by the sampling method (i.e., small-diameter sampler versus test pit).

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Evidence of fill was also observed to the west at test pits TP-33, TP-34, and TP-35 (AEI No. 3: Suspect UST-2 and Switching Station), where cobbles, asphalt and brick were noted to depths of at least 3 ft bg. It is not known if this fill area is continuous with the railroad disposal area or a localized feature, possibly associated with backfill in the area of a former UST.

Petroleum impacts were noted at several locations within and below the fill, some associated with the surface-stained area to the west (AEI No. 9: Surficial Stained Area 1) and some at depth below the northern portion of the fill (possibly from an upgradient source).

AEI No. 11 is approximately 30,000 square feet in total area (not including the area near AEI No. 3: Suspect UST-2), with the industrial fill portion estimated at 12,200 square feet in area. Plate 5 presents a plan-view depiction of the Railroad Spur Disposal Area and a cross-sectional profile through the fill. The fill area estimate has a degree of uncertainty, as the southeastern limits have been defined via differences in slope and have not been subject to sampling. AEI No. 11 is bordered to the north by the AEI No. 1 (the ROW Disposal Area) and for purposes of area estimation, it is assumed to extend to the toe of slope to the southeast. The fill thins to the west (as exemplified in B-44, B-48, TP-27, TP-32).

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Review of the 1893 and 1945 historical topographic maps reveals differences that suggest areas to the east and north of the Main Building were filled in this timeframe to permit the construction of the Boiler Building, the railroad spur and, possibly, the Main Building (Figure 4). Since the Boiler Building was constructed prior to 1900, at least a portion of the onsite filling, beneath and south of the Boiler Building, appeared to have occurred prior to Noiseless/Remington's use of the site beginning in 1909. Site topography, at least as depicted on the USGS topographic maps, did not change significantly between 1945 and 1976.

The 1934 aerial photograph (Appendix I) shows the area east of the railroad spur to be heavily vegetated. The tree line appears to be close to the top of the current fill slope. The position of the railroad spur over or near the edge of the filled area (e.g., in the area of TP-38) suggests that the railroad spur may have post-dated the placement of at least some of the cinder fill material (assuming that the grade of the rail spur has not been changed over time). The exact date of the installation of the rail spur is not known; however, it is likely that it was installed coincident with the boiler building construction (pre-1900) for the purposes of bringing coal to the boilers. Further evidence of a pre-1900 installation is suggested by its depiction on the 1901 Sanborn. Based on a review of Sanborn maps, the northern section of the spur, from the FWSB to the Boiler Building, was removed between 1950 and 1979.

A large portion of this area contained metal and slag, possibly from the early 1900s foundry operations. What were described by VHB as connecting rods, possibly from the automobile engine manufacturing operation prior to 1909, were observed in test pit TP-28. The presence of typewriter parts in a portion of the fill area (TP-36 and TP-37) suggests that some portion of the filling in this area originated from typewriter manufacturing post 1909.

6.2.1.1 Cinder Fill

The characteristics of the cinder fill were investigated by VHB test pits and borings and LBG borings. The analytical data for samples from the borings and test pits interpreted to be within the cinder fill area (exclusive of the industrial fill area) are summarized on Table 16. Some of the specified sample intervals are broad and span the interface between fill and possibly native materials below the fill. Nonetheless, the most common characteristic is the high concentration of arsenic (greater than the DEC of 10 *milligrams per kilogram* (mg/Kg) in 6 of 11 samples). The arsenic occurrence was occasionally accompanied by elevated concentrations of other metals such as, lead, copper and selenium. The lead concentration at one location exceeded the RDEC, but did not exceed the I/C DEC. None of the other metals concentrations exceeded the DEC and none of the metals concentrations exceeded the GB PMC.

TPH/ETPH was present at concentrations greater than the RDEC and I/C DEC in five samples. In all instances those results were accompanied by observations of petroleum staining, odor, sheen, or oil globules, so the petroleum does not appear to be related to the cinders and other fill. Given the depth of most of the petroleum impacts, usually at or near the water table, it is likely that these represent petroleum migrating from an upgradient source(s). One soil sample collected from above the water table in the test pit TP-38 did contain TPH at a concentration above the GB PMC. Test pit TP-38 is near or within the area of surface soil staining to the west (AEI No. 9) and could be influenced by that release.

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PAH compounds were detected in two samples. The concentrations of PAHs in sample TP-31 exceeded the DEC and GB PMC. Test pit TP-31 was shallow and encountered a layer of macadam. It is not clear at what depth the sample was collected, but the analytical result may represent the PAHs from the asphalt. The TP-31 sample also contained an elevated concentration of arsenic. PAHs were either not detected or not detected at significant concentrations at two other locations where arsenic was detected, so there does not appear to be a relationship between arsenic and PAH occurrence, further suggesting an asphalt source for PAHs.

6.2.1.2 Industrial Fill

Analytical results for samples collected from borings and test pits within the industrial fill area by VHB and LBG are summarized on Table 16. This area is characterized by high concentrations of total lead, arsenic, copper and nickel. One sample also contained high concentrations of selenium, chromium, and thallium.

At two locations within the designated industrial fill area, boring B-10/MW-4 and test pit UST3/TP-1, soil samples contained TPH and PAH at concentrations that exceeded the RDEC and, in some cases, the I/C DEC and GB PMC. At both locations the samples were collected from tar layers. Although representative of the tars, these samples are not likely to be representative of the fill in general. It should be noted that the 1901 Sanborn map depicted an 'Oil House' to the west of the railroad spur, approximately between boring LBGWS-4 and test pit TP-31. The Oil House was not present on the 1907 map. The location appears to be outside of the fill area. It is not known if there is a connection between the former Oil House and the layer of thick tar observed at the approximate depth of the water table in downgradient boring B-10/MW-4.

A comparison between the soil-quality results from the industrial fill area in AEI No. 11 and the applicable remediation standards for TPH/ETPH, PAHs and metals is summarized below:

Analyte	Total Number of Samples (AEI No. 11)	Number of Samples Exceeding Criteria		
		RDEC	I/C DEC	GB PMC
TPH/ETPH	8	2	1	1
PAHs	4	2	2	1
Arsenic	26	20	20	0 of 11*
Chromium	6	0	0	0 of 1*
Copper	22	11	0	0 of 11*
Lead+	108	45	26	1 of 30*
Nickel	23	14	4	4 of 11*
Selenium	6	0	0	Not tested
Thallium	5	1	0	Not tested
Zinc	24	0	0	0 of 11*

* by SPLP
+ 500 mg/Kg is used as the RDEC

This comparison shows that TPH/ETPH, PAHs, arsenic, lead, and nickel are the regulatory drivers with respect to compliance with the I/C DEC. TPH/ETPH, PAHs, lead and nickel are regulatory drivers with respect to compliance with the GB PMC (note that it is likely that SPLP extraction and analysis of the tar samples for ETPH and PAH may demonstrate compliance), with nickel being the primary driver due to the high rate of non-compliance and the high concentrations relative to the standard. Review of the sample depths for those samples that exceeded the GB PMC summarized above indicates that only one of the samples is believed to have been collected below the seasonal high water table. That sample would, therefore, not be subject to the GB PMC.

It should be noted that during the VHB Phase III investigation, one sample from B60/MW-19, located within the industrial fill area, was reported to contain a TCLP-leachable lead concentration of 126 mg/L. This concentration exceeded the hazardous waste limit

(5 mg/L); therefore, wastes exported from portions of this area may be characteristic hazardous wastes.

6.2.1.3 Migration of Metals and Petroleum Hydrocarbons/Ground Water Quality

Most of the AEI No. 11 area is currently vegetated and unpaved and not particularly susceptible to erosion. Transport of metals and petroleum hydrocarbons from locations above the water table would be generally downward via infiltration and leaching. Some lateral movement of infiltrating water could also occur in response to stratification and permeability variations that would be expected in fill. As the fill extends to depths of between 7 and 14 ft bg (near or below the water table in some locations) dissolved metals and petroleum hydrocarbons in percolating water may have limited opportunity to attenuate due to adsorption. If these constituents reach the water table, they could travel with ground water, with concentrations expected to attenuate along the pathway primarily due to sorption. Transport of the petroleum and PAHs from the tar is considered unlikely (this could be further assessed by SPLP extraction and analysis).

Shallow ground water below AEI No. 11 flows to the east and east-northeast toward the nearby wetlands and, ultimately, to the Mattabessett River. Ground water samples collected from wells installed within and near AEI No. 11 (B-10/MW-4, LBGMW-8, B-60/MW-19 and LBGMW-21 in the industrial fill area and B-36/MW-16, B-43/MW-17 and LBGMW-22 in the cinder fill) show the following:

- Ground water samples collected from wells in the vicinity of the industrial fill contain elevated concentrations of nickel and zinc, with elevated cadmium and copper at some locations. One set of samples from LBGMW-21 (collected 12/02/04) was submitted both filtered and unfiltered to see if the nickel and zinc results were influenced by filterable particulate. The results showed no significant difference between the filtered and unfiltered aliquots. The concentrations of nickel and zinc in both the filtered and unfiltered samples exceeded the SWPC and CALC (Table 29). The concentration of zinc in the water sample from LBGMW-7 (collected 4/30/07), located upgradient of the industrial fill area, exceeded the SWPC and CALC, indicating some background contribution of zinc to portions of this area. The highest concentrations of cadmium, copper, nickel and zinc have historically been detected in monitoring well B-60/MW-19, located in the central portion of the industrial fill. Note that the detection limits for arsenic, which was detected in the fill in this area at concentrations below the GB PMC, were greater than the SWPC, but below the CALC.

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- Ground water samples collected from wells in the cinder fill portion of AEI No. 11 also contained elevated concentrations of copper, nickel and/or zinc, but the concentrations were generally lower than those detected in the industrial fill area (Table 29). Some of the water samples contained zinc and copper at concentrations that exceeded the SWPC and CALC. Nickel was also detected in two of the wells (B-43/MW-17 and LBGMW-22) at concentrations above the CALC. Again, the laboratory detection limits for arsenic exceeded the SWPC, but were less than the CALC.

- PAHs were detected in ground water samples from only one well, B-10/MW-4 (Table 28), where very high concentrations of PAHs were also detected in a soil sample. Consequently, dissolved PAHs appear to be a localized problem and not a characteristic of this fill area.

- VHB only completed a limited number of ground water quality analyses for TPH/ETPH. Since there is no established remediation standard for TPH/ETPH in ground water in GB areas, it was not tested for in most samples collected by LBG. TPH/ETPH was not detected in the ground water samples (Table 28).

- AVOCs were detected in one water sample from well B-10/MW-4 (Table 27). The concentrations of AVOCs were at trace levels, below the AALC. The presence of MTBE, albeit at a trace concentration, along with naphthalene and trimethylbenzenes, suggests that the source may be petroleum products, such as degraded gas from an upgradient location. AVOCs do not appear to be characteristic of the fill.

- CVOCs, primarily TCE, were detected at trace-to-low concentrations in ground water samples collected from wells within the fill area (Table 27). A water sample collected from LBGMW-8 contained TCE at a concentration above the proposed RGWVC. Given the presence of higher concentrations TCE at some upgradient locations (e.g., LBGMW-7), some or all of these detections could be attributed to other source(s). CVOCs do not appear to be characteristic of the AEI No. 11 fill.

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Investigation identified ash/cinders and industrial fill in AEI No. 11. Historical review indicates much of this fill material was probably deposited to facilitate construction of site features, including the Boiler Building and railroad spur, prior to Noiseless/Remington Rand activities. The content of industrial fill, however, does suggest a portion of the industrial fill material in AEI No. 11 is associated with Noiseless/Remington Rand activities. The industrial fill material in AEI No. 11 contains metals, petroleum hydrocarbons and PAHs at concentrations above the remediation standards. Some COCs in ground water beneath portions of the fill area also exceed the remediation standards.

Although ground water quality beneath AEI No. 11 exceeds the SWPC and CALC, additional monitoring downgradient of AEI No. 11 could be used to evaluate compliance with the SWPC and/or CALC. If the source of metals in ground water is the industrial fill, then remedial actions to achieve compliance with the GB PMC should reduce metals concentrations in ground water. Fill below the water table that contains leachable concentrations of metals may also require remediation to achieve compliance with the SWPC, although deeper fill may pre-date Noiseless/Remington Rand activities on the site.

6.2.2 AEI No. 12: Suspect UST-5

Petroleum-impacted soil and ground water were initially identified to the north of Building No. 2 during the VHB Phase II investigation. TPH was detected in a soil sample from boring B-18/MW-6 at a concentration above the RDEC and I/C DEC (Table 17). Attempts were made to locate an UST as a potential source for these impacts, including a magnetometer survey and test pit excavation, but no USTs were found (two metal 'ports' were found, but it is unknown if these were associated with a tank). An UST was not noted on the Sanborn maps through 1979, suggesting that if there was an historical UST, it was either not recorded or was installed after 1979.

The interior of the adjacent building (Building No. 2) was also inspected for evidence of a tank beneath the floor. The inspection identified an L-shaped concrete patch, a possible floor drain, a small hole adjacent to the concrete patch and a pipe that exited the floor along the northeastern wall of the building (see Section 3.2.7 for additional investigation details). A GPR survey of the interior floor identified an anomaly beneath a portion of the concrete patch area that was interpreted to be a potential underground pipe. An UST was not identified in this area.

Samples were collected from test pits (TP-20 through TP-25) and borings (B-50 through B-53, B-56 and B-57) advanced by VHB in this area. The VHB boring logs noted elevated PID readings and visual and olfactory evidence of petroleum impacts including the presence of separate-phase product at some locations (TP-23 and B-50) and petroleum odors in the majority of the borings. Several samples collected from these locations contained TPH at concentrations above the RDEC, I/C DEC and GB PMC, but AVOCs associated with petroleum were not detected in those samples analyzed (Table 17). PAHs were detected in soil samples that contained high concentrations of TPH, but the PAH concentrations were below the applicable criteria. Soil samples were collected at depths between 4 and 8 ft bg, approximately at or near the water table, determined to be between 3.5 and 5 ft bg; therefore, the GB PMC likely do not apply to the VHB soil quality results.

Additional soil samples collected by LBG in support of the proposed waterline installation project confirmed the presence of TPH at concentrations above the RDEC and I/C DEC (Table 17). The LBG results also detected TPH in soil samples collected from above the water table (0 to 4 ft bg) in WL-7, WL-10 and WL-12 at concentrations above GB PMC. PAHs were detected in samples WL-3 and WL-11 at concentrations above the RDEC and I/C DEC. The concentrations of PAHs in the 2 to 4 ft bg sample from WL-11 also exceeded the GB PMC.

Ground water samples collected within and downgradient of the area of petroleum-impacted soil (LBGMW-2, B-18/MW-6, B-33/MW-13 and WL-3) have historically contained primarily CVOCs (related to an upgradient source area) and only trace (or non-detect) levels of AVOCs (Table 27). However, the concentration of n-buytlbenzene detected in the sample from B-18/MW-6 in September 1998 exceeded the AALC. N-butylbenzene was not detected during subsequent sampling completed in 2004 and 2007. Elevated concentrations of TPH were detected in water samples collected by VHB from monitoring well B-18/MW-6 (Table 28). PAHs were detected in water samples from monitoring wells B-18/MW-6, B-33/MW-13 and WL-3 during March 2004 sampling events, some at concentrations above the SWPC and/or AALC (Table 28). Several additional PAHs were detected in water samples collected from monitoring wells B-18/MW-6 and B-33/MW-13 in May 2007. The concentrations of several PAHs detected in water samples from B-18/MW-6 exceeded the SWPC and/or AALC. The concentration of two PAHs detected in the water sample from B-33/MW-13 exceeded the AALC.

Investigation confirmed a petroleum release in AEI No. 12, originating in proximity to the northeast corner of Building No. 2. The lateral extent of the release has been defined. The concentrations of petroleum hydrocarbons and PAHs in soil and PAHs in ground water in the release area exceed the remediation standards. The VHB Phase III report suggested that the petroleum source was gasoline, but the analytical results, specifically the relative absence of AVOCs and more recent detections of PAHs in ground water, do not support this conclusion. There is no information to make a definitive conclusion about the source or timing of the release. An UST has not been located. A 1901 Sanborn map indicates the presence of a furnace and case-hardening operations in Building No. 2 prior to Remington Rand/Noiseless occupation of

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the property in 1909. Sanborn maps from the time period of Remington Rand/Noiseless operations indicate that Building No. 2 housed 'grinding and hardening' operations. Hardening operations typically involved quenching metal in air, water, or oil. The proximity of the former metal hardening operation to AEI No. 12 and the absence of other identified sources suggest that it may be a potential source for these impacts.

6.2.3 AEI No. 13: Solvent Release Area

A potential solvent release was identified when solvent odors were noted in ground water to the east of Building No. 8 during the VHB investigation of UST-4. Low concentrations of TCE were later identified in soil samples collected from below the water table in borings B-1 and B-3 (Table 18). TCE and vinyl chloride were identified in the ground water collected from monitoring well B-3/MW-1 at concentrations above the RGWVC and I/C GWVC (Table 27).

Additional investigations were completed by VHB and LBG to identify the potential source for the VOC impacts. The investigations were directed at existing and potential former interior drainage structures and areas of GPR anomalies beneath concrete patching and an exterior area beneath a former exhaust vent and second story drainage pipe. These investigations included the collection of 25 soil-vapor samples (within Building Nos. 1C, 4, 8 and 12 and west of Building No. 1C) by LBG and the advancement of 12 soil borings (two beneath the large catch basins in Building No. 12, one beneath the exhaust vent located outside Building No. 1C, and nine located throughout Building Nos. 1C, 8 and 12) by VHB and LBG. Seven of the borings were subsequently completed as ground water monitoring wells.

These investigations did not identify TCE in soil or soil vapor at concentrations above the applicable remediation standards or concentrations of CVOCs that would be representative of a source for the identified impacts to ground water (Tables 18 and 30). However, concentrations of TCE, 1,1-DCE and vinyl chloride were detected in the ground water collected from monitoring well MW-21 (interior Building No. 8) (Table 27).

The investigation results suggest that a potential source for CVOCs in ground water was direct discharge of solvents to the catch basins in Building No. 12 and possible, subsequent leakage from the basins to ground water. This suggestion is based on: (1) the limited extent of CVOCs in the ground water beneath the building (highest concentrations at MW-21 and absence of VOCs at LBGMW-10 and LBGMW-12); (2) the lack of identifiable CVOC source material in

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the soil; (3) the location of the catch basins in Building No. 12 relative to MW-21 (hydraulically upgradient); and (4) the depth of the basins relative to ground water (the bottom of the basins at or near ground water at roughly 4 ft bg). The general decrease in the concentrations of TCE and vinyl chloride in ground water at MW-21 between August 1998 and May 2007, as summarized in the following table, also suggests the absence of significant residual source materials in AEI No. 13. Evidence for the natural degradation of CVOCs in ground water is discussed in the April 13, 2004 Microseeps MNA report (Appendix V).

Monitoring well ID	Sample date	Concentration in micrograms per liter (ug/L)	
		Trichloroethylene	Vinyl Chloride
MW-21	9/98	**1,079**	**17**
	8/00	**840**	**500**
	2/03	**490**	**110**
	3/04	**660**	**120**
	11/04	**320**	**97**
	5/07	**340**	**100**
Proposed RGWVC		27	1.6
Proposed I/C GWVC		67	52

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A review of historical ground water quality for monitoring wells located in the vicinity of AEI No. 13 indicates that a likely source area for CVOCs is directly upgradient of monitoring well MW-21. Figure 8 presents an isoconcentration map of TCE in ground water in AEI No. 13. CVOCs in ground water appear to be migrating in a north-northeasterly direction as evidenced by the TCE concentrations in monitoring well MW-15. The extent of CVOCs in ground water beneath the site buildings and areas downgradient of B-74/MW-21 is defined by existing monitoring wells; bounded to the south by LBGMW-12, to the west by LBGMW-10 and LBGMW-13 and to the east by LBGMW-20. It appears that CVOCs in ground water at B-34/MW-14 and B-35/MW-15 may be associated with AEI No. 13. Although concentrations of TCE in recent ground water samples from B-34/MW-14 and B-35/MW-15 exceed the proposed RGWVC, the industrial land use and limitations on new building construction imposed by the wetlands and landfill may preclude the need for remediation to achieve compliance with the proposed RGWVC in that area. The concentrations of TCE in ground water in AEI No. 13 presently meet the SWPC, but exceed the AALC at monitoring well B-74/MW-21.

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TCE and vinyl chloride are present in ground water at monitoring well B-74/MW-21 at concentrations above the proposed I/C GWVC (the vinyl chloride concentration was 30 times the proposed RGWVC) (Table 27). On February 18, 2004, LBG completed a soil-vapor sampling program in the vicinity of B74/MW-21. The soil-vapor results are summarized below:

Sample ID	Sample Depth (ft bg)	Concentrations of VOCs in parts per million by volume (ppmv)					
		Benzene	Toluene	Chloromethane	PCE	TCE	1,1,1-TCA
VP-30-S1	1.5	0.0012	0.0012	0.0139	0.0015	0.0045	0.0043
VP-30-S2		ND<0.0004	0.0016	0.0095	0.0024	0.0057	ND<0.0002
VP-30-D1	4.1	ND<0.0004	0.0007	ND<0.0006	0.0008	ND<0.0003	ND<0.0002
VP-30-D2		ND<0.0004	0.0007	ND<0.0006	ND<0.0001	ND<0.0003	ND<0.0002
Proposed Soil-Vapor Volatilization Criteria							
RSVVC		0.78	42	5.1	0.56	0.14	70
I/C SVVC		1.4	180	53	1.0	0.26	130

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ft bg Feet below grade.
ND Not detected.
PCE Tetrachloroethylene
TCE Trichloroethylene
1,1,1-TCA 1,1,1-Trichloroethane

TCE was detected in the soil vapor at concentrations well below the proposed RSVVC and I/C SVVC (Table 30). Vinyl chloride was not detected. The soil-vapor sampling results suggest that the TCE and vinyl chloride in ground water are not impacting the sub-slab soil vapor at concentrations that pose a health concern to building occupants. Soil-vapor sampling may be an effective approach to demonstrate compliance with the GWVC.

Investigations have identified the catch basins centrally located in Building No. 12 as a potential source area for CVOC-impacted ground water in AEI No. 13. However, there is no information that confirms a definitive source area, the related activity, or the timing of the release. When the initial samples were collected from well B-74/MW-21 in 1998, the ratio of TCE to its breakdown products was approximately 2.4:1. In 2003 and 2007, that ratio was approximately 1.8:1. The concentration of total CVOCs in 1998 was 1,525 ug/L (micrograms per liter) versus 529 ug/L in 2007. The results show that TCE is degrading naturally and total CVOC concentrations are decreasing.

6.2.4 AEI No. 16: Loading Dock/Building No. 1A

During a site walk on December 19, 2000, Martin Beskind and Peter Hill of the CTDEP noted "odors" emanating from the catch basin at the southwestern end of the loading dock access drive, located adjacent to Building No. 2 (Figure 2). A copy of an internal CTDEP memo referencing the basin is included as Appendix IX.

The identification of AEI No. 16 by the CTDEP began a phased investigation that included GPR surveys and several phases of soil, soil-vapor, and ground water sampling. The soil, soil-vapor and ground water sampling locations associated with AEI No. 16 are depicted in detail on Plate 6. In January 2003, in an effort to determine the source of the odors, LBG sampled the solids and water in the basin (LD Catch Basin) and collected soil and ground water grab samples from two borings completed adjacent to the catch basin (LDCB-1 and LDCB-2). The results from the basin sampling indicated that TCE and associated daughter products (*cis-1,2 dichloroethylene* (cis-1,2 DCE) and vinyl chloride) were present within both media (Tables 21 and 27). The concentration of TCE in solids accumulated in the catch basin did not exceed the remediation standards, although not applicable to accumulated solids, and thus did not appear to represent a potential source for continued ground water impact. Significant concentrations of TCE were reported in the water samples from the basin and boring LDCB-2.

A previous GPR survey of the area around the catch basin identified one anomaly interpreted to be a potential buried pipe between the basin and southwestern end of Building No. 2. A visual inspection of the floor in the southwest portion of Building No. 2 did not identify any drainage structures. A visual inspection of the basin did not identify piping leading into or out of the basin, and the basin was confirmed to have a solid base.

Three monitoring wells (LBGMW-17, 18 and 19) were installed adjacent to and in the presumed downgradient direction of the catch basin. The initial ground water sample from LBGMW-17 contained TCE at a concentration well above the proposed RGWVC, proposed I/C GWVC, SWPC and AALC (Table 27). The concentration of TCE detected in the ground water sample from well LBGMW-18 exceeded the proposed RGWVC. No TCE was detected in the water sample from LBGMW-19, although the TCE degradation product vinyl chloride was detected at a concentration above the I/C GWVC.

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In June 2004, LBG collected soil and ground water samples from seven Geoprobe® borings (GP-21 through GP-27) completed within and adjacent to the loading dock to assess if a TCE source was possibly present in the soils beneath the loading dock driveway and to determine the extent of CVOCs in ground water. TCE was not identified in soil samples from the borings at concentrations representing a residual source or concentrations above the applicable remediation criteria (Table 21 and Plate 5); however, significant concentrations of TCE, ranging from 34 ug/L at GP-22 to 1,800 ug/L at GP-24, were detected in the ground water samples. Ground water samples collected around the same time period from monitoring wells LBGMW-17 and LBGMW-18 contained TCE at concentrations above the applicable remediation standards; however, the results indicate a general downward trend when compared with previously collected samples (Table 27). As depicted on figure 7, the highest concentrations of TCE detected in ground water up to that point in the phased investigation (June 2004) were found in LBGMW-17.

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The TCE source-area investigation then focused on the interior of Building No. 1A, including a potential trench drain in Building No. 1B immediately upgradient of the loading dock basin. In October 2004, LBG collected six soil-vapor samples (VP-40 through VP-45) along the northeastern wall of Building Nos. 1A and 1B (including the area of the drain) and the northern wall of Building No. 2. The soil-vapor samples contained low concentrations of TCE, with the exception of samples VP-42 and VP-43, where slightly higher concentrations of TCE were detected (Table 30). The concentration of TCE at VP-42 exceeded the proposed RSVVC.

In November 2004, LBG collected soil and ground water samples from six Geoprobe® borings (GP-34 through 39) completed within and adjacent to the loading dock. TCE was not detected in soil samples from these borings at concentrations likely to represent a residual VOC source or at concentrations above the remediation criteria (Table 21 and Plate 6); however, significant concentrations of TCE, ranging from 22 ug/L at GP-39 to 3,000 ug/L at GP-27, were detected in the ground water samples from these borings (Table 27). As depicted on figure 7, LBGMW-17 contained the highest concentration of TCE detected in ground water samples collected up to that point in the phased investigation (November 2004).

To further define the extent of TCE in ground water, LBG installed four additional monitoring wells (LBGMW-25 through LBGMW-28) within the loading dock area in November 2004 and completed a synoptic ground water sampling event of wells located in AEI No. 16. The ground water quality results suggested that the monitoring well network was sufficient to characterize the extent of TCE in ground water. In addition, the concentrations of TCE in monitoring well LBGMW-17 continued to show a downward trend (Table 27).

Between March 2005 and April 2007, LBG completed additional, phased Geoprobe® investigation beneath and adjacent to Building No.1 and on two adjacent properties to the southwest to locate a TCE source and to determine the upgradient extent of TCE in ground water. The investigation included the advancement of 56 Geoprobe® borings and the collection of soil and ground water samples. The 44 onsite borings (borings GP-40 through GP-43; GP-48 through GP-83; and GP-96 through GP-97) were advanced beneath the concrete floor in Building No.1A, beneath two exterior drainage pipes connected to former floor drains from the second floor and adjacent to and immediately northeast and southwest of Building No. 1A. The offsite borings were advanced at the vacant CAF Associates property (GP-84 through GP-90), located east of the North Main Street and Johnson Street intersection, and along the Connecticut Department of Transportation (DOT) railroad property (GP-91 through GP-95), located immediately southwest of the site.

Trace levels of TCE were detected in the majority of soil samples (Table 21 and Plate 6). The concentrations of TCE in 15 soil samples collected from 13 borings (GP-42, GP-48, GP-49, GP-61, GP-63, GP-64A, GP-72, GP-73, GP-76, GP-81, GP-92, GP-97 and LBGMW-34) were greater than the numerical standards for GB PMC, but only three samples from three of the borings (GP-64A, GP-73 and GP-76) were collected from above the seasonal high water table and, therefore, exceed the GB PMC. Four soil samples from three borings (GP-64A, GP-76 and LBGMW-34) contained TCE at concentrations above the RDEC. The I/C DEC was exceeded at two of these locations (GP-76 and LBGMW-34). Concentrations of TCE detected in vadose-zone soils beneath the building were all well below the GB PMC of 1 ppm. In addition, the highest concentration of TCE identified in soil below the water table beneath the building was 2.30 ppm at a depth of 8 to 9.5 ft bg (on top of clay) at boring GP-49.

TCE detected in soil samples from borings GP-64A, GP-73 and GP-76 at concentrations above the GB PMC suggest a possible shallow source area for the TCE impacts along the southwestern fence line A semi-translucent, non-aqueous film was observed on a clay surface, encountered at approximately 8 ft bg at boring location GP-72, suggesting this location as the likely source area for TCE impacts to groundwater traced from the area of the Loading Dock catch basin. The soil boring investigation did not confirm a source of TCE at tested locations on the CAF Associates and DOT railroad properties.

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In July 2006, LBG completed a GPR survey outside Building 1A, between the Main Building and the property-boundary fence to locate buried structures that could present a potential source of VOCs. The survey identified an anomaly interpreted to be sub-grade piping for the water-supply system to the building. No other anomalies were found.

The ground water grab samples from the boreholes completed in AEI No. 16 contained TCE at concentrations ranging from non-detect at several of the off site borings to 72,000 ug/L at GP-76. TCE concentrations were above the proposed RGWVC at 51 locations, the proposed I/C GWVC at 44 locations, the SWPC at 16 locations and the AALC at 38 locations (Table 27). Six ground water grab samples collected from beneath the building (GP-42, GP-43, GP-48, GP-49, GP-53 and GP-54) contained TCE at concentrations above the Significant Environmental Hazard notification thresholds (30 times the I/C GWVC). In February 2006, LBG completed a soil-vapor survey beneath Building 1A to assess the potential for impacts to indoor air quality from the CVOCs in ground water. The laboratory results identified two locations (VP-47 and VP-49) where soil vapor beneath Building No. 1A contained TCE at concentrations above the proposed RSVVC and I/C SVVC (Table 30). Based on these results, LBG installed an SSDS beneath areas of Building No.1 A. A discussion of the SSDS is presented in Section 2.4.1 of this report.

Concentrations of TCE detected in ground water grab samples collected along the fence line (GP-72 and GP-76) suggest a potential for DNAPL; although no free-phase layer of DNAPL was encountered in any of the soil borings or ground water monitoring wells. The occurrence of elevated concentrations of TCE in ground water grab samples from GP-42, GP-48 and GP-49 (located inside Building No. 1A) suggests that DNAPL may have migrated from the fence line area and settled beneath the building. The soil boring data do not indicate a source of DNAPL originating within Building No. 1A. In summary, despite detecting elevated concentrations of TCE in ground water grab samples collected from borings advanced beneath Building No. 1A, no DNAPL was observed in either soil or ground water beneath the building. It is possible that TCE sorbed onto suspended solids in ground water grab samples collected from the borings artificially elevated 'dissolved' TCE concentrations, suggesting the existence of DNAPL and a free-phase product layer, when in fact neither has been found to exist beneath Building No. 1A.

In April 2007, following the completion of the phased Geoprobe® investigation, LBG supervised the installation of six additional ground water monitoring wells (LBGMW-30 through LBGMW-35) to further evaluate the extent of the TCE in ground water in AEI No. 16.

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Analytical results for ground water samples obtained from these wells in May 2007 indicate significantly lower concentrations of TCE than were initially detected in the ground water grab samples, some of which were collected two-to-three years earlier (Table 27). To confirm the May 2007 ground water quality results, LBG resampled monitoring wells LBGMW-17, 25, 28, 31 and 34 in July 2007. The laboratory results for the July 2007 samples confirmed the decreased concentrations of TCE in ground water. The discrepancy between the analytical results for ground water grab samples from soil borings and ground water samples from monitoring wells may be attributable to several factors, including but not limited to: 1) turbidity in the original grab samples (CVOCs tend to partition more strongly to soil than water),; 2) seasonal variations in ground-water elevations resulting in greater sample dilution; and 3) degradation of TCE by natural attenuation processes (i.e., dispersion, sorption, and/or chemical and biological degradation). These natural attenuating mechanisms may have reduced concentrations of dissolved VOCs in the intervening three years between collection of the grab samples and well samples.

The finding of TCE at relatively high concentrations in near-surface soils along the southwestern fence line is consistent with a surface spill of TCE or TCE-containing waste. Some of the released VOC would be expected to volatilize from the surface materials and shallow soil. Transport of the TCE adsorbed to the shallow, unsaturated soils would be generally downward via infiltration and leaching. As TCE migrates downward through the unsaturated soils, it would be expected to attenuate due to volatilization, adsorption and degradation. If the release volume was sufficient, the TCE could migrate downward to the ground water and possibly below the water table as DNAPL. Under such circumstances, it could migrate through the water column and settle on impermeable strata, as may be the case at GP-72 and GP-76. Lateral migration of DNAPL may be controlled by the topography of the impermeable layer, in this case, the clay unit identified beneath this area. TCE would also enter into a dissolved phase in ground water and migrate in the general direction of ground water flow, which is consistent with the current distribution of CVOCs in ground water (Figure 7 and Plate 6). It is expected however that concentrations of dissolved TCE would continue to attenuate in the ground water due to a variety of chemical and biological processes, including dispersion, sorption and chemical and biological degradation. The occurrence of these processes is supported by a decrease in TCE in ground water further east of the likely source area, and the increased concentrations of vinyl chloride

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versus TCE in several downgradient monitoring wells. Evidence of chemical degradation is also discussed in the April 13, 2004 Microseeps MNA report (Appendix V).

Investigation has confirmed a possible release of TCE along the southwestern property boundary, west of Building No. 1A. Dissolved-phase TCE and its breakdown CVOCs have migrated to the east, under Building No. 1A and in the vicinity of the loading dock area. There is no information to indicate the timing of this potential TCE release or any activity associated with that potential release; although it does appear to have been surficial only. The concentrations of TCE in soil in the source area and CVOCs in ground water downgradient of the source area exceed applicable remediation standards. Data show that water quality in AEI No. 16 is improving as a result of natural attenuation.

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6.2.5 AEI No. 17: Boiler Room

The boiler room building is a 'T'-shaped building located east of the Main Building. It appears to have been part of the original building construction at the site, and is included on the 1901 Sanborn map. The boiler room is the southern portion of the building, southwest of the smokestack and north of the railroad spur. (Note that the earliest Sanborn map reference to boilers in the southern portion of the boiler room building was 1950). Based upon Sanborn map notations, other activities were conducted in the building portions north of the boiler room, including possible engine testing, carpentry and storage.

It is presumed that coal was used as boiler fuel during the early years of boiler room operations, although a 'crude oil' tank is shown on the Sanborn maps (circa 1913 and 1924) to the west of the northern end of the Boiler Building (some distance from the boiler room). This tank area was investigated as AEI No. 3/UST-2. Historical references indicate the railroad spur extended from the main rail line to the area of the boiler room as early as 1901, presumably to ferry coal to the boilers. AST-2 (AEI No. 7), located east of the boiler room, appears to have been installed sometime between 1934 and 1941. The AST is shown on a 1941 aerial photograph provided in Appendix I. Oil may have been the primary fuel after this time, and AST-1 (AEI No. 8) located outside the southern corner of the Boiler Building, may have also been used as part of the boiler-fuel feed system or used to heat the northern portion of the boiler building (Building No.6).

LBG completed GPR surveys, visual reconnaissance and soil and ground water sampling within the area of this structure to determine potential impacts related to possible historical releases of fuel oil reportedly used to fuel the boiler. Several pipes and other features were observed within and in the vicinity of the boiler room and were investigated, as follows:

- Inspection of a manway located outside the southern corner of the boiler room building identified two pipes at the base of the structure. The depth of the manway prevented tracing the pipes with GPR or pipe-tracing methods. Water (source unknown) was observed to be flowing in the bottom of the manway.

- A pipe exiting the above ground storage tank (AST-2), located outside the Boiler Room, was traced underground to the southeastern wall of the Boiler Room using the signal-broadcast method. A subsequent GPR survey of this area identified anomalies that were interpreted to confirm the location of the buried pipe. This is presumed to have been a boiler-fuel supply or return pipe. An open pit is visible in the floor inside the southern corner of the Boiler Room, near the location where the subsurface pipe traced from AST-2 is projected to enter the building. No pipes were observed in the pit.

- Two catch basins are visible inside the southeastern portion of the Boiler Room. The GPR survey identified anomalies interpreted to be a potential pipe connecting these two catch basins and a possible pipe exiting the south side of the southwestern-most catch basin.

- Interior inspection of the boiler room floor revealed no cracks or other surface defects that could act as a pathway for migration of fuel oil to the surface.

- It should be noted that during the time of GPR investigation, the tenant in the boiler room was conducting auto body work and other automotive repairs.

Monitoring well LBGMW-22 was installed downgradient of the boiler room to investigate the potential for a fuel oil release from the boiler room. Soil samples collected from the monitoring well boring were analyzed for VOCs, PAHs, ETPH and metals. Ground water samples collected from the monitoring well were analyzed for VOCs, PAHs and metals.

CVOCs were detected in the both the soil and ground water samples collected from monitoring well LBGMW-22 at concentrations below applicable remediation criteria (Tables 22 and 27). The detected CVOCs are more likely associated with general site-wide conditions rather than activities conducted in the boiler room. The ground water sample collected from LBGMW-22 also contained MTBE at a concentration below applicable remediation criteria.

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MTBE is not expected to have been present in fuel oils at the time that the boiler room was in use by Noiseless/Remington Rand (pre 1970-1971). The presence of MTBE in the ground water sample is more likely associated with more recent, post 1984 (approximate year MTBE was globally introduced as a gasoline additive) activities, such as the automotive repair operations ongoing at the time of the investigation or other recent petroleum releases, rather than previous boiler room operations.

ETPH, a common indicator of fuel oil release, was not detected at a significant concentration in the soil sample collected from the boring for LBGMW-22 and VHB boring B-40, but was detected in samples from borings B-9, B-37, and B-38, also downgradient of the boiler room (Table 22). ETPH was not detected at or above laboratory detection limits in boring B-39. Based upon the relative locations of these borings to the boiler room and the AST-2 piping, it appears more likely that releases have occurred from the underground piping associated with AEI No. 7/AST-2 or AST-2 itself (discussed separately in this report).

The most recent ground water sample results for LBGMW-22 from May 2007 indicate that copper and zinc were detected at concentrations above the SWPC and CALC (Table 29). Nickel was also detected at a concentration above the CALC. The presence of nickel and copper may be attributable to the cinder fill that has been identified in the vicinity of and potentially beneath the Boiler Building (see Sections 6.2.1.1 and 6.2.1.3 of this report). Zinc has been detected at monitioring well MW-11, located along the upgradient property line at higher concentrations than those detected in LBGMW-22 (see Section 6.2.4 of this report). Therefore, the zinc in LBGMW-22 is likely attributed to off-site, upgradient sources, including activities on nearby industrial/commercial properties and/or the adjacent railroad property.

Investigations found no evidence of a release of petroleum from the Boiler Room building. Petroleum impacts east of the boiler room are likely associated with releases from the AST systems. The Boiler Room building was operated by numerous parties since its construction circa 1897.

6.2.6 AEI No. 18: Potential Former Septic Field

The potential for a former septic field was first considered by VHB based upon observation of a "dark black organic septic sludge" at a depth of approximately 8 to 10 ft bg in VHB boring B-25 in the area north of Building No. 6. The organic material was encountered at approximately 4 feet below the seasonal high water table, and could have been paleo-wetland deposits.

A VHB Revised Scope of Work, dated August 9, 2001, included a figure showing the approximate location of a site septic system north of Building No. 6 and east of the Quonset Building (Appendix X). The figure, labeled "Remington Office Machines", suggest the drawing depicts site conditions between approximately 1951 and 1971. In September 2003, the CTDEP requested that LBG's investigation evaluate the potential for a former septic system in this area. Note that the septic system location depicted on the map appeared to be within the ROW Disposal Area (AEI No. 1).

COCs associated with a septic system may include liquid wastes potentially produced by likely historical operations, such as petroleum hydrocarbons, metals in plating or cleaning wastes and solvents. Discharge from the septic system would be released to the environment from a septic tank or leaching galleries. Organic and inorganic constituents in the septic discharge may accumulate in soil and/or migrate to and move laterally in ground water. Solvents could potentially migrate downward through ground water-saturated sediment as DNAPL.

LBG completed visual inspections, GPR survey, dye-tracer study and excavated test pits in the potential former septic field area, identified on the previously referenced figure.

Visual inspections of the area identified two manways containing pipes. A GPR survey confirmed that the northernmost manway was connected via piping to a surface drain located beneath a transformer between Building 6 and the Quonset Building. The dye-tracer study did not identify connections between site facilities (e.g., sinks, drains, toilets, et cetera.) and the identified manways. The dye-tracer study also did not indicate a connection between the tested lavatories and another piping system located north of the potential former septic system area. A water sample was collected from the pipe for laboratory analysis for VOCs, PAHs and total metals. Zinc was detected in the water sample at a concentration exceeding the SWPC and CALC. All other detected compounds were at concentrations below applicable remediation criteria.

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In March 2004, test pits LBGTP-1, LBGTP-2 and LBGTP-3 were excavated to investigate the potential former septic field area. The test pits did not encounter subsurface structures or materials indicative of a septic system. Soil samples collected from the base of two of the excavations were submitted for laboratory analysis for VOCs, PAHs, ETPH and metals. The sample collected from LBGTP-2 was analyzed for both trivalent and hexavalent chromium and leachable lead, barium and chromium by the SPLP method.

Soil samples collected from test pits LBGTP-1 and LBGTP-2 contained ETPH at concentrations exceeding the RDEC, I/C DEC and GB PMC (Table 23). The samples were likely collected below the seasonal high water table so the GB PMC would not apply. The sample collected from LBGTP-2 also contained methylene chloride and lead at concentrations exceeding the GB PMC and the RDEC, respectively. PAHs were also detected in the soil sample from LBGTP-2 at concentrations below remediation criteria. Barium, total chromium, mercury and several AVOCs were also detected at elevated concentrations, but below applicable remediation criteria. Hexavalent chromium and leachable metals were not detected at

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concentrations above laboratory detection limits. All other detected compounds in soil samples collected from the test pits were below applicable remediation criteria.

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In June 2004, borings GP-1 through GP-5 were drilled to further investigate the potential former septic field area. Soil samples were collected at two-foot intervals and submitted to the laboratory for analysis for total lead and total chromium. The sample collected from the interval displaying the highest PID reading was also analyzed for VOCs and ETPH. The laboratory results for total metals were reviewed. Subsequently, the sample interval containing the highest concentration of total metals was also analyzed for leachable lead and chromium by the SPLP method. Several sample intervals were also analyzed for trivalent and hexavalent chromium.

VOCs were detected in all of the soil-quality samples that were collected from these borings (Table 23). Only three samples contained VOCs at concentrations potentially above the GB PMC, but all three were collected at depths believed to be below the seasonal high water table. ETPH was detected in all of the soil samples collected from these borings at concentrations exceeding the RDEC. The samples collected from GP-1 through GP-4 contained ETPH at concentrations exceeding the I/C DEC.

Only one sample from this area (GP-5, 2 to 4 ft bg) was collected above the estimated seasonal high water table of 5 ft bg. AVOCs, methylene chloride, and ETPH were present. The concentration of ETPH exceeded the RDEC. A shallow soil sample collected from an upgradient soil boring installed by VHB (B-4) at the northwestern end of the potential former septic field area contained ETPH at a concentration exceeding the RDEC, I/C DEC and the GB PMC.

Total lead was detected in the soil sample collected from 2 to 4 ft bg in GP-3 at a concentration above the RDEC and the I/C DEC (Table 23). SPLP lead was not detected in this sample at a concentration at or above laboratory detection limits. The potential former septic field area exists within the ROW Disposal Area, AEI No. 1. Laboratory results for other samples collected in AEI No. 1 indicate that lead is also associated with the fill material. All other compounds detected in the soil samples collected from these borings were at concentrations below applicable remediation criteria.

Monitoring well LBGMW-23 was installed downgradient of the potential former septic field area. The soil sample collected from the boring for LBGMW-23 was submitted for VOCs analysis. The ground water samples collected from LBGMW-23 were also analyzed for VOCs. Several ground water samples from this area were also analyzed for PAHs and metals.

Trace concentrations of CVOCs (including methylene chloride) were detected in the soil sample from LBGMW-23 (Table 23). CVOCs and MTBE were detected in ground water samples collected from LBGMW-23 at concentrations below applicable remediation criteria. Zinc was detected in a ground water sample collected from this well at a concentration exceeding the SWPC and CALC (Table 29). The site-wide ground water quality data suggest that background concentrations of zinc are relatively high and may not be related to the fill or septic system use. Nickel was also detected at a concentration above the CALC, but below the SWPC. SVOCs were not detected in the ground water samples collected from this well at concentrations at or above laboratory detection limits (Table 29).

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Evidence for the existence of a sanitary system was not confirmed through visual surface inspection, GPR data, the dye-tracer study, test pits and borings completed in this area. Similarly, investigation did not find evidence of a release from a septic system in AEI No. 18. The presence of VOCs and ETPH in soils potentially above the water table in GP-3 and GP-5 indicates a possible localized source for VOCs and ETPH, likely related to the ROW Disposal Area or a surface release.

6.2.7 AEI No. 19: Former Waste Storage Building

The reported FWSB is located at the southern end of the site, southeast of the Main Building and adjacent to the railroad spur. Based on a review of available Sanborn maps, the building was erected sometime between 1924 and 1950. The building is constructed of cinder-block walls and a concrete floor and divided into two rooms by a cinder-block wall with one window. Each room is accessed through a separate doorway located along the western wall of the structure. Several windows, now boarded up, are present on all four exterior walls.

The SSESI Phase I ESA made the initial reference that the building was used for waste storage. An inspection of the interior of the building completed during the Phase I identified several containers including: one 5-gallon bottle of hydrochloric acid and several unmarked drums and pails reported to contain grease, oil and/or other chemicals. A visual inspection of the interior of the building by LBG in October 2002 confirmed the presence of these containers. Additional inspection indicated that the interior floor was competent and free of cracks or visible evidence of defects and no floor drains were identified. Minor staining was observed on several areas of the floor. A metal pipe (approximately 4 inches in diameter) protrudes from the northern corner of the western wall, bends 90-degrees and enters the ground. In addition, three smaller-diameter metal pipes (approximately 1 to 2-inches in diameter) exit the central portion of the western wall and enter a buried vault structure. Geophysical survey was unable to trace the subsurface routing of these pipes.

In February 2003, LBG initiated a soil and ground water investigation to determine if releases associated with the FWSB had occurred. The investigation included the advancement of one soil boring east of the FWSB that was completed as monitoring well LBGMW-8 and collection of soil and ground water samples. The shallow soil sample (2-4 ft bg) from the boring for LBGMW-8 contained TCE and arsenic at concentrations exceeding the GB PMC, and the RDEC and I/C DEC, respectively (Table 24). The ground water sample collected from LBGMW-8 in February 2003 contained 36 ug/L of TCE, which is above the proposed RGWVC of 27 ug/L (Table 27). The ground water sample did not contain arsenic at a concentration above the laboratory reporting limit (Table 29).

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In March 2004, four additional soil borings (LBGWS-1, LBGWS-2, LBGWS-3 and LBGWS-4) were drilled adjacent to the FWSB, to further define the extent of TCE and arsenic in the shallow soil and ground water and determine if the release was related to the FWSB. One of the borings was completed as monitoring well LBGMW-24. Also in March 2004, one additional monitoring well LBGMW-21 was installed downgradient of LBGMW-8 to assess the extent of TCE-impacted ground water. The results of the additional investigation identified TCE and arsenic in all soil samples analyzed for these parameters at concentrations below the applicable remediation criteria (Table 24). The laboratory results for ground water samples collected from the new and existing wells in March 2004 indicated that TCE was detected in all wells. The concentrations of TCE in LBGMW-8 (34 ug/L) and LBGMW-24 (31 ug/L) were above the proposed RGWVC (Table 27). Follow-up ground water sampling in June 2004 confirmed these results.

The laboratory results for ground water samples collected in November/December 2004 indicated an increased concentration of TCE in LBGMW-24 and concentrations consistent with past data in LBGMW-8 and downgradient monitoring well LBGMW-21. The most recent ground water sampling results from April 2007 indicate that the concentration of TCE in all

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wells located near the FWSB has declined to well below the proposed RGWVC (Table 27). Several metals, likely associated with the industrial fill, were also detected in the ground water down gradient of the FWSB at concentrations above the applicable remediation criteria (see Sections 6.2.1.2 and 6.2.13 of this report).

During the course of investigation, LBG was provided with a 1940s-era map of the site by the Middletown Water Department that indicated that the FWSB was not used for the storage of wastes, but was, in fact, a former propane gas house (Appendix XI). The map also indicates that the cradles located to the southwest of the FWSB were used for propane tanks and not oil tanks, as originally believed. The small-diameter pipes identified along the western wall of the FWSB were likely used to transfer propane into the facility. The larger-diameter pipe that enters the building along the northwestern corner was likely part of the building fire-suppression system.

The observed concentrations of TCE in soil and ground water near the FWSB, suggest DNAPL is not present in this area. It is more likely that small surface releases occurred, which were subject to volatilization, but were also transported from the shallow soils to the underlying ground water via precipitation, infiltration and leaching. Vertical attenuation is suggested by a decrease in TCE concentration in the deeper soil sample collected from 4 to 6 ft bg in the boring for LBGMW-8. When dissolved-phase TCE in infiltrating water reaches the water table it would be expected to migrate in the general direction of ground water flow, as is observed at this location. It is expected that concentrations of TCE would attenuate in the ground water with distance from the source due to a variety of chemical and biological processes, including dispersion, sorption or chemical degradation. This is supported by the most recent ground water quality data, which indicate the concentrations of TCE in ground water have decreased to well below the applicable remediation criteria. Further evidence of the potential for degradation of TCE is discussed in the April 13, 2004 Microseeps MNA report (Appendix V). The decrease of TCE in ground water may also be linked to attenuation of the shallow TCE source in soil, which may be evidence of recent rather than an old release.

Investigation has identified a potential release of TCE to shallow soils east of the FWSB. The concentration of TCE in shallow soils exceeds the GB PMC. The most recent ground water quality shows TCE concentrations have attenuated and do not require remediation. This historical release may be unrelated to Noiseless/Remington Rand operations conducted in the

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FWSB. This conclusion is based primarily on the historical fact (Middletown Water Department Map – circa 1940) that Noiseless/Remington Rand used the building for propane gas distribution and that visual inspection of the FWSB by LBG found waste storage in the building to have the appearance of being the result of recent activities.

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6.2.8 AEI No. 20: Floor Drains

Visual inspection of building floors were conducted to locate floor drains and other surface features that could act as a pathway for migration of released fluids to the subsurface. Impact to soil is possible via leakage from the piping or the drain sumps. Given a sufficient volume of leakage from the drainage system, COCs can move or be leached to deeper soil and/or the underlying ground water. Drain discharges directed to the land surface, dry wells or septic systems provide additional pathways for release to the subsurface.

Floor drains, sumps, catch basins and/or other related surface features were identified in several buildings (Buildings 2, 4, 5, 7, 9B, 10, 11A, 11B, 11C, 11D and 12). Yard drains were identified throughout the site, primarily in paved/roadway areas. GPR surveys, beacon tracing, induction and signal-broadcast methods were used to identify subsurface piping associated with the floor drains. Identified subsurface structures were further investigated by soil, soil-vapor and ground water sampling. The floor drain investigations are described below on a building-by-building basis. Locations of the features discussed in the following sections are represented on (Plate 2).

6.2.8.1 Building No. 2

An L-shaped concrete patch was identified in the northwest corner of Building No. 2. The concrete patch intersects the northwestern wall, approximately 7 feet southwest of the northern corner of the building. A possible floor drain and a small hole were visible in the floor adjacent to the concrete patch. A pipe was also visible exiting the floor along the northeastern wall of the building. The GPR survey conducted in this area identified an anomaly beneath a portion of the concrete patch area, interpreted to be a potential underground pipe.

Two test borings (LBGB2-1 and LBGB2-2) were drilled in the area of concrete patching inside the northern corner of Building No. 2. Soil samples collected from the test borings were submitted for laboratory analysis for VOCs, ETPH and the RCRA 8 metals. The laboratory results indicate that VOCs and metals were not detected in the soil samples at concentrations exceeding applicable remediation criteria (Table 25). ETPH was detected in the unsaturated soil samples from both borings at concentrations that exceed the RDEC. In addition, ETPH was detected in the samples collected from below the water table in each boring at concentrations exceeding both the RDEC and the I/C DEC.

Monitoring well LBGMW-2 was installed outside Building No. 2, downgradient of the observed subsurface structures. Two soil samples collected from below the water table in the test boring for LBGMW-2 were submitted for laboratory analysis for VOCs, PAHs, ETPH and the RCRA 8 metals.

VOCs, PAHs and the RCRA 8 metals were not detected in either of the soil samples at concentrations exceeding applicable remediation criteria (Table 25). ETPH was detected in both of the soil samples at concentrations above the RDEC and I/C DEC.

Ground water samples collected from LBGMW-2 during four sampling events between February 2003 and May 2007 were submitted for laboratory analysis for VOCs (4 events), PAHs (2 events) and RCRA 8 metals (1 event). Laboratory results indicate that TCE was detected at concentrations exceeding the proposed RGWVC (3 samples) and the proposed I/C GWVC (1 sample) (Table 27). The ground water quality results show a pattern of decreasing VOC concentrations. PAHs and the RCRA 8 metals were not detected at concentrations at or above laboratory detection limits in the samples analyzed for these parameters.

VHB collected environmental samples from borings B-51 and B-58, and well B-58/MW-18 in the area of Building No. 2. Laboratory data for soil collected from below the water table in B-51 indicate that VOCs were not detected at or above laboratory detection limits (Table 25). Anthracene was the only PAH compound detected. Soil from B-51 also contained ETPH at a concentration exceeding the RDEC and I/C DEC.

Ground water samples collected from B-36/MW-16 and B-58/MW-18 in September 1998 contained zinc at concentrations above the CALC (Table 29). The concentration of zinc in B-58/MW-18 also exceeded the SWPC. Zinc has been detected at monitioring well MW-11, located along the upgradient property line at higher concentrations than those detected in LBGMW-22 (see Section 6.2.4 of this report). Therefore, the zinc in LBGMW_22 is likely attributed to off-site, upgradient sources, including activities on nearby industrial/commercial properties and/or the adjacent railroad property.

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. Investigation found evidence of a potential release from the subsurface features identified in the northwest corner of Building No. 2.

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TPH was also detected, which provides an indication of the presence of petroleum constituents in ground water, but there is no applicable remediation standard for TPH in ground water in GB areas. Trace concentrations of AVOCs and TCE were detected, at concentrations below applicable criteria.

Investigation found evidence of a potential petroleum release from the subsurface features identified in the northwest corner of Building No. 2. Investigation did not confirm the source area or the relative timing of the release. Sanborn maps indicate that Building No. 2 was used for industrial activities, including grinding and hardening, since its construction sometime between 1897 and 1900. There is no direct link between the identified release and Noiseless/Remington Rand operations. An additional discussion of both soil and ground water impacts potentially related to the drainage features in this building are provided in the discussion of AEI No. 12: Suspect UST-5, in section 6.2.2 of this report.

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6.2.8.2 Building No. 4

Concrete patching is visible throughout a major portion of the concrete floor in Building No. 4. The concrete patches spanned the length and width of the building and intersect each other at right angles. The GPR survey identified anomalies interpreted to be potential underground piping beneath a patched portion of the floor in the northeastern end of Building No. 4. A relatively large concrete patch is also visible on the floor in the southern corner of the building. The GPR survey indicated a marked difference between the soil immediately beneath the patch, interpreted to be backfill material, and the surrounding soils. Investigation did not find connection between potential subsurface features identified by GPR and visible surface features.

Monitoring well LBGMW-20 was installed outside of Building No. 4 to assess water quality downgradient of the GPR anomalies identified inside the building. Soil samples collected from below the water table in the boring for LBGMW-20 were submitted for laboratory analysis for VOCs, PAHs, ETPH and the RCRA 8 metals. Several AVOCs, PAHs and metals were detected in the soil samples at concentrations below the RDEC or I/C DEC (Table 25). ETPH was detected in the soil sample at a concentration exceeding the RDEC and I/C DEC.

Ground water samples collected from LBGMW-20 during four sampling events between March 2003 and May 2007 were submitted for laboratory analysis for VOCs (3 rounds), PAHs (3 rounds), RCRA 8 metals (1 round) and 13 PPM (1 round). AVOCs (2 rounds) and TCE (1 round) were detected at trace concentrations (Table 27). The two AVOCs, n-buytlbenzene and sec-buytlbenzene, were detected in the water samples collected in March 2004 at concentrations above the AALC. These AVOCs were not detected during subsequent sampling events completed in November 2004 and May 2007. Phenanthrene was detected in the March 2004 ground water samples at a concentration exceeding the SWPC, but was not detected at concentrations above laboratory detection limits in the subsequent sampling rounds (Table 28). Naphthalene, 1-methylnaphthalene, and 2-methylnaphthalene were also detected in the March 2004 ground water samples at concentrations above the AALC. Subsequent samples collected from LBGMW-20 in November 2004 contained 1-methylnaphthalene and 2-methylnaphthalene at concentrations above the AALC. The most recent ground water sample results from May 2007 indicate that PAHs were not detected above the laboratory detection limits. Nickel was detected during the most recent sampling event in May 2007 at a concentration above the CALC, but well below the SWPC (Table 29).

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The investigation found no definitive evidence of a release from the GPR anomalies identified in Building No. 4.

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6.2.8.3 Building No. 5

The investigation, analytical results, findings, and conclusions for the Building No. 5 area are discussed in section 6.2.9.

6.2.8.4 Building No. 7 (Boiler Room)

The investigation, analytical results, findings and conclusions for the Boiler Room area are discussed in section 6.2.5.

6.2.8.5 Building No. 9B

One floor drain is visible in the northwestern portion of Building No. 9B. The GPR survey identified anomalies interpreted to be two potential buried pipes in the vicinity of the drain. One of the pipes appears to exit the drain in a westerly direction and was traced for approximately three feet. The second pipe appears to exit the drain in a northeasterly direction and continues to the northeastern wall of the building. The GPR survey conducted outside the northern end of Building No. 9B did not identify any anomalies.

Monitoring well LBGMW-3 was installed outside of Building No. 9 to assess soil and ground water quality downgradient of the floor drain and potential buried pipes identified inside the building. A soil sample collected from the boring for LBGMW-3 was submitted for laboratory analysis for VOCs, PAHs, ETPH and the RCRA 8 metals. This soil sample collected from 6 to 8 ft bg, had a PID reading of 399 ppm, however, VOCs were not detected in this sample at concentrations above laboratory detection limits (Table 25). The soil sample did contain phenanthrene and ETPH at trace concentrations, well below applicable remediation criteria. Several RCRA 8 metals were detected in the soil sample at concentrations below the applicable remediation criteria.

Ground water samples collected from LBGMW-3 during sampling events in February 2003 and March 2004 were submitted for laboratory analysis for VOCs (2 rounds), PAHs (2 rounds), and RCRA 8 metals (1 round). Several AVOCs and metals were detected in the ground-water samples at trace concentrations, well below the applicable remediation criteria (Tables 27 and 29). PAHs were not detected at or above laboratory detection limits.

The investigation did not find evidence of a release from the floor drain and potential buried pipes identified in Building No. 9B.

6.2.8.6 Building No. 10

A catch basin is visible outside the southeastern corner of Building No. 10. Three floor drains are located along the interior northeastern wall. The GPR survey did not identify anomalies in the vicinity of the catch basin and floor drains.

A closet, reported to contain components of a fire-suppression system, is present in the northern corner of the building. A large metal plate in the floor immediately adjacent to the closet could not be accessed for inspection. A second metal plate in the floor that extends roughly 8 feet northwest from the southeastern wall also could not be accessed for inspection.

A plywood wall divides the space inside Building No. 10. A large sump is visible in the floor in the northeastern half of the building, along the northeastern side of the wall. Three pipes are visible in the sump. The pipe exiting the eastern corner of the sump appears to continue toward the center of the northeastern room, possibly connecting with the floor drain located in the center of the northeastern wall. The pipe exiting the southeast side of the sump was traced for approximately three feet to the southeast. The pipe exiting the west side of the sump is connected to a concrete vault in the western corner of Building No. 10. A pipe that is visible in the southwestern wall of this vault was traced beneath the wall separating Building Nos. 10 and 1C and appeared to terminate beneath a cross-shaped concrete patch in Building No.1C.

Samples of accumulated solids from the bottom of the sump identified in the northeastern half of the building (labeled B-10 Front) and the concrete vault located in the western corner of the building (labeled B-10 Rear) were collected and submitted for laboratory analysis for VOCs, ETPH and the RCRA 8 metals. Several VOCs were detected at concentrations below remediation standards (Table 25). ETPH was detected in both of the samples at concentrations exceeding the RDEC, the I/C DEC and GB PMC. Lead was detected in the sump sample (B-10 Front) at a concentration exceeding the RDEC and I/C DEC. No other metals were detected at concentrations exceeding remediation standards, although the concentrations of chromium selenium, mercury and barium appeared elevated as compared to other site samples. It should be noted that the remediation standards are not directly applicable to solids accumulated in a sump, but were used to evaluate potential impacts of a release from the structures.

Monitoring well LBGMW-5 was installed outside of Building No. 10 to assess soil and ground water quality downgradient of the exterior catch basin and interior metal plate, vault and subgrade piping. Soil samples collected from the boring for LBGMW-5 were submitted for laboratory analysis for VOCs, PAHs, ETPH and the RCRA 8 metals. The soil sample contained trace levels of AVOCs and TCE, and ETPH and chromium were detected; all reported concentrations were below applicable remediation criteria (Table 25).

Ground water samples collected from LBGMW-5 during four sampling events between February 2003 and May 2007 were submitted for laboratory analysis for VOCs (4 rounds), PAHs (3 rounds), RCRA 8 metals (1 round), and 13 PPM (1 round). The ground water samples contained TCE (3 rounds) and MTBE (1 round) at concentrations well below applicable remediation criteria (Table 27). Cadmium and barium were present in the ground water samples at concentrations well below the applicable remediation criteria (Table 29). PAHs were not detected in the ground water samples.

Although accumulated solids in the sump and concrete vault contained ETPH and lead at concentrations that exceeded remediation standards for soil, the investigation found no evidence of a release from the sump, the vault or other identified structures inside or outside of Building No. 10.

6.2.8.7 Building Nos. 11A, 11B, 11C and 11D

Building No. 11 is comprised of two separate, but connected structures that are subdivided into four distinct areas (Plate 2). For the purpose of this investigation, these areas are referred to as Building Nos. 11A, 11B, 11C and 11D. Building Nos. 11A, 11B and 11C comprise the northern structure, and Building No. 11D comprises the southern structure. Building Nos. 11A and 11B are subdivided by wooden partition walls; Building No. 11C is defined by a cinder-block partition wall. The investigations in these areas are presented separately below.

A floor drain is visible in the southeastern portion the Building No. 11A and a small hole is visible in the floor near the center of the building. The GPR survey identified anomalies interpreted to be a potential pipe extending from the hole near the center of the room to the northeastern wall and a second potential pipe leading from the first pipe to the floor drain.

Five floor drains are visible in Building No. 11B. One of the drains is located near the northeastern exterior wall; two of the drains are located 10 feet apart, approximately 5 feet from the southeastern wall; and two drains are also located 10 feet apart, approximately 31 feet from the northwestern wall. The GPR survey identified anomalies interpreted to be potential piping beneath the floor, running southwest to northeast through the center of the room. The location of this piping suggests that it may be a continuation of the piping identified in Building No.11A. This central pipe may be connected to the two floor drains located near the southeastern wall of Building No. 11B. The GPR survey did not identify subsurface anomalies in the vicinity of the three remaining floor drains in Building No. 11B and the central pipe running southwest to northeast beneath Building No. 11B.

Two floor drains, separated by a distance of approximately 12 feet, are located approximately eight feet from the northwest wall in Building No. 11C. The GPR survey identified anomalies interpreted to be a potential pipe connecting these drains and a potential pipe leading from the northeastern drain toward Building No. 11B.

One floor drain is located in the approximate center of the office area at the north-central portion of Building No. 11D. The GPR survey did not locate any subsurface anomalies in the vicinity of the drain.

Monitoring well LBGMW-1 was installed outside of Building No. 11B to assess soil and ground downgradient of the identified drains and subgrade piping. A soil sample collected from the boring for LBGMW-1 was submitted for laboratory analysis for VOCs, PAHs, ETPH and the RCRA 8 metals. Laboratory results indicate that no analyte was detected in the soil sample at a concentration exceeding the applicable remediation criteria (Table 25). Note that MTBE, a gasoline additive, was detected in the soil sample.

Ground water samples collected from LBGMW-1 during four sampling events between February 2003 and May 2007 were submitted for laboratory analysis for VOCs (4 rounds), PAHs (2 rounds) and RCRA 8 metals (1 round). The water samples from LBGMW-1 contained single detections of TCE, acetone, MTBE and 4-isopropyltoluene at trace concentrations below the applicable remediation criteria (Table 27). Barium was the only metal detected in the water sample but at a very low concentration below the AALC (there is no SWPC established for barium) (Table 29). PAHs were not detected at concentrations at or above the laboratory detection limits (Table 28).

VHB boring B-15 was drilled was drilled to the east of Building No. 11B. One soil sample collected from this boring was submitted for laboratory analysis for VOCs and ETPH. The laboratory results indicate that VOCs and ETPH were not detected in the soil sample at concentrations at or above laboratory detection limits (Table 25).

Investigation found no evidence of a release from floor drains and potential subgrade piping in Building Nos. 11A, 11B, 11C, and 11D.

6.2.8.8 Building No. 12

There are three catch basins inside Building No. 12. Two of the catch basins are located approximately 50 feet apart, near the center of the room, and the third catch basin is located at the southwestern end of the room. Piping is visible on the southwestern side of the two centrally located catch basins. A GPR survey conducted by LBG identified anomalies interpreted to be potential piping leading northeast from the two central catch basins, although interior inspection of the catch basins found no evidence of these pipes.

A series of five vertical support pillars, located approximately 20 feet apart, are located in the central portion of the building. Three vertical pipes attached to the two end pillars and the center pillar penetrate the floor.

The pipes visible on the southwestern sides of the two central catch basins were traced with the duct router and appear to connect to the vertical pipes attached to the nearby support pillars.

Four separate pipes are visible in the southwestern-most catch basin. The pipe on the northwest side of the basin was traced to the vertical pipe adjacent to the center support. The pipe on the east corner of the basin was traced to the vertical pipe attached to the southeastern-most support pillar. The pipe on the southeast side of the basin was traced for approximately two feet where it appeared to terminate. The pipe on the southwest side of the basin was traced to the southwestern wall of Building No. 12 and appeared to terminate beneath the wall.

Investigation identified a release of CVOCs in AEI No. 13 (Solvent Release Area) located immediately north and downgradient of Building No. 12 (see Section 6.2.3 of this report). Investigation of AEI No. 13 points to the two central catch basins in Building No. 12 as a potential source area for CVOCs observed in ground water beneath and north of Building No. 8. However, there is no information that identifies a source area, the related activity or the timing of the release. The association between identified above grade and subgrade piping in Building No. 12 to the CVOC release is not known.

6.2.9 AEI No. 21: Building No. 5

Visual inspection of the interior of Building No. 5 identified a short section of vertical pipe exiting the floor in the western corner (Plate 2). GPR and induction methods were used to trace the pipe beneath the floor, but no sub-grade piping was identified. A small hole was also identified in the western corner of the building. The GPR survey identified anomalies interpreted to be a potential subgrade pipe extending from the hole to the east. Four drains were identified in the floor of the building. Two of the drains are located approximately eight feet from the northwestern wall. The other two drains are located approximately eight feet from the southeastern wall. The GPR survey detected anomalies interpreted to be potential subgrade piping exiting the northeastern and southwestern sides of the northwestern drains. These pipes may connect to subgrade piping associated with the small hole in the western corner of the building. Subsurface piping was not identified in the area surrounding the other two floor drains.

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An area of concrete patching was identified in the southern corner of the building. The GPR survey did not identify anomalies beneath the concrete patching.

Monitoring wells LBGMW-6 and LBGMW-7 were installed downgradient of Building No. 5 to assess the potential for releases from the identified surface pipe, drains, and subgrade piping.

Soil samples collected from borings for LBGMW-6 and 7 were submitted for laboratory analysis for VOCs, PAHs, ETPH and the RCRA 8 metals. The soil sample from LBGMW-7 contained TCE at a concentration below the applicable remediation criteria (Table 26). ETPH and metals were present in both soil samples at concentrations below the applicable remediation criteria. PAHs were not detected in either soil sample at concentrations above the laboratory detection limits.

Ground water samples collected from LBGMW-6 and 7 in February 2003 were submitted for laboratory analysis for VOCs, PAHs and the RCRA 8 metals. The laboratory results indicate that the ground water sample from LBGMW-7 contained TCE at a concentration above the RGWVC and I/C GWVC (Table 27). Trace concentrations of TCE, cis-1,2 DCE and MTBE were detected in the ground water sample from well LBGMW-6, but none at concentrations that exceeded the applicable remediation criteria. PAHs were not detected in either ground water sample at concentrations above the laboratory detection limits; however, the detection limits for several PAHs exceeded the applicable remediation criteria. Subsequent ground water sampling in March 2004 indicated that only a trace concentration of benzo(g,h,i)perylene, well below the AALC, was detected in LBGMW-7. Nickel was detected at a concentration above the CALC, but well below the SWPC (Table 29). Zinc was detected in LBGMW-7 during the most recent sampling event in April 2007 at a concentration exceeding the SWPC and CALC. The elevated concentration of zinc may be attributed to the nearby industrial fill (see Section 6.2.1.2 and 6.2.1.3)

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The detection of TCE in the sample collected from LBGMW-7 prompted additional investigation to evaluate the potential source for TCE. These investigations included the collection of three soil vapor samples (VP-33 through VP-35), the drilling of seven additional soil borings (GP-31 through GP-33 and GP-44 through GP-47), and the completion of GP-32 as monitoring well LBGMW-29, inside of Building No. 5. Four additional soil vapor samples (VP-36 through VP-39) were collected and monitoring wells (LBGMW-36 and LBGMW-37) were installed in Building No. 5 and Building No. 1C to establish the upgradient limit of the TCE in ground water. The soil, soil vapor and ground water samples were submitted for laboratory analysis for VOCs. Grab ground water samples were also collected from borings GP-44 through GP-46 and submitted for laboratory analysis for VOCs.

TCE was detected in soil vapor samples collected from VP-33 and VP-34 at concentrations exceeding the RSVVC (Table 30). No VOCs were detected in the soil quality samples collected from the additional soil borings or monitoring wells at concentrations exceeding the applicable remediation criteria. The concentrations of TCE detected in two soil samples from boring GB-46 did exceed the GB PMC, but both of the samples may have been collected below the seasonal high water table (Table 26).

The grab ground water sample collected from GP-45 contained TCE at a concentration exceeding the proposed RGWVC and AALC (Table 27). TCE was also detected in the grab ground water samples from GP-44 and GP-46, but at concentrations below the remediation criteria. The grab-sample data confirmed that well LBGMW-29 was located in the area of the highest TCE concentrations detected in ground water.

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The water sample collected from LBGMW-29 in November 2004 contained TCE at a concentration exceeding the proposed RGWVC and I/C GWVC, SWPC and AALC. However, the concentration of TCE detected in the ground water sample collected from LBGMW-29 in May 2007 exceeded only the proposed RGWVC and I/C GWVC. TCE was detected in the ground water samples collected from well LBGMW-7 in 2004 and 2007 at concentrations above the proposed RGWVC and I/C GWVC. VOCs were not detected in the water samples collected from wells LBGMW-36 and LBGMW-37 at concentrations at or above the laboratory detection limits. Relatively low concentrations of TCE (1.7 to 4 ug/L) detected in ground water samples from B-43/MW-17, located hydraulically downgradient of LBGMW-7, may be associated with AEI No. 21. The presence of vinyl chloride in the 2007 ground water samples from B-43/MW-17 indicates that the TCE is attenuating as it migrates to the east. Figure 9 presents an isoconcentration map of TCE in ground water in AEI No. 21

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Investigations have identified a possible TCE release from Building No. 5, in the vicinity of LBGMW-29. The release appears to be associated with identified surface pipes, drains or subgrade pipes. No residual TCE source material was identified and the extent of TCE in ground water is defined by existing wells. The concentration of CVOCs in ground water appears to be decreasing as a result of dechlorination by natural processes.

Investigation has not determined a specific process or activity that caused the release or the timing of the release, since industrial activities could have been conducted in Building No. 5 since construction (pre-1900).

6.3 AEIs Not Investigated by LBG

VHB investigated areas of environmental concern that were later designated by LBG as AEI Nos. 1 through 15. Based upon the VHB results and historical information no further investigation was conducted by LBG at AEI Nos. 1 through 10, 12, 14 and 15. The environmental information for these 13 AEIs is summarized below.

6.3.1 AEI 1: Right-of-Way (ROW) Disposal Area

The ROW Disposal Area was originally identified in the SSESI Phase I site assessment and was investigated by VHB (Phase II and Phase III). The ROW Disposal Area is located northwest of the Boiler Building and Quonset Building. Although not specifically targeted, additional information for AEI No. 1 was obtained during LBG's investigation of a potential former septic field in June 2004. The area is mostly unpaved and partially vegetated. It appears to have at least some soil cover over much of the area, but there are areas where stumps and debris are visible and there are voids in the fill. The fill material deposited in this area varies between 2 and 7 feet in thickness. The ROW Disposal Area covers an area of approximately 50,000 square feet and the volume of fill material is estimated to be approximately estimated at 6,800 cubic yards. Plate 5 presents a plan-view and cross-sectional profile of the ROW Disposal Area.

The fill composition varies to some degree with location. To the immediate north and northwest of the Boiler Building the fill material consists of ash, cinders, glass, metal, brick and wood, with a blue-colored material also observed in some locations. Field observations indicate the fill is principally granular material with debris. The VHB report noted the presence of limited amounts of "construction and landscaping materials" in this area. Fill containing a larger percentage of debris (including automotive parts, plastic, rags and wood) borders this area to the north in the vicinity of TP-4 and TP-5. VHB further noted that a portion of the fill at TP-6, 7, 8 and 9, and TP-16 contains ash, laboratory glassware, resin, metal, and ceramic. In the vicinity of test pits TP-14, TP-15, and LBGTP-2 the fill appears to extend below the seasonal high water table. The thickness of soil cover also varies with location.

The variation in fill composition likely represents several phases of filling including pre-development/construction fill, industrial fill from site operations and more general bulky-waste fill by tenants and/or non-tenants. Some of the fill extends offsite to the north. Petroleum and solvent impacts within the fill material, may have resulted from releases to the surface during filling (e.g., released, then covered), after the filling (e.g., at the surface), or migration from upgradient locations (e.g., within the zone of water table fluctuation).

To date, none of the fill material in the ROW Disposal Area has been dated by the discovery of datable items. Figure 4 shows an overlay of the buildings on the site topography circa 1893. The buildings on the eastern portion of the site appear to have been constructed in wetland areas. Fill material was likely placed in this area in the late 1890s to facilitate construction, particularly in the area of the Boiler Building. Appendix I shows the historical aerial photos for the site. Photographs dated 1959 and 1963 show evidence of excavation and/or filling in the area northeast of the Quonset Building. By 1972, fill or vegetation had been established over part of that area. The 1972 photograph also shows a possible fill area extending offsite to the east of the Boiler Building, which indicates fill activity occurred in these areas between 1963 and 1972. Test pits TP-15 and TP-16, located northeast of the Quonset Building, encountered wood, metal and brick (TP-15) and polymer-like material (TP-16).

Thirty-four samples of the fill-containing material and soil adjacent to the fill were collected by VHB and LBG from 17 locations in and around AEI No. 1 for laboratory analysis. The laboratory results indicate that petroleum hydrocarbons were present in a number of the fill and soil samples at concentrations above the RDEC and I/C DEC (Table 7). The fill material also contained elevated concentrations of lead, arsenic, chromium, silver, nickel, copper and zinc. The concentrations of arsenic, copper and lead in several fill samples exceeded the RDEC and/or I/C DEC. One fill sample contained lead at a concentration above the GB PMC. VOCs were detected in two soil samples at concentrations that exceed the GB PMC, but the samples were collected from below the water table so the GB PMC do not apply. The laboratory results for fill and soil samples for TPH/ETPH and metals are summarized below.

Analyte	Background[1/] Level used for Comparison Purposes (mg/Kg)	Fill Material			Soil		
		No. of Samples	No. of Sample results above Background Levels	No. of Sample results above RDEC (I/C DEC)	No. of Samples	No. of Sample results above Background Levels	No. of Samples above RDEC (I/C DEC)
TPH or ETPH	500	5	5	5 (4)	10	10	10 (9)
Antimony	--	3	--	0 (0)	3	--	0 (0)
Arsenic	7.4	4	2	2 (2)	4	0	0 (0)
Cadmium	--	4	--	0 (0)	4	--	0 (0)
Chromium*	52	9	5	0 (0)	22	9	0 (0)
Copper	22	3	3	1 (0)	3	1	0 (0)
Lead	17	9	9	4 (3)	26	16	0 (0)
Nickel	18	3	2	0 (0)	3	1	0 (0)
Selenium	0.45	4	2	0 (0)	4	1	0 (0)
Silver	--	4	--	0 (0)	4	--	0 (0)
Zinc	52	3	3	0 (0)	3	1	0 (0)

Notes: 1/ Background for TPH is arbitrarily set at the RDEC. Background levels for metals are arithmetic mean concentrations for the eastern U.S., from USGS Professional Paper 1270, 1984

* The RDEC and I/C DEC for trivalent chromium are used for comparison, although the chromium valence in the samples was not determined

VOCs and PAHs were also present in some samples; none exceeded the RDEC, where established

For the purposes of the fill and soil quality summary, fill was interpreted as material that contained foreign, non-native or man-made objects as described in the geologic logs for borings and test pits. For the most part, laboratory samples were selected based on field screening results, but in some cases were collected from pre-determined depths or as a composite of a larger sample interval.

Petroleum-impacted soils observed in test pits and borings were present mostly at or below the seasonal high water table. TPH/ETPH was detected in only three soil samples collected from above the seasonal high water table in the area of Boring B-4 at concentrations above the GB PMC. TPH was identified in a near-surface soil sample from B-4, indicating a surface release. This suggests that petroleum impacts observed in the other ROW Disposal Area samples likely resulted from releases upgradient of the fill area.

Transport of the petroleum and metals from portions of the fill located above the water table would be generally downward via infiltration and leaching. Some lateral movement of infiltrating water could occur in more transmissive fill layers. The concentration of petroleum and/or metals migrating in the unsaturated zone would be expected to attenuate due to adsorption and degradation. If petroleum and/or metals constituents reach the water table, they could travel with ground water, and continue to attenuate along the pathway in response to a variety of natural processes, including sorption. The finding of petroleum at or below the seasonal high water table, as noted in the previous paragraph, is consistent with this transport scenario. Those portions of the fill that are not covered with clean fill or pavement or stabilized with vegetation may be subject to erosion leading to possible physical migration of petroleum- and/or metal-impacted material.

Shallow ground water from below AEI No. 1 would be expected to discharge to the nearby wetlands and/or the Mattabessett River. Ground water samples collected from monitoring wells B-8/MW-3, B-34/MW-14, and LBGMW-23 installed within AEI No. 1 show the following:

- TCE and vinyl chloride were detected in ground water samples from B-34/MW-14 at concentrations above the proposed RGWVC (Table 27). Ground water samples from B-34/MW-14 and LBGMW-23 contained trace concentrations of petroleum-related AVOCs and several other CVOCs at concentration below the applicable remediation criteria. Both wells are located within the northern portion of the fill area, but also downgradient of several known and/or potential petroleum and solvent release areas located southwest of the fill. These wells are also located near the suspected former septic system.

- PAHs were detected in the ground water sample from well B-34/MW-14, some at concentrations above the SWPC and or AALC (Table 28). PAHs were not detected in water samples from wells B-8/MW-3 and LBGMW-23 at concentrations greater than the laboratory detection limits (note: Laboratory reports from VHB investigations were not available, therefore, detection limits for the sample from B-8/MW-3 could not be verified).

- Ground water samples from B-8/MW-3 and B-34/MW-14 contained significant concentrations of TPH (Table 28), which suggests the presence of petroleum constituents. There are no remediation criteria for TPH/ETPH in GB ground water areas.

- Metals were detected in ground water samples from all three wells (Table 29). One ground water sample from each well contained zinc at concentrations above the SWPC and CALC. In addition, concentrations of copper (B-34/MW-14) and nickel (LBGMW-23) exceeded the CALC, but not the SWPC.

Although ground water quality beneath AEI No. 1 exceeds the SWPC, CALC and AALC, additional monitoring downgradient of AEI No. 1 may demonstrate compliance with

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6.3.2 AEI No. 2: Suspect UST-1

A 250-gallon gasoline UST was identified on a 1913 Sanborn map with the notation "not in use". The tank was not noted on the 1907 or the 1924 Sanborn maps, suggesting that it may have had a relatively short operating life. The UST was likely associated with Eisenhuth's brief automobile-manufacturing operations on the site from 1900 to 1908-1909.

VHB investigated the suspect UST-1 area with one boring and three test pits. Two test pits and one test boring were advanced to at or below the water table, which was noted at a depth of 4 ft bg. No evidence of the suspect UST or petroleum-impacted soil or ground water was observed. The third test pit, UST-1/TP-2, encountered a 1-inch diameter pipe at a depth of 2 ft bg, so the test pit was terminated at that depth. One soil sample collected from boring B-13 contained TPH at trace levels, well below the applicable remediation criteria (Table 8). This TPH occurrence cannot be directly linked to the suspect UST. Given the age of the tank, it is also within reason that minor releases, if they occurred, may have naturally dissipated.

The investigation did not find definitive evidence of a release from suspect UST-1. No additional investigations were recommended by VHB or conducted.

6.3.3 AEI No. 3: Suspect UST-2 and Switch Room

Suspect UST-2 was located east of Building No. 4, at the approximate location of a "crude-oil" tank noted on the 1913 and 1924 Sanborn maps (not noted on the 1950 or 1979 maps). Three transformers and a switch room were noted adjacent to the crude-oil tank on the 1924 Sanborn. The VHB investigation of this area included borings and tests pits. Test pit UST-2/TP-1 encountered fill material that contained empty artillery shells. The empty artillery shells are assumed to be associated with Andover Kent Aviation operations conducted in the 1940s. This suggests that operation of the Suspect UST-2 pre-dated fill placement in the 1940s, which is also consistent with the Sanborn maps that do not show the tank in 1950.

VHB investigation of AEI No. 3 was reportedly limited by surface structures and subsurface utilities. Information from four VHB test pits (UST-2/TP-1 and TP-22, 34 and 35), five VHB test borings (B-5, 6, 61, 62, 63, 64 and 65) and one former VHB monitoring well (B-7/MW-2) were used to evaluate conditions in AEI No. 3. Soil quality samples collected from UST-2/TP-1 and borings B-5 and B-62 contained TPH at concentrations above the RDEC and the I/C DEC (Table 9). One soil sample collected from boring B-61, located about 40 feet side gradient from AEI No. 3, contained TPH at a concentration above the RDEC. These soil samples were collected from depths of 4 to 8 ft bg, which corresponds with the water table, so comparison to the GB PMC could not be made. VHB boring B-62 was drilled approximately 30 feet upgradient from suspected UST-2. A soil sample from B-62 potentially collected from above the water table contained TPH at a concentration that exceeded the GB PMC. A soil sample from B-64 collected from below the water table contained TPH at a concentration above the RDEC. TPH was not detected in VHB boring B-63 at a concentration above the laboratory detection limit. The findings at B-62, B-63 and B-64 may be unrelated to AEI No. 3.

TPH was not detected in the soil sample from boring B-65, located approximately 40 feet directly downgradient of the suspect UST-2 location (Table 9). Test pits TP-33, TP-34 and TP-35, excavated near the suspect UST location, encountered a dark-stained cinder layer near the surface, but no deeper evidence of petroleum impacts to a depth of 3 ft bg. Shallow soil samples collected from these test pits were also analyzed for PCBs, due to the presence of the former transformers and switch room. No PCBs were detected.

A ground water sample from former VHB monitoring well B-7/MW-2, located downgradient of suspect UST-2 location, west of the Boiler Building, contained MTBE and TPH (Tables 27 and 28). MTBE can be present in fuel oil as a contaminant, but was not in use during the apparent operational period of suspect UST-2. Nickel was detected at a concentration above the CALC (Table 29). The presence of nickel and copper may be attributable to the cinder fill that has been identified in this area.

Wells LBGMW-4, LBGMW-20 and boring GP-28, installed upgradient and cross-gradient from UST-2/TP-1, provide additional information relative to AEI No. 3. Soil samples from GP-28 collected from both above and below the water table contained TPH at concentrations below the applicable remediation criteria. Soil samples collected from below the water table in the borings for LBGMW-4 and LBGMW-20 contained PAHs at concentrations below the applicable remediation criteria (Table 9). AVOCs were detected in the soil sample from LBGMW-20. AVOCs and PAHs were also detected in some of the ground water samples from upgradient well LBGMW-20.

The history of underground storage tank use in this area is unclear. The investigations did find evidence of a petroleum release in AEI No. 3, but the observed impacts are only partly consistent with a suspect former crude oil UST, circa 1924-1940. Gasoline odors were noted by VHB during the excavation of test pit UST-2/TP-1. The gasoline odors, AVOCs and MTBE are not consistent with aged crude oil, and may have been caused by a more recent petroleum release within or upgradient of this area. This investigation provides evidence of other potential petroleum releases in this area (B-62 and LBGMW-20).

6.3.4 AEI No. 4: Suspect UST-3

AEI No. 4 is located in the southern corner of the site, in the vicinity of the former propane ASTs. A figure originally identified in the SSESI Phase I depicts a suspect UST in this area; however, the report does not provide any supporting documentation. Historical evidence indicates that the AST cradles visible in AEI No. 4 supported a propane tank circa 1940s.

The VHB investigation of AEI No. 4 included excavation of three test pits (UST-3/TP-1, 2 and 3) and visual observations. One soil quality sample was collected from UST-3/TP-1, located 30 feet downgradient of AEI No. 4 and within the Railroad Spur Disposal Area (AEI No. 11). The results for UST-3/TP-1 are included in the discussion of AEI No. 11 in Section 6.2.1 of this report.

The VHB test pits found no evidence of an UST or petroleum release in AEI No. 4.

6.3.5 AEI No. 5: UST-4

AEI No. 5/UST-4, is located immediately north of Building No. 8. A gasoline tank was identified in this area of the site on the 1950 and the 1979 Sanborn maps, and VHB's investigation of this area targeted a fill pipe believed to be associated with the UST. The condition of the gasoline UST when Remington Rand vacated the site in 1970-1971 and the operational history before and after that time are not known. The UST is presumed to have remained in operation following Remington Rand's departure, since it is also noted on the 1979 Sanborn map.

VHB's investigation of AEI No. 5 included excavation of test pit UST-4/TP-1. The excavation encountered a 500-gallon UST that was filled with water. A portion of the UST was above the water table, so the water-filled condition indicates there were no holes or perforations in the UST. VHB noted "strong gasoline/solvent odors" in the excavation between 8 and 9 ft bg. One soil quality sample from the excavation contained AVOCs at concentrations below applicable remediation criteria and TPH at a concentration above the RDEC and I/C DEC (Table 11). The soil sample was collected below the water table so the GB PMC do not apply.

Soil samples were collected from depths of 10 to 12 ft bg in VHB borings B-1, B-2 and B-3/MW-1, located within approximately 30 feet of the UST. TPH was detected at trace concentrations (well below applicable remediation standards) in the samples from B-1 and B-3/MW-1 and was not detected in the sample from B-2. AVOCs were not detected in these samples. TCE was detected at trace concentrations in the samples from B-1 and B-3/MW-1, but those detections are not believed to be associated with AEI No. 5.

Ground water samples were collected from the former VHB monitoring well B-3/MW-1 in 1997 and 1998 and LBGMW-16 in 2004 and 2007, located 30 and 45 feet hydraulically downgradient of AEI No. 5, respectively. No AVOCs were detected in the ground water samples. MTBE was detected in one sample from well B-3/MW-1 at a concentration below the SWPC and the RGWVC (Table 27). A trace concentration of anthracene, above the AALC, was detected in the sample from well LBGMW-16. CVOCs were detected in ground water samples from both wells. These results are expanded upon in the discussion of AEI No. 13 (Solvent Release Area) in section 6.2.3 of this report. Cadmium and zinc were detected at concentrations above the CALC, and both the CALC and SWPC in B-3/MW-1, respectively (Table 29).

VHB's investigation located UST-4 and identified evidence of a potential release from UST-4. VHB reported that the tank was "full of water", which suggests the UST was "tight". Therefore, overfill or piping failure (or a previous UST) are possible mechanisms for the release. Releases of sufficient volume could infiltrate to the water table and migrate with ground water. Similarly, smaller releases could be leached from soil to ground water by infiltrating precipitation. The release at UST-4 does not appear to have resulted in a significant area of ground water impact. Although the soil samples collected from borings B-1, B-2, and B-3/MW-1 were collected a few feet below the water table, the results do not indicate the presence of widespread petroleum impacts to soil in the area of UST-4. There is no information to indicate when the UST ceased being used for petroleum storage or when the petroleum release occurred.

6.3.6 AEI No. 6: Transformers

Four stanchion-mounted transformers and one stanchion associated with a former transformer are located throughout the property. The date of the installation of the transformers has not been documented; however, the VHB Phase II report indicated that the transformers are owned and operated by Northeast Utilities, Incorporated (NU). Soils beneath PCB-containing transformers could become impacted with PCBs if cooling oil stored within the transformers is released either during routine maintenance or through structural defects.

The VHB investigation of the soils beneath the transformers included the collection of shallow composite soil samples, Tran-1 through Tran-5, from beneath each of the stanchions. The sample results indicated that PCBs were detected at trace concentrations in three of the five samples and exceeded the RDEC of 1 ppm in samples Tran-2 and Tran-4 (Table 12). Though the soil samples were reportedly collected from near-surface soil (0-1 ft bg), as appropriate, composite samples are not appropriate for demonstrating compliance with remediation standards. The data do indicate that releases have occurred.

Based on the fact that Northeast Utilities owns and operates the transformers, VHB determined that the remediation of releases associated with the transformers was the responsibility of Northeast Utilities.

6.3.7 AEI No. 7: AST-1

AEI No.7, AST-1, is a 1,000-gallon, steel AST located adjacent to the southeast corner of the Boiler Building. Due to its relatively small size and the poor resolution of older aerial photos (1941 through 1980) an approximate age of the AST from photographic review could not be determined. AST-1 is first visible on the 1997 aerial photograph. The AST is not depicted on available Sanborn maps from 1901 through 1979. Piping from the AST is routed above grade into the Boiler Building. The AST is surrounded by a concrete berm and the southeastern wall of the Boiler Building. Field reconnaissance did not identify a solid (viz., concrete) base beneath the AST.

The VHB Phase II report indicated that the tank contained approximately 4 inches of sludge and residual No.2/No. 4 fuel oil at the time of their inspection in 1997. Shallow soils were collected by VHB from grade to 1 ft bg directly beneath the AST and visually evaluated for the presence of petroleum impact. No indications of a release of petroleum from the AST were observed. No soil samples were submitted for laboratory analysis.

6.3.8 AEI No. 8: AST-2

AST-2 is a 20,000-gallon, steel AST located on cradles to the east of the Boiler Building. The precise age of the AST is not known, but it appears in the 1959 aerial photograph and may also be present on the 1941 aerial photograph. AST-2 did not appear on the 1950 Sanborn map, but does appear to be hand-drawn on the 1979 Sanborn map. Piping from the AST is routed below ground to the boiler room. AST-2 is surrounded by a concrete wall. There appears to be asphalt covered concrete beneath the cradles that support the AST; possibly associated with a foundation. The asphalt/concrete does not extend to the perimeter concrete wall.

The VHB report indicated that the tank contained approximately 4 feet of No. 4 fuel oil and sludge at the time of their inspection in 1997. VHB identified oil-saturated surface soil to a depth of approximately 1 ft bg at the south end of AST-2. The size of the oil-impacted soil area was estimated at 20 ft^2. Surface soil samples were not collected for laboratory analysis. The finding of petroleum-impacted surface soil would be consistent with release during filling, a release from the AST or a release from above-ground piping.

VHB collected soil samples from a boring located immediately west of the AST (B-42), borings located 10 to 40 feet north and northeast of the AST (B-9, B-37, B-38, B-39 and B-40) and borings within 25 feet south and southwest of the AST (B-43/MW-17 and B-49) during their Phase II and III investigations. A soil-quality sample was collected from the former VHB boring B-36/MW-16, located 10 feet northeast of the AST, but this sample was not analyzed for petroleum constituents.

Petroleum-impacted soil was encountered in most of the VHB borings at or near the water table. Petroleum-impacted soil was encountered near grade in B-43/MW-17. No petroleum impacts were observed in B-36/MW-16. Soil-quality samples were collected from these borings from deeper intervals (8 ft bg or greater), at or below the seasonal high water table.

TPH was detected at concentrations exceeding the RDEC and I/C DEC in samples from B-9, B-37 and B-38 and above the RDEC in the sample from B-49 (Table 13). TPH was either not detected or detected at concentrations below the applicable remediation standards in samples from B-39, B-40, B-42 and B-43/MW-17.

LBG collected one soil sample from boring LBGMW-22, located approximately 35 feet north of the AST and near VHB boring B-40. The samples from this boring did not show visual evidence of petroleum impacts. The soil-quality sample collected from LBGMW-22 contained only a trace concentration of ETPH and trace concentrations of CVOCs. Because of the tank's proximity to the Boiler Building, it likely held a fuel. Consequently, CVOCs are not believed to be related to AST-2.

Ground water samples were collected from nearby wells B-36/MW-16, B-43/MW-17 and LBGMW-22. The interpreted ground water flow direction below the AST-2 area is to the northeast or east-northeast. Consequently, B-36/MW-16 is located downgradient of the north end of the AST. AVOCs, PAHs, and TPH were not detected in ground water samples from those wells that were analyzed for those parameters (Tables 27 and 28). Trace concentrations of MTBE were detected in samples from all three wells. CVOCs were also detected in ground water samples from all three wells. In only one instance did the concentration of a CVOC (vinyl chloride) slightly exceed the RGWVC. The CVOCs are not attributed to a petroleum release from AST-2.

Investigation data indicates the potential for two separate releases in AEI No. 8. Although not confirmed by sample analysis, field observations identified surficial petroleum impacts near the south end of AST-2 and at B-43/MW-17, also south of the AST. These impacts appear to diminish with depth, as suggested by the analytical results for the sample collected from 8.5 ft bg in B-43/MW-17. "Light petroleum impacts" were also observed at 1 ft bg in TP-39, located southwest of AST-2.

Petroleum impacts observed at the water table in borings B-9, B-37 and B-38 (confirmed by sample analysis) likely originated from an upgradient release. Based upon the ground water flow direction in this area and the findings in other nearby borings (B-36/MW-16, B-39, B-40 and LBGMW-22), a release area west-southwest of this location is suspected. The buried piping between AST-2 and the boiler room is a possible source for the petroleum impacts in B-9, B-37 and B-38. Releases from below-ground piping would be expected to move laterally within the piping backfill (if more permeable than the surrounding fill), seep downward to the water table and migrate with ground water.

The timeframe for the surface release and the source and timeframe of the deeper petroleum impacts are not known. Surface or subsurface releases from this tank system cannot be definitively attributed to Remington Rand activities, since 26 years had passed between the time Remington Rand left the site and VHB's initial discoveries of subsurface petroleum impacts in this area in 1997. The finding of MTBE in ground water, if it originates from this area, could indicate a more-recent release timeframe, as MTBE did not come into widespread use until 1984.

6.3.9 AEI No. 9: Surficial Stained Area 1

An area of stained surface soil and stressed vegetation was observed on the northeast side of the metal passageway, located southeast of Building No. 15, during the SSESI Phase I investigation. A second area of stained surface soils was also observed to the southwest of the metal passageway (designated AEI No. 10 and discussed in Section 6.3.10).

VHB also observed the surface staining and attributed the impacts to the storage of railroad ties and historical spillage from oil-filled equipment or other historical spillage. A December 21, 2000 CTDEP memorandum from Martin Beskind to "File" and Tom Riscassi, cites this area as being "surrounded with junk (discarded five-gallon drums, old lawnmowers et cetera)." A copy of the memorandum is included as Appendix IX. Recent inspection of these areas by LBG has identified discarded automobiles, automobile parts, various unmarked storage containers and other miscellaneous debris resulting from poor housekeeping by the tenants located proximate to this area.

VHB collected one composite surface soil sample (labeled SUR-1) from AEI No. 9 during their Phase II investigation in 1997. VHB described the soil as "black, fine to medium with coal ash/slag". The composite sample contained TPH at a concentration above the RDEC and benzo(a)fluoranthene and arsenic at concentrations above the RDEC and I/C DEC. The concentration of benzo(a)fluoranthene also exceeded the GB PMC (Table 14). The concentrations of chromium, copper, lead and zinc also appeared elevated above background and the PAH fluoranthene was also detected, but all at concentrations below applicable remediation criteria.

VHB estimated that Surficial Stained Area 1 covered 1,500 ft^2 with a maximum thickness of 2 feet. VHB borings B-46 and B-47, located about 10 feet north and south of Surficial Stained Area 1, encountered oil-stained soils within one foot of grade. Soil-quality samples were not collected below the stained interval to verify the depth of impacts.

LBG installed well LBGMW-7 in the area of AEI No. 9 for the purpose of investigating ground water quality downgradient of Building No. 5. The soil sample collected from the boring for LBGMW-7 contained no detectable PAHs but did contain TCE, ETPH and metals at concentrations below the applicable remediation criteria (Table 14).

Each ground water sample collected from well LBGMW-7 contained TCE at concentrations above the RGWVC (Table 27). Several of the ground water samples contained TCE at concentrations above the I/C GWVC. Zinc was detected in one water sample at a concentration above the SWPC and CALC (Table 29). Benzo(ghi)perylene was also detected at a trace concentration, well below the AALC. The CTDEP has not established a remediation standard for this compound in GB areas.

The observed TPH, PAH and metals impacts are consistent with release(s) of surface petroleum from machine oils and used lubricants, which typically contain metals. Some metals (e.g., arsenic) are likely associated with the ash and cinder fill observed in this area and common to the site. Impacts to the surface soils could be leached downward via infiltrating precipitation and travel with the underlying ground water. It is not known if the TCE detected in the soil and ground water sample from LBGMW-7 is associated with surface discharges in this area or an upgradient area (AEI No. 21: Building No. 5).

It appears likely that the petroleum impacts identified during the Phase I and observed more recently by VHB, the CTDEP and LBG are associated with recent materials storage, surface disposal or equipment maintenance activities that post date Noiseless/Remington Rand activities.

6.3.10 AEI No. 10: Surficial Stained Area 2

The SSESI Phase I ESA identified a second area of stained surface soils and stressed vegetation on the southwest side of the metal passageway, located southeast of Building No. 15. VHB, the CTDEP and LBG also observed the surface staining, and all parties noted various types of surface storage, disposal, and spillage in this area.

VHB described the soil in AEI No. 10 as similar to soil encountered in AEI No. 9. Composite sample SUR-2, collected from AEI No. 10, contained several PAHs and arsenic at concentrations above the RDEC and I/C DEC (Table 15). The concentration of several PAHs also exceeded the GB PMC. Chromium, copper, lead, nickel and mercury were detected in the composite soil sample at concentrations that appeared elevated compared to background, but below applicable remediation standards. TPH was also detected in the composite soil sample at a concentration well below the applicable remediation criteria.

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VHB estimated that Surficial Stained Area 2 covered 250 ft^2 with a maximum thickness of 2 feet. This estimate of areal extent appears to be based on observation, as no additional surface soil samples were collected in this area. VHB boring B-76 was drilled near this area but soil-quality samples were not collected and there is no geologic log available for review. In addition, soil samples were not collected below the stained interval to verify the depth of impacts.

LBG drilled two borings (LBGWS-1 and LBGMW-9) near AEI No. 10 during investigation of the FWSB and Building No. 5. Soil-quality samples were collected from LBGWS-1 and LBGMW-9. Each soil sample contained trace concentrations of TCE, below the applicable remediation criteria. The soil sample from LBGMW-9, which was also analyzed for metals and ETPH, contained metals and ETPH at concentrations below the applicable remediation criteria (Table 15).

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The nearest downgradient well from AEI No. 10, LBGMW-24, is also located downgradient of AEI No. 19, the FWSB. PAHs and metals, detected in soil samples from AEI No. 10, were not present in ground water samples from LBGMW-24. TCE was detected in ground water samples from LBGMW-24 at concentrations above the RGWVC and I/C GWVC (Table 27). The TCE occurrence in ground water at LBGMW-24 is likely the result of a surface release at AEI No. 19.

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Investigation has identified a release of PAHs and several metals to shallow surface soils in AEI No. 10. The PAHs and arsenic detected in shallow soil at AEI No. 10 may be related to ash-, cinder- and coal-containing fill that is common on site. Impacts to the surface soils could be leached downward via infiltrating precipitation and travel with the underlying ground water; however, no ground water impacts have been attributed to AEI No. 10.

The staining observed in surface soils in AEI No. 10 are most likely related to recent storage/disposal activities and not the result of former Noiseless/Remington Rand activities.

6.3.11 AEI No. 14: UST-6

AEI No. 14/UST-6 is located northeast of Building No. 8 and northwest of AEI No.5/UST-4. UST-6 is not depicted on available Sanborn maps from 1901 through 1979, and therefore, likely post-dates Remington Rand operations, although the precise age of the tank is not known.

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UST-6 was first identified during visual inspection by VHB during the Phase III investigation. VHB reported UST-6 was 550 to 1,000 gallons in capacity and contained 550 to 1,000 gallons of waste oil and water. A soil sample collected from 4 to 8 ft bg in VHB boring B-70, advanced northeast and downgradient of the UST, contained TPH at a concentration above the RDEC, I/C DEC and GB PMC (Table 19). This sample was collected below the water table so the GB PMC does not apply. The soil sample from B-70 also contained AVOCs and the gasoline oxygenate MTBE at concentrations below the applicable remediation criteria. TPH was also detected in a soil sample collected from below the water table in B-1, located about 20 feet east of UST-6, at a concentration well below the applicable remediation criteria. No TPH or AVOCs were detected in a soil sample collected from B-67, located 50 feet northeast of UST-6.

Ground water quality samples from the nearest monitoring wells, former B-3/MW-1, located 50 feet to the east, and LBGMW-15, located 40 feet northeast of UST-6, contained no petroleum/oil-related constituents.

The investigation results indicate a potential release of petroleum/oil from UST-6. The release area appears to be limited in areal extent, which may suggest a relatively recent release post-dating Remington Rand operations at the Site. The operational history of the tank and the age of the release are not known. If MTBE detected in the soil samples from B-70 is associated with the release, it confirms a release date that post dates Noiseless/Remington Rand activities.

6.3.12 AEI No. 15: UST-7

AEI No. 15/UST-7 is located 50 feet south of the southwestern corner of the Boiler Building. UST-7 is not depicted on available Sanborn maps from 1901 through 1979, and

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therefore, likely post-dates Remington Rand operations, although the precise age of the tank is not known.

VHB reported UST-7 was abandoned in place. No estimate of the UST capacity was provided.

VHB's investigation activities in the area of UST-7 included borings B-43/MW-17, B-45, B-49 and test pits TP-37 and 39. Soil quality samples were only collected from B-49, located 20 feet northeast, and B-43/MW-17, located 45 feet east of UST-7, from depths at or below the water table. Both sample locations are downgradient of UST-7. The soil sample from B-49 contained TPH at a concentration above the RDEC (Table 20). The soil sample from B-43/MW-17 contained TPH at a concentration below the regulatory criteria and elevated levels of total lead, copper, zinc, and leachable lead at concentrations above the GB PMC. The metals are believed to be related to fill in AEI No. 11. The TPH source is not certain.

Ground water quality samples collected from B-43/MW-17 have been analyzed for VOCs, PAHs, TPH and metals. The laboratory results indicate that MTBE has been detected on a few occasions at trace concentrations well below the applicable remediation criteria, but has not been detected in ground water samples since 2003 (Table 27). No PAHs or other petroleum-related constituents have been detected.

The investigation did not find definitive evidence of a release from UST-7. The operational history of UST-7 is not known but presumed to post-date Remington Rand operations. The absence of UST-7 on Sanborn maps prepared during Noiseless/Remington Rand's occupation of the site supports this conclusion and suggests UST-7 was abandoned by others. Trace concentrations of CVOCs detected in ground water samples from B-43/MW-17 are likely related to upgradient sources, as there is no evidence of their disposal in the immediate area.

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6.4 Other Areas Investigated by LBG

LBG investigations identified two other potential areas of environmental impact that are not listed as separate AEI, including a vent outside Building No. 1C and the occurrence of PAHs in ground water upgradient of the site building.

6.4.1 Building 1C Vent

A large metal vent was observed during an inspection by LBG outside the southwestern side of Building No. 1C. The vent is located hydraulically upgradient of the Solvent Release Area (AEI No. 13). The vent appears to have been associated with air exhaust from historical operations on the second floor of Building No. 1C. The operational history of the vent is not known. The vent and underlying brick also showed evidence of corrosion.

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Surface soil sample "1C Vent" was collected from beneath the vent for laboratory analysis for VOCs, RCRA 8 metals and leachable lead. The soil sample contained two AVOCs at concentrations well below the applicable criteria; total lead at a concentration above the RDEC and leachable lead at a concentration below the GBPMC (Table 18).

The investigation did not find evidence of a release of VOCs from the Building No. 1C vent. The lead in soil beneath the vent may result from corrosion of the vent or lead-based paint. Due to the low concentration of lead detected in the soil, the area does not appear to have the potential to impact ground water.

6.4.2 PAHs, Zinc and Copper in Upgradient Ground Water

Ground water samples collected from monitoring wells MW-10, 11 and 12, located along the southwest property boundary, hydraulically upgradient of the site buildings, have shown periodic detections of PAHs at concentrations above the SWPC and AALC (Table 28). Zinc has been detected in MW-11 at concentrations above the SWPC and CALC. Copper has also been detected in upgradient ground water at concentrations above the CALC (Table 29). It should be noted that monitoring well MW-11 and MW-12, originally installed by VHB, were over-drilled and reinstalled by LBG in April 2007. Copies of the boring logs, including well construction details are included in Appendix IV. Site investigations have not identified a potential source of PAHs, copper or zinc in this area related to historical site operation. Potential upgradient sources include activities on nearby industrial/commercial properties and the adjacent railroad property.

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Another potential source for the PAHs was identified beneath the asphalt driveway located southwest of the main building. In July 2007, an excavation for a water pipe in this area encountered a thin, viscous layer of tar beneath the asphalt roadway, to a maximum depth of approximately 0.75 ft bg. The tar appeared to be associated with the roadbase and extended beneath the majority of the paved area exposed by excavation. PAHs present in the tar could be leached by infiltrating surface water and transported to the underlying soils and ground water.

6.5 Summary of Findings

Site investigation has determined a general chronology of site operations. Many of the historical uses included industrial and manufacturing activities that have or could have used petroleum products or hazardous substances that, in turn, create the potential for releases to the environment. Investigation has identified fill material and CVOCs and petroleum releases that are related to the historical site activities. This section of the report presents a summary of investigation findings and conclusions, thereby providing a basis for the RAP.

6.5.1 Historical Operations

Historical industrial activities at the site have included the manufacture of bicycles, motorized bicycles, automobiles, typewriters, office equipment and military munitions. In addition, since Remington Rand's departure from the site in 1970/1971 and sale of the site in 1971, there have been numerous other activities conducted on site, such as auto-body repair, maintenance of equipment, manufacturing of cabinets and furniture and storage of various goods and products, including storage of petroleum. There have also been activities on the site that are not documented (e.g., EIS Automotive, other various tenant activities since 1971).

6.5.2 Fill Areas

There are two major fill areas that comprise the eastern and southeastern sides of the site. There are also 'pockets' of fill at various locations, possibly associated with backfilling after removal of previous buried structures such as USTs, regrading, et cetera. The two major fill areas, the ROW Disposal Area and the Railroad Spur Disposal Area, appear to have been generated over a period of time, some predating site development (e.g., filling near, and possibly below, the Boiler Building, beneath the former section of the railroad spur, and immediately east of the spur). This is exemplified by evidence of fill in borings northwest of the current section of the railroad spur (cinders in borings B-45 and B-49) and evidence of organic (possibly wetland) soils at depth in boring LBGMW-6. These fill areas contain cinders, brick and other debris typical of community disposal areas from the early 1900s. They also contain areas of industrial wastes (polymer materials and laboratory glassware), wastes associated with automobile

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manufacturing (connecting rods), wastes associated with typewriter manufacturing (typewriter parts) and more-recent debris (fencing, plastic, wood, et cetera).

Environmental concerns with regard to potential impacts to soil, ground water and surface water quality in these areas include leachable metals and petroleum hydrocarbons (see Section 6.5.4 below). Potential human health concerns with regard to possible, direct, chronic ingestion or inhalation include the presence of metals (in particular, arsenic, lead, copper and nickel), petroleum hydrocarbons, and some PAHs. For the most part, petroleum hydrocarbons and PAHs are present at depth in the fill areas, which limits the potential for direct contact. Conversely, arsenic appears to be more evenly distributed within the fill

6.5.3 TCE Releases

TCE appears to have been released at a minimum of four locations: 1) to surface soil along the western property boundary (GP-64A, GP-73 and GP-76); 2) to soils beneath the water table in Building No. 5 (GP-32 and GP-46); 3) to the land surface southeast of the Former Waste Storage Building (LBGMW-8); and to subgrade soils at sumps in the vicinity of B-75/MW-21 in Building No. 8. The most significant TCE release appears to have occurred along the southwestern property boundary, near GP-76, between the railroad tracks and Building No. 1C.

Although TCE was known to have been used for degreasing operations in American industry during the period of Noiseless/Remington Rand operations at the site (1909 through 1970), there is no documented evidence of its use by Noiseless/Remington Rand. Noiseless/Remington Rand ceased operations at the property prior to RCRA regulations and associated manifesting and recordkeeping requirements. The SSESI Phase I report references a P-5 Form found in the CTDEP files that indicates Remington Rand discharged wastes to the Mattabessett River. The P-5 Form noted one VOC (acetone) and made no mention of TCE. Finally, investigation shows that TCE is not associated with portions of the waste disposal areas known or suspected to have been used during Noiseless/Remington Rand's ownership or operation of the site. This information suggests that TCE may not have been used by Remington Rand at the property.

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Given the half-life of TCE (0.77 to 13.9 years used in the documentation for the BioChlor model (USEPA, January 2000)) the concentration of TCE in ground water should be much less than half the total CVOC concentration actually identified if it was released prior to 1971.

However, in the majority of instances (85% of wells sampled in 1997 or 1998, 82% in March 2004 and 72% in April/May 2007), TCE comprises 50% or more of the total CVOCs detected at individual wells. At localized areas where the TCE/total CVOC ratio has shifted to favor degradation products, conditions may favor degradation, thereby resulting in half-lives at the lower end of the range. This analysis does not account for the TCE that has completely degraded beyond vinyl chloride (and, thus, not detected in the EPA Method 8021 or 8260 analysis) or the effects of a continuing TCE source. It does, however, suggest that the current distribution of CVOCs in ground water could easily have resulted from releases of TCE within the past 35 years.

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The downgradient extent of the TCE in ground water provides further evidence that the TCE releases may have occurred after 1971. The TCE occurrence in AEI No. 16 (Loading Dock/Building No. 1A) is well suited to this evaluation since the source area is known, the extent of TCE in ground water is well defined and the shallow sediments are relatively uniform. In addition, since this is the largest area of TCE-impacted ground water identified on the site, this may also be the oldest. In this example, the distance between the release area and the farthest point downgradient where TCE is detected in ground water (near LBGMW-2) is approximately 360 feet. Using this distance and a range of ground water flow velocities of 0.04 feet per day to 0.4 feet per day (see Section 6.1.3), the travel time from the release area and the furthest downgradient extent of TCE is estimated to be 2.5 to 25 years. This evaluation does not consider the time for the TCE to infiltrate through the unsaturated zone to the water table and factors that retard migration of CVOCs in ground water, such as adsorption related to the aquifer matrix and CVOC degradation. Nonetheless, the calculation suggests that the observed extent of CVOCs in ground water at AEI No. 16 could likely have resulted from a release within the past 35 years, post-dating Remington Rand's occupancy.

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6.5.4 Petroleum Releases

The site investigations have identified numerous separate petroleum releases from known and suspected, and surficial and subgrade sources: Suspect UST-2, UST-4, AST-2, Suspect UST-5, UST-6, UST-7, Floor Drains (Building Nos. 2 and 4) and Surficial Stained Area 1 and Surficial Stained Area 2. In addition, petroleum impacts were noted at areas within the ROW

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Disposal Area (specifically in AEI No.18: Former Septic Field) and the Railroad Spur Disposal Area. Petroleum-related releases were not identified at UST-1, Suspect UST-3 and AST-1.

The ten identified petroleum release areas can be subdivided into the following categories:

- *USTs/ASTs or site activities that are suspected as potential sources based upon their existence in the historical record.* Those USTs/ASTs or industrial activities that were, according to historical maps, present or employed during Noiseless/Remington Rand's occupancy.

  - AEI No. 3: Suspect UST No. 2: An UST has not been identified in this area. Historical Sanborn maps for 1913 and 1924 indicate that a 'crude oil' UST existed at this approximate location. Due to the proximity of the reported UST to the Boiler House, it may have contained heavy fuel oil (e.g., No. 6) to fire the boilers during that time. Given that the UST dates from at least 1913 and is not indicated on Sanborn maps after 1924, the UST appears likely to have existed during Noiseless/Remington Rand operations on the property.

  - AEI No. 5: UST-4: Sanborn maps of the property for 1950 and 1979 show a gasoline UST at the location of UST-4. As such, the UST was apparently present during Remington Rand's occupation of the property, but may have been used by subsequent owners and occupants of the site. Site reconnaissance has determined that Building 8, located adjacent to UST-4 has been used by past tenants to work on automobiles and/or other motorized vehicles. VHB investigation determined UST-4 to have a capacity of approximately 500-gallons and to contain water.

  - AEI No. 8: AST-2: The presence of an AST is visible on a 1959 aerial photograph and possibly visible on a 1941 photograph of the property. VHB investigation determined that the AST contained oil and a sludge-like residue in 1997. Although the AST appears to have been present during the period of Remington Rand operations, it could likely have been used after Remington Rand departed the property in 1971. Furthermore, although there appears to have been a release of petroleum from this AST system, the timing of the release (or releases) is not known and could well have occurred during the more than 30-year period following Remington Rand's departure from the property in 1971.

  - AEI No. 12: Suspect UST-5: No direct evidence of a tank has been identified in the location of Suspect UST-5. The source of petroleum impacts detected in the soils and ground water in this area is unknown. A 1901 Sanborn map indicates the presence of a furnace and case-hardening operations in Building No. 2 prior to Remington Rand/Noiseless occupation of the property in 1909. Sanborn maps for the time period during Remington Rand/Noiseless operations indicate Building 2 housed "grinding and hardening" operations. Hardening operations typically

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A tank was identified at the

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<#>UST-7 was not identified on historical maps dated during Noiseless/Remington Rand's occupancy, but was first identified by VHB. The UST was reportedly filled with concrete. The UST's presence on the site during Noiseless/Remington Rand's occupancy is not documented.¶
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<#>Petroleum impacts were investigated following the observation of staining at Surficial Stained Area 1. VHB, CTDEP and LBG observed debris in this area. These surficial impacts are attributed to the recent activities observed in the area.¶
¶
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employ quenching metal in air, water or oil. The area of impact associated with AEI-12 is proximal to Building No.2.

- AEI No. 20: Floor Drains, Building Nos. 2 and 4: Petroleum releases in these areas appear to have been related to discharges to the floor drains, although the timing of the discharges is unknown. Historical documents indicate that Noiseless/Remington Rand conducted manufacturing operations in these areas.

- *USTs/ASTs that are suspected as potential sources, but are not documented in the historical record.* Those USTs/ASTs that were not located on historical maps, but identified during site investigation, and therefore likely installed after Remington Rand departed the property in 1971.

  - AEI No. 14: UST-6: A UST containing waste oil and water was confirmed to be present at this location. This UST is not shown on any Sanborn maps found for the property and, therefore, the UST likely post-dates Remington Rand operations. Site reconnaissance indicates that Building 8, located adjacent UST 6, was used by past tenants to work on automobiles and/or other motorized vehicles. Given this information, Unisys concludes that UST-6 was installed after Remington Rand sold and departed the property in 1971.

  - AEI No. 15: UST-7: An abandoned-in-place UST was identified in the access roadway between the Boiler Building and Building 15 No. 15. This UST is not shown on any of the Sanborn maps for the property and, therefore, likely post-dates Remington Rand operations. Furthermore, because the UST was found to have been filled with cement-like material, indicating that someone (not Remington Rand) assumed responsibility for the tank.

- *Areas where suspected sources were identified through visual observation.* Those areas where site inspections have documented current, improper storage and/or handling of petroleum-containing equipment.

  - AEI Nos. 9 and 10: Surficial Stained Areas 1 and 2: Petroleum hydrocarbon compounds associated with these two areas of surface soil staining appear to be related to recent activities. Site reconnaissance indicates that these areas are used for the storage and maintenance of lawnmowers and related items, such as gasoline cans and containers of motor oil. Furthermore, Sanborn maps show no processes in these areas during the period of Noiseless/Remington Rand operations that would relate to these impacts. A review of historical documents indicates that the Former Waste Storage Building, located nearby, did not show evidence of petroleum impacts. Given this information, Unisys concludes that petroleum impacts occurred after Remington Rand ceased its operations and departed the property in 1971.

- *Petroleum impacts from unknown sources.* Where petroleum impacts are identified and the source is not known or cannot be reasonably inferred from testing, a source and/or timing of the source cannot be assumed.

- AEI No. 1: ROW Disposal Area: Petroleum impacts were observed above and at the water table in the ROW Disposal Area during the investigation of AEI No. 18. Impacts at the water table could result from transport from upgradient sources. Impacts above the water table are likely the result of disposal of petroleum-impacted soil or the disposal of petroleum products in the fill area at some time. Based on this information, the exact source and timing of the release are uncertain.

- AEI No. 11: Railroad Spur Disposal Area: Petroleum impacts were observed above and at the water table in the Railroad Spur Disposal Area, but given their depth at or near the water table, they are attributed to upgradient sources. Based on this information, the exact source and timing of the release are uncertain.

It should be noted that MTBE detections in ground water were widespread across the southern half of the site, with most detections reported at concentrations ranging between 1 and 50 ug/L and with many detections reported only sporadically. MTBE detection in ground water may provide some indication of the age of petroleum releases at the site. MTBE was not in use until the 1970s and was not in widespread use until the 1980s, so the presence of MTBE must be related to more recent activities that considerably post-date Noiseless/Remington Rand's occupation of the site. MTBE is primarily associated with gasoline (as an oxygenate), but is also commonly found associated with fuel oils due to the inevitable cross contamination that occurs in storage and transport vessels. The presence of MTBE suggests that some of the petroleum releases could be more recent in origin, such as from the auto-body work that has been observed in Building Nos. 10 and 15, the rear portion of Building No. 5 and the Boiler Building, located at the southern half of the site.

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Petroleum impacts were observed above and at the water table in the ROW Disposal Area.

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6.6 Assessment of Identified Impacts Relative to Former Noiseless/Remington Rand Operations

Table 31 provides a summary of the investigation findings and historical information for the AEIs. Sample analytical data and/or field observations show that releases of petroleum products or hazardous substances have occurred in AEI Nos. 1, 3, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 19, 20 and 21. No releases or no releases above remediation standards were identified or suspected based upon sample analytical data and/or field observations at AEI Nos. 2, 4, 7 and 17. Evidence confirming the existence of AEI No. 18/Potential Former Septic Field was not identified in the explorations conducted in the area depicted on the historical map.

Based upon the historical information, there are 16 AEIs where releases were confirmed. Those AEIs fall into the three general categories based on the source and timing of the release with respect to Noiseless/Remington Rand operations at the property:

1) Instances where the source is known or can be inferred and the source was present during Noiseless/Remington Rand's operations at the site:

- AEI No. 1/ROW Disposal Area - Aerial photos and the filling sequence suggest that part of the area was filled or disturbed during Noiseless/Remington Rand's occupancy; filling below the area of the boiler room and filling at the outer edges of the area likely pre-dated and post-dated Noiseless/Remington Rand, respectively. Consequently, Unisys will address remediation of impacts attributed to Noiseless/ Remington Rand filling operations.

- AEI No. 3/Suspect UST-2 - The UST dates from at least 1913 and is not indicated on Sanborn maps after 1924, and therefore appears likely to have existed during Noiseless/Remington Rand operations at the property. Consequently, Unisys will address remediation of petroleum impacts that are determined to be related to the use of Suspect UST-2.

- AEI No. 5/ UST-4 - Since this UST was present on site at least 23 years prior to Remington Rand's departure in 1971, Unisys will address petroleum impacts determined to be related to the use of UST-4 by Remington Rand. However, because the Consent Order expressly limits Unisys responsive efforts solely to impacts arising from Noiseless/Remington Rand operations, Unisys should not be held responsible for the removal and disposal of UST-4 and its contents because the UST was sold with the property.

- AEI No. 8/AST-2 - Because the tank is indicated to have been present on the property at least 14 years prior to Remington Rand's departure, Unisys will address petroleum impacts determined to be related to use of the AST by Remington Rand. Because the Consent Order expressly limits Unisys responsive efforts solely to impacts arising from Noiseless/Remington Rand operations, Unisys should not be held responsible for the removal and disposal of AST-2 and its contents because the UST was sold with the property.

- AEI No. 11/Railroad Spur Disposal Area - A portion of the industrial fill within AEI No. 11/Railroad Spur Disposal Area contains typewriter parts that appear to be associated with Noiseless/Remington Rand activities. Though

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No confirmed source or mechanism

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<#>AEI No. 12/Suspect UST-5 and associated AEI No. 20/Floor Drain/Building No. 2.¶
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Instances where the source is known or can be inferred, but

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<#>AEI No. 5/ UST-4¶
<#>AEI No. 6/Transformers (believed to be the responsibility of the electric utility)¶
<#>AEI No. 8/AST-2¶
<#>AEI No. 13/Solvent Release Area¶
<#>AEI No. 14/ UST-6 (believed to be recent)¶
<#>AEI No. 15/ UST-7 (believed to be recent)¶
<#>AEI No. 16/Loading Dock/Building No. 1A¶
<#>AEI No. 19/Former Waste Storage Building (believed to be recent)¶
<#>AEI No. 20/Floor Drains¶
<#>AEI No. 21/Building No. 5¶
¶
Instances where the source and timeframe can be inferred:

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<#>AEI No. 9/Surficial Stained Area 1 (known recent activities)¶
<#>AEI No. 10/Surficial Stained Area 2 (known recent activities)¶
<#>AEI No. 11/Railroad Spur Disposal Area¶
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much of the industrial fill also contains slag and other metal debris (e.g., automotive connecting rods) that likely derive from onsite activities that pre-date Noiseless/Remington Rand (viz., automobile manufacturing). Unisys will address the industrial fill portion of the Railroad Spur Disposal Area.

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- AEI No. 12/Suspect UST-5 - Sanborn maps for the time period prior to, and during, the majority of Noiseless/Remington Rand operations indicate Building No. 2 housed "grinding and hardening" operations. Hardening operations typically employ quenching metal in air, water or oil. The area of impact associated with suspect UST-5 is proximal to Building No. 2. Based upon this information, Unisys will remediate the petroleum release associated with AEI No.12; although it is possible that owners and occupants prior to, and following, Remington Rand's departure may have caused these impacts.

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- AEI No. 20/Floor Drains (Building No. 2 and 4) - Historical documents indicate that Noiseless/Remington Rand conducted manufacturing operations in these areas. As a result, Unisys will remediate the petroleum releases associated with AEI No. 20.

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2) Instances where the source is known or can be inferred and the source likely post-dates Noiseless/Remington Rand's occupancy of the site:

- AEI No. 9 and 10/Surficial Stained Areas 1 and 2 - Site reconnaissance conducted during the investigation has documented the improper storage or handling of petroleum-containing equipment in these areas. Sanborn maps show no processes in these areas during the period of Noiseless/Remington Rand's occupancy that would relate to these impacts. In addition, the investigation of the nearby Former Waste Storage Building did not show evidence of petroleum impacts. Given this information, Unisys concludes that the petroleum impacts occurred after Remington Rand ceased its operations and sold the property in 1971. Therefore, Unisys has no responsibility to address these impacts.

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- AEI No. 14/ UST-6 - This UST is not shown on any Sanborn maps during the period of Noiseless/Remington Rand operations and, therefore, UST-6 likely post-dates Remington Rand operations. Site reconnaissance conducted during the investigation has documented that Building No. 8, located adjacent UST-6, has been used by post-Remington Rand tenants to work on automobiles and/or other motorized vehicles. Given this information, Unisys concludes that UST-6 was installed after Remington Rand sold and departed the property in 1971. Therefore, Unisys has no responsibility to address the impacts associated with AEI No. 14 or bear any responsibility for UST-6 and its contents.

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- AEI No. 15/ UST-7 - This UST is not shown on any of the Sanborn maps for those years that Noiseless/Remington Rand occupied the subject property and,

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3) Instances where the source is known or can be inferred, but the date of the source is uncertain:

- AEI No. 6/Transformers - Based on the fact that Northeast Utilities owns and operates these transformers, remediation of releases associated with these transformers is the responsibility of Northeast Utilities.

- AEI Nos. 13, 16, 19 and 21/Areas of TCE Releases - There is no direct evidence that TCE releases arose from Noiseless/Remington Rand operations. Nonetheless, because TCE was utilized by American industry during certain of the years that Noiseless/Remington Rand's operated at the subject property, Unisys will address suspected TCE releases. It should be strongly noted that owners of the property, occupants, tenants and trespassers since the date of Remington Rand's departure from the site in 1971 may also be responsible for any or all such TCE releases.

Based upon the above assessment of historical information, site investigation, and analytical data, Unisys agrees to conduct remedial actions to address the impacts associated with Noiseless/Remington Rand operations at AEI No. 1:ROW Disposal Area; AEI No. 3:Suspect UST-2; AEI No. 5:UST-4 (petroleum only); AEI No. 8 (petroleum only) :AST-2; the industrial fill portion of AEI No. 11/Railroad Spur Disposal Area; AEI No. 12:Suspect UST-5; AEI No. 20:Floor Drains (Building Nos. 2 and 4) and AEI Nos. 13, 16, 19 and 21.

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UST-7 was not identified on historical maps dated during Noiseless/Remington Rand's occupancy, but was first identified by VHB. The UST was reportedly filled with concrete. The UST's presence on the site during Noiseless/Remington Rand's occupancy is not documented.

Petroleum impacts were investigated following the observation of staining at Surficial Stained Area 1. VHB, CTDEP and LBG observed debris in this area. These surficial impacts are attributed to the recent activities observed in the area.

USTs that are suspected as potential sources based upon their existence in the historical record. Those USTs that were, according to historical maps, in use during Noiseless/Remington Rand's occupancy were regarded as possibly attributable to Noiseless/Remington Rand activities.

Suspect UST-2 was depicted as a 'crude oil' tank, but the investigation noted gasoline odors, not consistent with crude oil; no UST was found.

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AEI No. 9/Surficial Stained Area 1 (known recent activities)
AEI No. 10/Surficial Stained Area 2 (known recent activities)
AEI No. 11/Railroad Spur Disposal Area

Based upon the assessment of historical information, site investigation, and analytical data, only portions of AEI No. 1/ROW Disposal Area and a portion of AEI No. 11/Railroad Spur Disposal Area can be potentially linked with historical Noiseless/Remington Rand activities. In the case of the ROW Disposal Area, aerial

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7.0 REMEDIAL ALTERNATIVE SCREENING/ANALYSIS

The remedial alternatives described in the following sections have been considered to address the twelve (12) AEIs (# 1, 3, 5, 8, 11, 12, 13, 16, 18, 19, 20 and 21) where COCs were identified at concentrations above applicable remediation standards, CALC or CTDEP-approved AALC and there is a reasonable historical connection with former Noiseless/Remington Rand operations; those AEIs, environmental media and regulatory criteria exceeded are listed below:

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ROW Disposal Area ... [1]

AEI	Media	Regulatory Criteria Exceeded
AEI No. 1 ROW Disposal Area	Soil/fill and debris	GBPMC (TPH/ETPH and lead); RDEC (TPH/ETPH, arsenic, copper, lead); I/C DEC (TPH/ETPH, arsenic, lead)
	Ground water	AALC (PAHs) CALC (copper, nickel, zinc)
AEI No. 3 UST-2/Switch Station	Soil	RDEC (TPH/ETPH) I/CDEC (TPH/ETPH) GBPMC (TPH/ETPH)
AEI No. 5 UST-4	Soil	RDEC (TPH/ETPH) I/C DEC (TPH/ETPH)
	Ground Water	AALC (PAHs)
AEI No. 8 AST-2	Soil	RDEC (TPH/ETPH) I/C DEC (TPH/ETPH)
A portion of the industrial debris area within AEI No. 11 Railroad Spur Disposal Area	Soil/fill and debris	GBPMC (TPH/ETPH, PAH, lead, nickel); RDEC (TPH/ETPH, PAHs, arsenic, copper, lead, nickel, thallium); I/C DEC (TPH/ETPH, PAHs, arsenic, lead, nickel)
	Ground Water	AALC (PAHs) CALC (copper, nickel, zinc, cadmium)
AEI No. 12 UST-5	Soil	GBPMC (TPH/ETPH and PAHs) RDEC (TPH/ETPH and PAHs) I/C DEC (TPH/ETPH and PAHs)
	Ground Water	SWPC (PAHs) AALC (PAHs)
AEI No. 13 Solvent Release Area	Ground Water	RGWVC (CVOCs) I/C GWVC (CVOCs) AALC (CVOCs)
AEI No. 16 Loading Dock Area: Bldg 1A	Soil	GBPMC (CVOC exceedance assumed based on free phase product) RDEC (CVOCs) I/C DEC (CVOCs)
	Free Phase and Ground Water	RGWVC (CVOCs) I/C GWVC (CVOCs)

		SWPC (CVOCs) AALC (CVOCs)
	Vapor	RSVVC (CVOCs) I/C SVVC (CVOCs)
AEI No. 19 Former Waste Storage Building	Soil	GBPMC (CVOCs)
AEI No. 20 Floor Drains	Soil	RDEC (TPH/ETPH) I/C DEC (TPH/ETPH)
	Ground Water	SWPC (PAHs and Zn) CALC (Zn) AALC (PAHs)
AEI No. 21 Building No. 5	Soil	GBPMC (CVOCs)
	Ground Water	RGWVC (CVOCs) I/C GWVC (CVOCs)

In addition, for AEI No. 1, the ROW Disposal Area, some of the fill/waste materials are located off site; relocation of these materials may need to be part of a remedy for this area. The soils to be relocated on site would be appropriately tested and managed to ensure that their final disposition is consistent with Section-22a-133k-2(h) of RCSA.

The extent of the release associated with AEI No. 18 (Potential Former Septic field) is inside the boundary of AEI No. 1; therefore, the selected remedial alternative for AEI No. 18 will be addressed in conjunction with AEI No. 1.

7.1 Technology Screening-Effectiveness

The technology screening effectiveness is categorized into potential soil and ground-water remediation technologies that may be used at the Site. Any one or a combination of these remedial technologies may be used to provide the most effective remedy.

7.1.1 Soil Technology Screening Effectiveness

A preliminary technology screening for soil is presented below. The screening compares various general soil technologies that could be employed for the constituents that exceed regulatory criteria in soil/fill in the 12 AEIs. The intent is to eliminate technologies that are not or may not be suited to all the constituents of interest.

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Soil Remedial Technologies	Constituents of Concern			
	Total Metals	Leachable Metals	CVOCs	Petroleum Hydrocarbons
Institutional Controls- Employ land use restrictions in lieu of active remediation	P*	P+	P+*	P+*
Engineered Control- Use cap or other barrier to control exposure and leaching	**E***	**E**	**E***	**E***
Soil Cover—use of clean soil cover and asphalt to render soil 'inaccessible'	**E**	**N**	**P+**	**P+**
In-Situ Bioremediation- Utilize bioremediation methods, such as bioventing, to promote natural degradation of COCs in place	N	N	P	E
In Situ Stabilization- Utilize chemical additions to alter chemical composition and/or soil matrix to inhibit leaching	**P***	**E**	**P**	**P**
Phytoremediation (in-situ)- Use plants to remove and accumulate, to stabilize or to metabolize COCs	**P**	**N**	**N**	**P**
Excavation/Soil Washing- Use physical and chemical processes to remove COCs from excavated soil on site	**E**	**E**	**E**	**E**
Excavation/Bioremediation- Use biological processes to promote degradation of COCs in landfarms, bioreactors, et cetera, on site	N	P	E	E
Excavation/Thermal- Use of onsite thermal treatment or asphalt mill to treat soil	N	E	E	E
Excavation/Removal- Removal of the impacted soil, and either offsite treatment, blending, disposal or asphalt batching, as appropriate to the waste and ultimate reuse	**E**	**E**	**E**	**E**

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N= not expected to be effective for this COC
P= regarded as possibly effective for this COC
E= regarded as probably effective for this COC
+= potentially effective if combined with removal or treatment of soils exceeding the GB PMC
*= potentially effective if combined with measures to make soil 'inaccessible'

All in-situ methods discussed above shall be retained for further evaluation in subsequent sections of this report. In addition, in-situ stabilization was retained, at least temporarily, because it might be effective for metals and hydrocarbons, and although total metals concentrations would not be reduced, soils would be left in place and could be rendered inaccessible to demonstrate compliance with the DEC. Ex-situ methods that did not adequately address all the DEC, PMC and GWVC issues, such as excavation/bioremediation and excavation/thermal, were not retained for further evaluation. Those ex-situ methods would incur the high cost of excavation and treatment, and would not address the total metals/DEC exceedances.

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Brief soil technology descriptions are provided in Section 7.2.1 for those remedial alternatives that are considered possible or likely to be effective for all of the constituents of interest at the subject AEIs, including engineered controls (in-situ), soil cover (in-situ), excavation and offsite disposal or treatment, stabilization/solidification (in-situ), bioremediation via bio-venting, soil washing (ex-situ) and phytoremediation (in-situ). Institutional controls are discussed first as they may be used in combination with the selected remedies to achieve compliance with the remediation standard.

7.1.2 Ground-Water Technology Screening Effectiveness

A preliminary technology screening for ground water is presented below. The screening compares various general ground-water remedial technologies that could be employed for the constituents that exceed regulatory criteria in the ground water at the 12 AEIs under consideration. The intent is to eliminate technologies that are not, or may not be, suited to all the constituents of interest.

Ground-Water Remedial Technologies	Constituents of Concern		
	Total Metals	CVOCs	Petroleum Hydrocarbons
Monitored Natural Attenuation- Use of natural processes to remediate ground water	**P**	**E**	**E**
In-Situ Bioremediation- Utilize biostimulation or bioaugmentation to promote degradation of COCs in place	N	E	E
In Situ Chemical Treatment- Utilize chemical additions to breakdown chemical composition of COCs to innocuous end products	**P**	**P**	**P**
In-Situ High Vacuum Extraction- Use vacuum to recover and treat impacted ground water	**E**	**E**	**E**
In-Situ Ground-Water Pump and Treat- Use well pumps to recover and treat impacted ground water	**E**	**E**	**E**
In-Situ Thermal Treatment- Use heat to breakdown COCs and vacuum wells to extract COC-laden vapors.	N	E	E
Product Recovery- Recovery of free-phase product (AEI No. 16 only)	N/A	E	N/A
Sub-Slab Depressurization – Depressurize sub-slab material to prevent vapor intrusion.	N/A	E	N/A

N= not expected to be effective for this COC
P= regarded as possibly effective for this COC
E= regarded as probably effective for this COC

N/A = not applicable

In-situ ground-water pump and treat is not being considered further because of the anticipated long time to complete remediation in conjunction with high capital and O&M costs associated with this remedial technology. However, a temporary pump and treat system may be used for downgradient hydraulic control in conjunction with other in-situ remedial technologies such as bioremediation or chemical treatment.

In-situ thermal treatment is not being considered further because of the excessive costs and extensive vapor control required. All other ground-water remedial technologies have been retained for subsequent evaluation.

7.2 Technology Descriptions, Implementability and Relative Cost

The following technology descriptions are categorized into the soil and ground water technologies that are being considered for further evaluation.

7.2.1 Soil Technologies

7.2.1.1 Institutional Controls

Technology	Implementability	Relative Cost	Retained/Comments
Institutional Control	Relatively easy; need landowner and easement holder approvals	Low, but must be combined with another technology to achieve regulatory compliance	Not retained as a stand-alone approach

ELURs are legal limitations placed upon the land records that can be used instead of, or in conjunction with, remediation to assure that site conditions are protective of human health and the environment. An ELUR is used to allow COCs, to remain onsite, so institution of an ELUR does not, in and of itself, result in a reduction in concentrations of COCs. If the administrative requirements are met, institutional controls can be implemented in the short term.

Standard ELUR provisions place restrictions on the use of the "subject area" by the owner or anyone holding interest in the property and grants to the CTDEP an easement to access the subject area and take actions necessary to abate a threat to human health and the environment. ELURs can be used in the following ways:

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- An ELUR can be used to prohibit residential activities on a parcel so that the I/C DEC, I/C GWVC or I/C SVVC can be used instead of the residential DEC or VC as the compliance criteria.

- An ELUR can be used to render soil 'inaccessible' that is below a building or other permanent structure, that is four feet or more below grade, and/or that is two feet or more below an approved pavement layer and less than 15 ft bg. The ELUR would prohibit excavation or other disturbance of the restricted area, thereby protecting site users and workers from contacting the impacted soil. DEC do not apply to 'inaccessible' soil restricted in this manner.

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- An ELUR can be used to render soil above the seasonal high water table (in a GB area) 'environmentally isolated', prohibiting the exposure of impacted soil to infiltrating precipitation, thereby preventing leaching of the COCs to ground water. Under this scenario, the impacted soil must be located below a permanent structure that would prevent the migration of pollutants, and if impacted with VOCs, the concentrations must be reduced to the maximum extent prudent. The ELUR would prohibit the removal of the structure. PMC do not apply to 'environmentally isolated' soils restricted in this manner.

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- An ELUR can be used to prevent the construction of a building above an area where VOCs are present in ground water, thereby allowing VOCs at concentrations above the GWVC or SVVC to remain in place.

The process of instituting an ELUR includes the following:

- The intent to institute an ELUR must be published in a newspaper of general circulation in the site area (public notice), although publishing is not required if the ELUR is only for the purpose of restricting land use to industrial/commercial activities and the municipal zoning limits the parcel to those activities.

- A draft declaration of environmental land use restriction and decision document must be prepared and submitted to CTDEP along with an A-2 survey and a certified copy of the public notice.

- The application of an ELUR to the land records will require the cooperation and permission of the landowner and other easement holders. Subordination agreements and/or certificate of title, if required and as appropriate, must be prepared and executed and submitted to the CTDEP for review and approval.

- The ELUR must be recorded on the land records and written notification must be sent via certified mail to municipal officials and persons who commented on the ELUR.

The ELUR contains a provision for the temporary suspension of specified provisions of the ELUR in the event of an emergency that presents a "significant" risk to human health or the environment. To request a permanent release from the provisions of the ELUR or a release for non-emergency activities, the owner would have to make request and obtain approval for the release and, presumably, would have to agree to conditions specified by the CTDEP that would assure that actions taken or future conditions in the subject area do not pose a threat to human health and the environment. The CTDEP's release would then have to be recorded on the land records.

7.2.1.2 Engineered Controls

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Technology	Implementability	Relative Cost	Retained/Comments
Engineered Controls	Easy in short term; long-term obligations	Moderate	Yes

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Engineered controls can be used to isolate impacted soils from direct contact and to minimize leaching of COCs to ground water. Engineered controls isolate and control the migration of COCs, but do not reduce the level of COCs. Implementation of an engineering control requires adequate time for approvals, design and construction. Monitoring and maintenance activities continue over the long term.

Engineered controls, as described in RCSA Section 22a-133-2 (f)(2), may be used with the CTDEP's approval if:

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1) The CTDEP authorized the disposal of solid waste or impacted soil;

2) Remediation of the soil is not technically practicable;

3) The CTDEP and the Department of Public Health (DPH) have determined that the removal actions would create an unacceptable risk to human health; or

4) The cost of remediation is significantly greater that the cost of an engineered control and that the cost difference outweighs the risk to human health and the environment should the control fail.

If implemented in accordance with the regulation, the DEC and PMC do not apply to soils below the engineered control.

To obtain CTDEP's approval to use an engineered control, a report must be submitted that demonstrates how it will be designed, constructed and maintained to achieve the objectives of effectively isolating the underlying soil. In addition, a ground water monitoring plan must be prepared and an appropriate ELUR will need to be instituted. A surety is required to cover the cost of maintenance and monitoring (the amount of the reserve to be increased annually over five years until the amount is equal to the cost of five years of maintenance and monitoring).

Specific design considerations for an engineered control [from RCSA 22a-133k-2(f)(2)(B)] include:

1) Isolate the impacted soil and minimize migration of liquids through the soil;

2) Promote drainage and minimize erosion;

3) Accommodate settling and subsidence, maintain structural integrity, and function with minimum maintenance; and

4) With respect to an engineered 'cap', have a vertical permeability of less than 10^{-6} cm/second, as otherwise specified by CTDEP or as required by regulation for a solid waste facility (if the area is a lawful solid waste disposal facility).

Pre-design studies may be needed to evaluate the stability of the materials, the need to reshape or regrade the fill materials, drainage considerations and the need for gas venting. Materials that might achieve the specified cap permeability limits might include clay, geo-membranes and modified asphalt (e.g., Matcon). An alternative cover system (such as a phytocap/evapotransporation cover) may meet the regulatory requirements of an engineered control if it is designed to meet the above performance requirements.

In addition to CTDEP approval of an engineered control, this option will likely require permits for disturbance of a fill/solid waste area and for working near a wetland.

Subject to obtaining the appropriate approvals and permits, an engineered control could be used to address soils with concentrations that exceed the DEC and the PMC and would be suited to the AEIs that do not have VOCs above the PMC criteria (AEIs 1, 3, 5, 8, 11, 12 and 20).

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7.2.1.3 Soil Cover ('Inaccessible Soil')

Technology	Implementability	Relative Cost	Retained/Comments
Soil Cover	Easy to moderate	Low to Moderate	Yes, must be combined with another technology to address GB PMC

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By definition, soil that is rendered 'inaccessible' and where an ELUR is in place to prohibit disturbance is not subject to the DEC. Inaccessible soil is defined as soil more than four feet below grade, more than two feet below a qualifying paved surface or below a building or permanent structure. The purpose of the soil cover is to prevent direct contact with the soil by rendering it inaccessible.

Inaccessible soil is still subject to the PMC, so those areas where the PMC is exceeded must be addressed with an alternative approach. Soil cover is not considered a viable alternative for many of the AEIs at the Site because a number of samples exceeded the GB PMC, so statistical analysis and/or spot removals are unlikely to demonstrate compliance with the GB PMC. However, at select AEIs a more comprehensive soil sampling and testing program may be used to fully characterize the nature and extent of select COCs. Using those data and existing data, the 95% upper confidence limit (95% UCL) for soils subject to the GB PMC can be calculated. If the 95% UCL is less than the GB PMC and the CTDEP agrees to waive the requirement that the concentration of no single sample exceeds two times the criteria, then compliance with the GB PMC will be demonstrated.

To implement a soil cover, pre-design studies may be needed to evaluate the stability of the fill materials (particularly in areas of bulky waste) and the need to reshape or regrade the fill materials. Where site area is limited, partial fill removal or surface regrading might be required to accommodate the addition and grading of the imported cover materials. In addition, drainage systems may need to be modified to accommodate the altered surface drainage patterns and possible increased runoff (particularly where pavement is added as part of the cover). Asphalt or other pavement used as part of a soil cover should be maintained in good condition. If the design does not include pavement, the design should include vegetative cover or another stabilizing material to prevent erosion. This option will likely require permits for disturbance of a fill/solid waste area and for working near a wetland. An ELUR that prohibits excavation in the area will also be necessary.

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Given that only limited areas within the ROW Disposal Area exceed the GB PMC, it

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A more comprehensive soil sampling and testing program can

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<#>A more comprehensive soil sampling and testing program can be used to fully characterize the nature and extent of lead and TPH/ETPH across the area. If the sampling program indicates that there are localized areas where soils do not comply with the GB PMC, then those areas can be addressed by excavation and offsite disposal, leaving in place only soils that do not comply with the DEC. ¶
¶
Soil cover is not considered a viable alternative for AEI No. 11 (Railroad Spur Disposal Area) because a number of samples exceeded the GB PMC, so statistical analysis and/or spot removals are unlikely to demonstrate compliance with the GB PMC.

Included in the RSRs is an exemption for "polluted fill" (RCSA Section 22a-133k-2(c)(4)(C)) wherein "fill polluted only with coal ash, wood ash, coal fragments, asphalt paving fragments" and not containing VOCs is exempt from the PMC. This may be helpful in demonstrating compliance in some areas of the site (e.g., the cinder fill portion of the Railroad Fill Area), but does not provide an exemption from demonstrating compliance with the DEC.

7.2.1.4 In-Situ Bioremediation

Technology	Implementability	Relative Cost	Retained/Comments
In-Situ Bioremediation via bioventing	Easy to moderate; will create disruption if design requires treatment inside buildings.	Low to Moderate;	Yes, however, it would most likely be used in very select circumstances and in conjunction with other remedial technologies.

Bioventing is an in-situ remediation technology that uses indigenous microorganisms to biodegrade organic constituents adsorbed to soil in the unsaturated zone. Soils in the capillary fringe and saturated zone are not affected. In bioventing, the activity of the indigenous bacteria is enhanced by inducing air (or oxygen) flow into the unsaturated zone (using extraction or injection wells) and, if necessary, by adding nutrients. Remedial technologies that improve air flow through the unsaturated soil include soil-vapor extraction (SVE) and high-vacuum extraction (HVE) systems. The air recovered by the system is replaced with air from the atmosphere, which may contain more oxygen.

Bio-venting would only be considered for certain COCs at the Site that are conducive to degradation by this remedial technique. For instance, bio-venting would not be considered a viable remedial soil technology for TCE because anaerobic (i.e., oxygen deficient) conditions would be preferred for biodegradation of this compound. Conversely, VC (a daughter product of TCE) may be well suited to bio-venting since aerobic conditions are required for breakdown of this compound.

This would not be a stand-alone remedial technology for the site given the location and nature of the COCs; however, it would aid in achieving DEC and PMC criteria for TPH in unsaturated soil locations. This technology will not treat metals in the subsurface. This technology is potentially suitable for AEIs with TPH as the predominant COC in the soil.

7.2.1.5 Excavation with Offsite Disposal/Treatment

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Technology	Implementability	Relative Cost	Retained/Comments
Excavation/Offsite disposal or treatment	Easy to moderate; will create disruption, probable loss of usable land	Moderate; depends on waste classification(s)	Yes

Excavation is a timely and effective means of remediation of impacted soil. This approach results in a reduction of the COCs onsite and, depending on the treatment or disposal method, can result in constituent destruction, recycling or landfilling. It can be implemented in the short to moderate term.

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For this approach to be practical and cost-effective, impacted soil must be accessible to excavation equipment. Other considerations include the proximity of the soil relative to buildings and other structures, the depth of the soil, the depth to ground water, area available for staging/stockpiling, ability of current operations to accommodate disruption, health and safety aspects of the excavation, and costs relative to other feasible technologies.

An excavation plan should be prepared that addresses worker health and safety, including vapor and dust monitoring, if appropriate; waste characterization; erosion and sedimentation controls for the stockpiled materials and the excavation area; vehicle management and anti-tracking, as appropriate; dust-control measures; permits and operating hours; post-excavation sampling and analysis; and backfilling and site restoration. Permits will likely be required for disturbance of fill/solid waste area and for excavation near a wetland.

The project Health and Safety Plan (HASP) should include, but not be limited to, identification of potential hazards, work methods to mitigate hazards, environmental monitoring (vapor, dust, et cetera) measures, procedures for securing the site/open excavations, emergency-response procedures and emergency contacts, and worker training and medical monitoring.

Soil waste must be appropriately characterized prior to manifesting and offsite disposal. Existing data may be sufficient to identify the COCs, but representative samples of the waste may also need to be collected and analyzed for waste determination (hazardous versus non-hazardous/Connecticut-regulated) and to satisfy the disposal facility permit requirements. This may require thorough advance testing of the in-situ materials (e.g., borings on a grid pattern), which may permit live-loading, or the collection of representative samples from the stockpile. The necessary waste characterization documentation must be completed and forwarded to the disposal facility prior to manifesting and offsite shipment of wastes. Transportation arrangements must be made with appropriately licensed haulers.

The staging of wastes on site in quantities greater than 10 CY for projects of duration less than two years would require compliance with the terms of the General Permit for Contaminated Soil and/or Sediment Management (Staging and Transfer). Registration is not required if the quantity is less than 1,000 CY and the material is staged at the site of excavation. Registration is required if the quantity is greater than 1,000 CY (but less than 10,000 CY) and the material is staged at the site of excavation for a period greater than 45 days or if the quantity is greater than 10 CY but less than 10,000 CY for any duration at another site. Approval must be obtained if the quantity exceeds 10,000 CY at the site of excavation and the duration exceeds 45 days or if the quantity exceeds 10,000 CY at an offsite location for any duration.

Soil/material staging plans should address securing the materials from erosion and proper material labeling. Materials stored in covered containers do not pose the same risk of erosion as stockpiles, which must be covered and secured from the elements. Depending on the waste (hazardous versus non-hazardous) there may be labeling, inspection and recordkeeping requirements that should also be addressed in the plan.

Depending on site conditions and work methods, measures such as anti-tracking pads and decontamination areas may need to be implemented to avoid spreading of waste materials on and off the site through vehicle movement. Dust-control measures, such as misting or foaming, may also be necessary depending on the nature of the COCs and the potential for exposures.

A plan for post-excavation sampling should include descriptions of the sampling methods, frequency, analytical parameters and methods, sample nomenclature and handling, and compliance levels. Site restoration plans should describe the acceptable types of backfill, pre-acceptance testing or approvals for backfill material, compaction requirements, and paving or re-vegetation requirements.

Remediation will require post-remediation ground water monitoring. Monitoring wells may need to be installed or replaced so that representative ground water samples can be obtained. In a GB area, two years of post-remediation monitoring are required. Compliance monitoring (four consecutive quarters that can overlap with the post-remediation monitoring) is also required.

The 12 AEIs appear to be suited to excavation and removal as a remedial alternative. Removal can also address impacted soil from below the water table, thereby removing a potential source of impacts to ground water (a possible consideration for compliance with the SWPC, CALC or CTDEP-approved AALC). Potential obstacles that may impact the extent of the excavation activities at the AEIs may include impacted soil located under buildings or in a wetland buffer zone.

Based on the waste characterization samples, excavated soil from each AEI will be disposed as hazardous waste, Connecticut-regulated waste, non-hazardous waste or bulky waste.

Deleted: The disposal areas appear to be suited to excavation and removal as a remedial alternative. All wastes/fill appear to be within a reasonable excavation depth and only a small quantity of the overall waste/fill appears to be below the seasonal low water table. Wastes from AEI No. 11 (Railroad Spur Disposal Area) will likely require disposal as a hazardous waste (D008). Conversely, the materials at AEI No. 1 (ROW Disposal Area) consist at least partly of bulky waste and municipal solid waste; the remainder may be a combination of areas of Connecticut-regulated waste and, possibly, some hazardous waste. Removal can address fill materials from below the water table, thereby removing a potential source of impacts to ground water (a possible consideration for SWPC compliance).¶
¶
7.2.5 . Solidification/Stabilization¶

7.2.1.6 Solidification/Stabilization

Technology	Implementability	Relative Cost	Retained/Comments
Solidification/ stabilization	Moderately difficult; specialized equipment needed; debris would likely be a problem	Moderate to high; would likely need to be combined with another approach to be completely effective	No

Using solidification/stabilization technologies the COCs in the soils are rendered less leachable, although they remain in place. Solidification techniques utilize cement and other additives to alter the oxidation state of the metal (rendering it less soluble) then bind the soil; stabilization technologies reduce metals' solubility through the addition of chemicals such as phosphates, mineral fertilizers, iron oxyhydroxides, other minerals, biosolids or limestone (RTDF). Total metals concentrations would be expected to remain relatively unchanged (except as might have occurred due to the increase in total mass caused by the addition of materials). Solidification/stabilization could be implemented in the short to moderate term, requiring up-front time for bench-scale testing and design.

In-situ solidification/stabilization could be used to address areas where soils do not comply with the GB PMC, but do comply with the DEC. If COCs in soils exceed both the GB PMC and the DEC, soils that do not comply with the DEC could be rendered 'inaccessible', and the remaining soils that are not in compliance with the GB PMC could be addressed with solidification/stabilization techniques.

Considerations to application of these technologies include access, as many mixing technologies also require access to the area by heavy equipment, either excavators or specialized augering/mixing equipment. Organics may interfere with the bonding process, and long-term stability may be an issue (Wickramanayake, et al., 2001). For in-situ mixing, the debris content of the soil, soil characteristics and depth of mixing must be within the capabilities of the equipment. Because both methods require the addition of materials to the subsurface (but not necessarily to ground water) the need for permits is unclear.

In-situ vitrification, which could be considered a form of in-situ solidification, was not considered due to its high cost.

Solidification may successfully address GB PMC issues, but does not address the widespread high total metals, TPH/ETPH and CVOCs at many of the AEIs that exceed the I/C DEC. It may be effective in bringing certain AEIs into compliance if combined with soil cover to render soils inaccessible. If applied to fill below the water, it would also address the potential for fill below the water table to act as a continuing source of impacts to ground water (e.g., CALC and CTDEP-approved AALC compliance).

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However, given the moderate to high cost to apply the technology, the total cost with soil cover would likely render this combined alternative as too costly.

7.2.1.7 Phytoremediation

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Technology	Implementability	Relative Cost	Retained/Comments
Phytoremediation	Easy for shallow soil; would require additional research and pilot tests; may not be easy to implement on deeper soil	Low	Not retained as a stand-alone solution/depth of fill, total metals concentrations render this alternative insufficient; concepts could be considered in cap design for approval by the CTDEP

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Plants can be used to change soil chemistry, thereby reducing chemical mobility (phytostabilization), and to absorb metals from the soil and accumulate the metals in the plant tissue (phytoaccumulation or phytoextraction). *Phytoextraction* would be expected to reduce exposure risk by removal of COCs (into the plant biomass, which is then harvested and removed from the site), and if effective, would be a long-term treatment technology that reduces levels of COCs. Whereas, *phytostabilization* may be effective in lowering the leachable concentrations of metals, it may not be a suitable method of demonstrating compliance in areas where the DEC are exceeded, as it does not result in a reduction of COCs in soil.

Deleted: A phytocap or evaportransporation cover would be considered under the engineered control alternative.

The consideration of phytoremediation as a remedial technology must include the following:

- Laboratory studies should be available that document the effectiveness of the selected vegetation varieties in remediating the target constituents in the target media. As an example, EPA (2000) indicates that Indian mustard, hybrid poplar, pennycress, sunflower and alyssum have been used in phytoextraction of lead.

- The target zone must be within the root zone (depth) of the plants or the COCs must be moved to within the root zone by plowing or tilling. The root zones for most metal-accumulating plants are limited to the top foot of soil (EPA, 2000).

- The constituent concentrations should be within the range of tolerance of the vegetation, otherwise growth may be inhibited.

- Bioaccumulation and the possible effects on other parts of the food chain should be evaluated.

- The biomass will have to be harvested and properly recycled or disposed of for chemical reduction to be accomplished.

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This technology has not been retained as a stand-alone solution and is evaluated further in Section 8.0.

7.2.1.8 Soil Washing

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Technology	Implementability	Relative Cost	Retained/Comments
Soil Washing	Limited availability	Moderate to high	No/due to availability and cost

Soil washing removes COCs from excavated soil, placing those constituents into the wash solution. The wash solution is then accumulated and treated using waste-water treatment technologies. As necessary, solids would be separated, dewatered and disposed offsite. The process relies upon particle-size separation (removal of fines) and/or chemical processes (such as leaching agents or pH adjustment). Once the transfer is completed, the washed soils or larger particles are returned to the site and the COCs are removed from the site. This technology can be accomplished on the short to moderate term. However, this technology reportedly has only limited commercial availability (EPA Federal Remediation Technology Roundtable - FRTR) and may only be economical for large sites. Furthermore, the nature of the onsite materials (containing debris and foreign materials) may add to the processing required and/or may alter the effectiveness of the technology.

Soil flushing, an in-situ form of soil washing, was not considered due to the need for ground water containment to complete the removal process.

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7.2.2 Ground-Water Technologies

7.2.2.1 Monitored Natural Attenuation

Technology	Implementability	Relative Cost	Retained/Comments
Monitored Natural Attenuation	Easy, however, achieving RSR standards is anticipated to take a long time.	Low, but monitoring costs would continue for the foreseeable future.	Retained as a stand-alone approach or may be combined with another approach

Monitored natural attenuation (MNA) is a passive remedial approach that depends upon natural processes to degrade and dissipate the COCs in the soil and ground water. Some of the processes involved in natural attenuation include aerobic and anaerobic biodegradation, advection, dispersion, volatilization and adsorption.

This remedial technology may be used as a stand-alone measure for all COCs or in conjunction with other remedial technologies; however, as a standalone technology, this approach is not viewed to achieve applicable clean-up criteria, CALC or CTDEP-approved AALC in a reasonable time frame.

A ground-water sampling program would be implemented for the site that would monitor the ground-water quality at periodic intervals. The ground-water sampling program would also include an assessment of water quality with respect to tidal influences. The sampling program may also include a periodic evaluation of the wetlands to assess its condition.

This remedial approach has applicability at all the AEIs at the Site particularly where active remedial soil technologies such as excavation are being implemented.

7.2.2.2 In-Situ Bioremediation

Technology	Implementability	Relative Cost	Retained/Comments
In-Situ	Easy to moderate	Moderate initial capital cost	Retained as a stand-

Bioremediation	depending on locations of AEI with respect to buildings. The need for hydraulic control may be required to protect downgradient wetlands. Injection permit required.	but O&M costs are relatively low compared to other ground water technologies.	alone approach or may be combined with another approach.

In-situ bioremediation of the ground water and saturated soil is a remediation technology that uses the injection of proprietary products to enhance/accelerate the degradation of COCs by naturally occurring bacteria. In cases where the necessary bacteria are not present or are not abundant, the appropriate bacteria would also be injected.

As part of the implementation for this remedial option, soil and ground-water parameters would be evaluated to acquire the necessary site-specific geochemical and hydraulic information for design purposes. Further delineation of AEIs that are required to provide an accurate assessment of the extent of the COCs will be completed prior to initiating this remedial technology.

The two major components to consider with this remedial option include the product selection and delivery method for the product. Bioremediation products can be categorized into two classifications that consist of the following:

- products that contain specific bacteria designed to degrade the COC that are not indigenous to the site (i.e., bio-augmentation), and;
- products used to condition the subsurface to promote increased metabolic activity of indigenous bacteria (i.e., bio-stimulation).

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For CVOC releases that contain TCE, it is important to maintain an anaerobic (oxygen-deficient) subsurface environment when considering bioremediation as a remedial option although there have been some products that have the ability to allow certain microorganisms to degrade TCE utilizing co-metabolic processes that do not require an anaerobic environment.

Implementation of bioremediation will require a site-specific HASP that will include, but may not be limited to, the identification of potential hazards, work methods to mitigate hazards, drilling/injection safety protocols, product safety (MSDSs), environmental monitoring, site security, worker training, medical monitoring, emergency procedures and emergency contacts.

Bioremediation will be effective at treating CVOCs and/or TPH-impacted ground water but would be ineffective in treating of metals impacted ground water. Distribution and delivery of a product to the COC-impacted areas will be critical for success. Permits to inject the product would be required by the CTDEP and downgradient hydraulic control may be required to protect the wetlands area in the short-term if this remedial technology is to be implemented.

7.2.2.3 In-Situ Chemical Treatment

Technology	**Implementability**	**Relative Cost**	**Retained/Comments**
In-Situ Chemical Treatment	Moderate depending on locations of AEI with respect to buildings. The need for hydraulic control may be required to protect downgradient wetlands. Injection permits are required.	Moderate initial capital cost but O&M costs are relatively low compared to other ground water technologies. Chemical treatment may require follow-up injections to achieve applicable standards.	Retained as a stand-alone approach or may be combined with another approach. May require additional applications.

Chemical treatment can be broken down into two categories, chemical oxidation and chemical reduction.

In-situ chemical oxidation is a remediation process that involves the injection of strong oxidizing compounds to effectively destroy the compounds through oxidation-reduction (redox) reactions, which are essentially an exchange of electrons between chemical species. This exchange of electrons affects the oxidation state (valence) of the chemical species involved. The carbon bonds are broken as a result and the organic compounds are either completely destroyed or converted to smaller and typically less hazardous compounds. Examples of products that would promote chemical oxidation are permanganate, persulfate, fenton's reagent (hydrogen peroxide and iron) and ozone.

In-situ chemical reduction is a remediation process that involves the introduction of material into the soil that creates an environment with a reducing condition. The reductive dehalogenation reaction degrades the COCs, ultimately, to non- hazardous compounds. Examples of products and processes that would promote chemical reduction may include but not be limited to the injection zero-valent iron as well as funnel and gate permeable, reactive walls.

To implement the in-situ chemical reduction technology, chemical reactants would be introduced into the ground at prescribed locations and depths. The chemical constituents will have a certain time interval to react with the COCs before the chemical products become ineffective. As with in-situ bioremediation, product distribution and delivery are critical to success. Some chemicals that are available have the ability to breakdown certain metals so this technology may also be used to remediate metals impacted ground water. Special chemical handling and safety precautions may be required if this remediation technology is implemented.

The construction of a funnel and gate permeable, reactive wall would have the same effect as the impacted ground-water plume migrates through the gate of the wall. The reactions would occur in the gate and the remediated water would exit the down-gradient side of the gate.

Implementation of this technology will require a site-specific HASP that will include but may not be limited to the identification of potential hazards, work methods to mitigate hazards, drilling/injection safety, product safety (MSDSs), environmental monitoring, site security, worker training, medical monitoring, emergency procedures and emergency contacts.

This remedial approach would be most suited to addressing the CVOCs and TPH in the ground water. Permits to inject the product would be required by the CTDEP and downgradient hydraulic control might be required to protect the wetland area.

7.2.2.4 High Vacuum Extraction

Technology	Implementability	Relative Cost	Retained/Comments
High Vacuum Extraction	Moderate to implement; Discharge permit would be required.	High Capital and O&M cost. May take several years before COC concentrations achieve compliance with applicable criteria.	Retained for select areas of the site.

High vacuum extraction (HVE) is an in-situ technology that uses high vacuum to remove various combinations of ground water, free-phase product, and vapors from the subsurface. HVE wells are screened through the unsaturated and saturated zone of the subsurface so this technology has the ability to treat the saturated or unsaturated zones and may be used as a soil remedial technology for certain AEI. Permits to discharge treated water would be required by the CTDEP and downgradient hydraulic control would likely be required by the CTDEP if this remedial technology is to be implemented. The recovered ground water is treated and discharged to a sanitary sewer or surface water body. The recovered vapor may or may not be treated depending on air emissions and sensitive receptors at the Site.

This technology has the potential to remove the COCs from the ground water; however, because of the high capital and O&M costs this technology will only be considered at select AEIs.

7.2.2.5 Free-Phase Product Recovery

Technology	Implementability	Relative Cost	Retained/Comments
Free-phase Product Recovery	Easy to moderate	Low to moderate cost; Requires disposal of recovered product.	Retained for AEI No. 16 where CVOC free-phase has been detected.

The free-phase product or non-aqueous phase liquid (NAPL) recovery technology is a process that recovers free-phase product from the subsurface ground-water. Recovery processes may include the use of product recovery pumps, skimmers or high vacuum equipment to remove NAPL from recovery or monitoring wells.

NAPL in the subsurface is an indication of a source of COCs; and as such, should be remediated to the extent practicable before other ground-water remedial technologies can be successfully implemented. The presence of NAPL in the subsurface will significantly decrease the effectiveness of bioremediation and chemical treatment products because the NAPL will "use up" the injected product before it can remediate the impacted ground water.

Implementation of product recovery will require a site-specific HASP that includes but may not be limited to identification of potential hazards, work methods to mitigate hazards, equipment safety, work area security, waste disposal procedures, emergency procedures and emergency contacts.

7.2.2.6 Sub-Slab Depressurization

Technology	Implementability	Relative Cost	Retained/Comments
Sub-slab depressurization	Easy to moderate. Diagnostic testing would be required for system design.	Low to moderate cost; Requires periodic performance testing and O&M.	Retained for AEI with CVOCs exceeding GWVC

Sub-slab depressurization (SSD) consists of inducing sufficient vacuum beneath a building slab to prevent the migration of vapor from impacted soil and/or ground-water into a building. VOCs in soil and ground water migrate through diffusive and advective forces from the subsurface through cracks and penetrations in buildings foundations and slabs. SSD is the preferred method to intercept vapors in the sub-slab material to prevent vapor intrusion into a building.

An SSD system, while not a remedial technology, was included in the ground-water technology screening analysis and may be used as an engineered control in conjunction with other remedial alternatives to achieve compliance with the applicable GWVC.

Implementation of a SSD system will require diagnostic testing to properly size the extraction fan and to determine the proper location and spacing of suction points. Treatment of the extracted vapor is typically not required due to the low concentrations and low flow rate from SSD systems.

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AEI No. 1 ROW Disposal Area	Soil/fill and debris	GBPMC (TPH/ETPH and lead); RDEC (TPH/ETPH, arsenic, copper, lead); I/C DEC (TPH/ETPH, arsenic, lead)
A portion of the industrial debris area within AEI No. 11 Railroad Spur Disposal Area	Soil/fill and debris	GBPMC (TPH/ETPH, lead, nickel); RDEC (TPH/ETPH, PAHs, arsenic, copper, lead, nickel, thallium); I/C DEC (TPH/ETPH, PAHs, arsenic, lead, nickel)

In addition, for AEI No. 1, the ROW Disposal Area, some of the fill/waste materials are located off site; relocation of these materials may need to be part of a remedy for this area.

The SWPC for metals is exceeded in ground water within both areas; ground-water quality downgradient of the disposal areas is not known. It is not known if bringing these areas into compliance with the GB PMC and monitoring at downgradient locations outside of the fill will be sufficient to assure compliance with the SWPC, since the fill is present below the water table at some locations.

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	Total Metals	Leachable Metals	Petroleum Hydrocarbons
Institutional Controls- Employ land use restrictions in lieu of active remediation	N	N	N
Engineered Control- Use cap or other barrier to control exposure and leaching	**E**	**E**	**E**
Soil Cover—use of clean soil cover and asphalt to render soil 'inaccessible'	**E**	**P+**	**P+**
In-Situ Bioremediation- Utilize bioremediation methods, such as bioventing, to promote natural degradation of COCs in place	N	N	P
In Situ Stabilization- Utilize chemical additions to alter chemical composition and/or soil matrix to inhibit leaching	**P***	**E**	**P**
Phytoremediation (in-situ)- Use plants to remove and accumulate, to stabilize or to metabolize COCs	**P**	**P**	**P**
Excavation/Soil Washing- Use physical and chemical processes to remove COCs from excavated soil on site	**E**	**E**	**E**
Excavation/Bioremediation- Use biological processes to promote degradation of COCs in landfarms, bioreactors, et cetera, on site	N	P	E
Excavation/Thermal- Use of onsite thermal treatment or asphalt mill to treat soil	N	E	E
Excavation/Removal- Removal of the impacted soil, and either offsite treatment, blending, disposal	**E**	**E**	**E**

	Total Metals	Leachable Metals	Petroleum Hydrocarbons
or asphalt batching, as appropriate to the waste and ultimate reuse			

N= not expected to be effective for this COCs
P= regarded as possibly effective for this COCs
E= regarded as probably effective for this COCs

8.0 SITE-SPECIFIC REMEDIAL ALTERNATIVES

The preferred remedial alternatives must consider the site-specific conditions, be cost-effective and achieve compliance with the applicable remediation standards. The remedial alternatives for AEI No. 1 (ROW Disposal Area) and the industrial fill portion of AEI No. 11 (Railroad Spur Disposal Area) must also meet the requirements of the Solid Waste Regulations. The selection and need for ground water remediation in several AEI will depend on the water quality at downgradient monitoring wells that would be constructed during the remedial design phase.

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8.1 Fill Areas

Three soil remedial alternatives were considered for AEI No. 1 (ROW Disposal Area) and the industrial fill portion of AEI No. 11 (Railroad Spur Disposal Area). These alternatives combined technologies that were retained from the screening analysis, including soil cover, soil excavation and offsite disposal and engineered controls. Each alternative also utilizes ELURs as necessary. Specific ground water remediation technologies for these AEI are not considered at this time because the water quality down gradient of the AEI is not known. Monitoring wells will be installed and sampled prior to the remedial design phase to assess ground water quality. If ground water remediation is required, one of the alternatives summarized for the other AEI would be selected.

The three soil remedial alternatives under consideration for the Site are described below. Tables 1 through 4 in Appendix XII show preliminary estimated costs and assumptions for each remedial alternative; the alternatives and cost are summarized on Table 5 in Appendix XII.

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8.1.1 Soil Remedial Alternative 1 – Excavation, Engineered Control and Soil Cover

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Soil Remedial Alternative 1 utilizes excavation and an engineered control to address soil/fill exceeding the GB PMC and soil cover to comply with the DEC.

Prior to initiating this alternative, the surface of the ROW Disposal Area and the industrial fill portion of the Railroad Spur Disposal Area would be cleared of vegetation and secured with sediment and erosion controls. Final characterization of the ROW Disposal Area would then be completed using test pits and/or borings for the purpose of determining the nature and extent of areas that exceed the GB PMC, identifying thickness and quality of existing cover materials and evaluating compliance alternatives. Limited additional investigation of the industrial fill portion of the Railroad Spur Disposal Area would be conducted to determine the limits of the area to be covered by the proposed engineered control. The soil/fill exceeding the GB PMC in the ROW Disposal Area (estimated at 14,000 sq ft) would be excavated, transported and deposited in a specific area adjacent to the soil exceeding the GB PMC in the industrial fill portion of the Railroad Spur Disposal Area (estimated at 12,517 sq ft). An evaluation with respect to grading and ultimately land use would be made prior to relocating the soils. An engineered control would be constructed in the Railroad Spur Disposal Area to prohibit the infiltration of precipitation into the soil/fill that exceeds the GB PMC. The engineered control would consist of liner with a permeability less than 10^{-6} centimeters per second (cm/s), overlain by a geotextile for structural integrity and a drainage grid to drain precipitation from the top of the liner. The liner would be covered with clean fill material and stabilized with grass and/or asphalt pavement. An alternative to a conventional cap, a phytocap/evapotranspiration cap, would be considered. A phytocap/evapotranspiration cap may represent a lower-cost, lower-maintenance alternative that would meet the design objectives. The CTDEP Bureau of Materials Management and Compliance Assurance indicated that a phytocap/evapotranspiration cap, if proposed for these areas, could be considered, but would require CTDEP approval of the design.

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The soil/fill in ROW Disposal Area that exceeds the DEC would be addressed by rendering the soil "inaccessible" and recording the appropriate ELUR on the municipal land records. The soil and solid waste deposited on the adjacent property to the north of the site would be excavated and used in the ROW Disposal Area to backfill the GB PMC excavations. The soils to be relocated on site would be tested and managed to ensure that the final disposition is consistent with Section-22a-133k-2(h) of RCSA. Soil exceeding the GB PMC would be relocated to the capped area within the Railroad Spur Disposal Area. The bulky waste would be disposed of offsite as non-hazardous waste. The entire ROW Disposal Area, with the exception of the existing building, would then be covered with additional clean fill such that soils that exceed the DEC would be rendered inaccessible (covered with four feet of "clean fill" and/or two feet of fill and three inches of asphalt). The first 18 inches of clean fill placed on the ROW Disposal Area would be compacted to decrease the permeability of the soil to comply with the Solid Waste Regulations.

Per the Solid Waste Regulations, the side slopes of both disposal areas would be graded to achieve a maximum slope of 1 to 3 (horizontal to vertical) and the top would be graded to a minimum 4 percent grade. Unpaved areas would be stabilized with the appropriate seeding mixture for sedimentation and erosion control. An ELUR prohibiting disturbance of the soil in either area and demolition of existing building(s) in the ROW Disposal Area would be recorded on the municipal land records. In the event that the landowner wishes to demolish the buildings, the ELUR can be lifted if appropriate measures are taken to remediate the soil rendered 'inaccessible' and 'environmentally isolated'. This may include constructing a building over the AEI and recording another ELUR prohibiting demolition of the new building.

A ground water monitoring plan consistent with Section 22a-133k-2(f)(2) of RCSA would be implemented to monitor the integrity of the engineered control and ground water quality. In addition, a surety in the amount of five years monitoring costs would be reserved.

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The approximate cost for Soil Remedial Alternative 1 is $1,500,000 (Table 1 in Appendix XII). This cost includes design, permitting, implementation and monitoring, and maintenance costs. This alternative would not result in a significant loss of useable area of the site (although there would be added restrictions to protect the integrity of the engineered control), but would cause temporary site disruption during construction.

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8.1.2 Soil Remedial Alternative 2 – Excavation and Disposal of All Impacted Soil

Soil Remedial Alternative 2 consists of the excavation and offsite disposal of soil/fill in the ROW and Railroad Spur Disposal Areas that exceeds the applicable regulatory standards.

Prior to initiating this alternative, the surface of the ROW Disposal Area and the industrial fill portion of the Railroad Spur Disposal Area would be cleared of vegetation and secured with sedimentation and erosion controls. Final characterization of the nature and extent of soil/fill exceeding the remediation standards in both areas would then be completed using test pits and/or borings. Soil/fill samples would also be analyzed for disposal profiling. Soil/fill that exceeds the applicable DEC and GB PMC in the ROW Disposal Area and the industrial fill portion of the Railroad Spur Disposal Area would be excavated and screened to remove bulky wastes. Excavation would extend below the water table, as necessary, to remove the impacted soil/fill material. Dewatering may be necessary to facilitate deeper excavation. The excavated and screened materials would be stockpiled in separate areas according to the soil/fill-quality

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data. It is anticipated that the majority of the excavated material would be disposed as non-hazardous, Connecticut-regulated waste. Investigation indicates that some soil/fill in the industrial fill portion of the Railroad Spur Disposal Area contains leachable lead at concentrations that exceed the characteristic criterion for a hazardous waste. This material would be stockpiled separately for disposal at a hazardous waste landfill. The material stockpiles would be sampled, as necessary, for waste profiling and the material would be transported to the appropriate permitted disposal facility.

The vertical and horizontal extent of soil excavation will be pre-determined through the pre-remediation soil sampling program that will also serve to document attainment of remediation standards, in effect serving as post-excavation sampling. The remedial excavation in the industrial fill portion of the Railroad Spur Disposal Area would be backfilled with clean fill to pre-remediation grades. The remedial excavation in the ROW Disposal Area would be backfilled with clean fill to one foot above the seasonal high water table. Excavation areas immediately adjacent to existing buildings, remnant structures, or other areas as determined through consultation with the current property owner at the time of the remediation, in the ROW Disposal Area would be backfilled with clean fill to the approximate pre-remediation elevation, with appropriately graded slopes to lower excavated areas. Both disposal areas would be stabilized with appropriate seeding or asphalt pavement to prevent sedimentation and erosion. Ground-water monitoring wells would be installed/replaced as necessary for post-remediation monitoring.

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Inaccessible soil/fill beneath the existing building in the ROW Disposal Area would be addressed by recording an ELUR prohibiting demolition of the building. In the event that the landowner wishes to demolish the buildings, the ELUR can be lifted if appropriate measures are taken to remediate the soil rendered 'inaccessible' and 'environmentally isolated'. This may include constructing a building over the AEI and recording another ELUR prohibiting demolition of the new building.

The estimated cost for Soil Remedial Alternative 2 is $5,000,000 (Table 2 in Appendix XII). This cost includes clearing the area, a pre-remediation subsurface investigation, permitting, preparation of remedial action plans, implementation, reporting, preparing and filing the ELUR and monitoring costs. This alternative would result in a loss of useable space in the ROW Disposal Area and temporary disruption of the site during implementation.

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8.1.3 Soil Remedial Alternative 3 – Selective Disposal and Soil Cover

Soil Remedial Alternative 3 consists of the excavation and disposal of soil/fill that exceeds the GB PMC from above the seasonal high water table, and rendering the remaining soil/fill exceeding the DEC 'inaccessible' by placement of soil cover and recording an ELUR.

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The surface of the ROW Disposal Area and the industrial fill portion of the Railroad Spur Disposal Area will first be cleared of vegetation and secured with sedimentation and erosion controls. Final characterization of soil/fill exceeding the GB PMC in the ROW Disposal Area would be completed using test pits and/or borings. Soil/fill that exceeds the GB PMC (a portion of the ROW Disposal Area and the industrial fill within the Railroad Spur Disposal Area) would be excavated to the seasonal high water table, screened to remove "bulky" waste and stockpiled for disposal according to the available soil/fill-quality data. Additional waste characterization analysis would be completed as necessary. The stockpiled material will be disposed as Connecticut-regulated, non-hazardous waste or as hazardous waste, as applicable.

Following removal of the soil/fill that exceeds the GB PMC from the ROW Disposal Area only soil/fill exceeding the DEC would need to be addressed. Soil/fill that was deposited on the adjacent property to the north of the site (part of the ROW Disposal Area) would be excavated, screened to remove the bulky waste and used to backfill the GB PMC remedial excavations in the ROW Disposal Area. The soils to be relocated on site would be tested and managed to ensure that the final disposition is consistent with Section-22a-133k-2(h) of RCSA. Any soil exceeding the GB PMC would be stockpiled, characterized and disposed as Connecticut-regulated, non-hazardous waste or as hazardous waste, as applicable. Per the Solid Waste Regulations, the side slopes of the disposal areas would be graded to achieve a maximum slope of 1 to 3 (horizontal to vertical) and the top would be a minimum 4-percent grade. Soil in the ROW Disposal Area would be rendered 'inaccessible' by supplementing existing clean cover material to create a cover layer of four feet of clean fill and/or two feet of clean fill and three inches of asphalt over the impacted soil. The first 18 inches of soil placed in the ROW Disposal Area would be compacted to reduce the permeability of the soil layer per the Solid Waste Regulations. The unpaved area would be stabilized with appropriate seeding mixture for sedimentation and erosion control.

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Soil/fill that exceeds the GB PMC in the industrial fill portion of the Railroad Spur Disposal Area is coincident with soil/fill that exceeds the DEC. Consequently, excavation to address the GB PMC concern will also address the DEC concern for soils in the Railroad Spur Disposal Area. As such, a cover of clean fill will not be required to render remaining soils 'inaccessible'. However, the excavations will be backfilled with clean fill to approximately pre-remediation grades. The soil at final grades will be seeded to establish a stabilizing vegetative cover and/or covered with an impermeable surface, such asphalt or concrete to prevent sedimentation and erosion.

Soil beneath the existing building is considered to be 'inaccessible' and would remain in place beneath the building. An ELUR will be recorded in the land records prohibiting the disturbance of the soil in the ROW Disposal Area and demolition of the building in the ROW Disposal Area. In the event that the landowner wishes to demolish the buildings, the ELUR can be lifted if appropriate measures are taken to remediate the soil rendered 'inaccessible' and 'environmentally isolated'. This may include constructing a building over the AEI and recording another ELUR prohibiting demolition of the new building.

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Monitoring wells would be installed for post remediation and compliance monitoring.

The approximate cost for Soil Remedial Alternative 3 is $3,367,000 (Table 3 in Appendix XII). This estimate includes a pre-remediation subsurface investigation, permitting, preparation of remedial action plans, implementation, reporting, preparing and filing the ELUR and monitoring costs. This alternative would not result in a significant loss of useable area of the site (there will be some restrictions to protect the integrity of the soil cover), but will cause temporary site disruption during construction.

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8.1.4 Soil Remedial Alternative 4 – GB PMC Beneath the Seasonal High Water Table

Soil Remedial Alternative 3 addresses soil/fill above the seasonal high water table, which is appropriate for a site located in a GB ground water area. Remedial Alternative 4 includes excavation of soil/fill from below the seasonal high water table and offsite disposal of the impacted soil in conjunction with Soil Remedial Alternatives 1 through 3, should it be necessary to remove that soil/fill to achieve compliance with the SPWC, CALC or CTDEP-approved AALC in ground water.

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Dewatering of the excavation(s) may be required to facilitate excavation below the water table.

The approximate additional cost to implement Soil Remedial Alternative 4 is $443,000 (Table 4 in Appendix XII). This estimate includes costs for permitting the dewatering system discharge and additional excavation disposal and backfill costs.

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8.2 TCE Release Areas

Two soil remedial alternatives were considered for AEI No. 16 (Loading Dock Area/Building 1A) and AEI No. 21 (Building No. 5) and three ground water remedial alternatives were considered for AEI No. 13 (Solvent Release Area), AEI No. 16 Loading Dock/Building No. 1A) and AEI No. 21 (Building No. 5), all of which are impacted by releases of TCE. The alternatives combine technologies that were retained from the screening analyses, including soil excavation and offsite disposal, HVE (in combination with HVE for ground water impacts) and engineering controls for impacted soil and HVE, in-situ chemical or enhanced biological treatment and MNA for the impacted ground water. .

The remediation of TCE-impacted soil in AEI No. 19 (Former Waste Storage Building) would be addressed in conjunction with the remedial alternative selected for the industrial fill portion of AEI No. 11 (Railroad Spur Disposal Area) and is not considered in this section.

8.2.1 Soil Remedial Alternatives

The soil remedial alternatives are described below. Tables 6 and 7 in Appendix XII show preliminary estimated costs and assumptions for each remedial alternative; the alternatives and cost are summarized on Table 8 in Appendix XII.

8.2.1.1 Soil Remedial Alternative 1 – Excavation and Offsite Disposal

Soil Remedial Alternative 1 consists of the excavation and offsite disposal of TCE-impacted soil. This alternative includes the excavation of impacted soil into the water table, should it be necessary to remove that soil to achieve compliance with the SPWC, CALC or the CTDEP-approved AALC in ground water.

Prior to initiating this alternative, final characterization of the nature and extent of soil exceeding the remediation standards in AEI No. 21 (Building No. 5) will be completed using soil borings. Soil that exceeds the applicable DEC and GB PMC will be excavated and stockpiled. Saw cutting the concrete slab in AEI No. 21 will be required to access the impacted soil. The excavated material stockpile will be sampled, as necessary, for waste profiling and the material will be transported off-site to an appropriate permitted disposal facility. It is anticipated that the soil excavated in the vicinity of soil boring GP-76 will be disposed as hazardous waste based on the concentration of VOC observed in some soil samples collected during previous investigation activities. The concentration of VOCs in the excavated soil may exceed the Land Disposal Restrictions (LDR), which would require treatment by a disposal facility prior to land filling. Dewatering of the excavation(s) may be required to facilitate excavation below the water table.

The vertical and horizontal extent of soil excavation will be pre-determined through the pre-remediation soil boring program that will also serve to document attainment of remediation standards, in effect serving as post-excavation sampling. The remedial excavation would be backfilled with clean fill to pre-remediation grades. In AEIs where ground water remediation may include the injection of chemical or biological treatment products, slotted PVC piping may be installed in the bottom of the excavations prior to backfilling. The excavated areas would be stabilized to the pre-remediation conditions with appropriate seeding or pavement restoration to prevent sedimentation and erosion. Ground water monitoring wells will be installed/replaced as necessary for post-remediation monitoring.

If further remediation of the impacted soil beneath the building in AEI No. 21 is not practicable, impacted soil beneath the existing buildings may be designated 'inaccessible' and 'environmentally isolated' and will remain in place with the building floor serving as a cover. In this situation, an ELUR will be recorded in the land records prohibiting demolition of the buildings covering identified AEIs. In the event that the landowner wishes to demolish the buildings, the ELUR can be lifted if appropriate measures are taken to remediate the soil rendered 'inaccessible' and 'environmentally isolated'. This may include constructing a building over the AEI and recording another ELUR prohibiting demolition of the new building.

The estimated cost for Soil Remedial Alternative 1 is $322,000 (Table 6 in Appendix XII). This cost includes a pre-remediation subsurface investigation in AEI No. 21, permitting, preparation of remedial action plans, implementation (including dewatering), reporting, preparing and filing the ELUR and monitoring costs. This alternative would result in a temporary disruption of the site during implementation. No loss of usable space would result from implementing this alternative.

8.2.1.2 Soil Remedial Alternative 2 – High Vacuum Extraction

Soil Remedial Alternative 2 consists of constructing a HVE system with extraction wells located to recover VOCs from the unsaturated zone. The alterative would be implemented in conjunction with the use of a HVE system as a ground water remedial alternative. One benefit of an HVE system is that drawdown at the extraction wells exposes impacted soil that was formerly located below the water table, allowing the system to recover TCE that volatilizes from the soil.

Prior to initiating this alternative, pilot-scale tests will be conducted to provide necessary information to design the HVE system components and to determine the number and spacing of wells required to remediate the soil.

Extraction wells will be constructed in the appropriate locations as determined by the test results with screens that extend through the unsaturated soil. The construction of extraction wells will likely be required within and outside the footprint of the buildings. Piping from the exterior extraction wells to the final location of the system(s) would be installed below-grade in trenches. Piping from the interior extraction wells to the system(s) would be located above grade inside the building. Each extraction well will be piped individually back to the system(s) to allow the ability to vary the extraction rates from each well and to shut down wells in the AEI when soil is compliant.

A soil boring program will be completed to document that soil-quality criteria are achieved and to petition the CTDEP to shut down the system.

The HVE system(s) will consist of a liquid-ring or dry rotary claw pump(s) capable of meeting the desired performance characteristics. A phase-separator tank will be located between the extraction well(s) and pump to separate the liquid and vapor phases. The recovered vapor would be discharged directly to the atmosphere or through vapor-phase carbon vessels to remove the VOCs.

The estimated cost for Soil Remedial Alternative 2 is $28,000 (Table 7 in Appendix XII). This cost includes preparation of remedial action plans, conducting the soil boring program and reporting. This alternative would only be selected if the HVE ground water remedial alternative is selected. The majority of the cost to design, construct and operate the system is included in the ground water remedial alternative. This alternative would result in a temporary disruption of the site during implementation. The only loss of usable space would be where the HVE system would be constructed.

8.2.2 Ground-Water Remedial Alternatives

The ground-water remedial alternatives are described below. Tables 9 through 12 in Appendix XII show preliminary estimated costs and assumptions for each remedial alternative; the alternatives and cost are summarized on Table 13 in Appendix XII.

8.2.2.1 Ground Water Remedial Alternative 1 - High Vacuum Extraction System

Ground Water Remedial Alternative 1 consists of constructing extraction wells in the AEIs where necessary and connecting the wells to either a centralized or separate HVE system(s). As noted above, this alternative would also remediate TCE-impacted soil in the unsaturated zone.

Prior to initiating the alternative, pilot-scale tests will be conducted to provide the necessary information to design the HVE system components and to determine the number and spacing of wells required to remediate the areas of impacted ground water.

Extraction wells will be constructed within and outside the footprint of the buildings. Piping from the exterior extraction wells to the system(s) would be installed in below-grade trenches. Piping from the interior extraction wells to the system(s) would be completed above grade. Each extraction well will be piped individually back to the system(s) to allow the ability to vary the extraction rates from each well and to shut down wells in AEI when ground-water quality is compliant.

The HVE system(s) will consist of a liquid-ring or dry rotary claw pump (s) capable of the desired performance characteristics. A phase-separator tank will be located between the extraction well(s) and pump to separate the liquid and vapor phases. The recovered vapor would be discharge directly to the atmosphere. The recovered water would be pumped to the appropriate equipment to treat the recovered water. The cost estimate assumes that liquid phase carbon vessels would be used for water treatment. The treated water would be discharged to the sanitary sewer under a General Permit to be issued by the CTDEP.

The approximate cost for Ground Water Remedial Alternative 1 is $1,223,000 (Table 9 in Appendix XII). This estimate includes pilot tests, permitting, preparation of remedial action plans and design documents, implementation, reporting, routine operation and maintenance and electrical costs for a period of 10 years. This alternative would result in a temporary disruption of the site during implementation. The only loss of usable space would be where the HVE system would be constructed.

8.2.2.2 Ground Water Remedial Alternative 2 – In-Situ Remedial Technologies

Ground Water Remedial Alternative 2 consists of the injection of product(s) to promote chemical oxidation or reductive dehalogenation of TCE, through enhanced biological processes, to less hazardous compounds that will effect remediation of soil and groundwater.

Prior to implementing the alternative, a design and permitting phase will be required. The design process would consist of a bench-scale study to determine which product would treat the TCE to the desired end products. If the correct product is not selected, the breakdown of TCE may not proceed through vinyl chloride to ethene gas. Product selection would also consider if the remediation of TCE-impacted ground water beneath a building is required. The chemical oxidation reaction is considered a more aggressive reaction compared to reductive dehalogenation and can produce a significant amount of heat and/or potentially harmful vapor.

A permit application for the injection will be prepared for CTDEP approval. The permit review and approval process takes approximately 90 days.

The selected product would be injected into the saturated soil by advancing direct-push soil borings to the appropriate depths. The product can also be injected into slotted PVC piping if excavation is selected as the soil remedial alternative.

A temporary ground water pump and treat or HVE system would be utilized to provide hydraulic control down-gradient of the AEI to prevent the injected chemical treatment product and/or breakdown by-products that have not degraded to the less hazardous compounds from migrating into the wetlands or other sensitive receptors.

The approximate cost for Ground Water Remedial Alternative 2 is $529,000 (Table 10 in Appendix XII). This estimate includes design, permitting, preparation of remedial action plans and design documents, implementation, and reporting costs. This alternative would result in a temporary disruption of the site during implementation. No loss of usable space would result from implementing this alternative.

8.2.2.3 Ground Water Remedial Alternative 3 – Monitored Natural Attenuation

Ground Water Remedial Alternative 3 consists of MNA to track the natural degradation of the COCs in the areas of impacted ground water. An evaluation of the potential for natural biodegradation of VOCs as a component of MNA was conducted by Microseeps, Inc., a laboratory specializing in environmental analyses. The report indicates that biodegradation is 'possible' and 'probable' in the monitoring wells sampled. The detection of breakdown products of TCE, primarily 1,2-dichloroethene and vinyl chloride, indicated that dehalogenation processes are naturally occurring at the Site.

To implement this alternative, additional monitoring wells would likely be constructed down-gradient of the AEI and a ground water monitoring plan would be prepared. The plan would summarize the sample collection methods, quality assurance/quality control procedures, wells to be monitored, parameters to be analyzed and the frequency of the monitoring events. The plan may also include a periodic evaluation of the wetlands to assess its condition and if the wetlands are receiving the impacted ground water. The plan would also include an assessment of water quality with respect to tidal influences.

The approximate cost for Ground-Water Remedial Alternative 3 is $231,000 (Table 11 in Appendix XII). This estimate includes preparation of a monitoring plan, implementation, and reporting costs. The cost estimate assumes that monitoring will be conducted annually for a period of 15 years. This alternative would result in a temporary disruption of the site during well construction. No loss of usable space would result from implementing this alternative.

8.2.2.4 Supplemental Ground Water Remedial Alternative - Sub-Slab Depressurization System

A SSD system may be considered to supplement the ground water remedial alternatives described above. The SSD system consists of the installation of sub-slab suction points and depressurization fans to depressurize the sub-slab material as an engineered control for compliance with the applicable GWVC if a ground water plume exists or migrates under a building or the SVVC if impacted soil remains under the building slab. This alternative has been implemented in AEI No. 16 (Loading Dock/Building No. 1A) where impacted ground water is present under the building.

Prior to implementing this alternative, a soil vapor investigation would be conducted to determine the need of a SSD for compliance with the GWVC or the SVVC. If a SSD system is necessary, a design phase would be conducted to locate the suction points to provide adequate coverage to depressurize the sub-slab material over the entire affected area and to size the depressurization fans.

Suction points would be constructed through the concrete slab and above-grade piping will connect the suction point to the fan(s). The piping would be located along walls and/or structural columns to minimize the disturbance to the operations in the building(s). Control valves will be installed on the above-grade piping to vary the air flow from the sub-surface material if several suction points are connected to a single fan. The SSD system will consist of a moisture separator, depressurization fan(s), monitoring instrumentation and associated controls.

The approximate cost for the SSD system alternative is $295,000 (Table 12 in Appendix XII). This estimate includes preparation of remedial action plans and design documents, implementation, reporting, routine operation and maintenance, and electrical costs for a period of 5 years. This alternative would result in a temporary disruption of the site during implementation. A minor loss of usable space would result at the location of the suction points and where the SSD system would be constructed.

8.3 Petroleum Hydrocarbon Releases

Three soil remedial alternatives and three ground water remedial alternatives were considered for AEI No. 3 (Suspect UST-2 and Switching Station), AEI No. 5 (UST-4), AEI No. 8 (AST-2), AEI No. 12 (Suspect UST-5) and AEI No. 20 (Floor Drains, specifically downgradient of Building Nos. 2 and 4), all of which are impacted by releases of petroleum hydrocarbons. The alternatives combine technologies that were retained from the screening analyses, including soil excavation and offsite disposal, HVE and engineered controls for the impacted soil and in-situ bioremediation, HVE and MNA for the impacted ground water.

The remedial alternatives do not include the removal and closure of the USTs or ASTs that currently exist in the AEI. The removal of tanks is not the responsibility of Unisys because the tanks are not owned by Unisys

8.3.1 Soil Remedial Alternatives

The soil remedial alternatives are described below. Tables 14 through 16 in Appendix XII show preliminary estimated costs and assumptions for each remedial alternative; the alternatives and cost are summarized on Table 17 in Appendix XII.

8.3.1.1 Soil Remedial Alternative 1 – Excavation and Disposal of Accessible Impacted Soil

Soil Remedial Alternative 1 consists of the excavation and offsite disposal of soil impacted by petroleum hydrocarbons located outside the footprint of the buildings that exceeds the applicable regulatory standards and rendering the remaining soil beneath the building 'inaccessible' and 'environmentally isolated' by recording an ELUR prohibiting demolition of the buildings. This alternative includes the excavation of impacted soil into the water table, should it be necessary to achieve compliance with the SPWC, CALC or the CTDEP-approved AALC in ground water.

Prior to initiating this alternative, final characterization of the nature and extent of soil exceeding the applicable criteria in AEI No. 12 (Suspect UST-5) would be completed using test pits and/or borings. Soil located outside the footprint of the buildings that exceeds the applicable DEC and GB PMC would be excavated and stockpiled. It is anticipated that the excavated material would be disposed as non-hazardous, Connecticut-regulated waste. The excavated material stockpile would be sampled, as necessary, for waste profiling and the material would be transported to the appropriate permitted disposal facility. Dewatering of the excavation(s) may be required to facilitate excavation below the water table.

The vertical and horizontal extent of soil excavation will be pre-determined through the pre-remediation soil sampling program that will also serve to document attainment of remediation standards, in effect serving as post-excavation sampling. The remedial excavation would be backfilled with clean fill to pre-remediation grades. If the in-situ bioremediation, ground water remedial alternative is selected, slotted PVC piping would be installed in the excavation prior to backfilling. The excavated areas would be stabilized to the pre-remediation conditions with appropriate seeding or suitable pavement to prevent sedimentation and erosion. Ground water monitoring wells would be installed/replaced as necessary for post-remediation monitoring.

Impacted soil beneath the existing buildings is considered to be 'inaccessible' and 'environmentally isolated' and would remain in place beneath the building. An ELUR will be recorded in the land records prohibiting the demolition of the buildings in the identified AEI. In the event that the landowner wishes to demolish the buildings, the ELUR can be lifted if appropriate measures are taken to remediate the soil rendered 'inaccessible' and 'environmentally isolated'. This may include constructing a building over the AEI and recording another ELUR prohibiting demolition of the new building.

The estimated cost for Remedial Alternative 1 is $1,032,000 (Table 14 in Appendix XII). This cost includes a pre-remediation subsurface investigation in AEI No. 12, permitting, preparation of remedial action plans, implementation (including dewatering), reporting, preparing and filing the ELUR and monitoring costs. This alternative would result in a temporary disruption of the site during implementation. No loss of usable space would result from implementing this alternative.

8.3.1.2 Soil Remedial Alternative 2 – Selective Excavation and Offsite Disposal

Soil Remedial Alternative 2 consists of selective excavation and offsite disposal of impacted soil located above the seasonal high water table and rendering the remaining soil beneath the building 'inaccessible' and 'environmentally isolated' by recording an ELUR prohibiting demolition of the buildings. This alternative would require the selection of one of the ground water remedial alternatives to achieve compliance with the SPWC, CALC or the CTDEP-approved AALC in ground water, if necessary.

Prior to initiating this alternative, final characterization of the nature and extent of soil exceeding the remediation standards in AEI No. 12 (Suspect UST-5) would be completed using test pits and/or borings. Impacted soil exceeding the applicable regulatory criteria above the seasonal high water table would be excavated and stockpiled. The excavated material stockpile would be sampled, as necessary, for waste profiling and the material would be transported to the appropriate permitted disposal facility.

The vertical and horizontal extent of soil excavation will be pre-determined through the pre-remediation soil sampling program that will also serve to document attainment of remediation standards, in effect serving as post-excavation sampling.. The excavation would be backfilled to the pre-remediation grade and stabilized to the pre-remediation conditions with appropriate seeding or asphalt pavement to prevent sedimentation and erosion. If the bioremediation ground-water remedial alternative is chosen, slotted PVC piping would be installed at the bottom of the excavation to allow the injection of the selected bioremediation product. Ground water monitoring wells would be installed/replaced as necessary for post-remediation monitoring.

Soil beneath the existing building is considered to be 'inaccessible' and 'environmentally isolated' and would remain in place beneath the building. An ELUR will be recorded in the land records prohibiting the demolition of the buildings in the identified AEI. In the event that the landowner wishes to demolish the buildings, the ELUR can be lifted if appropriate measures are taken to remediate the soil rendered 'inaccessible' and 'environmentally isolated'. This may include constructing a building over the AEI and recording another ELUR prohibiting demolition of the new building.

The approximate cost for Soil Remedial Alternative 2 is $762,000 (Table 15 in Appendix XII). This estimate includes a pre-remediation subsurface investigation in AEI No. 12, permitting, preparation of remedial action plans, implementation, reporting, preparing and filing the ELUR and monitoring costs. This alternative would not result in a loss of useable area of the site, but will cause temporary site disruption during construction.

8.3.1.3 Soil Remedial Alternative 3 – High Vacuum Extraction

Soil Remedial Alternative 3 consists of constructing an HVE system with extraction wells located to promote the aerobic degradation of TPH in the unsaturated soil by pulling air through the sub-surface material. The alterative would be implemented in conjunction with the use of an HVE system as a ground water remedial alternative. The benefit of an HVE system is the drawdown at the extraction wells exposes impacted soil that was formerly located below the water table to promote degradation.

Prior to initiating this alternative, pilot-scale tests will be conducted to provide necessary information to design the HVE system components and to determine the number and spacing of wells required to remediate the soil.

Extraction wells will be constructed in the appropriate locations as determined by the test results with screens that extend into the unsaturated soil. The construction of extraction wells will likely be required within and outside the footprint of the buildings. Piping from the exterior extraction wells to the final location of the system(s) may be installed below-grade in trenches. Piping from the interior extraction wells to the system(s) would be located above grade inside the building. Each extraction well will be piped individually back to the system(s) to allow the ability to vary the extraction rates from each well and to shut down wells in the AEI when soil is compliant.

A soil boring program will be completed to document that soil quality criteria are achieved and to petition the CTDEP to shut down the system.

The HVE system(s) will consist of a liquid-ring or dry rotary claw pump (s) capable of the desired performance characteristics. A phase-separator tank will be located between the extraction well(s) and the pump to separate the liquid and vapor phases. The recovered vapor would be discharge directly to atmosphere. The recovered water would be pumped to the appropriate equipment to treat the recovered water. The cost estimate assumes that liquid phase carbon vessels would be used for water treatment. The treated water would be discharged to the sanitary sewer under a General Permit to be issued by the CTDEP.

The estimated cost for Soil Remedial Alternative 3 is $34,000 (Table 16 in Appendix XII). This cost includes preparation of remedial action plans, conducting the soil boring program and reporting. This alternative would only be selected if the HVE ground water remedial alternative is selected. The majority of the cost to design, construct and operate the system is included in the ground water remedial alternative. This alternative would result in a temporary disruption of the site during implementation. The only loss of usable space would be where the HVE system would be constructed.

8.3.2 Ground Water Remedial Action

The ground water remedial alternatives are described below. Tables 18 through 20 in Appendix XII show preliminary estimated costs and assumptions for each remedial alternative; the alternatives and cost are summarized on Table 21 in Appendix XII.

8.3.2.1 Ground Water Remedial Alternative 1 – High Vacuum Extraction System

Ground Water Remedial Alternative 1 consists of constructing extraction wells in the AEI where necessary and connecting the wells to either a centralized or separate HVE system(s).

Prior to initiating the alternative, pilot-scale tests will be conducted to provide necessary information to design the HVE system components and to determine the number and spacing of wells required to remediate the areas of impacted ground water.

Extraction wells will be constructed within and outside the footprint of the buildings. Piping from the exterior extraction wells to the system(s) would be installed in below-grade trenches. Piping from the interior extraction wells to the system(s) would be completed above grade. Each extraction well will be piped individually back to the system(s) to allow the ability to vary the extraction rates from each well and to shut down wells in AEI when ground-water quality is compliant.

The HVE system(s) will consist of a liquid-ring or dry rotary claw pump (s) capable of the desired performance characteristics. A phase-separator tank will be located prior to the pump to separate the liquid and vapor phases. The recovered vapor would be discharge directly to atmosphere. The recovered water would be pumped to the appropriate equipment to treat the recovered water. The cost estimate assumes that liquid phase carbon vessels would be used for water treatment. The treated water would be discharged to the sanitary sewer under a General Permit to be issued by the CTDEP.

The approximate cost for Ground-Water Remedial Alternative 1 is $604,000 (Table 18 in Appendix XII). This estimate includes pilot tests, permitting, preparation of remedial action plans and design documents, implementation, reporting, routine operation and maintenance and electrical costs for a period of 5 years. This alternative would result in a temporary disruption of the site during implementation. The only loss of usable space would be where the HVE system would be constructed.

8.3.2.2 Ground Water Remedial Alternative 2 – In-Situ Bioremediation

Ground Water Remedial Alternative 2 consists of the injection of the selected in-situ bioremediation product to enhance the aerobic degradation of the petroleum hydrocarbons.

Prior to implementing the alternative, a permitting phase will be required. A permit application for the injection will be prepared for CTDEP approval. The permit review and approval process takes approximately 90 days.

The selected product would be injected into the saturated soil by advancing direct-push soil borings to the appropriate depths. The product can also be injected into slotted PVC piping if the excavation soil remedial alternative is selected.

A temporary ground water pump and treat or HVE system would be utilized to provide hydraulic control down-gradient of the AEI to prevent the injected bioremediation product from migrating into the wetlands or other sensitive receptors.

The approximate cost for Ground-Water Remedial Alternative 2 is $462,000 (Table 19 in Appendix XII). This estimate includes design, permitting, preparation of remedial action plans and design documents, implementation, and reporting costs. This alternative would result in a temporary disruption of the site during implementation. No loss of usable space would result from implementing this alternative.

8.3.2.3 Ground Water Remedial Alternative 3 – Monitored Natural Attenuation

Ground Water Remedial Alternative 3 consists of MNA to track the natural degradation of the COCs in the areas of impacted ground water.

To implement this alternative, additional monitoring wells would likely be constructed down-gradient of the AEI and a ground water monitoring plan would be prepared. The plan would summarize the sample collection methods, quality assurance/quality control procedures, the wells to be monitored, parameters to be analyzed and the frequency of the monitoring events. The plan may also include a periodic evaluation of the wetlands to assess its condition and if the wetlands are receiving the impacted ground water. The plan would also include an assessment of water quality with respect to tidal influences.

The approximate cost for Ground-Water Remedial Alternative 3 is $167,000 (Table 20 in Appendix XII). This estimate includes preparation of monitoring plan, implementation, and reporting costs. The cost estimate assumes that monitoring will be conducted annually for a period of 8 years. This alternative would result in a temporary disruption of the site during implementation. No loss of usable space would result from implementing this alternative.

9.0 PRELIMINARY REMEDIAL ACTION PLAN AND SCHEDULE

9.1 Preferred Remedial Approach

The preferred remedial alternative at this time is as follows:

Release Area	*AEI*	*Preferred Soil Remedial Alternative*	*Preferred Ground Water Remedial Alternative*
Fill Areas	No. 1 and No. 11 (industrial fill portion only)	RA 1 – Excavation, Engineered Control and Soil Cover (Section 8.1.1)	Evaluation and selection of remedial alternative to be determined following down-gradient ground water quality investigation
TCE Release Areas	No. 13, No. 16 and No. 21 (No. 19 addressed with industrial fill portion of No. 11)	RA 1 – Excavation and Offsite Disposal (Section 8.2.1.1)	RA 3 – Monitored Natural Attenuation (Section 8.2.2.3)
Petroleum Hydrocarbon Release Areas	No. 3, No. 5, No. 8, No. 12, and No. 20	RA 2 – Selective Excavation and Offsite Disposal (Section 8.3.1.2)	RA 3 – Monitored Natural Attenuation (Section 8.3.2.3)

The site-specific remedial alternatives were each designed to be protective of human health and the environment and to achieve compliance with the RSRs for those impacted areas attributed to Noiseless/Remington Rand. Therefore, the selected remedial alternatives were based upon projected cost and impact to useable site area. Additional cost savings may be realized for the remedial alternative for the fill areas through the use of alternative cap design methods, such as a phytocap/envirotranspiration cover, which is an innovative technology. This alternative cap design will be further considered in consultation with CTDEP prior to the preparation of a final RAP.

If future investigation indicates a more aggressive approach to remediate ground water is required, the preferred remedial alternative for the TCE release areas would be Ground Water Remedial Alternative 2 – In-Situ Chemical Treatment, likely bioaugmenation (Section 8.2.2.2).The preferred remedial alternative for the petroleum hydrocarbon release areas would be Ground Water Remedial Alternative 2 – In-Situ Bioremediation (Section 8.3.2.2).

The preferred remedial alternatives outlined above would require the following actions:

- Final characterization of the nature and extent of non-compliant soil/fill in the AEI No. 1 (ROW Disposal Area), AEI No. 3 (Suspect UST-2 and Switching Station), No. 5 (UST-4), No. 8 (AST-2), No. 12 (Suspect UST-5), No. 16 (Loading Dock/Building No. 1A), and No. 21 (Building No. 5); and confirmation of the areal extent of the Noiseless/Remington Rand subarea of the industrial fill portion of the Railroad Disposal Area.

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Final characterization of the nature and extent of non-compliant soil/fill in the ROW Disposal Area and confirmation

- Hydrogeologic investigation to determine the discharge location for site ground water. Results of this investigation would be used to determine the appropriate clean-up criteria for ground water (e.g., SWPC, CALC and/or CTDEP-approved AALC).

- Down-gradient ground water investigation to assess compliance with the appropriate ground water clean-up criteria as determined by the above hydrogeologic investigation. The ground water investigation would also include a study to assess the potential for tidal influence on ground water quality.

- Assess alternative methods of demonstrating compliance (e.g., statistical methods), determine the extent of soil/fill in the ROW Disposal Area that exceeds the GB PMC such that removal will be required and re-evaluate removal as an alternative based upon the volumes of non-compliant soil/fill in each area.

- Design the excavation, fill processing and engineered control plan, including plans for cap monitoring and maintenance and ground water monitoring. The City of Middletown or the current land owner will be consulted during the design of the excavation activities to review the proposed finished grades and to discuss the proposed land use in these areas.

- Design the monitored natural attenuation (MNA) plan.

- If a more aggressive ground-water remediation is required, design an injection plan including bench scale studies for bacteria and nutrient amendment selection.

- Obtain all necessary permits and approvals.

- Implement the soil remedial approaches by 1) relocating soil/fill that exceeds the GB PMC from the ROW Disposal Area to the Railroad Spur Disposal Area and implementing capping and cover plans and 2) excavating and disposal of impacted soil from the TCE and petroleum hydrocarbon release areas.

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- Implement MNA plan or a more aggressive ground water remedial approach.

- Institute necessary ELURs.

- Install monitoring well network and implement ground water monitoring plan.

- Meet surety requirements.

- Document completion.

Development of a comprehensive final RAP would follow 1) CTDEP's review and approval of the preferred remedial alternatives, 2) the implementation of pre-design testing and evaluation of the results to confirm the assumptions that form the basis for the selection, and 3) verifying that all necessary permits can be obtained.

9.2 Predesign Activities

To implement the selected remedial alternative, the following items must be addressed prior to preparation of the engineering designs:

9.2.1 Landowner and Easement Holder Agreements

The City of Middletown or the current the land owner must agree to institute the required ELURs following cap and soil cover installation. Subordination agreements with other easement holders, access agreements with tenants and long-term access agreements for monitoring and maintenance may also be necessary. The final RAP will indicate when and where these agreements are necessary and when they have been achieved.

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9.2.2 Evaluate and Obtain Necessary Permits

It will be necessary to confirm that the required permits can be obtained, with actual permit application to be undertaken prior to implementation of the remedial actions. The following matrix summarizes the permits, registrations and approvals that will likely be required to implement the remedial alternatives:

Regulatory Agency or Other Approval Entity	Permit Application	Rationale
CTDEP	Authorization Application for Disruption of a Solid Waste Disposal Area	Per Section B.g. of the Consent Order. Disposal areas are classified as solid waste disposal areas
	General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities	Area of disturbance is one or more total acres of land area on the site, regardless of project phasing
	General Permit for the Discharge of Groundwater Remediation Wastewater Directly to Surface Water	Excavation of soil into the water table may require dewatering
	General Permit for Contaminated Soil and/or Sediment Management (Storage and Transfer)	Required if stockpiling of excavated soil meets volume requirements for registration
	Commissioner's Approval of	Fill area Soil Remedial

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Regulatory Agency or Other Approval Entity	Permit Application	Rationale
	Engineered Control Design and Monitoring Plan	Alternative 1 utilizes an engineered control to address PMC impacted soil
	Application for an Emergency or Temporary Discharge Authorization	For injection of bioremediation products, if a more aggressive ground water remediation is required.
City of Middletown, Inland Wetlands and Watercourses Agency	Application for Inlands Wetlands and Watercourses Activity	Grading and/or filling proposed within 100-feet of wetland boundaries
City of Middletown or current land owner at the time of remediation	Environmental Land Use Restriction (ELUR)	Institutional controls must be approved by the current property owner

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9.2.3 Pre-Design Investigation

Final characterization will be completed prior to final RAP development to:

1) Quantify the soil/fill in the AEI No. 1 (ROW Disposal Area) with regard to the existence and quality of cover materials and the number and distribution of GB PMC exceedences. The data will be used to assess:
   a. the quality and quantity of existing cover materials that might be incorporated into the soil cover,
   b. statistical analysis alternatives to demonstrate compliance with the GB PMC,
   c. the feasibility of using targeted excavation to achieve compliance with the GB PMC and
   d. the quality of soil/fill below the seasonal high water table relative to compliance with the SWPC.

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2) Determine the areal extent and depth of Noiseless/Remington Rand wastes in AEI No. 11 (industrial fill portion of the Railroad Spur Disposal Area). Should the additional data indicate that the area and volume are limited, then removal may be reconsidered as an economical option.

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3) Assess the quantity of recent bulky wastes in both of the disposal areas.

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4) Determine the areal and vertical extent of non-compliant soil in AEI No. 3 (Suspect UST-2 and Switching Station), No. 5 (UST-4), No. 8 (AST-2), No. 12 (Suspect UST-5), No. 16 (Loading Dock/Building No. 1A), No. 20 (Floor Drains associated with Building Nos. 2 and 4) and No. 21 (Building No. 5).

5) Assess down-gradient ground water quality compliance with the appropriate ground water quality criteria as determined through hydrogeologic investigation (e.g., SWPC, CALC and/or CTDEP-approved AALC) and determine the potential for tidal influence on the ground water quality.

Prior to sampling, a plan will be developed to accomplish the stated goals, and the plan will be submitted to CTDEP for approval.

9.3 Prepare Final Remedial Action Plan

Following completion of the pre-design investigation, the findings and conclusions will be documented in a final RAP along with a description of any changes in the proposed remedial approach. The report will detail the areas to be excavated to achieve compliance with the applicable criteria; the proposed relocation of the soil/fill, the location and extent of the engineered control, the conceptual design of the engineered cap and will outline the proposed cap maintenance and monitoring plan in AEI No. 11; the MNA plan or the proposed ground water remedial approach, if a more aggressive approach is required; and the proposed ground water monitoring plan. The final RAP will be submitted to CTDEP for approval.

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9.4 Development of Engineering Plans

Upon CTDEP approval of the final RAP, which is assumed at this time to include an engineered control and soil cover, and potentially a non-passive ground water remedial action, LBG will prepare detailed design plans and specifications sufficient to obtain approvals and permits and to construct the engineered control and soil cover. The documents will address cap/cover design and construction methods and materials, grading/backfilling/compaction requirements, field testing and quality assurance (as appropriate), site management, waste management, site safety, environmental monitoring and safeguards, sampling and analysis and project documentation.

9.5 Implementation

The necessary permits will be obtained and public notifications will be made. The remediation plans will be implemented in accordance with the design plans and documented.

9.6 Post-Remedial Action

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LBG will prepare a draft ELUR and decision document. Public notice of the proposed ELUR will be published and mailed, as appropriate. The draft documents and subordination agreements will be submitted to CTDEP for approval. Following approval, the ELUR will be filed on the land records and the filing will be documented to CTDEP.

Ground water and cap monitoring and maintenance will be implemented and documented in accordance with the approved plans. A surety will be created.

9.7 Schedule for Implementation

The proposed chronological schedule of milestones for implementation of the above actions is as follows: (Note that Unisys will await CTDEP approval of critical submissions prior to proceeding with implementation of pre-remedial design investigation, remedial actions and monitoring plans.)

Milestones	Number of Months to Completion
Remedial Investigation Report to CTDEP	0
CTDEP review	1
Comment response	2
CTDEP final review and approval	3
Submit pre-design sampling plan	3.5
CTDEP approval of pre-design sampling plan	4
Complete pre-design studies	9
Submit pre-design report and final RAP	11
CTDEP review	12
Comment response	13
CTDEP approval of final RAP	14
Submit applications for permits and approvals	15
Submit ground water monitoring plan to CTDEP	15
Complete design documents	16
Public notice of intent to remediate	16
Contractor selection	17
Obtain final permits and schedule work	18
Construction phase	18-22
Document completion in report to CTDEP	24
Draft ELUR to CTDEP	23
Place ELUR on land records	24
Initiation of MNA and cap monitoring	24

Notes:
CTDEP will be notified within 10 days of receipt of permits and approvals.
Field work and construction schedules broad to allow for weather.

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September 29, 2008

Final_Revised Sections 9 and 10 (DEP)

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10.0 REFERENCES

Connecticut Department of Environmental Protection, "GIS Data Guide Support. Quaternary Geologic Map of Connecticut and Long Island Sound Basin," from U.S. Geologic Survey, 2007.

Connecticut Department of Environmental Protection, "Water Quality Classification Connecticut River and Southcentral Coastal Basin" (Map), adopted February 1993.

Connecticut Department of Environmental Protection, "Water Quality Standards", (surface water standards effective December 17, 2002, ground water standards effective April 12, 1996).

Connecticut State Library, digital online collection, 1934 aerial photograph.

Federal Remediation Technologies Roundtable (FRTR), Remediation Technologies Screening Matrix and Reference Guide, Version 4.0.

Freeze, R. Allan and Cherry, John A.; "Groundwater" published by Prentice-Hill, Inc., 1979.

Iott, T. (2008) Telephone conversation with John Zbell, September 5

Mancini, E. R., A. Steen, G. A. Rausina, D. C. L. Wong, W. R. Arnold, F. E. Gostomski, T. Davies, J. R. Hockett, W. A. Stubblefield, K. R. Drottar, T. A. Springer, and P. Errico. "MTBE Ambient Water Quality Criteria Development: A Public/Private Partnership." *Environmental Science and Technology* 36, no. 2 (2002): 125-129.

Rodgers, John, "Bedrock Geological Map of Connecticut", Connecticut Geological and Natural History Survey, 1985.

Soil Science and Environmental Services, Inc., "Phase I Environmental Assessment, Former Remington Rand Facility, 180, Johnson Street, Middletown, Connecticut," April 6, 1993

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Suter, G. W. II and C. L. Tsao. "Toxicological Benchmarks for Screening Potential Contaminants of Concern for Effects on Aquatic Biota: 1996 Revision", ES/ER/TM-96/R2, Oak Ridge National Laboratory, Oak Ridge, Tennessee, June 1996.

U.S. Environmental Protection Agency, "BIOCHLOR Natural Attenuation Decision Support System User's Manual Version 1.0", EPA/600/R-00-008, January 2000.

U.S. Environmental Protection Agency, "Great Lakes Initiative (GLI) Clearinghouse," http://www.epa.gov/gliclear/ (accessed September 5, 2008).

U.S. Environmental Protection Agency, National Risk Management Research Laboratory, "Introduction to Phytoremediation", EPA/600/R-99/107, February 2000.

U.S. Environmental Protection Agency, Region 5, RCRA Corrective Action, "Ecological Screening Levels", August 22, 2003.

Vanasse Hangen Brustlin, Inc., "Environmental Site Assessment and Consulting Services, Former Remington-Rand Facility, 180 Johnson Street, Middletown, Connecticut", prepared for Municipal Development Office, Middletown, Connecticut, January 1999.

Vanasse Hangen Brustlin, Inc., "Phase II Environmental Site Assessment, Former Remington Rand Facility, 180 Johnson Street, Middletown, Connecticut", prepared for Economic Development Committee, Middletown, Connecticut, June 1997.

Vanasse Hangen Brustlin, Inc., "Remedial Action Plan, Former Remington-Rand Facility, 180 Johnson Street, Middletown, Connecticut", prepared for Municipal Development Office, Middletown, Connecticut, January 1999.

Wickramanayake, Godage B; Cizerle, Kim; Condit, Wendy; "Treatment Options for Arsenic Wastes," proceedings from UPEPA Workshop on Managing Arsenic Risks to the Environment, Characterization of Waste, Chemistry, Treatment and Disposal, Denver Colorado, May 1-3, 2001.

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CTDEP	Authorization Application for Disruption of a Solid Waste Disposal Area	Per Section B.g. of the Consent Order. Disposal areas are classified as solid waste disposal areas
	General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities	Area of disturbance is one or more total acres of land area on the site, regardless of project phasing
	General Permit for the Discharge of Groundwater Remediation Wastewater Directly to Surface Water	Excavation of soil into the water table may require dewatering
	General Permit for Contaminated Soil and/or Sediment Management (Storage and Transfer)	Required if stockpiling of excavated soil meets volume requirements for registration
	Commissioner's Approval of Engineered Control Design and Monitoring Plan	Remedial alternative 1 utilizes an engineered control to address PMC impacted soil

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CTDEP	Authorization Application for Disruption of a Solid Waste Disposal Area	Per Section B.g. of the Consent Order. Disposal areas are classified as solid waste disposal areas
	General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities	Area of disturbance is one or more total acres of land area on the site, regardless of project phasing
	General Permit for the Discharge of Groundwater Remediation Wastewater Directly to Surface Water	Excavation of soil into the water table may require dewatering
	General Permit for Contaminated Soil and/or Sediment Management (Storage and Transfer)	Required if stockpiling of excavated soil meets volume requirements for registration
	Commissioner's Approval of Engineered Control Design and Monitoring Plan	Remedial alternative 1 utilizes an engineered control to address PMC impacted soil

TABLES

TABLE 8

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 1: ROW Disposal Area

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm)																																		Concentration of leachable metals by SPLP in milligrams per liter (mg/L)				
			VOCs														SVOCs/PAHs						TPH[1]	Total Metals																	
			Trichloroethene	Methylene Chloride	Toluene	Xylenes	Benzene	p-Isopropyltoluene	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Naphthalene	Isopropylbenzene	Fluorene	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Bis(2 ethylhexyl)phthalate		Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium [2]	Copper	Lead	Mercury	Nickel	Selenium	Silver	Zinc	Chromium	Copper	Nickel	Lead	Zinc
B-4	0 to 2	4.5	ND	ND	ND	0.84	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND							**12,300**[R,I,P]																		
	8 to 10		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.43	ND	ND	ND	1.69	ND	**4,870**[R,I]	ND	5.07		0.53	0.06	14.8	14.8	7.84	ND	12.4	ND	ND	39.7		ND	ND	ND	0.35
B-69	4 to 8	5.0	ND	ND	ND	ND	ND	ND	0.04	0.07	ND	0.10	0.23	0.64	ND	0.57							**2,860**[R,I]																		
B-8/MW-3	8 to 10	8.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.27	ND	**4,920**[R,I]	ND	ND		0.55	0.07	13.9	13.4	8.54	ND	10.9	5.5	ND	26.5		ND	ND	ND	0.76
ROW/TP-1	0 to 2	7.5															ND	ND	ND	ND	ND	ND		ND	ND		0.33	2.54	36.6	180.0	163.0	0.082	14.4	ND	34.3	905	ND	ND	ND	ND	0.19
ROW/TP-6	3 to 4	9.5															ND	ND	ND	ND	ND	ND		6.23	**36.1**[R,I]		0.25	17.1	272.0	1,420.0	**9,130**[R,I]	ND	434.0	5.77	1.93	1,400	0.09	ND	ND	**0.31**[P]	0.30
ROW/TP-7	2 to 3	9.0															ND	ND	ND	ND	ND	ND	**38,200**[R,I,P]	ND	**28.9**[R,I]		0.25	7.9	188.0	**29,500**[R]	**1,240**[R,I]	0.059	179.0	15.2	ND	17,800	ND	0.09	0.28	ND	5.45
ROW/TP-9	6 to 8	8.0															ND	ND	ND	ND	ND	ND	**3,000**[R,I]																		
ROW/TP-10	4 to 6	5.0				3.5											ND	ND	ND	ND	ND	3.6	**7,450**[R,I]	ND	ND		0.44	0.14	14.1	24.4	7.44	ND	38.3	ND	ND	237	ND	ND	0.08	ND	0.30
ROW/TP-11	3 to 4	4.5															ND	ND	ND	ND	ND	ND	35.2																		
GP-1	0 to 2	5.0																											59.5		183.0										
	2 to 4																												52.3		108.0										
	4 to 6																												56.2		43.0										
	6 to 8		ND	0.75	ND	1.20	ND	3.20	4.90	3.50	3.10	6.50	57.00	24.00	2.10	ND							**3,600**[R,I]						21.1		9.5										
GP-2	0 to 2	5.0																											29.8		63.3										
	2 to 4																												40.4		85.7										
	4 to 6		ND	0.40	0.45	0.55	0.06	1.80	1.70	2.40	2.10	1.20	8.80	1.10	0.84	ND							**4,100**[R,I]						47.3		52.4										
	6 to 8																												16.6		7.0										
GP-3	0 to 2	5.0																											74.6		201.0										
	2 to 4																												432.0		**1,120**[R,I]										
	4 to 6		ND	1.40	ND	2.20	ND	1.80	9.90	6.40	6.60	10.00	82.00	52.00	2.30	ND							**6,700**[R,I]						56.6		184.0										
	6 to 8		ND	4.40	ND	11.00	ND	22.00	28.00	20.00	22.00	34.00	290.00	180.00	6.10	ND													18.9		11.8										
	8 to 10																												177.0		365.0										
GP-4	0 to 2	5.0																											64.1		44.1										
	2 to 4																												145.0		155.0										
	4 to 6																												88.7		278.0										
	6 to 8		ND	ND	0.36	2.20	0.33	1.00	6.50	5.20	3.80	5.90	88.00	35.00	1.70	ND							**10,000**[R,I]						31.6		25.4										
GP-5	0 to 2	5.0																											47.3		38.1										
	2 to 4		ND	0.55	0.14	3.50	ND	5.00	6.00	3.10	2.60	2.80	27.00	17.00	3.90	ND							**1,200**[R]						23.6		395.0										
	4 to 6																												21.2		8.8										
	6 to 8																												213.0		132.0										
GP-29	0 to 2	5.0																													16.8										
	2 to 4																						81								6.8										
	4 to 6																														6.6										
	14 to 16																						5																		
GP-30	0 to 2	5.0																													214.0										
	2 to 4																						**550**[R]								215.0										
	4 to 6																														137.0										
	6 to 8																						**1,500**[R]																		
LBGMW-23	8 to 10	5.7	0.001	0.002	ND	ND	ND	ND	ND	ND	ND	0.001	0.004	ND	ND	ND																									
LBGTP-1	6.5 to 7	5.0	ND	0.22	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**4,900**[R,I]		1.4	269.0		0.1	15.0		18.8	0.1		ND	ND						
LBGTP-2	5.5 to 6	5.0	ND	4.00	0.47	0.80	ND	13.00	ND	9.00	12.00	8.20	95.00	8.60	11.00	ND	ND	6.0	7.4	9.4	ND	ND	**21,000**[R,I]		2.7	3,950.0		11.3	144.0		**957**[R]	2.4		ND	31.7						
CTDEP Remediation Standards for Soil in GB Areas																																									
Residential Direct Exposure Criteria			56	82	500	500	21	NE	500	500	500	500	500	500	1,000	500	1,000	NE	474	1,000	1,000	44	500	27	10	4,700	2	34	3,900	2,500	500	20	1,400	340	340	20,000	NE	NE	NE	NE	NE
Industrial/Commercial Direct Exposure Criteria			520	760	1,000	1,000	200	NE	1,000	1,000	1,000	1,000	1,000	1,000	2,500	1,000	2,500	NE	2,500	2,500	2,500	410	2,500	8,200	10	140,000	2	1,000	51,000	76,000	1,000	610	7,500	10,000	10,000	610,000	NE	NE	NE	NE	NE
GB Pollutant Mobility Criteria			1	1	67	19.5	0.2	14	14	14	14	14	70	70	56	132	56	NE	10	56	40	11	2,500	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.50	13	1	0.15	50

Notes:
AEI = Area of environmental investigation
VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
PAHs = Polynuclear aromatic hydrocarbons
TPH = Total petroleum hydrocarbons
ft bg = Feet below grade
DTW = Estimated depth to seasonal high water table in feet below grade; inferred from April 2007 ground water elevations.

SPLP = Synthetic Precipitation Leaching Procedure
1 = Concentrations of TPH or ETPH; refer to Table 5A for specific analytical method.
2 = The DEC for trivalent chromium are used; concentrations of hexavalent chromium were not detected at or above laboratory detection limits in select samples analyzed for both fractions.
ND = Not detected
NE = Not established

(shaded) = Not analyzed for this parameter.
BOLD = Exceeds remediation standard for specified criteria
R = Concentration exceeds the Residential Direct Exposure Criteria.
I = Concentration exceeds the Industrial/Commercial Direct Exposure Criteria.
P = Concentration exceeds the GB Pollutant Mobility Criteria; it was assumed that samples were collected above the seasonal high water table when a sample interval was not provided.
CTDEP = Connecticut Department of Environmental Protection

TABLE 10

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 3: Suspect UST-2 and Switching Station

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm)																																		
			VOCs												SVOCs/PAHs																		TPH[1]	Total Metals					
			Trichloroethene	Toluene	Xylenes	1,2-Dichlorobenzene	p-Isopropyltoluene	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Naphthalene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene)	1-Methylnaphthalene	2-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene		Arsenic	Barium	Cadmium	Chromium[2]	Lead	Nickel
B-5	6 to 8	5.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																			**4,490**[R,I]						
B-6	10 to 11	5.0																															46.2						
B-7/MW-2	10 to 11	5.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																			46.2						
B-61	4 to 8	5.0													ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.22	**2,300**[R]						
B-62	4 to 8	5.0																															**7,380**[R,I]						
B-63	8 to 12	5.0																															ND						
B-64	4 to 8	5.0																															**916**[R]						
B-65	8 to 12	5.0																															ND						
UST2/TP-1	6 to 6	5.5	ND	ND	0.547	ND	ND	ND	ND	ND	ND	ND	ND	ND																			**9,380**[R,I]						
GP-28	0 to 2	5.0																																				49.30	
	2 to 4																																53.0					34.80	
	4 to 6																																					20.90	
	12 to 14																																6.7						
LBGMW-4	6 to 8	5.0	0.200	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.075	0.099	0.098	0.290	0.280	0.330	0.130	0.280	0.300	0.092	0.560	0.120	0.130	0.071	0.071	0.058	0.170	0.480	8.4	2.10	40.90	ND	11.10	8.70	ND
LBGMW-20	8 to 10	5.0	ND	0.043	0.093	0.040	0.690	1.6	0.540	0.460	0.920	5.1	0.590	6.4	ND	ND	1.1	0.95	ND	ND	ND	ND	1.2	ND	ND	1.3	ND	180	220	4.3	3.3	1.3	**5,600**[R,I]	1.50	25.10	0.43	13.20	6.30	0.06
CTDEP Remediation Standards for Soil in GB Areas																																							
Residential Direct Exposure Criteria			56	500	500	500	NE	500	500	500	500	500	500	1,000	1,000	1,000	1,000	1	1	1	1,000	8.4	84	1	1,000	1,000	1	NE	474	1,000	1,000	1,000	500	10	4,700	34	3,900	500	1,400
Industrial/Commercial Direct Exposure Criteria			520	1,000	1,000	1,000	NE	1,000	1,000	1,000	1,000	1,000	1,000	2,500	2,500	2,500	2,500	7.8	1	7.8	2,500	78	780	1	2,500	2,500	7.8	NE	2,500	2,500	2,500	2,500	2,500	10	140,000	1,000	51,000	1,000	7,500
GB Pollutant Mobility Criteria			1	67	20.0	3.1	14	14	14	14	14	70	70	56	84	400	400	1	1	1	42	1	1	1	56	56	1	NE	10	56	40	10	2,500	NE	NE	NE	NE	NE	NE

Notes:
AEI = Area of environmental investigation
VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
PAHs = Polynuclear aromatic hydrocarbons
TPH = Total petroleum hydrocarbons
ft bg = Feet below grade
DTW = Estimated depth to seasonal high water table in feet below grade; inferred from April 2007 ground water elevations
1 = Concentrations of TPH or ETPH; refer to table 5A for specific analytical method.
2 = The DEC for trivalent chromium are used; concentrations of hexavalent chromium were not detected at or above laboratory detection limits in select samples analyzed for both fractions.

(shaded) = Not analyzed for this parameter.
BOLD = Exceeds remediation standard for specified criteria.
R = Concentration exceeds the Residential Direct Exposure Criteria.
I = Concentration exceeds the Industrial/Commercial Direct Exposure Criteria.
ND = Not detected
NE = Not established
CTDEP = Connecticut Department of Environmental Protection

TABLE 15

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 10: Surficial Stained Area 2

Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm)

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	VOCs: Trichloroethene	SVOCs: Acenapthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene)	Phenanthrene	Pyrene
Sur-2	0-1.0	5.5	BDL	1.36	2.18	**11.7** R,I,P	**14.3** R,I,P	**15** R,I,P	6.67	**13.1** R,P	**14.7** P	**1.83** R,I,P	0.37	21.3	0.56	**10** R,I,P	9.57	25.1
LBGMW-9	4.0-6.0	5.5	0.0012	ND	ND	ND	ND	ND	ND	ND	ND	ND		ND	ND	ND	ND	ND
LBGWS-1	2.0-4.0	6.0	0.077															
LBGWS-1	8.0-10.0	6.0	0.0010															
CTDEP Remediation Standards for Soils in GB Areas																		
Residential Direct Exposure Criteria			56	1,000	1,000	1	1	1	1,000	8.4	84	1	270	1,000	1,000	1	1,000	1,000
Industrial/Commercial Direct Exposure Criteria			520	2,500	2,500	7.8	1	7.8	2,500	78	780	1	2,500	2,500	2,500	7.8	2,500	2,500
GB Pollutant Mobility Criteria			1	84	400	1	1	1	42	1	1	1	5.6	56	56	1	40	40

Sample ID	Sample Interval (ft bg)	TPH [1]	Total Metals: Arsenic	Barium	Beryllium	Cadmium	Chromium [2]	Copper	Lead	Mercury	Nickel	Selenium	Zinc	Leachable metals by SPLP (mg/L): Cadmium	Chromium	Nickel
Sur-2	0-1.0	147	**18.0** R,I		0.47	0.45	118	506	132	0.27	84.2	15.3	127	**0.73** P	0.33	**1.11** P
LBGMW-9	4.0-6.0	ND	**1.9**	22.9		ND	11		5	ND		ND	ND			
LBGWS-1	2.0-4.0															
LBGWS-1	8.0-10.0															
CTDEP Remediation Standards for Soils in GB Areas																
Residential Direct Exposure Criteria		500	10	4,700	2	34	3,900	2,500	500	20	1,400	340	20,000	NE	NE	NE
Industrial/Commercial Direct Exposure Criteria		2,500	10	140,000	2	1,000	51,000	76,000	1,000	610	7,500	10,000	610,000	NE	NE	NE
GB Pollutant Mobility Criteria		2,500	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.05	0.5	1

Notes:
AEI = Area of environmental investigation
VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
TPH = Total petroleum hydrocarbons
SPLP = Synthetic Precipitation Leaching Procedure
ft bg = Feet below grade
DTW = Estimated depth to seasonal high water table in feet below grade; inferred from April 2007 ground water elevations.
1 = Concentration of TPH or ETPH, refer to Table 5A for specific analytical method.
2 = The DEC for trivalent chromium are used; concentrations of hexavalent chromium were not detected at or above laboratory detection limits in select samples analyzed for both fractions.

(shaded) = Not analyzed for this parameter.
BOLD = Exceeds remediation standard for specified criteria.
R = Concentration exceeds the Residential Direct Exposure Criteria.
I = Concentration exceeds the Industrial/Commercial Direct Exposure Criteria
P = Concentration exceeds the GB Pollutant Mobility Criteria.
NE = Not established
CTDEP = Connecticut Department of Environmental Protection

TABLE 16

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 11: Railroad Spur Disposal Area

Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm)

Sample ID	Sample Interval (ft bg)	VOCs: Trichloroethene	VOCs: Methylene Chloride	VOCs: 1,2 Dichlorobenzene	VOCs: cis-1-2 Dichloroethene	VOCs: tert Butylbenzene	SVOCs/PAHs: Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	2,4-Dimethylphenol	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	2-Methylphenol (o-cresol)	3-&4-Methylphenol (m&p-cresol)	Naphthalene	Phenanthrene	Phenol	Pyrene	1,2,4-Trichlorobenzene	TPH[1]
LBGMW-8	2 to 4	4.5^{P}	ND	0.12	ND	ND																										13
	4 to 6	0.390	ND	ND	ND	ND																										390
LBGMW-21	12 to 14	0.0012	0.0034	ND	0.0028	0.0016																										190
SLTP-1[3]	0 to 3	ND	ND	ND	ND	ND																										
SLTP-2[3]	1 to 1	ND	ND	ND	ND	ND																										
	3 to 3	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CTDEP Remediation Standards for Soils in GB Areas																															
Residential Direct Exposure		56	82	500	500	500	1,000	1,000	1,000	1	1	1	1,000	8.4	84	1	270	1,000	1,000	1,000	1,000	1	NE	474	1,000	340	1,000	1,000	1,000	1,000	680	500
Industrial/Commercial Direct Exposure Criteria		520	760	1,000	1,000	1,000	2,500	2,500	2,500	7.8	1	7.8	2,500	78	780	1	2,500	2,500	2,500	2,500	2,500	7.8	NE	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
GB Pollutant Mobility Criteria		1	1	3.1	14	14	84	84	400	1	1	1	42	1	1	1	1	28	140	56	56	1	NE	9.8	7	1	56	40	800	40	14	2,500

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	Total Metals: Arsenic	Barium	Beryllium	Cadmium	Chromium[2]	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	SPLP (mg/L): Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Concentrations of leachable lead by TCLP in milligrams per liter (mg/L)
Industrial Fill Area																							
GP-15	4 to 6	6.5	49.8^{R,I}			ND		6,020^{R}	1,240^{R,I}		2,740^{R}				3,480	ND	ND		ND	0.81	ND	0.27	
	6 to 8								16.2														
GP-16	0 to 2	7.0							901^{R}														
	2 to 4								568^{R}														
	4 to 6		42^{R,I}			ND		1,120	2,040^{R,I}		462				7,290						ND		
	6 to 8								1,990^{R,I}														
	8 to 10								477														
GP-17	0 to 2	8.0							298														
	2 to 4		ND			ND		2,350	953^{R}		11,700^{R,I}				3,370	ND	ND		ND	0.05	ND	0.02	
	4 to 6								248														
	6 to 8								216														
	8 to 10								273														
	10 to 12		ND			1.3		167	4,000^{R,I}		249				820								
GP-18	0 to 2	8.5	43.2^{R,I}			1.0		8,290^{R}	3,100^{R,I}		4,390^{R}				4,400						ND		
	2 to 4								2,350^{R,I}														
	4 to 6								1,000^{R,I}														
	6 to 8								2,440^{R,I}														
	8 to 10								364														
	10 to 12								968^{R}														
GP-19	0 to 2	9.0	13.2^{R,I}			ND		725	2,050^{R,I}		462				613	ND	ND		ND	0.06	ND	0.08	
	2 to 4								42.2														
	4 to 6								3.0														
	6 to 8		19^{R,I}			13.3		1,460	9,220^{R,I}		344				4,430								
	8 to 10								135														
	10 to 12								212														
	12 to 14								300														
GP-20	0 to 2	9.0							464														
	2 to 4								1,040^{R,I}														
	4 to 6		38.6^{R,I}			4.4		5,800^{R}	1,240^{R,I}		1,900^{R}				5,550						ND		
	6 to 8								60.3														
	8 to 10								145														
	10 to 12								56.4														
LBGPB-1	6 to 8	8.0							426														ND
	8 to 10								59.2														
	10 to 12								53.5														
LBGPB-2	6 to 8	8.5							1,530^{R,I}														9.7^{P}
LBGPB-3	2 to 4	8.0							2,920^{R,I}												0.003		2.5^{P}
	6 to 8								736^{R}												0.005		0.5^{P}
LBGPB-4	2 to 4	7.5							692^{R}														9.4^{P}
LBGPB-5	2 to 4	7.0							515^{R}												0.003		0.7^{P}
LBGPB-6	2 to 4	9.0							193												ND		
LBGPB-7	2 to 4	7.5							2,820^{R,I}												ND		
LBGPB-8	2 to 4	8.5							491												ND		
	6 to 8								2,150^{R,I}												ND		
LBGPB-9	0 to 2	7.0							96.5												ND		
	4 to 6								297												ND		
LBGMW-8	2 to 4	5.1	52^{R,I}	151		ND	59.4		298	1.00		ND	ND								ND		
	4 to 6		2.4	124		0.76	27.2		11.4	ND		ND	ND								ND		
LBGMW-21	12 to 14	11.4	5.0	123		0.81	29.6		84.1	0.98		ND	0.24										
SLTP-1[3]	0 to 3																						
SLTP-2[3]	1 to 1																						171
	3 to 3		ND		ND	ND	14.5		11.0		19.5	ND	ND	ND	50.0	ND	ND	ND			ND		2.5
CTDEP Remediation Standards for Soils in GB Areas																							
Residential Direct Exposure			10	4,700	2	34	3,900	2,500	500	20	1,400	340	340	5.4	20,000	NE	NE	NE	NE	NE	NE	NE	NE
Industrial/Commercial Direct Exposure Criteria			10	140,000	2	1,000	51,000	76,000	1,000	610	7,500	10,000	10,000	160	610,000	NE	NE	NE	NE	NE	NE	NE	NE
GB Pollutant Mobility Criteria			NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.5	0.05	0.5	13	1	0.15	50	0.15

Notes:

AEI - Area of environmental Investigation
VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
PAHs = Polynuclear aromatic hydrocarbons
TPH = Total petroleum hydrocarbons
SPLP = Synthetic Precipitation Leaching Procedure
TCLP = Toxicity Characteristic Leaching Procedure
ft bg = Feet below grade
DTW - Estimated depth to seasonal high water table; inferred from April 2007 ground water elevations

= Not analyzed for this parameter.
BOLD = Exceeds remediation standard for specified criteria.
R = Concentration exceeds the Residential Direct Exposure Criteria.
I = Concentration exceeds the Industrial/Commercial Direct Exposure Criteria.
P = Concentration exceeds the GB Pollutant Mobility Criteria; it was assumed that samples were collected above the seasonal high water table when a sample interval was not provided
R^ = Reportedly exceeds the Residential Direct Exposure Criteria based on VHB information presented in the Phase II, but no concentration was provided.
ND = Not detected
NE = Not established
NA = Not applicable

1 = Concentration of TPH or ETPH, refer to Table 5A for specific analytical method
2 = The DEC for trivalent chromium are used; concentrations of hexavalent chromium were not detected at or above laboratory detection limits in select samples analyzed for both fractions.
3 = These materials were removed and disposed of appropriately in June 2007 during site utility upgrades.
CTDEP = Connecticut Department of Environmental Protection

TABLE 16

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 11: Railroad Spur Disposal Area

Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm)

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	VOCs: Trichloroethene	VOCs: Methylene Chloride	VOCs: 1,2 Dichlorobenzene	VOCs: cis-1-2 Dichloroethene	VOCs: tert Butylbenzene	SVOCs/PAHs: Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Dibenzofuran	2,4-Dimethylphenol	Di-n-butylphthalate	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	2-Methylnaphthalene	2-Methylphenol (o-cresol)	3-&4-Methylphenol (m&p-cresol)	Naphthalene	Phenanthrene	Phenol	Pyrene	1,2,4-Trichlorobenzene
Cinder Fill Area																																
TP-27	1^ to 1^	5.0						ND	ND	ND	ND	ND	ND	ND	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
TP-31	1^ to 1^	5.0						0.624	0.587	2.44	12.44^{R,I,P}	7.26^{R,I,P}	8.13^{R,I,P}	2.87	4.93^{P}	12.14^{P}			ND		24.22	0.795	3.68^{R,P}	ND	ND	ND	ND	0.249	ND	ND	13.3	24.17^{P}
TP-38	1^ to 1^	7.0						ND	ND	ND	ND	ND	ND	ND	ND	ND			ND		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
B-9	9 to 11	8.5						ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND		10.7^{P}	ND	ND	ND	ND	ND	ND	ND
B-36/MW-16	8 to 12	9.5																														
B-38	8 to 12	8.5																														
B-39	15 to 18	8.5																														
B-40	8 to 12	8.5																														
B-42	8 to 12	7.0																														
B-43/MW-17	8 to 12	8.8																														
B-49	1^ to 1^	6.5																														
LBGMW-22	10 to 12	9.0	0.0069	ND	ND	0.002	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND				ND	ND	ND	ND	ND			ND	ND		ND	
Industrial Fill Area																																
B-10/MW-4	6 to 7	6.0						528	556	1,500^{R}	1,560^{R,I}	1,380^{R,I}	1,200^{R,I}	ND	830^{R,I}	1,590^{R,I}	184^{R,I}	1,000^{R}	210	11.2	4,680^{R,I}	1,640^{R,I}	684^{R,I}	ND	1,000^{R}	122	92	3,700^{R,I}	6,540^{R,I}	68.7	3,440^{R,I}	ND
B-60/MW-19	8 to 12	7.3																														
TP-28	1^ to 1^	6.0						ND	ND	ND	0.214	0.195	0.163	ND	ND	0.235					0.447	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.384	0.401
TP-38	1^ to 1^	7.0						ND	ND	ND	ND	ND	ND	ND	ND	ND					ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
UST3/TP-1	0 to 2	6.0																														
	3 to 4							146^{P}	ND	316	ND	400^{R,I,P}	ND	ND	ND	548^{R,P}	ND	73.3^{P}	ND	ND	1,270^{R,P}	85.3^{P}	163^{R,I,P}	ND	129^{P}	ND	ND	76.7^{P}	1,270^{R,P}	ND	1,130^{R,P}	ND
GP-6	0 to 2	7.0																														
	2 to 4																															
	4 to 6																															
	6 to 8																															
	8 to10																															
	10 to 12																															
GP-7	0 to 2	7.0																														
	2 to 4																															
	4 to 6																															
	6 to 8																															
	8 to 10																															
	10 to 12																															
	12 to 14																															
GP-8	0 to 2	7.5																														
	2 to 4																															
	4 to 6																															
	6 to 8																															
	8 to 10																															
	10 to 12																															
GP-9	0 to 2	8.0																														
	2 to 4																															
	4 to 6																															
	6 to 8																															
	8 to 10																															
	10 to 12																															
	12 to 14																															
GP-10	0 to 2	8.0																														
	2 to 4																															
	4 to 6																															
	6 to 8																															
	8 to 10																															
	10 to 12																															
	12 to 14																															
GP-11	0 to 2	7.0																														
	2 to 4																															
	4 to 6																															
	6 to 8																															
	8 to 10																															
	10 to 12																															
	12 to 14																															
GP-12	0 to 2	6.5																														
	2 to 4																															
	4 to 6																															
	6 to 8																															
	8 to 10																															
GP-13	0 to 2	6.0																														
	2 to 4																															
	4 to 6																															
	6 to 8																															
	8 to 10																															
GP-14	0 to 2	6.0																														
	2 to 4																															
GP-15	0 to 2	6.5																														
	2 to 4																															
CTDEP Remediation Standards for Soils in GB Areas																																
Residential Direct Exposure			56	82	500	500	500	1,000	1,000	1,000	1	1	1	1,000	8.4	84	1	270	1,000	1,000	1,000	1,000	1	NE	474	1,000	340	1,000	1,000	1,000	1,000	680
Industrial/Commercial Direct Exposure Criteria			520	760	1,000	1,000	1,000	2,500	2,500	2,500	7.8	1	7.8	2,500	78	780	1	2,500	2,500	2,500	2,500	2,500	7.8	NE	2,500	2,500	2,500	2,500	2,500	2,500	2,500	2,500
GB Pollutant Mobility Criteria			1	1	3.1	14	14	84	84	400	1	1	1	42	1	1	1	1	28	140	56	56	1	NE	9.8	7	1	56	40	800	40	14

Sample ID	Sample Interval (ft bg)	TPH[1]	Total Metals: Arsenic	Barium	Beryllium	Cadmium	Chromium[2]	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc	Concentrations of leachable metals by SPLP in milligrams per liter (mg/L): Arsenic	Cadmium	Chromium	Copper	Nickel	Lead	Zinc	Concentrations of leachable lead by TCLP in milligrams per liter (mg/L)
Cinder Fill Area																							
TP-27	1^ to 1^	33	20.1^{R,I}		ND	ND	ND	58.0	128	ND	7.4	ND	ND	ND	24.2	ND			0.02	ND	ND	0.31	
TP-31	1^ to 1^	96	10.6^{R,I}		ND	ND	ND	679	132	ND	229.0	ND	ND	ND	177.0	ND			0.02	0.49	ND	0.12	
TP-38	1^ to 1^	10,240^{R,I,P}	28^{R,I}		ND	ND	ND	284	501^{R}	ND	84.0	ND	ND	ND	155.0	ND			0.02	ND	ND	0.07	
B-9	9 to 11	62,500^{R,I}	42.9^{R,I}		0.15	0.26	4.42	75.8	44.4	0.044	11.6	8.8	ND	ND	21.2	ND			0.26	ND	ND	0.26	
B-36/MW-16	8 to 12	ND	15.7^{R,I}					669	20.2		10.7			ND	39.6	ND			0.01	ND	ND	ND	
B-38	8 to 12	6,760^{R,I}	96.1^{R,I}					149	43.0		17.6			ND	48.9	ND			0..03	ND	ND	0.09	
B-39	15 to 18	ND	4.4																				
B-40	8 to 12	38	1.5					14.3	15.8		12.6			ND	35.7								
B-42	8 to 12	ND	2.3					7.1	13.2		10.9			ND	32.2								
B-43/MW-17	8 to 12	144	4.2					2,240	325		321			ND	187								
B-49	1^ to 1^	R^																					
LBGMW-22	10 to 12	6.4	2.0	47.0		0.04	10.8		6.6	0.03		ND	ND										
Industrial Fill Area																							
B-10/MW-4	6 to 7	10,400^{R,I}	11.7^{R,I}		ND	2.82	18.2	69.4	296		39.8		ND	ND	1,300	ND	ND		0.30	0.16	1.37	6.55	
B-60/MW-19	8 to 12	ND	9.7					730	1,200^{R,I}		8,800^{R,I}			ND	650	ND			4.17	6.86	13.80	7.36	
TP-28	1^ to 1^	68	52^{R,I}					29,000^{R}	221		23,400^{R,I}	ND	ND	ND	6,800	ND			0.15	4.05^{P}	ND	2.56	
TP-38	1^ to 1^	10,240^{R,I,P}	28^{R,I}		ND	ND	ND	284	501^{R}	ND	84.0	ND	ND	ND	155.0	ND			0.02	ND	ND	0.07	
UST3/TP-1	0 to 2		87.3^{R,I}		0.18	3.1	99.8	16,300^{R}	518^{R}	0.31	5,160^{R}	85.1	ND	56.2^{R}	2,950	ND	ND	ND	0.16	1.87^{P}	ND	1.47	
	3 to 4	830^{R}																					
GP-6	0 to 2								217														
	2 to 4								88.4														
	4 to 6		67.9^{R,I}			ND		7,270^{R}	783^{R}		2,940^{R}				2,230						ND		
	6 to 8								10.6														
	8 to10								105														
	10 to 12								5.8														
GP-7	0 to 2								27.2														
	2 to 4								32.5														
	4 to 6		39.2^{R,I}			ND		2,340	876^{R}		704				812	ND	ND		ND	0.25	ND	0.02	
	6 to 8								17														
	8 to 10								197														
	10 to 12								9.7														
	12 to 14								26.1														
GP-8	0 to 2								114														
	2 to 4								150														
	4 to 6		39^{R,I}			2.7		909	2,630^{R,I}		272				1,670						ND		
	6 to 8		16.4^{R,I}			1.4		345	788^{R}		36.6				472						ND		
	8 to 10								572^{R}														
	10 to 12								5.4														
GP-9	0 to 2								148														
	2 to 4		66.9^{R,I}			ND		21,800^{R}	648^{R}		6,410^{R}				3,830	ND	0.0012		ND	2.8^{P}	ND	1.20	
	4 to 6								244														
	6 to 8								163														
	8 to 10								261														
	10 to 12								9.0														
	12 to 14								195														
GP-10	0 to 2								178														
	2 to 4		93.4^{R,I}			4.8		40,000^{R}	1,570^{R,I}		26,500^{R,I}				10,800						ND		
	4 to 6								1,040^{R,I}														
	6 to 8								565^{R}														
	8 to 10								974^{R}														
	10 to 12								198														
	12 to 14								5.8														
GP-11	0 to 2								68.6														
	2 to 4								475														
	4 to 6		98.9^{R,I}			ND		2,270	687^{R}		2,730^{R}				2,280	ND	ND		ND	0.54	ND	0.07	
	6 to 8								72.2														
	8 to 10								78.7														
	10 to 12								11.9														
	12 to 14								103														
GP-12	0 to 2								93.7														
	2 to 4		43.6^{R,I}			3.2		5,480^{R}	2,040^{R,I}		1,560^{R}				3,160						ND		
	4 to 6								1,190^{R,I}														
	6 to 8								1,360^{R,I}														
	8 to 10								708^{R}														
GP-13	0 to 2								177														
	2 to 4		74.5^{R,I}			ND		10,200^{R}	1,440^{R,I}		2,590^{R}				2,000	ND	ND		ND	ND	ND	ND	
	4 to 6								1,200^{R,I}														
	6 to 8								200														
	8 to 10								673^{R}														
GP-14	0 to 2		39.3^{R,I}			ND		6,320^{R}	1,060^{R,I}		3,990^{R}				2,960						ND		
	2 to 4								108														
GP-15	0 to 2								585^{R}														
	2 to 4								406														
CTDEP Remediation Standards for Soils in GB Areas																							
Residential Direct Exposure		500	10	4,700	2	34	3,900	2,500	500	20	1,400	340	340	5.4	20,000	NE	NE	NE	NE	NE	NE	NE	NE
Industrial/Commercial Direct Exposure Criteria		2,500	10	140,000	2	1,000	51,000	76,000	1,000	610	7,500	10,000	10,000	160	610,000	NE	NE	NE	NE	NE	NE	NE	NE
GB Pollutant Mobility Criteria		2,500	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	0.5	0.05	0.5	13	1	0.15	50	0.15

TABLE 17

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 12: Suspect UST-5

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm): VOCs										SVOCs/PAHs																	Total Metals											Concentration of leachable zinc by SPLP in milligrams per liter (mg/L)
			Trichloroethene	p-Isopropyltoluene	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	n-Propylbenzene	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Naphthalene	Isopropylbenzene	Acenaphthene	Anthracene	Benzo(a)anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	1-Methylnaphthalene	Naphthalene	Phenanthrene	Pyrene	TPH[1]	Arsenic	Barium	Beryllium	Cadmium	Chromium[2]	Copper	Lead	Mercury	Nickel	Selenium	Zinc	
B-18/MW-6	5 to 7	3.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.11	ND	ND	ND	2.17	ND	**5,200** [R, I]	ND		0.42	0.06	10.90	13.00	7.51	ND	12.50	6.07	27.50	0.15
B-50	4 to 8	4.0																											**4,332** [R, I]												
B-51	4 to 8	4.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.126	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	**20,700** [R, I]												
B-52	4 to 8	4.0																											ND												
B-53	4 to 8	4.0																											**17,856** [R, I]												
B-57	8 to 12	4.0																											ND												
TP-21		4.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	80												
TP-23		4.0																											**23,400** [R, I, P]												
TP-24		4.0																											**4,800** [R, I, P]												
LBGMW-2	4 to 6	4.0	0.086	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.640	0.970	0.890	0.620	0.400	0.760	ND	1.000	0.340	0.51	ND	1.10	0.610	1.300	**4,100** [R, I]	1.40	24.60		ND	12.20		22.70	0.12		ND		
	6 to 8		ND	0.140	1.200	0.500	ND	0.440	ND	ND	ND	0.230	0.520	0.360	ND	ND	ND	ND	ND	ND	ND	ND	2.00	ND	26.0	ND	3.20	ND	**11,000** [R, I]	ND	ND		ND	8.40		5.30	ND		ND		
WL-1	4 to 6	4.0																											30												
WL-2	4 to 6	4.0																											**620** [R]												
WL-3	4 to 6	4.0	ND	ND	ND	1	0.098	0.660	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.4	5.3	ND	47	ND	6.6	1.6	**9,300** [R, I]												
WL-4	6 to 8	4.5																											**1,800** [R]												
WL-5	4 to 6	4.5																											7												
WL-6	6 to 8	5.0																											230												
WL-7	0 to 2	5.0																											**1,500** [R]												
	2 to 4																												**5,700** [R, I, P]												
	6 to 8																												**6,500** [R, I]												
WL-8	2 to 4	5.0																											9												
WL-9	0 to 2	5.0																											180												
	2 to 4																												**560** [R]												
	6 to 8		ND	ND	ND	0.480	0.088	0.240	0.19	0.078	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	80	ND	14	ND	**9,500** [R, I]												
WL-10	0 to 2	4.5																											13												
	2 to 4																												**2,000** [R, I, P]												
	6 to 8		ND	ND	ND	0.160	ND	0.061	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	2.6	ND	110	ND	2.8	ND	**4,100** [R, I]												
WL-11	0 to 2	4.5																											490												
	2 to 4		ND	ND	ND	0.010	0.003	0.008	ND	ND	ND	ND	ND	0.23	**1.1** [R, P]	**1.1** [R, I, P]	**1.2** [R, P]	0.76	0.62	**1.3** [P]	0.23	23	0.13	0.7	ND	ND	1.3	2	**1,400** [R]												
WL-12	0 to 2	3.5																											**5,300** [R, I, P]												
	2 to 4		ND	ND	ND	0.810	ND	7.00	11.00	3.80	0.42	ND	ND	ND	ND	ND	ND	ND	ND	**2.1** [P]		ND	ND	ND	ND	ND	1.6	1.5	**6,200** [R, I, P]												
CTDEP Remediation Standards for Soils in GB Areas																																							
Residential Direct Exposure Criteria			56	NE	500	500	500	500	500	500	1,000	500	1,000	1,000	1	1	1	1,000	8.4	84	1	1,000	1,000	1	NE	1,000	1,000	1,000	500	10	4,700	2	34	3,900	2,500	500	20	1,400	340	20,000	NE
Industrial/Commercial Direct Exposure Criteria			520	NE	1,000	1,000	1,000	1,000	1,000	1,000	2,500	1,000	2,500	2,500	7.8	1	7.8	2,500	78	780	1	2,500	2,500	7.8	NE	2,500	2,500	2,500	2,500	10	140,000	2	1,000	51,000	76,000	1,000	610	7,500	10,000	61,000	NE
GB Pollutant Mobility Criteria			1	14	14	14	14	14	70	70	56	132	84	400	1	1	1	42	1	1	1	56	56	1	NE	56	40	40	2,500	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	NE	50.00

Notes:
AEI = Area of environmental investigation
VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
PAHs = Polynuclear aromatic hydrocarbons
TPH = Total petroleum hydrocarbons
SPLP = Synthetic Precipitatation Leaching Procedure
ft bg = Feet below grade
DTW = Estimated seasonal high water table in feet below grade; inferred from April 2007 ground water elevations
ND = Not detected
NE = Not established

[shaded] = Not analyzed for this parameter.
BOLD = Exceeds remediation standard for specified criteria.
R = Concentration exceeds the Residential Direct Exposure Criteria.
I = Concentration exceeds the Industrial/Commercial Direct Exposure Criteria.
P = Concentration exceeds the GB Pollutant Mobility Criteria.
1 = Concentrations of TPH or ETPH; refer to table 5A for specific analytical method.
2 = The DEC for trivalent chromium are used; concentrations of hexavalent chromium were not detected at or above laboratory detection limts in select samples analyzed for both fractions.
CTDEP = Connecticut Department of Environmental Protection

TABLE 19

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 14: UST-6

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm)						
			VOCs						TPH
			Trichloroethene	Methylene Chloride	Methyl-tert-butyl-ethe	cis-1,2-Dichloroethene	sec-Butylbenzene	tert-Butylbenzene	
B-1	10 to 12	3.5	0.058	ND	ND	ND	ND	ND	37.7
B-67	4 to 8	4.5	ND	ND	ND	ND	ND	ND	ND
B-70	4 to 8	4.0	ND	ND	0.052	ND	0.047	0.02	**9,900** R,I
LBGMW-15	7 to 9	4.0	0.010	0.0025	ND	0.0051	ND	ND	
CTDEP Remediation Standards for Soils in GB Areas									
Residential Direct Exposure Criteria			56	82	500	500	500	500	500
Industrial/Commercial Direct Exposure Criteria			520	760	1,000	1,000	1,000	1,000	2,500
GB pollutant Mobility Criteria			1	1	20	14	14.0	14	2,500

Notes:

AEI = Area of environmental investigation
VOCs = Volatile organic compounds
TPH = Total petroleum hydrocarbons
ft bg = Feet below grade
DTW = Estimated depth to seasonal high water table in feet below grade; inferred from April 2007 ground water elevations
ND = Not detected
[shaded cell] = Not analyzed for this parameter.
BOLD = Exceeds remediation standard for specified criteria.
R = Concentration exceeds the Residential Direct Exposure Criteria.
I = Concentration exceeds the Industrial/Commercial Direct Exposure Criteria.
P = Concentration exceeds the GB Pollutant Mobility Criteria.
CTDEP= Connecticut Department of Environmental Protection

TABLE 21

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 16: Loading Dock Area/Building No. 1A

Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm)

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	VOCs: Tetrachloroethene	Trichloroethene	Methylene Chloride	Toluene	cis-1,2-Dichloroethene	p-Isopropyltoluene	sec-Butylbenzene	n-Propylbenzene	Vinyl Chloride	trans-1,2-Dichloroethene	Isopropylbenzene	Chloromethane
LBGMW-32	10 to 10.5	4.0	ND	0.015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LBGMW-33	13.6 to 14	4.0	ND	0.0063	ND	ND	0.0066	ND	ND	ND	ND	ND	ND	ND
LBGMW-34	0 to 2	1.5	0.0026	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9 to 9.5		ND	**5,900^{R,I}**	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LBGMW-35	9 to 9.5	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
LD Catch Basin	0.5 to 1	0.0	ND	0.19	ND	0.190	5.200	0.240	ND	ND	0.140	0.110	0.075	ND
LDCB-1	7 to 8	1.0	0.00060	0.15	0.0016	ND	0.044	ND	ND	ND	ND	ND	ND	ND
LDCB-2	7 to 8	1.0	ND	0.27	ND	ND	0.120	ND	ND	ND	ND	ND	ND	ND
CTDEP Remediation Standards for Soil in GB Areas														
Residential Direct Exposure Criteria			12	56	82	500	500	NE	500	500	0.32	500	500	47
Industrial/Commercial Direct Exposure Criteria			110	520	760	1,000	1,000	NE	1,000	1,000	3	1,000	1,000	440
GB pollutant Mobility Criteria			1	1	1	67	1.4	14	14	14	0.4	20	132	140

Sample ID	Sample Interval (ft bg)	SVOCs/PAHs: Acenapthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene)	Naphthalene	Phenanthrene	Pyrene	Total Metals: Arsenic	Barium	Cadmium	Chromium [1]	Lead	Mercury
LBGMW-32	10 to 10.5																					
LBGMW-33	13.6 to 14																					
LBGMW-34	0 to 2																					
	9 to 9.5																					
LBGMW-35	9 to 9.5																					
LD Catch Basin	0.5 to 1	0.110	0.042	0.300	0.480	0.850	0.420	0.340	0.450	0.130	0.670	ND	0.410	0.036	0.180	0.560	1.80	54.8	1.40	13.7	126	0.25
LDCB-1	7 to 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	1.10	21.1	ND	8.30	4.30	ND
LDCB-2	7 to 8	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.045	0.074	ND	0.015	0.057	ND	ND	26.9	ND	8.50	4.80	ND
CTDEP Remediation Standards for Soil in GB Areas																						
Residential Direct Exposure Criteria		1,000	1,000	1	1	1	1,000	8.4	84	1	1,000	1,000	1	1,000	1,000	1,000	10	4,700	34	3,900	500	20
Industrial/Commercial Direct Exposure Criteria		2,500	2,500	7.8	1	7.8	2,500	78	780	1	2,500	2,500	7.8	2,500	2,500	2,500	10	14,000	1,000	51,000	1,000	610
GB pollutant Mobility Criteria		84	400	1	1	1	42	1	1	1	4	56	7.4	56	40	40	NE	NE	NE	NE	NE	NE

Notes:
AEI = Area of environmental investigation
VOCs = Volatile organic compounds
SVOCs = Semi-volatile organic compounds
PAHs = Polynuclear aromatic hydrocarbons
ft bg = Feet below grade
DTW = Estimated depth to seasonal high water table in feet below grade; inferred from April 2007 ground water elevations
1 = The DEC for trivalent chromium are used; concentrations of hexavalent chromium were not detected at or above laboratory detection limits in select samples analyzed for both fractions.
ND = Not detected
NE = Not established

(shaded) = Not analyzed for this parameter.
BOLD = Exceeds remediation standard for specified criteria
R = Concentration exceeds the Residential Direct Exposure Criteria
I = Concentration exceeds the Industrial/Commercial Direct Exposure Criteria.
CTDEP = Connecticut Department of Environmental Protection

TABLE 21

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 16: Loading Dock Area/Building No. 1A

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm)																																
			VOCs												SVOCs/PAHs															Total Metals					
			Tetrachloroethene	Trichloroethene	Methylene Chloride	Toluene	cis-1,2-Dichloroethene	p-Isopropyltoluene	sec-Butylbenzene	n-Propylbenzene	Vinyl Chloride	trans-1,2-Dichloroethene	Isopropylbenzene	Chloromethane	Acenapthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene)	Naphthalene	Phenanthrene	Pyrene	Arsenic	Barium	Cadmium	Chromium [1]	Lead	Mercury
GP-21	6 to 8	2.0	ND	0.03	0.0092	ND	0.0037	ND	ND	ND	ND	ND	ND	ND																					
GP-22	6 to 7	2.0	ND	0.033	ND	ND	0.0093	ND	ND	ND	ND	ND	ND	ND																					
GP-23	10 to 12	2.0	ND	0.61	ND	ND	0.370	ND	ND	ND	ND	ND	ND	0.041																					
GP-24	2 to 3	2.0	0.00094	0.17	0.0016	ND	0.100	ND	ND	ND	ND	0.00058	ND	ND																					
GP-25	8 to 10	3.0	0.0016	0.16	0.0020	ND	0.110	ND	ND	ND	ND	ND	ND	ND																					
GP-26	12 to 13	3.0	ND	0.031	0.0014	ND	0.019	ND	ND	ND	ND	ND	ND	ND																					
GP-27	2 to 4	2.0	ND	0.014	0.0012	ND	0.024	ND	0.0032	0.0011	0.00085	ND	ND	ND																					
	12 to 13		ND	0.10	ND	ND	0.110	ND	ND	ND	ND	ND	ND	ND																					
GP-34	0 to 2	2.5	ND	0.00072	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-35	0 to 2	2.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	10 to 11.5		ND	0.082	ND	ND	0.023	ND	ND	ND	ND	ND	ND	ND																					
GP-36	0 to 2	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	12 to 14		ND	0.97	ND	0.024	0.67	ND	ND	ND	ND	ND	ND	ND																					
GP-37	12 to 13.5	3.0	ND	0.52	ND	ND	0.12	ND	ND	ND	ND	ND	ND	ND																					
GP-38	12 to 12.5	3.0	ND	0.28	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-40	14.5 to 15	3.0	ND	0.056	ND	ND	0.019	ND	ND	ND	ND	ND	ND	ND																					
GP-41	15 to 15.5	3.0	ND	0.20	ND	ND	0.13	ND	0.0012	ND	0.0036	0.00069	ND	ND																					
GP-42	2 to 3	3.0	0.00097	0.082	ND	ND	0.036	ND	ND	ND	ND	ND	ND	ND																					
	7 to 8		ND	1.90	0.17	ND	1.9	ND	ND	ND	0.052	ND	ND	ND																					
GP-43	1 to 2	3.0	ND	0.41	0.13	ND	0.062	ND	ND	ND	ND	ND	ND	ND																					
	7 to 8		ND	0.38	ND	ND	0.25	ND	ND	ND	ND	ND	ND	ND																					
GP-48	2 to 3	3.5	ND	0.004	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	11 to 12		0.040	2.10	0.2	ND	2.0	ND	ND	ND	0.074	ND	ND	ND																					
GP-49	2 to 3	3.0	ND	0.0051	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	8 to 9.5		0.041	2.30	0.13	ND	0.66	ND	ND	ND	0.024	ND	ND	ND																					
GP-50	2 to 3	3.0	ND	ND	0.0038	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	10 to 11.5		ND	0.32	ND	ND	0.21	ND	ND	ND	ND	ND	ND	ND																					
GP-51	2 to 4	3.5	ND	ND	0.0037	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	10 to 12		ND	0.066	ND	ND	0.0021	ND	ND	ND	ND	ND	ND	ND																					
GP-52	0 to 2	3.5	ND	0.0088	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	10 to 12		ND	0.037	0.0028	ND	0.0081	ND	ND	ND	ND	ND	ND	ND																					
GP-53	2 to 3	3.0	ND	ND	0.0044	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	14 to 16		ND	0.52	ND	ND	0.73	ND	ND	ND	ND	ND	ND	ND																					
GP-54	2 to 4.4	3.0	ND	ND	0.0051	0.00032	ND	ND	ND	ND	ND	ND	ND	ND																					
	11 to 13		ND	0.52	0.13	ND	0.25	ND	ND	ND	ND	ND	ND	ND																					
GP-55	2 to 4	3.0	ND	ND	0.0053	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	6 to 8		ND	0.011	0.0039	ND	0.0055	ND	ND	ND	ND	ND	ND	ND																					
GP-56	2 to 4	3.5	ND	0.0013	0.0033	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	9.5 to 11.5		ND	0.16	0.0049	ND	0.00095	ND	ND	ND	ND	ND	ND	ND																					
CTDEP Remediation Standards for Soil in GB Areas																																			
Residential Direct Exposure Criteria			12	56	82	500	500	NE	500	500	0.32	500	500	47	1,000	1,000	1	1	1	1,000	8.4	84	1	1,000	1,000	1	1,000	1,000	1,000	10	4,700	34	3,900	500	20
Industrial/Commercial Direct Exposure Criteria			110	520	760	1,000	1,000	NE	1,000	1,000	3	1,000	1,000	440	2,500	2,500	7.8	1	7.8	2,500	78	780	1	2,500	2,500	7.8	2,500	2,500	2,500	10	14,000	1,000	51,000	1,000	610
GB pollutant Mobility Criteria			1	1	1	67	1.4	14	14	14	0.4	20	132	140	84	400	1	1	1	42	1	1	1	4	56	7.4	56	40	40	NE	NE	NE	NE	NE	NE

TABLE 21

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 16: Loading Dock Area/Building No. 1A

Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm)

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	VOCs: Tetrachloroethene	Trichloroethene	Methylene Chloride	Toluene	cis-1,2-Dichloroethene	p-Isopropyltoluene	sec-Butylbenzene	n-Propylbenzene	Vinyl Chloride	trans-1,2-Dichloroethene	Isopropylbenzene	Chloromethane
GP-57	0 to 2	3.0	ND	ND	0.0023	ND	ND	ND	ND	ND	ND	ND	ND	ND
	12 to 12.5		ND	0.68	0.11	ND	0.23	ND	ND	ND	ND	ND	ND	ND
GP-58	14 to 15	3.0	ND	ND	ND	ND	ND	ND	0.220	ND	ND	ND	ND	ND
GP-59	8 to 9.0	3.0	ND	0.044	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-60	10 to 10.5	3.0	ND	0.87	ND	ND	0.024	ND	ND	ND	ND	ND	ND	ND
GP-61	11 to 12	3.0	ND	1.90	ND	ND	0.900	ND	ND	ND	ND	ND	ND	ND
GP-62	2 to 3	3.0	ND	ND	0.0039	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10 to 11		ND	ND	ND	ND	ND	0.580	0.540	0.390	ND	ND	ND	ND
GP-63	10 to 11	3.0	ND	1.20	ND	ND	2.20	ND	ND	ND	ND	ND	ND	ND
GP-64A	1 to 2	3.0	ND	**150**[R,P]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-64	8 to 9	3.0	ND	0.031	ND	ND	0.450	0.077	0.073	0.033	0.076	ND	ND	0.015
GP-65	3 to 4	3.0	ND	ND	0.0069	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9 to 10		ND	0.17	0.0096	ND	0.0083	ND	ND	ND	ND	ND	ND	ND
GP-66	5 to 6	3.0	ND	0.00087	0.0071	ND	ND	ND	ND	ND	ND	ND	ND	ND
	10 to 11		ND	0.18	0.0068	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-67	2 to 3	3.0	ND	0.014	0.0063	ND	0.00044	ND	ND	ND	ND	ND	ND	ND
	7 to 8		ND	0.049	0.0072	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-68	10 to 11	3.0	ND	0.075	0.0031	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-68A	11.5 to 11.5	3.0	ND	0.072	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-69	5 to 6	3.0	ND	0.038	0.011	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-70	2.5 to 3	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	13 to 13.5		ND	0.0022	ND	ND	0.0064	ND	ND	ND	ND	ND	ND	ND
GP-71	2.5 to 3	3.0	ND	0.011	ND	ND	0.0015	ND	ND	ND	ND	ND	ND	ND
	8.5 to 9		ND	0.057	0.0019	ND	0.068	ND	ND	ND	0.003	0.00078	ND	ND
GP-72	2.5 to 3	3.0	ND	0.009	ND	ND	0.003	ND	ND	ND	ND	ND	ND	ND
	8 to 8.5		ND	43.0	ND	0.140	0.820	ND	ND	ND	ND	ND	ND	ND
GP-73	2.5 to 3	3.0	0.110	**16**[P]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	6.3 to 6.7		ND	11.0	ND	ND	0.330	ND	ND	ND	ND	ND	ND	ND
GP-74	2 to 2.5	3.0	ND	0.023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	9 to 9.5		ND	0.73	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-75	3.5 to 4	3.0	ND	0.0007	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	7 to 7.5		ND	0.37	ND	ND	0.021	ND	ND	ND	ND	ND	ND	ND
GP-76	0 to 1	3.0	ND	**78**[R,P]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	5.7 to 5.7	3.0	ND	**940**[R,I]	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-77	0.5 to 1	3.0	ND	0.0088	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	6.6 to 6.9		ND	0.15	ND	ND	0.0071	ND	ND	ND	ND	ND	ND	ND
GP-78	0 to 2	3.0	ND	0.041	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
GP-79	0 to 2	3.0	ND	0.023	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
	6.5 to 6.7		ND	0.017	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
CTDEP Remediation Standards for Soil in GB Areas														
Residential Direct Exposure Criteria			12	56	82	500	500	NE	500	500	0.32	500	500	47
Industrial/Commercial Direct Exposure Criteria			110	520	760	1,000	1,000	NE	1,000	1,000	3	1,000	1,000	440
GB pollutant Mobility Criteria			1	1	1	67	1.4	14	14	14	0.4	20	132	140

Criteria	SVOCs/PAHs: Acenapthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene)	Naphthalene	Phenanthrene	Pyrene	Total Metals: Arsenic	Barium	Cadmium	Chromium [1]	Lead	Mercury
Residential Direct Exposure Criteria	1,000	1,000	1	1	1	1,000	8.4	84	1	1,000	1,000	1	1,000	1,000	1,000	10	4,700	34	3,900	500	20
Industrial/Commercial Direct Exposure Criteria	2,500	2,500	7.8	1	7.8	2,500	78	780	1	2,500	2,500	7.8	2,500	2,500	2,500	10	14,000	1,000	51,000	1,000	610
GB pollutant Mobility Criteria	84	400	1	1	1	42	1	1	1	4	56	7.4	56	40	40	NE	NE	NE	NE	NE	NE

TABLE 21

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Soil Analytical Results
AEI No. 16: Loading Dock Area/Building No. 1A

Sample ID	Sample Interval (ft bg)	DTW (ft bg)	Concentrations of detected constituents in milligrams per kilogram (mg/kg) or parts per million (ppm)																																			
			VOCs												SVOCs/PAHs																Total Metals					
			Tetrachloroethene	Trichloroethene	Methylene Chloride	Toluene	cis-1,2-Dichloroethene	p-Isopropyltoluene	sec-Butylbenzene	n-Propylbenzene	Vinyl Chloride	trans-1,2-Dichloroethene	Isopropylbenzene	Chloromethane	Acenapthylene	Anthracene	Benzo(a) anthracene	Benzo(a)pyrene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Naphthalene	Phenanthrene	Pyrene	Arsenic	Barium	Cadmium	Chromium [1]	Lead	Mercury
GP-80	0 to 2	3.0	ND	0.0097	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-81	0 to 2	3.0	ND	0.0074	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	9 to 9.5		ND	1.10	ND	ND	2.10	ND	ND	ND	ND	ND	ND	ND																					
GP-82	0 to 2	3.0	ND	0.097	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	9 to 9.2		ND	0.64	ND	ND	0.550	ND	ND	ND	ND	ND	ND	ND																					
GP-83	11 to 11	3.0	ND	0.14	ND	ND	0.0075	ND	ND	ND	ND	ND	ND	ND																					
GP-84	10.5 to 10.5	3.0	ND	ND	ND	0.00044	ND	0.00031	ND	ND	ND	ND	ND	ND																					
	14.5 to 14.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-85	11.5 to 11.5	3.0	ND	ND	ND	0.00042	ND	0.001	ND	ND	ND	ND	ND	ND																					
	14.5 to 14.5		ND	0.0015	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-86	10.5 to 10.5	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	14.5 to 14.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-87	11 to 11	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	17 to 17		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-88	10.5 to 10.5	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	15 to 15.5		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-89	10.5 to 10.5	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00036																					
	18 to 18		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-90	10.5 to 10.5	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	14 to 14		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	0.00039																					
GP-91	0 to 2	3.0	ND	ND	0.021	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	3.5 to 3.5		ND	0.20	0.020	ND	0.014	ND	ND	ND	ND	ND	ND	ND																					
GP-92	0 to 2	3.0	ND	0.057	0.021	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	8.5 to 8.5		ND	3.30	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-93	0 to 2	3.0	ND	0.0098	0.031	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	3.5 to 3.5		ND	0.019	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-94	0 to 2	3.0	ND	0.0074	0.022	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	8 to 8		ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-95	0 to 2	3.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
	8.5 to 8.5		ND	0.056	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-96	10 to 10.2	3.0	ND	0.21	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
GP-97	8 to 8	3.0	ND	1.90	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
LBGMW-18	4 to 6	5.5	ND	0.0029	0.0023	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
LBGMW-19	2 to 4	3.0	ND	ND	0.0025	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
LBGMW-19	6 to 8	3.0	ND	ND	0.0029	ND	ND	ND	ND	ND	ND	ND	ND	ND																					
LBGMW-30	15.5 to 16	3.5	ND	0.50	ND	ND	0.015	ND	ND	ND	ND	ND	ND	ND																					
LBGMW-31	12.5 to 13	3.5	ND	0.12	ND	ND	0.077	ND	ND	ND	ND	ND	ND	ND																					
CTDEP Remediation Standards for Soil in GB Areas																																			
Residential Direct Exposure Criteria			12	56	82	500	500	NE	500	500	0.32	500	500	47	1,000	1,000	1	1	1	1,000	8.4	84	1	1,000	1,000	1	1,000	1,000	1,000	10	4,700	34	3,900	500	20
Industrial/Commercial Direct Exposure Criteria			110	520	760	1,000	1,000	NE	1,000	1,000	3	1,000	1,000	440	2,500	2,500	7.8	1	7.8	2,500	78	780	1	2,500	2,500	7.8	2,500	2,500	2,500	10	14,000	1,000	51,000	1,000	610
GB pollutant Mobility Criteria			1	1	1	67	1.4	14	14	14	0.4	20	132	140	84	400	1	1	1	42	1	1	1	4	56	7.4	56	40	40	NE	NE	NE	NE	NE	NE

TABLE 27

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Analytical Results for VOCs in Ground Water Samples

Sample ID	Date	Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Acetone	Benzene	Xylenes	Methyl tert-butyl ether	n-Butylbenzene	sec-Butylbenzene	Isopropylbenzene	n-Propylbenzene	Chlorobenzene	Chloroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Methylene Chloride	Chloroform	Chloromethane	Naphthalene	4-Isopropyltoluene	Dichlorodifluoromethane
		Concentrations of detected constituents in micrograms per liter (ug/l) or parts per billion (ppb)																							
B-3/MW-1	5/27/97	*	$275^{R,I,A}$	3.1	71.6	1.2	17.9^{R}	*	*	*	BDL	*	*	*	*	BDL	BDL	*	*	BDL	*	*	*	*	*
	9/10/98	*	$81^{R,I}$	2	22	BDL<1	BDL<1	*	BDL<1	*	9	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
B-7/MW-2	5/27/97	*	BDL	BDL	BDL	BDL	BDL	*	*	*	2,110	*	*	*	*	BDL	BDL	*	*	61	*	*	*	*	*
	9/10/98	*	BDL<1	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
B-8/MW-3	5/27/97	*	BDL	BDL	BDL	BDL	BDL	*	*	*	BDL	*	*	*	*	BDL	BDL	*	*	BDL	*	*	*	*	*
	9/10/98	*	BDL<1	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
B-10/MW-4	5/27/97	*	37^{R}	BDL	BDL	BDL	BDL	*	*	*	BDL	*	*	*	*	BDL	BDL	*	*	BDL	*	*	*	*	*
	9/10/98	*	29^{R}	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	2	2	*	BDL<1	BDL<1	18	*	*
B-14/MW-5R	5/27/97	*	$167^{R,I}$	BDL	BDL	BDL	BDL	*	*	*	BDL	*	*	*	*	3.7	14.5	*	*	BDL	*	*	*	*	*
	9/10/98	*	29^{R}	BDL<1	2	1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	3	31	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
	3/19/04	ND<1	8.5	ND<1	3.7	ND<1	ND<1		ND<1	ND<1	14	ND<1	ND<1	ND<1	ND<1	1.3	2.5	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	6.4
	11/30/04	ND<1	10	ND<1	8.4	ND<1	ND<1		ND<1	ND<1	3.0	ND<1	ND<1	ND<1	ND<1	ND<1	1.3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	ND<1	ND<1	1.2	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
B-18/MW-6	5/27/97	*	BDL	BDL	BDL	BDL	BDL	*	*	*	BDL	*	*	*	*	BDL	BDL	*	*	BDL	*	*	*	*	*
	9/10/98	*	BDL<1	BDL<1	BDL<1	BDL<1	40^{R}	*	BDL<1	*	BDL<1	2^{A}	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
	3/18/04	ND<1	ND<1	ND<1	ND<1	ND<1	4.0^{R}		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/29/04	ND<1	ND<1	ND<1	3.6	ND<1	40^{R}		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<2	2.6^{R}	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	1.1	1.2	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
MW-7	9/10/98	*	BDL<1	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
MW-8	9/10/98	*	BDL<1	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
MW-9	9/10/98	*	BDL<1	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
MW-10	9/10/98	*	BDL<1	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
	3/17/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
MW-11	9/10/98	*	BDL<1	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
	3/19/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	1.1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
MW-12	9/10/98	*	1	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	2	BDL<1	BDL<10	*	*
	3/17/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
B-33/MW-13	9/10/98	*	BDL<1	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
	3/18/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	2.3	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
B-34/MW-14	9/10/98	*	$97^{R,I}$	BDL<1	14	BDL<1	BDL<1	*	4	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
	2/25/03	ND<1	13	ND<1	5.2	ND<1	ND<1		0.85 J	ND<1	7.1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/18/04	ND<1	33^{R}	ND<1	7.4	ND<1	3.6^{R}		ND<1	ND<1	3.2	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	28^{R}	ND<1	7.8	ND<2	ND<1	10	0.58	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
B-35/MW-15	9/10/98	*	$97^{R,I}$	1	24	BDL<1	BDL<1	*	BDL<1	*	138	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
	2/25/03	ND<1	26	ND<1	6.8	ND<1	ND<1		ND<1	ND<1	2.6	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/18/04	ND<1	59^{R}	1.1	14	ND<1	5.3^{R}		ND<1	ND<1	3.2	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	1.4	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/3/07	ND<1	66^{R}	1.3	11	ND<2	3.7^{R}	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
B-36/MW-16	9/10/98	*	BDL<1	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	6	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
B-43/MW-17	9/10/98	*	4	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	7	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	5	BDL<1	BDL<10	*	*
	2/25/03	ND<1	1.8	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	1.4	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/19/04	ND<1	2.8	ND<1	2.3	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/2/04	ND<1	1.7	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	4/30/07	ND<1	2.3	ND<1	1.9	ND<2	1.5	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
B-58/MW-18	9/10/98	*	2	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	1	1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
B-60/MW-19	9/10/98	*	6	BDL<1	1	BDL<1	BDL<1	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
	3/18/04	ND<1	5.7	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/2/04	ND<1	5.1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	4/30/07	ND<1	4.8	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
B-68/MW-20	9/10/98	*	BDL<1	BDL<1	2	BDL<1	BDL<1	*	BDL<1	*	88	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
CTDEP Remediation Standards for Ground Water in GB Areas																									
Proposed Residential Volatilization Criteria (1996 Criteria)		340 (1,500)	27 (219)	190 (1)	830 (NE)	1,000 (NE)	1.6 (2)	50,000 (50,000)	130 (215)	8,700 (21,300)	21,000 (50,000)	1,500 (NE)	1,500 (NE)	2,800 (NE)	NE	1,800 (1,800)	12,000 (NE)	360 (NE)	280 (NE)	160 (50,000)	26 (287)	390 (429)	NE	1,600 (NE)	93 (NE)
Proposed Industrial/Commercial Volatilization Criteria (1996 Criteria)		810 (3,820)	67 (540)	920 (6)	11,000 (NE)	13,000 (NE)	52 (2)	50,000 (50,000)	310 (530)	48,000 (50,000)	50,000 (50,000)	21,000 (NE)	20,000 (NE)	6,800 (NE)	NE	23,000 (6,150)	29,000 (NE)	4,800 (NE)	3,900 (NE)	2,200 (50,000)	62 (710)	5,500 (1,449)	NE	22,000 (NE)	1,200 (NE)
Alternative Aquatic Life Criteria		53"	220"	210"	620"	560"	931"	1,700"	160"	27"	51,000*	1"	1"	21"	21	47"	NE	15"	26"	1,200"	140"	16"	21"	16.5"	NE
Surface Water Protection Criteria		88	2,340	96	NE	NE	15,750	NE	710	NE	NE	NE	NE	NE	NE	420,000	NE	NE	NE	48,000	14,100	NE	NE	NE	NE

TABLE 27

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Analytical Results for VOCs in Ground Water Samples

Sample ID	Date	Concentrations of detected constituents in micrograms per liter (ug/l) or parts per billion (ppb)																							
		Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Acetone	Benzene	Xylenes	Methyl tert-butyl ether	n-Butylbenzene	sec-Butylbenzene	Isopropylbenzene	n-Propylbenzene	Chlorobenzene	Chloroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Methylene Chloride	Chloroform	Chloromethane	Naphthalene	4-Isopropyltoluene	Dichlorodifluoromethane
B-74/MW-21	9/10/98	*	1,079 [R,I,A]	39	386	4	17 [R]	*	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	204 [A]	BDL<10	*	*
	2/26/03	ND<20	490 [R,I,A]	19 J	140	ND<20	110 [R,I]		ND<20	ND<20	30	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<100	ND<20	ND<20	ND<20	ND<20	ND<20
	3/17/04	ND<20	660 [R,I,A]	24	170	ND<20	120 [R,I]		ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<100	ND<20	ND<20	ND<20	ND<20	ND<20
	11/29/04	ND<10	320 [R,I,A]	ND<10	75	ND<10	97 [R,I]		ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<50	ND<10	ND<10	ND<10	ND<10	ND<10
	5/2/07	ND<1	430 E [R,I,A]	11	81	ND<2	110 E [R,I]	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	3.9	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
B-75/MW-22	9/10/98	*	4	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	*	2	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<1	BDL<1	*	BDL<1	BDL<1	BDL<10	*	*
	2/26/03	ND<1	2.8	ND<1	0.99 J	ND<1	ND<1		ND<1	ND<1	9.9	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/17/04	ND<1	1.9	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	1.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/1/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	2.0	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/2/07	ND<1	5.4	ND<1	4.0	ND<2	16 [R]	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-21	6/24/04	ND<2.5	130 [R,I]	ND<2.5	42	ND<2.5	ND<2.5		ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<12	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5
GP-22	6/24/04	ND<1	34 [R]	ND<1	18	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-23	6/24/04	ND<20	1,000 [R,I,A]	ND<20	910 [R,A]	22	ND<20		ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<100	ND<20	ND<20	ND<20	ND<20	ND<20
GP-24	6/24/04	ND<50	1,800 [R,I,A]	ND<50	1,300 [R,A]	ND<50	ND<50		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-25	6/24/04	ND<50	1,200 [R,I,A]	ND<50	1,000 [R,A]	ND<50	ND<50		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-26	6/24/04	ND<20	300 [R,I,A]	ND<20	560	ND<20	ND<20		ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<100	ND<20	ND<20	ND<20	ND<20	ND<20
GP-27	6/24/04	ND<50	860 [R,I,A]	ND<50	1,600 [R,A]	ND<50	ND<50		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-34	11/23/04	ND<1	50 [R]	ND<1	41	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-35	11/23/04	ND<25	610 [R,I,A]	ND<25	380	ND<25	ND<25		ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<120	ND<25	ND<25	ND<25	ND<25	ND<25
GP-36	11/23/04	ND<50	1,700 [R,I,A]	ND<50	1,300 [R,A]	ND<50	ND<50		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-37	11/23/04	ND<50	3,000 [R,I,A,S]	ND<50	1,700 [R,A]	ND<50	ND<50		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-38	11/23/04	ND<5	200 [R,I]	ND<5	120	ND<5	ND<5		ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<25	ND<5	ND<5	ND<5	ND<5	ND<5
GP-39	11/23/04	ND<1	22	ND<1	17	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-40	3/17/05	ND<2	56 [R]	ND<2	75	ND<2	ND<2		ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<10	ND<2	ND<2	ND<2	ND<2	ND<2
GP-41	3/17/05	ND<5	240 [R,I,A]	ND<5	240	ND<5	10 [R]		ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<25	ND<5	ND<5	ND<5	ND<5	ND<5
GP-42	3/17/05	ND<500	9,700 [R,I,A,S]	ND<500	17,000 [R,I,A]	ND<500	840 [R,I]		ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<2,500	ND<500	ND<500	ND<500	ND<500	ND<500
GP-43	3/17/05	ND<100	5,100 [R,I,A,S]	ND<100	4,500 [R,A]	ND<100	ND<100		ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<500	ND<100	ND<100	ND<100	ND<100	ND<100
GP-44	3/16/05	ND<1	3.1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-45	3/16/05	ND<1	51 [R]	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-46	3/16/05	ND<1	26	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-48	3/17/05	ND<500	10,000 [R,I,A,S]	ND<500	20,000 [R,I,A]	ND<500	2,400 [R,I,A]		ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<2,500	ND<500	ND<500	ND<500	ND<500	ND<500
GP-49	3/17/05	ND<250	6,300 [R,I,A,S]	ND<250	11,000 [R,A]	ND<250	1,700 [R,I,A]		ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<1,200	ND<250	ND<250	ND<250	ND<250	ND<250
GP-50	8/3/05	ND<50	2,000 [R,I,A]	ND<50	2,700 [R,A]	ND<50	130 [R,I]		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-51	8/1/05	ND<50	1,800 [R,I,A]	ND<50	ND<50	ND<50	ND<50		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-52	8/3/05	ND<10	150 [R,I]	ND<10	62	ND<10	ND<10		ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<50	ND<10	ND<10	ND<10	ND<10	ND<10
GP-53	8/3/05	ND<50	3,100 [R,I,A,S]	ND<50	2,400 [R,A]	50	230 [R,I]		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-54	8/3/05	ND<250	8,000 [R,I,A,S]	ND<250	6,300 [R,A]	ND<250	910 [R,I]		ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<250	ND<1,200	ND<250	ND<250	ND<250	ND<250	ND<250
GP-55	8/3/05	ND<1	58 [R]	ND<1	3.6	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-56	8/3/05	ND<50	1,400 [R,I,A]	ND<50	ND<50	ND<50	ND<50		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-57	8/3/05	ND<50	2,400 [R,I,A,S]	ND<50	1,500 [R,A]	ND<50	ND<50		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-58	3/8/06	ND<25	610 [R,I,A]	ND<25	550	ND<25	51 [R]		ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	33 J	ND<25	ND<25	ND<25	ND<25	ND<25
GP-59	3/8/06	ND<2	43 [R]	ND<2	140	1.9 J	16 [R]		ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	9.3 J	ND<2	ND<2	ND<2	ND<2	ND<2
GP-60	3/8/06	ND<100	2,700 [R,I,A,S]	ND<100	1,800 [R,A]	ND<100	280 [R,I]		ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<500	120 J [R,I]	ND<100	ND<100	ND<100	ND<100
GP-61	3/8/06	ND<50	1,600 [R,I,A]	ND<50	1,300 [R,A]	ND<50	120 [R,I]		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-62	3/7/06	ND<100	2,700 [R,I,A,S]	ND<100	2,500 [R,A]	ND<100	310 [R,I]		ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	150 J	ND<100	ND<100	ND<100	ND<100	ND<100
GP-63	3/8/06	ND<50	970 [R,I,A]	ND<50	2,000 [R,A]	ND<50	340 [R,I]		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	61 J	ND<50	ND<50	ND<50	ND<50	ND<50
GP-64 [1]	3/8/06	ND<500	ND<500	ND<500	15,000 [R,I,A]	ND<500	5,100 [R,I,A]		ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	ND<500	620 J [R]	ND<500	ND<500	ND<500	ND<500	ND<500
GP-65	3/7/06	ND<2	36 [R]	ND<2	5.3	ND<2	ND<2		ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<10	ND<2	ND<2	ND<2	ND<2	ND<2
GP-66 [2]	3/7/06	ND<5	99 [R,I]	ND<5	ND<5	ND<5	ND<5		ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	4.8 J	ND<5	ND<5	ND<5	ND<5	ND<5
GP-67	3/7/06	ND<50	1,000 [R,I,A]	ND<50	ND<50	ND<50	ND<50		ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
GP-68	3/8/06	ND<25	490 [R,I,A]	ND<25	ND<25	ND<25	ND<25		ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	34 J	ND<25	ND<25	43 [A]	ND<25	ND<25
GP-68a	4/6/07	ND<2	160 [R,I]	ND<2	ND<2	ND<4	ND<2	ND<10	ND<1	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<10	ND<2	ND<2	ND<2	ND<2	ND<2
GP-69	3/8/06	ND<25	620 [R,I,A]	ND<25	ND<25	ND<25	ND<25		ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	27 J	ND<25	ND<25	ND<25	ND<25	ND<25
GP-70 [3]	7/12/06	ND<1	1.4	ND<1	1.3	ND<1	ND<1		0.45 J	1.7	0.54 J	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	3.0	ND<1	ND<1
GP-71 [4]	7/12/06	ND<5	42 [R]	ND<5	210	ND<5	8.1 [R]		ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<25	ND<5	ND<5	ND<5	ND<5	ND<5
GP-72 [4a]	7/12/06	ND<1,000	50,000 [R,I,A,S]	ND<1,000	4,200 [R,A]	ND<1,000	ND<1,000		ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<5,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000
GP-73 [1a]	7/12/06	ND<100	7,000 [R,I,A,S]	ND<100	290	ND<100	ND<100		ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<500	ND<100	ND<100	ND<100	ND<100	ND<100
GP-74 [5]	7/12/06	ND<5	230 [R,I,A]	13	33	ND<5	ND<5		ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<25	ND<5	ND<5	ND<5	ND<5	ND<5
CTDEP Remediation Standards for Ground Water in GB Areas																									
Proposed Residential Volatilization Criteria (1996 Criteria)		340 (1,500)	27 (219)	190 (1)	830 (NE)	1,000 (NE)	1.6 (2)	50,000 (50,000)	130 (215)	8,700 (21,300)	21,000 (50,000)	1,500 (NE)	1,500 (NE)	2,800 (NE)	NE	1,800 (1,800)	12,000 (NE)	360 (NE)	280 (NE)	160 (50,000)	26 (287)	390 (429)	NE	1,600 (NE)	93 (NE)
Proposed Industrial/Commercial Volatilization Criteria (1996 Criteria)		810 (3,820)	67 (540)	920 (6)	11,000 (NE)	13,000 (NE)	52 (2)	50,000 (50,000)	310 (530)	48,000 (50,000)	50,000 (50,000)	21,000 (NE)	20,000 (NE)	6,800 (NE)	NE	23,000 (6,150)	29,000 (NE)	4,800 (NE)	3,900 (NE)	2,200 (50,000)	62 (710)	5,500 (1,449)	NE	22,000 (NE)	1,200 (NE)
Alternative Aquatic Life Criteria		53	220	210	620	560	931	1,700	160	27	51,000*	1	1	21	21	47	NE	15	26	1,200	140	16	21	16.5	NE
Surface Water Protection Criteria		88	2,340	96	NE	NE	15,750	NE	710	NE	NE	NE	NE	NE	NE	420,000	NE	NE	NE	48,000	14,100	NE	NE	NE	NE

TABLE 27

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Analytical Results for VOCs in Ground Water Samples

Sample ID	Date	Concentrations of detected constituents in micrograms per liter (ug/l) or parts per billion (ppb)																							
		Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Acetone	Benzene	Xylenes	Methyl tert-butyl ether	n-Butylbenzene	sec-Butylbenzene	Isopropylbenzene	n-Propylbenzene	Chlorobenzene	Chloroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Methylene Chloride	Chloroform	Chloromethane	Naphthalene	4-Isopropyltoluene	Dichlorodifluoromethane
GP-75 [1b]	7/12/06	ND<100	**3,900** [R,I,A,S]	ND<100	200	ND<100	ND<100		ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<500	ND<100	ND<100	ND<100	ND<100	ND<100
GP-75a	4/6/07	ND<100	**6,300** [R,I,A,S]	ND<100	490	ND<200	ND<100	ND<500	ND<50	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<300	ND<100	ND<100	ND<500	ND<100	ND<100	ND<100	ND<100	ND<100
GP-76	4/3/07	ND<1,000	**72,000** [R,I,A,S]	ND<1,000	**28,000** [R,I,A]	ND<2,000	**6,300** [R,I,A]	ND<5,000	ND<500	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<3,000	ND<1,000	ND<1,000	ND<5,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000	ND<1,000
GP-77	4/3/07	ND<25	**1,400** [R,I,A]	ND<25	52	ND<50	ND<25	ND<130	ND<13	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<75	ND<25	ND<25	ND<130	ND<25	ND<25	ND<25	ND<25	ND<25
GP-78 [3a]	4/3/07	ND<1	26.0	1.7	20.0	ND<2	ND<1	ND<5	ND<0.5	1.0	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-79	4/3/07	ND<1	21.0	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-80 [4b]	4/3/07	ND<1	1.2	ND<1	1.0	ND<2	ND<1	ND<5	ND<0.5	1.1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-81	4/3/07	ND<25	**1,800** [R,I,A]	ND<25	**2,300** [R,A]	ND<50	**110** [R,I]	ND<130	ND<13	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<75	ND<25	ND<25	ND<130	ND<25	ND<25	ND<25	ND<25	ND<25
GP-82	4/3/07	ND<100	**6,500** [R,I,A,S]	ND<100	**5,400** [R,A]	ND<200	**330** [R,I]	ND<500	ND<50	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<100	ND<300	ND<100	ND<100	ND<500	ND<100	ND<100	ND<100	ND<100	ND<100
GP-83	4/6/07	ND<1	7.1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-84	2/20/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		0.44 J	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-85 [4c]	2/20/07	ND<1	0.66 J	ND<1	ND<1	ND<1	ND<1		0.54 J	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-86	2/20/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		0.57 J	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-87	2/20/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	1.1	ND<1	ND<1	ND<1	ND<1
GP-88	2/20/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-89	2/20/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-90	2/20/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-91	4/2/07	ND<1	2.4	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-92	4/2/07	ND<1	3.3	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-93	4/2/07	ND<1	3.3	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-94	4/2/07	ND<1	2.9	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
GP-95	4/2/07	ND<5	**150** [R,I]	ND<5	370	ND<10	**26** [R]	ND<25	ND<2.5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<15	ND<5	ND<5	ND<25	ND<5	ND<5	ND<5	ND<5	ND<5
GP-96	4/6/07	ND<10	**680** [R,I,A]	ND<10	ND<10	ND<20	ND<10	ND<500	ND<5	11	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<30	**20** [A]	ND<10	ND<50	ND<10	ND<10	ND<10	ND<10	ND<10
GP-97	4/6/07	ND<4	**270** [R,I,A]	ND<4	53	ND<8	ND<4	ND<20	ND<2	ND<4	ND<4	ND<4	ND<4	ND<4	ND<4	ND<4	ND<12	ND<4	ND<4	ND<20	ND<4	ND<4	ND<4	ND<4	ND<4
LBGMW-1	2/26/03	ND<1	2	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/19/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	1.8	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/3/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	9.5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	1.9	ND<1
LBGMW-2	2/26/03	ND<2	**79** [R,I]	ND<2	56	ND<2	ND<2		ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<10	ND<2	ND<2	ND<2	ND<2	ND<2
	3/18/04	ND<1	**45** [R]	ND<1	13	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	**55** [R]	ND<1	16	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/3/07	ND<1	22	ND<1	4.3	ND<2	1.3	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-3	2/26/03	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	1.3	ND<1	ND<1	ND<1	ND<1	ND<1	1.1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/19/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-4	2/26/03	ND<10	**280** [R,I,A]	ND<10	39	ND<10	ND<10		ND<10	ND<10	12	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<50	ND<10	ND<10	ND<10	ND<10	ND<10
	3/19/04	ND<1	8.0	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	6/24/04	ND<1	5.7	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	13	ND<1	1.4	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/3/07	ND<1	15	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	2.4	ND<1	ND<1	ND<1	ND<1
LBGMW-5	2/26/03	ND<1	1.6	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	2.2	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/19/04	ND<1	1.0	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/2/04	ND<1	1.2	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-6	2/25/03	ND<1	1.4	ND<1	1.5	ND<1	ND<1		ND<1	ND<1	4.8	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/19/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	1.9	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/2/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	1.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-7	2/26/03	ND<2	**85** [R,I]	ND<2	ND<2	ND<2	ND<2		ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<10	ND<2	ND<2	ND<2	ND<2	ND<2
	3/18/04	ND<1	**31** [R]	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/2/04	ND<5	**150** [R,I]	ND<5	ND<5	ND<5	ND<5		ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<25	ND<5	ND<5	ND<5	ND<5	ND<5
	4/30/07	ND<1	**100** [R,I]	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-8	2/26/03	ND<1	**36** [R]	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/18/04	ND<1	**34** [R]	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	6/24/04	ND<1	**30** [R]	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	**30** [R]	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	4/30/07	ND<1	3.4	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
CTDEP Remediation Standards for Ground Water in GB Areas																									
Proposed Residential Volatilization Criteria (1996 Criteria)		340 (1,500)	27 (219)	190 (1)	830 (NE)	1,000 (NE)	1.6 (2)	50,000 (50,000)	130 (215)	8,700 (21,300)	21,000 (50,000)	1,500 (NE)	1,500 (NE)	2,800 (NE)	NE	1,800 (1,800)	12,000 (NE)	360 (NE)	280 (NE)	160 (50,000)	26 (287)	390 (429)	NE	1,600 (NE)	93 (NE)
Proposed Industrial/Commercial Volatilization Criteria (1996 Criteria)		810 (3,820)	67 (540)	920 (6)	11,000 (NE)	13,000 (NE)	52 (2)	50,000 (50,000)	310 (530)	48,000 (50,000)	50,000 (50,000)	21,000 (NE)	20,000 (NE)	6,800 (NE)	NE	23,000 (6,150)	29,000 (NE)	4,800 (NE)	3,900 (NE)	2,200 (50,000)	62 (710)	5,500 (1,449)	NE	22,000 (NE)	1,200 (NE)
Alternative Aquatic Life Criteria		53"	220"	210"	620"	560"	931"	1,700"	160"	27"	51,000*	1"	1"	21"	21	47"	NE	15"	26"	1,200"	140"	16"	21"	16.5"	NE
Surface Water Protection Criteria		88	2,340	96	NE	NE	15,750	NE	710	NE	NE	NE	NE	NE	NE	420,000	NE	NE	NE	48,000	14,100	NE	NE	NE	NE

TABLE 27

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Analytical Results for VOCs in Ground Water Samples

Sample ID	Date	Concentrations of detected constituents in micrograms per liter (ug/l) or parts per billion (ppb)																							
		Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Acetone	Benzene	Xylenes	Methyl tert-butyl ether	n-Butylbenzene	sec-Butylbenzene	Isopropylbenzene	n-Propylbenzene	Chlorobenzene	Chloroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Methylene Chloride	Chloroform	Chloromethane	Naphthalene	4-Isopropyltoluene	Dichlorodifluoromethane
LBGMW-9	2/26/03	ND<1	1.7	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/18/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-10	2/26/03	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	0.66 J	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/17/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/1/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-11	2/26/03	ND<1	1.7	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	5.7	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/17/04	ND<1	1.4	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/1/04	ND<1	1.3	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/2/07	ND<1	1.1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-12	2/26/03	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	7.4	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	3/17/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/29/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-13	3/17/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/1/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-14	3/17/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	2.3	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-15	3/19/04	ND<2	**77** ^{R,J}	2.3	43	2.0	**4.3** ^{R}		ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<10	ND<2	ND<2	ND<2	ND<2	ND<2
	11/30/04	ND<2	**77** ^{R,J}	ND<2	40	ND<2	ND<2		ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<10	ND<2	ND<2	ND<2	ND<2	ND<2
	5/1/07	ND<1	5.5	ND<1	3.1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-16	3/19/04	ND<1	7.1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	10	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	9.2	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-17	3/18/04	ND<200	**11,000** ^{R,J,A,S}	ND<200	**7,800** ^{R,A}	ND<200	ND<200		ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<1,000	ND<200	ND<200	ND<200	ND<200	ND<200
	6/24/04	ND<200	**7,500** ^{R,J,A,S}	ND<200	**5,600** ^{R,A}	ND<200	ND<200		ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<1,000	ND<200	ND<200	ND<200	ND<200	ND<200
	11/29/04	ND<200	**5,200** ^{R,J,A,S}	ND<200	**4,800** ^{R,A}	ND<200	ND<200		ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<200	ND<1,000	ND<200	ND<200	ND<200	ND<200	ND<200
	5/2/07	53	**1,500 E** ^{R,J,A}	11	**1,300 E** ^{R,A}	9.3	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	7/17/07	ND<20	**1,600** ^{R,J,A}	ND<20	**1,300** ^{R,A}	ND<40	ND<20	ND<100	ND<10	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<20	ND<60	ND<20	ND<20	ND<100	ND<20	ND<20	ND<20	ND<20	ND<20
LBGMW-18	3/18/04	ND<1	**43** ^{R}	ND<1	1.8	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	6/24/04	ND<1	**36** ^{R}	ND<1	1.2	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/29/04	ND<1	**45** ^{R}	ND<1	1.8	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/3/07	ND<1	21	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-19	3/18/04	ND<2.5	ND<2.5	ND<2.5	100	8.6	**89** ^{R,J}		ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<12	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25
	6/24/04	ND<2.5	ND<2.5	ND<2.5	180	10	**66** ^{R,J}		ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<12	ND<2.5	ND<2.5	ND<2.5	ND<2.5	ND<25
	11/29/04	ND<5	ND<5	ND<5	190	12	**95** ^{R,J}		ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<5	ND<25	ND<5	ND<5	ND<5	ND<5	ND<5
	5/1/07	ND<1	ND<1	ND<1	95	4.1	**73** ^{R,J}	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-20	3/19/04	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2		ND<2	2.9	ND<2	**12** ^{A}	**3** ^{A}	6.5	7.7	ND<2	ND<2	**44** ^{A}	4.4	ND<10	ND<2	ND<2	**110** ^{A}	ND<2	ND<2
	11/30/04	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2		ND<2	ND<2	ND<2	ND<2	ND<2	2.2	2.9	ND<2	ND<2	13	ND<2	ND<10	ND<2	ND<2	**36** ^{A}	ND<2	ND<2
	5/1/07	2.8	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-21	3/18/04	ND<1	4.9	ND<1	1.0	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/2/04	ND<1	4.1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	4/30/07	ND<1	1.2	ND<1	3.3	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-22	3/19/04	ND<1	4.4	ND<1	6.2	1.3	1.4		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	5.1	ND<1	13	ND<1	**1.9** ^{R}		ND<1	ND<1	2.4	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	2.7	ND<1	2.7	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-23	3/19/04	ND<1	2.0	ND<1	3.4	ND<1	ND<1		ND<1	ND<1	1.0	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	11/30/04	ND<1	ND<1	ND<1	1.4	ND<1	ND<1		ND<1	ND<1	1.3	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	0.60	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-24/WS-3	3/18/04	ND<1	**31** ^{R}	ND<1	1.1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	6/24/04	ND<1	**39** ^{R}	ND<1	1.1	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	12/2/04	ND<1	**72** ^{R,J}	ND<1	1.0	ND<1	ND<1		ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	4/30/07	ND<1	4.4	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
CTDEP Remediation Standards for Ground Water in GB Areas																									
Proposed Residential Volatilization Criteria (1996 Criteria)		340 (1,500)	27 (219)	190 (1)	830 (NE)	1,000 (NE)	1.6 (2)	50,000 (50,000)	130 (215)	8,700 (21,300)	21,000 (50,000)	1,500 (NE)	1,500 (NE)	2,800 (NE)	NE	1,800 (1,800)	12,000 (NE)	360 (NE)	280 (NE)	160 (50,000)	26 (287)	390 (429)	NE	1,600 (NE)	93 (NE)
Proposed Industrial/Commercial Volatilization Criteria (1996 Criteria)		810 (3,820)	67 (540)	920 (6)	11,000 (NE)	13,000 (NE)	52 (2)	50,000 (50,000)	310 (530)	48,000 (50,000)	50,000 (50,000)	21,000 (NE)	20,000 (NE)	6,800 (NE)	NE	23,000 (6,150)	29,000 (NE)	4,800 (NE)	3,900 (NE)	2,200 (50,000)	62 (710)	5,500 (1,449)	NE	22,000 (NE)	1,200 (NE)
Alternative Aquatic Life Criteria		53	220	210	620	560	931	1,700	160	27	51,000	1	1	21	21	47	NE	15	26	1,200	140	16	21	16.5	NE
Surface Water Protection Criteria		88	2,340	96	NE	NE	15,750	NE	710	NE	NE	NE	NE	NE	NE	420,000	NE	NE	NE	48,000	14,100	NE	NE	NE	NE

TABLE 27

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Analytical Results for VOCs in Ground Water Samples

Concentrations of detected constituents in micrograms per liter (ug/l) or parts per billion (ppb)

Sample ID	Date	Tetrachloroethene	Trichloroethene	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	Vinyl Chloride	Acetone	Benzene	Xylenes	Methyl tert-butyl ether
LBGMW-25	11/29/04	ND<50	**840** [R,I,A]	ND<50	71	ND<50	ND<50		ND<50	ND<50	ND<50
	5/3/07	1.2	**1,100 E** [R,I,A]	1.2	67	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
	7/10/07	ND<40	**2,900** [R,I,A,S]	ND<40	**2,700** [R,A]	ND<80	ND<40	ND<200	ND<20	ND<40	ND<40
LBGMW-26	11/29/04	ND<1	26	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1
	5/3/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
LBGMW-27	11/29/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1		ND<1	ND<1	ND<1
	5/2/07	ND<1	1.4	44	ND<1	ND<2	**94** [R,I]	ND<5	ND<0.5	ND<1	ND<1
LBGMW-28	11/29/04	ND<2	23	ND<2	94	2.7	**59** [R,I]		ND<2	ND<2	ND<2
	5/1/07	ND<1	**510 E** [R,I,A]	5.2	**1,000 E** [R,A]	9.1	**130 E** [R,I]	ND<5	ND<0.5	ND<1	ND<1
	7/17/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
LBGMW-29	11/29/04	ND<50	**2,400** [R,I,A,S]	ND<50	ND<50	ND<50	ND<50		ND<50	ND<50	ND<50
	5/1/07	ND<1	**180 E** [R,I]	1.1	4.7	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
LBGMW-30	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
LBGMW-31	5/2/07	ND<1	22	ND<1	32	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
	7/17/07	ND<5	**280** [R,I,A]	ND<5	300	ND<10	ND<5	ND<25	ND<2.5	ND<5	ND<5
LBGMW-32	5/2/07	ND<1	22.0	ND<1	2.5	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
LBGMW-33	5/2/07	ND<1	1.7	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
LBGMW-34 [6]	5/3/07	38	**770 E** [R,I,A]	6.9	**1,700 E** [R,A]	7.2	**250 E** [R,I]	ND<5	ND<0.5	1.3	ND<1
	7/10/07	40	**560** [R,I,A]	ND<40	**2,800** [R,A]	ND<80	**560** [R,I]	ND<200	ND<20	ND<40	ND<40
LBGMW-35	5/2/07	ND<1	1.9	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
LBGMW-36	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
LBGMW-37	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<2	ND<1	ND<5	ND<0.5	ND<1	ND<1
LD CATCH	1/24/03	ND<50	**3,100** [R,I,A,S]	29 J	**2,800** [R,A]	27 J	**120** [R,I]		ND<50	ND<50	
LDCB-1	1/29/03	ND<10	**320** [R,I,A]	ND<10	130	ND<10	ND<10		ND<10	ND<10	ND<10
LDCB-2	1/29/03	20 J	**2,500** [R,I,A,S]	25 J	**1,900** [R,A]	25 J	ND<50		ND<50	ND<50	ND<50
WL-3	3/3/04	ND<1	ND<1	ND<1	ND<1	ND<1	**6.5** [A]		ND<1	ND<1	ND<1
CTDEP Remediation Standards for Ground Water in GB Areas											
Proposed Residential Volatilization Criteria (1996 Criteria)		340 (1,500)	27 (219)	190 (1)	830 (NE)	1,000 (NE)	1.6 (2)	50,000 (50,000)	130 (215)	8,700 (21,300)	21,000 (50,000)
Proposed Industrial/Commercial Volatilization Criteria (1996 Criteria)		810 (3,820)	67 (540)	920 (6)	11,000 (NE)	13,000 (NE)	52 (2)	50,000 (50,000)	310 (530)	48,000 (50,000)	50,000 (50,000)
Alternative Aquatic Life Criteria		53^	220^	210^	620^	560^	931^	1,700^	160^	27^	51,000+
Surface Water Protection Criteria		88	2,340	96	NE	NE	15,750	NE	710	NE	NE

Sample ID	Date	n-Butylbenzene	sec-Butylbenzene	Isopropylbenzene	n-Propylbenzene	Chlorobenzene	Chloroethane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Methylene Chloride	Chloroform	Chloromethane	Naphthalene	4-Isopropyltoluene	Dichlorodifluoromethane
LBGMW-25	11/29/04	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
	5/3/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	7/10/07	ND<40	ND<40	ND<40	ND<40	ND<40	ND<120	ND<40	ND<40	ND<200	ND<40	ND<40	ND<40	ND<40	ND<40
LBGMW-26	11/29/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/3/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-27	11/29/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-28	11/29/04	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<2	ND<10	ND<2	ND<2	ND<2	ND<2	ND<2
	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	7/17/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-29	11/29/04	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-30	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-31	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	7/17/07	ND<5	ND<5	ND<5	ND<5	ND<5	ND<15	ND<5	ND<5	ND<25	ND<5	ND<5	ND<5	ND<5	ND<5
LBGMW-32	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-33	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	1.0	ND<1	ND<1	ND<1	ND<1
LBGMW-34 [6]	5/3/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
	7/10/07	ND<40	ND<40	ND<40	ND<40	ND<40	ND<120	ND<40	ND<40	ND<200	ND<40	ND<40	ND<40	ND<40	ND<40
LBGMW-35	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-36	5/2/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LBGMW-37	5/1/07	ND<1	ND<1	ND<1	ND<1	ND<1	ND<3	ND<1	ND<1	ND<5	ND<1	ND<1	ND<1	ND<1	ND<1
LD CATCH	1/24/03	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<100	ND<50	ND<50
LDCB-1	1/29/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<50	ND<10	ND<10	ND<10	ND<10	ND<10
LDCB-2	1/29/03	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<50	ND<250	ND<50	ND<50	ND<50	ND<50	ND<50
WL-3	3/3/04	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	ND<1	1.8 J	ND<1	ND<1	ND<1	ND<1	ND<1
CTDEP Remediation Standards for Ground Water in GB Areas															
Proposed Residential Volatilization Criteria (1996 Criteria)		1,500 (NE)	1,500 (NE)	2,800 (NE)	NE	1,800 (1,800)	12,000 (NE)	360 (NE)	280 (NE)	160 (50,000)	26 (287)	390 (429)	NE	1,600 (NE)	93 (NE)
Proposed Industrial/Commercial Volatilization Criteria (1996 Criteria)		21,000 (NE)	20,000 (NE)	6,800 (NE)	NE	23,000 (6,150)	29,000 (NE)	4,800 (NE)	3,900 (NE)	2,200 (50,000)	62 (710)	5,500 (1,449)	NE	22,000 (NE)	1,200 (NE)
Alternative Aquatic Life Criteria		1~	1~	21~	21	47^	NE	15^	26~	1,200^	140^	16^	21^	16.5~	NE
Surface Water Protection Criteria		NE	NE	NE	NE	420,000	NE	NE	NE	48,000	14,100	NE	NE	NE	NE

Notes:

CTDEP = Connecticut Department of Environmental Protection
VOCs = Volatile organic compounds
BDL = Below detection limit, as indicated.
ND = Not detected above laboratory reporting limit, as indicated.
* = Analyte not reported in VHB summary table, believed to be not detected.
J = Estimated Result. Result is less than laboratory reporting limit.
E = Estimated Result. Detected concentration exceeds calibration range.
NE = Criteria not established.
(shaded cell) = Not analyzed for this parameter.
BOLD = Exceeds Remediation Standard for specified criteria.
R = Concentration exceeds the proposed Residential Volatilization Criteria
I = Concentration exceeds the proposed Industrial/Commercial Volatilization Criteria
A = Concentrations exceeds the Alternative Aquatic Life Criteria
S = Concentration exceeds the Surface Water Protection Criteria.
^ = Chronic value from Great Lakes Initiative (GLI) Toxicity Data Clearinghouse.
+ = EPA Criterion Continuous Concentration
~ = CTDEP Tier II Chronic Aquatic Life Criteria (currently unpublished)

1 Dibromomethane was also detected at a concentration of 470 J ppb; no GB criteria exist for this compound.
1a Dibromomethane was also detected at a concentration of 100 ppb; no GB criteria exist for this compound.
1b Dibromomethane was also detected at a concentration of 58 J ppb; no GB criteria exist for this compound.
2 Hexachlorobutadiene and 1,2,3-Trichlorobenzene were also detected at concentrations of 3.7 J ppb and 1.4 J ppb, respectively. The concentration of Hexachlorobutadiene exceeds the Alternative Aquatic Life Criteria of 0.3 ppb (CTDEP Tier II Chronic Aquatic Life Criteria). No GB criteria exists for 1,2,3-Trichlorobenzene.
3 Ethylbenzene and Toluene were also detected at concentrations of 0.53 J ppb and 0.87 J ppb, respectively. Both concentrations are below the Alternative Aquatic Life Criteria of 61 ppb (Ethylbenzene) and 62 ppb (Toluene).
3a Ethylbenzene and Toluene were also detected at concentrations of 1.1 ppb and 1.4 ppb, respectively. Both concentrations are below the Alternative Aquatic Life Criteria.
4 Toluene was also detected at a concentration of 2.9 J, which is below the Alternative Aquatic Life Criteria.
4a Toluene was also detected at a concentration of 480 J, which is below the proposed Residential Volatilization Criteria of 7,100 ppb.
4b Toluene was also detected at a concentration of 1.7 ppb, which is below the Alternative Aquatic Life Criteria.
4c Toluene was also detected at a concentration of 1.1 ppb, which is below the Alternative Aquatic Life Criteria.
5 Dibromomethane and 1,1,1-Trichloroethane were also detected at concentrations of 3.0 J ppb and 3.4 J ppb, respectively. No GB criteria exist for Dibromomethane. The concentration of 1,1,1-Trichloroethane is below the Alternative Aquatic Life Criteria.
6 Toluene and 1,1,1-Trichloroethane were also detected at concentrations of 2.0 ppb and 1.2 ppb, respectively. Both concentrations are below the Alternative Aquatic Life Criteria.

TABLE 2ι

UNISYS CORPORATION
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MIDDLETOWN, CONNECTICUT

Summary of Positive Analytical Results for SVOCs and TPH in Ground Water Samples

Well ID	Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)pyrene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Chrysene	Naphthalene	Phenanthrene	Pyrene	1-Methylnaphthalene	2-Methylnaphthalene	TPH
		Concentrations of detected constituents in micrograms per liter (ug/L) or parts per billion (ppb)																		
B-3/MW-1	5/27/97	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	BDL
	9/10/98																			BDL<500
B-7/MW-2	5/27/97	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	650
	9/10/98																			BDL<5,000
B-8/MW-3	5/27/97	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	8,930
	9/10/98																			776,000
B-10/MW-4	5/27/97	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	BDL
	9/10/98	5.0	**4.8** [S]	*	*	*	*	*	*	*	*	8.0	*	*	**99**[A]	**12** [S,A]	*	*	*	BDL<5,000
B-14/MW-5R	5/27/97	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	BDL
	9/10/98																			BDL<500
	3/19/04	ND<100	ND<6.0	ND<100	ND<6.0	ND<6.0	ND<6.0	ND<6.0	ND<6.0	ND<10	ND<100	ND<100	ND<10	ND<80	ND<100	ND<6.0	ND<100	ND<200	ND<100	
B-18/MW-6	5/27/97	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	16,100
	9/10/98																			27,000
	3/18/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	1.1 J	ND<0.50	ND<4.0	ND<5.0	0.30	ND<5.0	**15**[A]	ND<5.0	
	5/2/07	0.32	**2.3** [S]	**1.1**[A]	**4.6** [S,A]	**2.4** [S]	**6.4** [S,A]	4.2	**2.3** [S]	0.98	**1.5**[A]	0.37	**4.8**[A]	2.7	0.18	0.14	2.4		ND<0.10	
MW-7	9/10/98																			BDL<5,000
MW-8	9/10/98																			BDL<5,000
MW-9	9/10/98																			8,000
MW-10	9/10/98																			BDL<500
	3/17/04	ND<5.0	ND<0.30	ND<5.0	**0.36** [S,A]	**0.31** [S]	**0.78** [S]	0.40	**0.31** [S]	ND<0.50	ND<5.0	ND<5.0	0.39 J	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
	5/1/07	0.19	**4.4** [S]	**2.8**[A]	**5.7** [S,A]	**5.2** [S,A]	**9.2** [S,A]	5.9	**3.0** [S,A]	1.3	**7.7**[A]	0.42	**6.2**[A]	**6.3**[A]	0.12	**2.1** [S]	**7.9**[A]		ND<0.10	
MW-11	9/10/98																			BDL<500
	3/19/04	ND<25	**16** [S,A]	**14 J** [A]	**45** [S,A]	**37** [S,A]	**63** [S,A]	**38**[A]	**22** [S,A]	**7.9**[A]	**58**[A]	ND<25	**6.5**[A]	**42**[A]	ND<25	**12** [S,A]	**59**[A]	ND<50	ND<25	
	5/2/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
MW-12	9/10/98																			BDL<500
	3/17/04	ND<5.0	**0.86** [S]	**0.68 J** [A]	**2.5** [S,A]	**1.7** [S]	**3.4** [S,A]	2.6	**1.2** [S,A]	0.48 J	**2.3 J** [A]	ND<5.0	2.2	1.9 J	ND<5.0	0.27 J	2.4 J	ND<10	ND<5.0	
	5/1/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
B-33/MW-13	9/10/98																			BDL<500
	3/18/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	**0.32** [S]	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
	11/30/04	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	
	5/1/07	ND<0.10	0.10	**0.12**[A]	**0.15**[A]	ND<0.10	0.23	0.12	ND<0.10	ND<0.10	ND<0.10	ND<0.10	0.15	ND<0.10	ND<0.10	ND<0.10	0.10		ND<0.10	
B-34/MW-14	9/10/98																			2,500
	5/1/07	ND<0.10	**0.4** [S]	**0.21**[A]	**0.53** [S,A]	**0.31** [S]	**0.74** [S]	0.49	0.27	0.11	0.32	ND<0.10	0.53	0.39	ND<0.10	ND<0.10	0.35		ND<0.10	
B-35/MW-15	9/10/98																			BDL<500
	5/3/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
B-36/MW-16	9/10/98																			BDL<5,000
CTDEP Remediation Standards for Ground Water in GB Areas																				
Surface Water Protection Criteria		NE	0.3	1,100,000	0.3	0.3	0.3	NE	0.3	NE	3,700	140,000	NE	NE	280	0.3	110,000	NE	NE	NE
Alternative Aquatic Life Criteria		15^	13^	0.02^	0.06^	4.7^	2.6^	7.64+	2.6^1	4.7^2	0.8^	19^	4.31+	4.7^	21^	2.3^	4.6^	2.1-	4.7^	NE

TABLE 2L

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Well ID	Date	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)pyrene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Chrysene	Naphthalene	Phenanthrene	Pyrene	1-Methylnaphthalene	2-Methylnaphthalene	TPH
		Concentrations of detected constituents in micrograms per liter (ug/L) or parts per billion (ppb)																		
B-43/MW-17	9/10/98	BDL<5	BDL<0.30	*	*	*	*	*	*	*	*	BDL<5	*	*	BDL<5	BDL<0.07	*	*	*	BDL<5,000
	3/19/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
	4/30/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
B-58/MW-18	9/10/98																			17,000
B-60/MW-19	9/10/98	BDL<5	BDL<0.30	*	*	*	*	*	*	*	*	BDL<5	*	*	BDL<5	BDL<0.07	*	*	*	BDL<5,000
	3/18/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
	4/30/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
B-68/MW-20	9/10/98																			11,000
B-74/MW-21	9/10/98																			BDL<500
	5/2/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
B-75/MW-22	9/10/98	BDL<5	BDL<0.30	*	*	*	*	*	*	*	*	BDL<5	*	*	BDL<5	BDL<0.07	*	*	*	BDL<5,000
	5/2/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
LBGMW-1	2/26/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	
	3/19/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
LBGMW-2	2/26/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	
	3/18/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<5.0	ND<10	
LBGMW-3	2/26/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	
	3/19/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
LBGMW-4	2/26/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	
	3/19/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
LBGMW-5	2/26/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	
	3/19/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
	5/1/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
LBGMW-6	2/25/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	
	3/19/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5 0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
	5/1/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
LBGMW-7	2/26/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	
	3/18/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	0.27 J	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
	4/30/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
LBGMW-8	2/26/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	
	3/18/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0 30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
	4/30/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
LBGMW-9	2/26/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	
	3/18/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	
	5/1/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
LBGMW-15	5/1/07	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11		ND<0.11	
LBGMW-16	5/1/07	ND<0.10	ND<0.10	**0.19^**	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10		ND<0.10	
CTDEP Remediation Standards for Ground Water in GB Areas																				
Surface Water Protection Criteria		NE	0.3	1,100,000	0.3	0.3	0.3	NE	0.3	NE	3,700	140,000	NE	NE	280	0.3	110,000	NE	NE	NE
Alternative Aquatic Life Criteria		15^	13^	0.02^	0.06^	4.7^	2.6^	7.64+	2.6^1	4.7^2	0.8^	19^	4.31+	4.7^	21^	2.3^	4.6^	2.1~	4.7^	NE

TABLE 2.

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Analytical Results for SVOCs and TPH in Ground Water Samples

Well ID	Date	Concentrations of detected constituents in micrograms per liter (ug/L) or parts per billion (ppb)																		
		Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)pyrene	Benzo(a)anthracene	Benzo(b)fluoranthene	Benzo(g,h,i)perylene	Benzo(k)fluoranthene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd)pyrene	Chrysene	Naphthalene	Phenanthrene	Pyrene	1-Methylnaphthalene	2-Methylnaphthalene	TPH
LBGMW-19	5/1/07	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	ND<0.11	—	ND<0.11	—
LBGMW-20	3/19/04	1.0 J	ND<0.30	ND<5.0	ND<0.30	0.26 J	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	1.9 J	ND<0.50	ND<4.0	**59 E^{A}**	**2.1^{S}**	ND<5.0	**75 E^{A}**	**68.0 E^{A}**	—
	11/30/04	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	ND<0.20	16	ND<0.20	ND<0.20	**15^{A}**	**8.6^{A}**	—
	5/1/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	—	ND<0.10	—
LBGMW-21	3/18/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	—
	4/30/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	—	ND<0.10	—
LBGMW-22	3/19/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	—
	5/1/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	—	ND<0.10	—
LBGMW-23	3/19/04	ND<5.0	ND<0.30	ND<5.0	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.30	ND<0.50	ND<5.0	ND<5.0	ND<0.50	ND<4.0	ND<5.0	ND<0.30	ND<5.0	ND<10	ND<5.0	—
	5/1/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	—	ND<0.10	—
LBGMW-24/WS-3	4/30/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	—	ND<0.10	—
LBGMW-27	5/2/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	—	ND<0.10	—
LBGMW-28	5/1/07	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	ND<0.10	—	ND<0.10	—
LD CATCH BASIN	1/25/03	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<0.10	0.43	ND<0.10	ND<0.10	0.14	ND<0.10	ND<0.10	—	ND<0.10	—
LDCB-1	1/29/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	ND<25	—
LDCB-2	1/29/03	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	—
WL-3	3/3/04	ND<25	ND<1.5	ND<25	ND<1.5	ND<1.5	ND<1.5	1.0 J	ND<1.5	ND<2.5	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	ND<10	—
											ND<25	8.6 J	ND<2.5	ND<20	ND<25	**7.2^{S,A}**	ND<25	**140^{A}**	ND<25	—
CTDEP Remediation Standards for Ground Water in GB Areas																				
Surface Water Protection Criteria		NE	0.3	1,100,000	0.3	0.3	0.3	NE	0.3	NE	3,700	140,000	NE	NE	280	0.3	110,000	NE	NE	NE
Alternative Aquatic Life Criteria		15$^{\wedge}$	13$^{\wedge}$	0.02$^{\wedge}$	0.06$^{\wedge}$	4.7$^{\wedge}$	2.6$^{\wedge}$	7.64^{+}	2.6$^{\wedge 1}$	4.7$^{\wedge 2}$	0.8$^{\wedge}$	19$^{\wedge}$	4.31^{+}	4.7$^{\wedge}$	21$^{\wedge}$	2.3$^{\wedge}$	4.6$^{\wedge}$	2.1$^{\sim}$	4.7$^{\wedge}$	NE

Notes:

CTDEP = Connecticut Department of Environmental Protection
SVOCs = Semi-volatile organic compounds
TPH = Total Petroleum Hydrocarbons
BDL = Below detection limit, as indicated.
ND = Not detected above laboratory reporting limit, as indicated.
* = Analyte not reported in VHB summary table, believed to be not detected.
J = Estimated Result. Result is less than laboratory reporting limit.
E = Estimated Result. Detected concentration exceeds calibration range.
NE = Criteria not established.

(shaded) = Not analyzed for this parameter.
BOLD = Exceeds Remediation Standard for specified criteria.
S = Concentration exceeds the Surface Water Protection Criteria.
A = Concentration exceeds the Alternative Aquatic Criteria
^ = Chronic value from Great Lakes Initiative (GLI) Toxicity Data Clearinghouse.
+ = U.S. EPA Region 5, RCRA, Ecological Screening Level (ESL)
~ = U.S. Department of Energy Tier II Chronic Value
1 = Criteria not established for the analyte, criteria for benzo(b)fluoranthene is used.
2 = Criteria not established for the analyte, criteria for benzo(a) anthraracene is used.

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Analytical Results for Metals in Ground Water Samples

Well ID	Date	Concentrations of detected constituents in micrograms per liter (ug/L) or parts per billion (ppb)									
		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Zinc
B-3/MW-1	5/27/97	*	*	**3^{C}**	*	BDL	*	*	14	*	**$213^{S,C}$**
	9/10/98		*	BDL<5	*			*	BDL<50	*	**$740^{S,C}$**
B-7/MW-2	5/27/97	*	*	BDL	*	BDL	*	*	**59^{C}**	*	20
	9/10/98		*		*			*	**70^{C}**	*	BDL<50
B-8/MW-3	5/27/97	*	*	BDL	*	1.5	*	*	9	*	**118^{C}**
	9/10/98		*		*	BDL<10		*	BDL<50	*	**$910^{S,C}$**
B-10/MW-4	5/27/97	*	*	BDL	*	**$82.4^{S,A}$**	*	*	**284^{C}**	*	**$298^{S,C}$**
	9/10/98	BDL<4	*		*	**$70^{S,A}$**	BDL<5	*	**870^{C}**	*	**$310^{S,C}$**
B-14/MW-5R	5/27/97	*	*	BDL	*	2.8	*	*	12	*	22
	9/10/98		*	BDL<5	*	BDL<10		*		*	**$250^{S,C}$**
	3/19/04	**15^{S}**	**310^{A}**	1.2 J	2.6 J		**$2.5\ J^{C}$**	ND<0.2		**$1.0\ J^{A}$**	
	5/1/07	ND<25		ND<10	ND<10	ND<10	ND<10	ND<0.2	13	ND<5	ND<50
B-18/MW-6	5/27/97	*	*	BDL	*	1.6	*	*	BDL	*	14
	9/10/98		*		*	**20^{C}**		*		*	BDL<50
MW-7	9/10/98		*	BDL<5	*	**20^{C}**		*		*	**$150^{S,C}$**
MW-8	9/10/98		*	BDL<5	*	BDL<10		*		*	BDL<50
MW-9	9/10/98		*	BDL<5	*	BDL<10		*		*	BDL<50
MW-10	9/10/98		*	BDL<5	*	BDL<10		*		*	BDL<50
	3/17/04	ND<10	25 J	ND<5.0	ND<10		ND<3.0	ND<0.2		ND<10	
	5/1/07	ND<25		ND<10	ND<10	ND<10	ND<10	ND<0.2	ND<10	ND<5	ND<50
MW-11	9/10/98		*	BDL<5	*	**40^{C}**		*		*	**$340^{S,C}$**
	3/19/04	ND<10	35 J	ND<5.0	ND<10		ND<3.0	ND<0.2		ND<10	
MW-12	9/10/98		*	BDL<5	*	BDL<10		*		*	60
	3/17/04	ND<10	15 J	0.028 J	ND<10		ND<3.0	0.061 J		ND<10	
B-33/MW-13	9/10/98		*		*	BDL<10		*		*	**80^{C}**
B-34/MW-14	5/1/07	ND<25		ND<10	ND<10	**20^{C}**	ND<10	ND<0.2	11	ND<5.0	**$350^{S,C}$**
B-36/MW-16	9/10/98	BDL<4	*		*			*		*	
CTDEP Remediation Standards for Ground Water in GB Areas											
Surface Water Protection Criteria		4	NE	6	NE	48	13	0.4	880	12	123
Chronic Aquatic Life Criteria		150	NE	1.35	11	4.8	1.2	0.77	28.9	NE	65
Alternative Aquatic Life Criteria			$220^{\wedge}$							$0.06^{\wedge}$	

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UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Analytical Results for Metals in Ground Water Samples

Well ID	Date	Concentrations of detected constituents in micrograms per liter (ug/L) or parts per billion (ppb)									
		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Zinc
B-43/MW-17	9/10/98	BDL<4	*		*			*		*	
	3/19/04	ND<10	35 J	ND<5.0	ND<10		ND<3.0	0.033 J		ND<10	
	12/2/04	ND<10		ND<5.0		**63 U^{S,C}/54 F^{S,C}**	ND<3.0		**36 J^{C}**		41
	4/30/07	ND<25		ND<10	ND<10	**30^{C}**	ND<10	ND<0.2	**86^{C}**	ND<5.0	**120^{C}**
B-58/MW-18	9/10/98		*		*	BDL<10		*		*	**150 ^{S,C}**
B-60/MW-19	9/10/98	BDL<4	*		*	BDL<20	BDL<5	*	**3,080 ^{S,C}**	*	**1,820 ^{S,C}**
	2/25/03						ND<3.0				
	3/18/04	2.7 J	51 J	**18 ^{S,C}**	ND<10		ND<3.0	ND<0.2		ND<10	
	12/2/2004 U	**5.0 J^{S}**		**17 ^{S,C}**		**1,200 ^{S,C}**	3.3		**6,900 ^{S,C}**		**4,100 ^{S,C}**
	12/2/2004 F	ND<10		**15 ^{S,C}**		**900 ^{S,C}**			**6,800 ^{S,C}**		**3,900 ^{S,C}**
	4/30/07	ND<25		ND<10	ND<10	**980 ^{S,C}**	ND<10	ND<0.2	**7,000 ^{S,C}**	ND<5.0	**4,600 ^{S,C}**
B-68/MW-20	9/10/98		*	BDL<5	*			*	BDL<50	*	**90^{C}**
B-74/MW-21	9/10/98		*	BDL<5	*			*	BDL<50	*	**320 ^{S,C}**
B-75/MW-22	9/10/98		*	BDL<5	*			*	BDL<50	*	BDL<50
LBGMW-1	2/26/03	ND<10	31 J	ND<5.0	ND<10		ND<3.0	ND<0.2		ND<10	
LBGMW-2	2/26/03	ND<10	ND<200	ND<5.0	ND<10		ND<3.0	ND<0.2		ND<10	
LBGMW-3	2/26/03	ND<10	60 J	0.29 J	ND<10		ND<3.0	ND<0.2		ND<10	
LBGMW-4	2/26/03	ND<10	34 J	ND<5.0	2.6 J		ND<3.0	ND<0.2		ND<10	
LBGMW-5	2/26/03	ND<10	29 J	0.42 J	ND<10		ND<3.0	ND<0.2		ND<10	
	5/1/07	ND<25		ND<10	ND<10	ND<10	ND<10	ND<0.2	ND<10	ND<5	ND<50
LBGMW-6	2/25/03	ND<10	60 J	ND<5.0	1.5 J		ND<3.0	ND<0.2		ND<10	
	5/1/07	ND<25		ND<10	ND<10	ND<10	ND<10	ND<0.2	ND<10	ND<5	ND<50
CTDEP Remediation Standards for Ground Water in GB Areas											
Surface Water Protection Criteria		4	NE	6	NE	48	13	0.4	880	12	123
Chronic Aquatic Life Criteria		150	NE	1.35	11	4.8	1.2	0.77	28.9	NE	65
Alternative Aquatic Life Criteria			220$^{\wedge}$							0.06$^{\wedge}$	

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UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Positive Analytical Results for Metals in Ground Water Samples

Well ID	Date	Concentrations of detected constituents in micrograms per liter (ug/L) or parts per billion (ppb)									
		Arsenic	Barium	Cadmium	Chromium	Copper	Lead	Mercury	Nickel	Silver	Zinc
LBGMW-7	2/26/03	ND<10	12 J	0.4 J	ND<10		ND<3.0	ND<0.2		ND<10	
	4/30/07	ND<25		ND<10	ND<10	ND<10	ND<10	ND<0.2	ND<10	ND<5	**150** S,C
LBGMW-8	2/26/03	ND<10	24 J	0.29 J	ND<10		ND<3.0	ND<0.2		ND<10	
	11/30/04	ND<10		ND<5.0		3.7 J	ND<3.0		26 J		**69** C
	4/30/07	ND<25		ND<10	ND<10	ND<10	ND<10	ND<0.2	**30** C	ND<5	ND<50
LBGMW-9	2/26/03	ND<10	11 J	0.28 J	ND<10		ND<3.0	ND<0.2		ND<10	
	5/1/07	ND<25		ND<10	ND<10	ND<10	ND<10	ND<0.2	22	ND<5	ND<50
LBGMW-20	3/19/04	ND<10	5.8 J	0.38 J	ND<10		ND<3.0	0.072 J		ND<10	
	5/1/07	ND<25		ND<10	ND<10	ND<10	ND<10	ND<0.2	**71** C	ND<5	ND<50
LBGMW-21	3/18/04	ND<10	68 J	0.81 J	ND<10		ND<3.0	ND<0.2		ND<10	
	12/2/2004 U	ND<10		**1.5 J** C		**10 J** C	ND<3.0		**3,200** S,C		**1,300** S,C
	12/2/2004 F								**3,100** S,C		**1,200** S,C
	4/30/07	ND<25		ND<10	ND<10	**12** C	ND<10	ND<0.2	**2,100** S,C	ND<5.0	**690** S,C
LBGMW-22	3/19/04	ND<10	46 J	ND<5.0	ND<10		ND<3.0	ND<0.2		ND<10	
	5/1/07	ND<25		ND<10	ND<10	**84** S,C	ND<10	ND<0.2	**43** C	ND<5.0	**150** S,C
LBGMW-23	3/19/04	ND<10	91 J	ND<5.0	2.3 J		ND<3.0	ND<0.2		ND<10	
	5/1/07	ND<25		ND<10	ND<10	ND<10	ND<10	ND<0.2	**130** C	ND<5	**210** S,C
LBGMW-24/WS-3	12/2/04	ND<10		ND<5.0		2.8 J	ND<3.0		ND<40		ND<20
	4/30/07	ND<25		ND<10	ND<10	ND<10	ND<10	ND<0.2	ND<10	ND<5	ND<50
LD CATCH	1/24/03	ND<10	ND<200	ND<5.0	ND<10		ND<3.0	ND<0.2		ND<10	
LDCB-1	1/29/03	ND<10	ND<200	ND<5.0	ND<10		ND<3.0	ND<0.2		ND<10	
LDCB-2	1/29/03	ND<10	ND<200	ND<5.0	ND<10		ND<3.0	ND<0.2		ND<10	
CTDEP Remediation Standards for Ground Water in GB Areas											
Surface Water Protection Criteria		4	NE	6	NE	48	13	0.4	880	12	123
Chronic Aquatic Life Criteria		150	NE	1.35	11	4.8	1.2	0.77	28.9	NE	65
Alternative Aquatic Life Criteria			220^							0.06^	

Notes:

CTDEP = Connecticut Department of Environmental Protection
BDL = Below detection limit, as indicated.
ND = Not detected above laboratory reporting limit, as indicated.
* = Analyte not reported in VHB summary table, believed to be not detected.
J = Estimated Result. Result is less than laboratory reporting limit.
E = Estimated Result. Detected concentration exceeds calibration range.
NE = Criteria not established.
^ = Chronic value from Great Lakes Initiative (GLI) Toxicity Data Clearinghouse.

(shaded) = Not analyzed for this parameter.
BOLD = Exceeds Remediation Standard for specified criteria.
S = Concentration exceeds the Surface Water Protection Criteria.
C = Concentration exceeds the Chronic Aquatic Life Criteria.
A = Concentration exceeds the Alternative Aquatic Life Criteria.
U = Sample was not filtered prior to analysis
F = Sample was filtered prior to analysis

TABLE 31

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Investigation Results and Potential Release History for Areas of Environmental Investigation (AEIs)

AEI No.	Description	Historical Information	Release Status	Constituents Exceeding CTDEP Remediation Standards											Association between release and Former Noiseless/Remington Rand Operations
				Solids (Soil/Fill)			Ground Water[1]						Soil Vapor		
				RDEC	I/C DEC	GB PMC	RGWVC	I/C GWVC	SWPC	CALC	AALC	RSVVC	I/C SVVC	
1	Right-of-Way (ROW) Disposal Area (also see AEI No. 18, below)	Historical filling that began prior to Boiler Building construction (pre-1901); activity evident in aerial photograph up to 1970s; probable recent surface dumping	Confirmed	TPH, As, Cu, Pb	TPH, As, Pb	TPH, Pb	TCE, vinyl chloride (possible upgradient source)	None	Zn, PAH	Zn, Cu, Ni	PAH	Not tested	Not tested	A portion of fill likely predates Noiseless/Remington Rand operations. Some filling likely during Noiseless/Remington Rand occupancy. Some filling likely after 1971.
2	Suspect UST-1	Gasoline underground storage tank (UST) post-1907 to Pre-1913	None identified	None	None	None	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	No release identified
3	Suspect UST-2 And Switching Station	"Crude Oil" UST noted 1913 and 1924 Sanborn maps, but not encountered during excavation; observations during excavation noted 'gasoline' odors not consistent with aged 'crude oil'; date and source of release not known	Confirmed	TPH	TPH	TPH (potentially below seasonal-high water table)	None	None	None	None	None	Not tested	Not tested	UST was present and possibly removed during Noiseless/Remington Rand occupancy.
4	Suspect UST-3	No UST identified; present AST cradles had been used for propane tanks	None identified	None attributed to suspected UST (see AEI No. 11)	None attributed to suspected UST (see AEI No. 11)	None attributed to suspected UST (see AEI No. 11)	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	No release identified
5	UST-4	Gasoline UST on 1950 and 1979 historical maps, use history unknown and may have been used after 1971; date of release in this area is not known	Confirmed	TPH	TPH	Unknown (no samples collected above water table)	None related to petroleum release	None related to petroleum release	None related to petroleum release	None related to petroleum release	Anthracene	Not tested	Not tested	UST was present during Noiseless/Remington Rand occupancy.
6	Transformers	Current and former transformer locations	Confirmed	PCBs at Tran-2 and Tran-4	PCB	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	Transformers reportedly owned by Northeast Utilities
7	AST-1	Fuel oil storage, unknown dates but believed to be after 1979.	None identified	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	Not tested	No release identified

TABLE 31
(continued)

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Investigation Results and Potential Release History for Areas of Environmental Investigation (AEI)

AEI No.	Description	Historical Information	Release Status	Constituents Exceeding CTDEP Remediation Standards – Solids (Soil/Fill): RDEC	Solids (Soil/Fill): I/C DEC	Solids (Soil/Fill): GB PMC	Ground Water[1]: RGWVC	Ground Water[1]: I/C GWVC	Ground Water[1]: SWPC	Ground Water[1]: CALC	Ground Water[1]: AALC	Soil Vapor: RSVVC	Soil Vapor: I/C SVVC	Association between release and Former Noiseless/Remington Rand Operations
8	AST-2	First appears on 1959 aerial photograph (possibly present on 1941 photograph); contained No. 4 oil and sludge as recently as 1997; surface and subsurface (piping) releases are possible	Suspected	TPH at downgradient boring (surface release area identified beneath AST not sampled)	TPH at downgradient boring (surface release area identified beneath AST not sampled)	Unknown (no samples collected above water table)	None related to petroleum release	None related to petroleum release	None	None	None	Not tested	Not tested	AST present during Noiseless/Remington Rand occupancy.
9	Surficial Stained Area 1	Surface release from storage, maintenance or use of equipment or surface disposal of petroleum liquids; release appears to result from recent activities	Confirmed	TPH, As, benzo(a)fluor.	As, benzo(a)fluor.	Benzo(a)fluor.	CVOCs, possibly from upgradient source	CVOCs, possibly from upgradient source	Zn	Zn	None	Not tested	Not tested	No definitive evidence linking release to Noiseless/Remington Rand operations. Site reconnaissance has documented improper storage and handing of petroleum-containing equipment in this area.
10	Surficial Stained Area 2	Surface release from storage, maintenance or use of equipment or surface disposal of petroleum liquids, as well as cinder/ash fill	Suspected	PAHs, As (possibly from ash and cinders)	PAHs, As (possibly from ash and cinders)	PAHs (possibly from ash and cinders)	None	None	None	None	None	Not tested	Not tested	No definitive evidence linking release to Noiseless/Remington Rand operations. Site reconnaissance has documented improper storage and handing of petroleum-containing equipment in this area.
11	Railroad Disposal Area – Cinder fill	Historical filling/surface disposal likely began prior to 1901 at northeastern end in section of former railroad spur	Confirmed	As, Pb, TPH, PAHs	As, TPH, PAH	TPH, PAH	None	None	Zn, Cu	Zn, Cu, Ni	None	Not tested	Not tested	Fill likely predates Noiseless/Remington Rand operations.
11	Railroad Disposal Area – Industrial fill	Historical filling/surface disposal; adjacent to railroad spur, so may have predated the spur; appears to be well established by 1934; slag and 'connecting rods' may be associated with Eisenhuth; typewriter parts also observed in one area	Confirmed	As, Cu, Pb, Ni, Th, TPH, PAH	As, Pb, Ni, TPH, PAH	Pb, Ni, TPH, PAH	None	none	Cu, Ni, Zn, PAHs	Cu, Ni, Zn,	PAHs	Not tested	Not tested	A large portion of fill contains miscellaneous manufacturing debris. A smaller portion of fill contains identifiable typewriter parts associated with Noiseless/Remington Rand operations.
12	Suspect UST-5	Unknown source, petroleum type not identified, no UST identified	Confirmed	TPH, PAHs	TPH, PAHs	TPH, PAHs	CVOCs (upgradient source)	CVOCs (upgradient source)	PAHs	None	PAHs	Not tested	Not tested	Area of impact is proximal to Building No. 2, which Noiseless/Remington Rand used for hardening operations. Hardening may have employed the use of oils to quench the heated metal.

TABLE 31
(continued)

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Investigation Results and Potential Release History for Areas of Environmental Investigation (AEI)

AEI No.	Description	Historical Information	Release Status	Constituents Exceeding CTDEP Remediation Standards										Association between release and Former Noiseless/Remington Rand Operations
				Solids (Soil/Fill)			Ground Water[1]					Soil Vapor		
				RDEC	I/C DEC	GB PMC	RGWVC	I/C GWVC	SWPC	CALC	AALC	RSVVC	I/C SVVC	
13	Solvent Release Area	Discharges to interior catch basins in Building No. 12; building constructed after 1924; unknown date of release	Suspected	None	None	None	CVOCs	CVOCs	None	None	CVOCs	None	None	No definitive evidence linking release to Noiseless/Remington Rand operations.
14	UST-6	Tank confirmed to be present; not shown on historical maps, so date and use are unknown; contained waste oil and water	Confirmed	TPH	TPH	None	None	None	None	None	None	Not tested	Not tested	No definitive association of release with Noiseless/Remington Rand operations. UST is not present on historical documents. Site reconnaissance has documented the servicing of motorized vehicles in Building No. 8, located adjacent to the UST.
15	UST-7	Tank was identified as abandoned in place, not shown on historical maps to date; age and use are unknown	Not confirmed	TPH	None	Lead (likely associated with AEI No. 11)	None	None	None	None	None	Not tested	Not tested	No definitive evidence linking release to Noiseless/Remington Rand operations. UST is not present on historical documents and appears to have been abandoned by others.
16	Loading Dock/ Building No. 1A	Surface spill along western property line adjacent to facility entrance for Building No. 1A; unknown date of release	Confirmed	TCE	TCE	TCE	CVOCs	CVOCs	CVOCs	None	CVOCs	TCE	TCE	No definitive evidence linking release to Noiseless/Remington Rand operations.
17	Boiler Room	Fuel oil used to fire boilers within the building; no known release.	None identified	Not tested	Not tested	Not tested	Not tested	Not tested	None	Not tested	Not tested	Not tested	Not tested	No suspected release.
18	Potential Former Septic Field	Presence of septic system is suspected based upon historical map c.1940s/1950s; suspect area is located within ROW Disposal Area	None identified	TPH, Pb (potentially associated with AEI No. 1)	TPH, Pb (potentially associated with AEI No. 1)	TPH (potentially associated with AEI No. 1)	None	None	Zn	Zn, Ni	None	Not tested	Not tested	No suspected release (impacts associated with ROW Disposal Area).

TABLE 31
(continued)

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Investigation Results and Potential Release History for Areas of Environmental Investigation (AEI)

AEI No.	Description	Historical Information	Release Status	Constituents Exceeding CTDEP Remediation Standards										Association between release and Former Noiseless/Remington Rand Operations
				Solids (Soil/Fill)			Ground Water[1]					Soil Vapor		
				RDEC	I/C DEC	GB PMC	RGWVC	I/C GWVC	SWPC	CALC	AALC	RSVVC	I/C SVVC	
19	Former Waste Storage Building	Building constructed between 1924 and 1950; historically a propane gas house, recently observed usage for storage of chemicals and wastes (nearby surface release, unrelated to building use , but suspect to be recent)	Confirmed (nearby surface release unrelated to building)	As (potentially associated with AEI No. 11)	As (potentially associated with AEI No. 11)	TCE	None	None	None	None	None	Not tested	Not tested	No definitive evidence linking release to Noiseless/Remington Rand operations.
20	Floor Drains	Sub-surface drainage systems present; unknown uses and potential dates of releases	Confirmed (Building Nos. 2, 4)	TPH (Building Nos. 2 ,4)	TPH (Building Nos. 2, 4)	None	None	None	Zn (Building No. 2) Phenanthrene (Building No. 4)	Zn (Building No. 2)	PAHs (Building No. 4)	Not tested	Not tested	Historical documents indicate that Noiseless/Remington Rand conducted manufacturing operations in these areas.
21	Building No. 5	Sub-surface drainage system present; unknown uses and potential dates of releases.	Possible	None	None	TCE (samples potentially collected below water table	TCE	TCE	None	None	None	TCE	None	No definitive association of release with Noiseless/Remington Rand operations.

Notes:

1	Most-recent ground water quality data are used for determining compliance with criteria
CTDEP	Connecticut Department of Environmental Protection
RDEC	Residential Direct Exposure Criteria
I/C DEC	Industrial/Commercial Direct Exposure Criteria
GB PMC	GB Pollutant Mobility Criteria
RGWVC	Residential Ground Water Volatilization Criteria
I/C GWVC	Industrial/Commercial Ground Water Volatilization Criteria
SWPC	Surface Water Protection Criteria
RSVVC	Residential Soil Vapor Volatilization Criteria
I/C SVVC	Industrial/Commercial Soil Vapor Volatilization Criteria
CALC	Chronic Aquatic Life Criteria
AALC	Alternative Aquatic Life Criteria
TPH	Total petroleum hydrocarbons and/or extractable total petroleum hydrocarbons
PAHs	Polynuclear aromatic hydrocarbons
TCE	Trichloroethylene
CVOCs	Chlorinated volatile organic compounds
As	Arsenic
Cu	Copper
Ni	Nickel
Zn	Zinc
Pb	Lead

FIGURES

APPENDIX XII

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

FIII - Soil Remedial Cost Estimate Alternative 1 - Engineered Control and Soil Cover

Engineered controls for PMC, Institutional controls for DEC

Permitting process
Wetland permitting (including wetlands flagging)
Design of engineered control includes communication with the CTDEP for Commissioner Approval of Cap
Pre-remediation investigation to delineate impacted soil exceeding PMC
Erosion and sedimentation controls consist of anti-tracking pad and silt fencing
Disposal areas will be cleared and grubbed
Excavate and relocate soil exceeding PMC in Right-of-way (ROW) Disposal Area to the industrial fill portion of the Railroad Spur Disposal Area for capping
Soil Remedial Action for AEI No. 19 (Former Hazardous Waste Storage Building) to be addressed during the RA for the industrial fill portion of AEI No. 11
Screen soil to remove bulky waste
Cost for disposal of bulky waste as non-hazardous waste based on Veolia Environmental Services quote dated July 9, 2007
Fuel surcharge of 26% added to disposal costs per Veolia Environmental Services quote dated July 9, 2007
Quotes from local waste transporters and disposal facilities will be obtained during Contractor Procurement phase
Excavate soil from adjacent property and place in ROW Disposal Area
Regrade remaining soil to fill excavations in ROW Disposal Area
Place 4 feet of clean fill over soil exceeding DEC (inaccessible) in ROW Disposal Area
Volume of backfill assumes 30% compaction of soil
Engineered control (cap) consisting of geosynthetic clay liner (GCL) with geotextile and drainage grid
Engineered control (cap) monitoring to be completed over 5 years
Engineered control (cap) maintenance to be completed over 30 years
Construct 4 ground-water monitoring wells down-gradient of ROW Disposal Area and 2 wells down-gradient of the industrial fill portion of the Railroad Disposal Area
Prepare Final Remedial Action Report
Prepare and record ELUR (includes cost for surveyor and attorney in ELUR process) assumes City or the property owner at the time of the remediation will accept ELUR.
Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Remedial work will take a total of 22 days
Contingency 20%

Variables

	ROW Disposal Area	Industrial Fill Portion Railroad Disposal Area	
Surface Area (ft2)	50,000	12,200	
Surface Area of soil exceedance PMC (ft2)	14,000	12,200	
Volume of soil exceeding PMC (yd3)	2,852	2,375	
Tons of soil exceeding PMC (tons)	4,278	3,563	conversion of 1.5 tons/cubic yard
Perimeter of PMC excavation (ft)	600	-	
Cubic yards of soil on adjacent property (yd3)	1,907	-	

Permitting	LBG - Permitting										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	6	hours	=	$ 420.00		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00		
									Sub-total	$ 6,120.00	
	Wetland Scientist								$ 2,500.00		
									Sub-total	$ 2,675.00	
										Permitting Subtotal	$ 8,795.00
Cap Design	LBG - Cap Design										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Principal (PE)	$ 140.00	per hour	x	12	hours	=	$ 1,680.00		
		Associate	$ 130.00	per hour	x	30	hours	=	$ 3,900.00		
		Senior Hydro	$ 90.00	per hour	x	10	hours	=	$ 900.00		
		Hydro II	$ 80.00	per hour	x	12	hours	=	$ 960.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	2	hours	=	$ 150.00		
		Clerical	$ 60.00	per hour	x	2	hours	=	$ 120.00		
									Sub-total	$ 9,292.20	
										Cap Design Subtotal	$ 9,292.20

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

FIII - Soil Remedial Cost Estimate Alternative 1 - Engineered Control and Soil Cover

RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Subtotal	$ 10,057.20
Contractor Procurement	LBG - Contractor Procurement										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 4,855.20	
										Contractor Procurement Subtotal	$ 4,855.20
Pre-Remediation Investigation	Drilling Contractor		$ 1,750.00	per day	x	6	days	=	$ 10,500.00		
									Sub-total	$ 11,235.00	
	Remedial Contractor - Test pits		$ 1,200.00	per day	x	2	days	=	$ 2,400.00		
									Sub-total	$ 2,568.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	20	hours	=	$ 2,800.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	60	hours	=	$ 5,400.00		
		Hydro II	$ 80.00	per hour	x	140	hours	=	$ 11,200.00		
		Hydro I	$ 70.00	per hour	x	60	hours	=	$ 4,200.00		
		Drafting	$ 75.00	per hour	x	10	hours	=	$ 750.00		
		Clerical	$ 60.00	per hour	x	20	hours	=	$ 1,200.00		
									Sub-total	$ 26,061.00	
	Laboratory - Investigation										
		ETPH	$ 65.00	per sample	x	100	samples	=	$ 6,500.00		
		VOCs	$ 83.00	per sample	x	20	samples	=	$ 1,660.00		
		Metals	$ 65.00	per sample	x	120	samples	=	$ 7,800.00		
		SPLP lead	$ 45.00	per sample	x	70	samples	=	$ 3,150.00		
		PAHs	$ 95.00	per sample	x	50	samples	=	$ 4,750.00		
									Sub-total	$ 23,860.00	
										Pre-Remediation Investigation Subtotal	$ 63,724.00

Appendix X[illegible]E 1

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 1 - Engineered Control and Soil Cover

Remedial Action	Remedial Contractor										
		E&S Controls							$ 15,000.00		
		Clearing and grubbing	$ 2,000.00	/acre	x	1.43	acre	=	$ 2,855.83		
		Excavation, screen & relocate PMC soil to Railroad Disposal Area	$ 55.00	/yd3	x	2,852	yd3	=	$ 156,851.85		
		Excavate and screen soil from adjacent property and grade	$ 45.00	/yd3	x	1,907	yd3	=	$ 85,833.33		
		Backfill in ROW for "inaccessible soil"	$ 15.00	/yd3	x	9,630	yd3	=	$ 144,444.44		
		Grade backfill	$ 10.00	/yd3	x	9,630	yd3	=	$ 96,296.30		
		Compact backfill	$ 5.00	/yd3	x	3,611	yd3	=	$ 18,055.56		
		Construct cap in Railroad Disposal Area	$ 4.00	ft2	x	28,640	ft2	=	$ 114,560.00		
		Restoration (seeding)							$ 15,000.00		
		Disposal of "bulky" waste	$ 182.65	ton	x	714	tons	=	$ 130,391.81		
									Sub-total	$ 779,289.12	
	Laboratory - Remedial Action sampling										
		Waste profile sampling	$ 550.00	per sample	x	3	samples	=	$ 1,570.56		
		Clean soil profiling	$ 550.00	per sample	x	39	samples	=	$ 21,185.19		
									Sub-total	$ 22,755.74	
	LBG - Remedial action oversight										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	10	hours	=	$ 1,300.00		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	209	hours	=	$ 16,693.33		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	12	days	=	$ 1,200.00		
		Expenses	$ 30.00	per day	x	22	days	=	$ 660.00		
									Sub-total	$ 24,202.60	
										Remedial Action Sub-total	$ 826,247.46
ELUR Documents	LBG - Prepare ELUR Documents										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	20	hours	=	$ 2,600.00		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	10	hours	=	$ 800.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	2	hours	=	$ 150.00		
		Clerical	$ 60.00	per hour	x	3	hours	=	$ 180.00		
									Sub-total	$ 6,211.80	
	Surveyor (ELUR)								$ 6,000.00		
									Sub-total	$ 6,420.00	
	Attorney (ELUR)								$ 7,500.00		
									Sub-total	$ 7,500.00	
										ELUR Sub-total	$ 20,131.80
Well construction	Driller (construct down-gradient monitoring wells for remediation and cap monitoring)					6	wells		$ 7,222.50		
									Sub-total	$ 7,222.50	
	LBG - Drilling oversight, well development, survey										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	8	hours	=	$ 720.00		
		Hydro II	$ 80.00	per hour	x	12	hours	=	$ 960.00		
		Hydro I	$ 70.00	per hour	x	48	hours	=	$ 3,360.00		
		Equip & exp	$ 200.00	per day	x	3	days	=	$ 600.00		
									Sub-total	$ 6,056.40	
										Well Construction Sub-total	$ 13,278.90

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 1 - Engineered Control and Soil Cover

GW Monitoring and reporting	Laboratory - GW monitoring										
		ETPH	$ 65.00	per sample	x	72	samples	=	$ 4,680.00		
		VOCs	$ 83.00	per sample	x	72	samples	=	$ 5,976.00		
		Metals	$ 65.00	per sample	x	72	samples	=	$ 4,680.00		
		PAHs	$ 95.00	per sample	x	72	samples	=	$ 6,840.00		
									Sub-total	$ 22,176.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
		Equip & exp	$ 200.00	per event	x	12	events		$ 2,400.00		
									Sub-total	$ 13,291.20	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
		Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
									Sub-total	$ 11,566.80	
										GW Monitoring & Reporting Sub-total	$ 47,034.00
Long-term Cap Monitoring	LBG - Cap monitoring										
		Principal	$ 140.00	per hour	x	20	hours	=	$ 2,800.00		
		Associate	$ 130.00	per hour	x	40	hours	=	$ 5,200.00		
		Senior Hydro	$ 90.00	per hour	x	0	hours	=	$ -		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
		Equip & exp	$ 200.00	per event	x	20	events		$ 4,000.00		
									Sub-total	$ 20,928.00	
	Laboratory - GW monitoring										
		ETPH	$ 65.00	per sample	x	40	samples	=	$ 2,600.00		
		VOCs	$ 83.00	per sample	x	40	samples	=	$ 3,320.00		
		Metals	$ 65.00	per sample	x	40	samples	=	$ 2,600.00		
		PAHs	$ 95.00	per sample	x	40	samples	=	$ 3,800.00		
									Sub-total	$ 12,320.00	
	LBG - Cap reporting										
		Principal	$ 140.00	per hour	x	40	hours	=	$ 5,600.00		
		Associate	$ 130.00	per hour	x	40	hours	=	$ 5,200.00		
		Senior Hydro	$ 90.00	per hour	x	0	hours	=	$ -		
		Hydro II	$ 80.00	per hour	x	80	hours	=	$ 6,400.00		
		Hydro I	$ 70.00	per hour	x	20	hours	=	$ 1,400.00		
		Drafting	$ 75.00	per hour	x	20	hours	=	$ 1,500.00		
		Clerical	$ 60.00	per hour	x	20	hours	=	$ 1,200.00		
									Sub-total	$ 21,726.00	
										Cap Monitoring & Reporting Sub-total	$ 54,974.00

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 1 - Engineered Control and Soil Cover

Long-term Cap Maintenance	LBG - Cap Maintenance									
		Principal	$ 140.00	per hour	x	15 hours	=	$ 2,100.00		
		Associate	$ 130.00	per hour	x	60 hours	=	$ 7,800.00		
		Senior Hydro	$ 90.00	per hour	x	0 hours	=	$ -		
		Hydro II	$ 80.00	per hour	x	0 hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	90 hours	=	$ 6,300.00		
		Equip & exp	$ 30.00	per event	x	0 events		$ -		
								Sub-total	$ 16,524.00	
	Contractor - Cap Maintenance									
			$ 2,000.00	per year	x	30 years	=	$ 60,000.00		
								Sub-total	$ 60,000.00	
	LBG - Cap reporting									
		Principal	$ 140.00	per hour	x	60 hours	=	$ 8,400.00		
		Associate	$ 130.00	per hour	x	90 hours	=	$ 11,700.00		
		Senior Hydro	$ 90.00	per hour	x	60 hours	=	$ 5,400.00		
		Hydro II	$ 80.00	per hour	x	0 hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	60 hours	=	$ 4,200.00		
		Drafting	$ 75.00	per hour	x	60 hours	=	$ 4,500.00		
		Clerical	$ 60.00	per hour	x	60 hours	=	$ 3,600.00		
								Sub-total	$ 38,556.00	
									Cap Maintenance Sub-total	$ 115,080.00
Final Remedial Action Report	LBG - Final Remedial Action Report									
		Principal	$ 140.00	per hour	x	24 hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	48 hours	=	$ 6,240.00		
		Senior Hydro	$ 90.00	per hour	x	48 hours	=	$ 4,320.00		
		Hydro II	$ 80.00	per hour	x	44 hours	=	$ 3,520.00		
		Hydro I	$ 70.00	per hour	x	0 hours	=	$ -		
		Drafting	$ 75.00	per hour	x	16 hours	=	$ 1,200.00		
		Clerical	$ 60.00	per hour	x	12 hours	=	$ 720.00		
								Sub-total	$ 19,747.20	
									FRAR Sub-total	$ 19,747.20
Contingency		Remedial Action and Disposal	20%	of remedial contractor costs						$ 155,857.82
		Other	20%	of all other costs						$ 82,785.57
									TOTAL	$ 1,431,860.35

UNISYS COF TION
FORMER REMING RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 2 - Excavation and Offsite Disposal

Excavation and off-site disposal of all impacted soil

Wetland permitting (including wetlands flagging)
Pre-remediation investigation to delineate impacted soil exceeding PMC
E&S controls consist of anti-tracking pad and silt fencing
Disposal areas will be cleared and grubbed
Excavate ALL impacted soil from Right-of-way (ROW) Disposal Area and the industrial fill portion of the Railroad Spur Disposal Area for off-site disposal
Soil from ROW Disposal Area to be disposed as non-hazardous waste per Veolia Environmental Services quote from July 9, 2007
Quotes from local waste transporters and disposal facilities will be obtained during Contractor Procurement phase
Soil from industrial fill portion of the Railroad Disposal Area to be disposed as hazardous waste (TCLP lead) per Veolia Environmental Services
Soil Remedial Action for AEI No. 19 (Former Hazardous Waste Storage Building) to be addressed during the RA for the industrial fill portion of AEI No. 11
Fuel surcharge of 26% added to disposal costs per Veolia Environmental Services quote
Place 2 feet of clean fill in ROW Disposal Area. Volume estimate assumes 30% compaction of soil.
Backfill around existing building and driveway in ROW Disposal Area for structural concerns
Backfill industrial fill portion of Railroad Disposal Area to original grade
Construct 4 ground-water monitoring wells down-gradient of ROW Disposal Area and 2 wells down-gradient of the industrial fill portion of the Railroad Disposal Area
Prepare Final Remedial Action Report
Prepare and record ELUR (includes cost for surveyor and attorney in ELUR process) assumes City or the property owner at the time of the remediation will accept ELUR.
Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Remedial work will take a total of 46 days
Contingency 20%

Variables	ROW Disposal Area	Industrial Fill Portion of Railroad Disposal Area
Cubic yards of impacted soil (yd3)	6,824	2,743
Tons of impacted soil above water table (tons)	10,236	4,115
Perimeter of excavation (ft)	1,008	520
Surface area of disposal area (ft2)	50,000	12,200

Permitting	LBG - Permitting										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	6	hours	=	$ 420.00		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00		
									Sub-total	$ 6,120.00	
	Wetland Scientist								$ 2,500.00		
									Sub-total	$ 2,675.00	
										Permitting Sub-total	$ 8,795.00
RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Subtotal	$ 10,057.20

Appendix XII -TABLE 2

UNISYS COF TION
FORMER REMING. RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 2 - Excavation and Offsite Disposal

Pre-Remediation Investigation - ROW Disposal Area	Drilling Contractor		$ 1,750.00	per day	x	7	days	=	$ 12,250.00		
									Sub-total	$ 13,107.50	
	Remedial Contractor - Test pits		$ 1,200.00	per day	x	3	days	=	$ 3,600.00		
									Sub-total	$ 3,852.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	20	hours	=	$ 2,800.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	70	hours	=	$ 6,300.00		
		Hydro II	$ 80.00	per hour	x	160	hours	=	$ 12,800.00		
		Hydro I	$ 70.00	per hour	x	70	hours	=	$ 4,900.00		
		Drafting	$ 75.00	per hour	x	10	hours	=	$ 750.00		
		Clerical	$ 60.00	per hour	x	20	hours	=	$ 1,200.00		
									Sub-total	$ 29,325.00	
	Laboratory - Investigation										
		ETPH	$ 65.00	per sample	x	100	samples	=	$ 6,500.00		
		VOCs	$ 83.00	per sample	x	20	samples	=	$ 1,660.00		
		Metals	$ 65.00	per sample	x	135	samples	=	$ 8,775.00		
		SPLP lead or nickel	$ 45.00	per sample	x	100	samples	=	$ 4,500.00		
		PAHs	$ 95.00	per sample	x	50	samples	=	$ 4,750.00		
									Sub-total	$ 26,185.00	
									Pre-Remediation Investigation Subtotal		$ 72,469.50
Pre-Remediation Investigation - Industrial Fill Portion of Railroad Disposal Area	Drilling Contractor		$ 1,750.00	per day	x	2	days	=	$ 3,500.00		
									Sub-total	$ 3,500.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00		
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -		
									Sub-total	$ 3,258.90	
	Laboratory - Investigation										
		ETPH	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		VOCs	$ 83.00	per sample	x	24	samples	=	$ 1,992.00		
		Metals	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		PAHs	$ 95.00	per sample	x	24	samples	=	$ 2,280.00		
									Sub-total	$ 7,392.00	
									Pre-Remediation Investigation Subtotal		$ 14,150.90
Contractor Procurement	LBG - Contractor Procurement										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 4,855.20	
									Contractor Procurement Sub-total		$ 4,855.20

Appendix XII -TABLE 2

UNISYS CO ATION
FORMER REMINC . RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 2 - Excavation and Offsite Disposal

Remedial Action	Remedial Action Contractor										
		E&S controls							$ 20,000.00		
		Clearing and grubbing	$ 2,000.00	/acre	x	1.43	acre	=	$ 2,855.83		
		Excavation, screening & loading	$ 45.00	/yd3	x	9,567	yd3	=	$ 430,520.00		
		Hauling & disposal (bulky waste)	$ 182.65	/ton	x	617	tons	=	$ 112,740.71		
		Hauling & disposal (regulated)	$ 182.65	/ton	x	10,236	tons	=	$ 1,869,544.52		
		Hauling & disposal (haz)	$ 272.65	/ton	x	4,115	tons	=	$ 1,121,954.75		
		Backfill	$ 15.00	/yd3	x	8,381	yd3	=	$ 125,717.22		
		Spread backfill	$ 10.00	/yd3	x	8,381	yd3	=	$ 83,811.48		
		Compact backfill	$ 5.00	/yd3	x	8,381	yd3	=	$ 41,905.74		
		Dewatering							$ 30,000.00		
		Restoration (seeding)							$ 15,000.00		
									Sub-total	$ 3,854,050.25	
	Laboratory - Remedial Action										
		Waste Profiling	$ 550.00	per sample	x	60	samples	=	$ 32,929.42		
		Clean soil Profiling	$ 550.00	per sample	x	34	samples	=	$ 18,438.53		
									Sub-total	$ 51,367.94	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	20	hours	=	$ 2,800.00		
		Associate	$ 130.00	per hour	x	20	hours	=	$ 2,600.00		
		Senior Hydro	$ 90.00	per hour	x	60	hours	=	$ 5,400.00		
		Hydro II	$ 80.00	per hour	x	416	hours	=	$ 33,241.14		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	34	days	=	$ 3,416.83		
		Expenses	$ 30.00	per day	x	46	days	=	$ 1,385.05		
									Sub-total	$ 49,963.93	
										Remedial Action Sub-total	$ 3,955,382.13
ELUR	LBG - Prepare ELUR										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	20	hours	=	$ 2,600.00		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	10	hours	=	$ 800.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	2	hours	=	$ 150.00		
		Clerical	$ 60.00	per hour	x	3	hours	=	$ 180.00		
									Sub-total	$ 6,211.80	
	Surveyor (ELUR)								$ 6,000.00		
									Sub-total	$ 6,420.00	
	Attorney (ELUR)								$ 7,500.00		
									Sub-total	$ 7,500.00	
										ELUR Sub-total	$ 20,131.80

Appendix XII -TABLE 2

UNISYS CO[illegible]TION
FORMER REMING[illegible]RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 2 - Excavation and Offsite Disposal

Well construction	Driller (construct down-gradient monitoring wells for remediation monitoring)					6	wells		$ 7,222.50		
									Sub-total	$ 7,222.50	
	LBG - Drilling oversight, well development, survey										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	8	hours	=	$ 720.00		
		Hydro II	$ 80.00	per hour	x	12	hours	=	$ 960.00		
		Hydro I	$ 70.00	per hour	x	48	hours	=	$ 3,360.00		
		Equip & exp	$ 200.00	per day	x	3	days	=	$ 600.00		
									Sub-total	$ 6,056.40	
										Well Construction Sub-total	$ 13,278.90
GW Monitoring and reporting	Laboratory - GW monitoring										
		ETPH	$ 65.00	per sample	x	72	samples	=	$ 4,680.00		
		VOCs	$ 83.00	per sample	x	72	samples	=	$ 5,976.00		
		Metals	$ 65.00	per sample	x	72	samples	=	$ 4,680.00		
		PAHs	$ 95.00	per sample	x	72	samples	=	$ 6,840.00		
									Sub-total	$ 22,176.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
		Equip & exp	$ 200.00	per event	x	12	events		$ 2,400.00		
									Sub-total	$ 13,291.20	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
		Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
									Sub-total	$ 11,566.80	
									GW Monitoring & Reporting Sub-total		$ 47,034.00
Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
		Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
		Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
		Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
									Sub-total	$ 19,747.20	
										FRAR Sub-total	$ 19,747.20
Contingency		Remedial Action and Disposal	20%	of remedial contractor costs							$ 770,810.05
		Other	20%	of all other costs							$ 62,370.31
										TOTAL	$ 4,999,082.20

Appendix XII -TABLE 3

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 3 - Excavation/Disposal of GB PMC Soil and Soil Cover

Excavation and off-site disposal of PMC impacted soil and render DEC impacted soil inaccessible

Wetland permitting (including wetlands flagging)
Pre-remediation investigation to delineate imapcted soil exceeding PMC
E&S controls consist of anti-tracking pad and silt fencing
Disposal areas will be cleared and grubbed
Excavate impacted soil exceeding PMC from Right-of-way (ROW) Disposal Area and industrial fill portion of the Railroad Spur Disposal Area for off-site disposal
Soil from ROW Disposal Area to be disposed as non-hazardous waste per Veolia Environmental Services quote
Soil from industrial fill portion of the Railroad Disposal Area to be disposed as hazardous waste (TCLP lead) per Veolia Environmental Services
Quotes from local waste transporters and disposal facilities will be obtained during Contractor Procurement phase
Soil Remedial Action for AEI No. 19 (Former Hazardous Waste Storage Building) to be addressed during the RA for the industrial fill portion of AEI No. 11
Fuel surcharge of 26% added to disposal costs per Veolia Environmental Services quote
Excavate soil from adjacent property and place in ROW Disposal Area
Backfill ROW Disposal Area with 4 feet of clean fill
Backfill industrial fill portion of the Railroad Spur Disposal Area with clean fill
Construct 4 ground-water monitoring wells down-gradient of ROW Disposal Area and 2 wells down-gradient of industrial fill portion of the Railroad Disposal Area
Prepare Final Remedial Action Report
Prepare and record ELUR (includes cost for surveyor and attorney in ELUR process) assumes City or the property owner at the time of the remediation will accept ELUR.
Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Remedial work will take a total of 31 days
Contingency 20%

Variables	ROW Disposal Area	Industrial Fill Portion of Railroad Disposal Area	
Surface Area (ft2)	45,723	12,517	
Cubic yards of impacted soil (yd3)	6,824	2,743	
Tons of impacted soil (tons)	10,236	4,115	
Cubic yards of impacted soil above water table (yd3)	6,376	2,375	
Tons of impacted soil above water table (tons)	9,565	3,563	
Perimeter of excavation (ft)	740	520	
Volume of soil exceeding PMC (yd3)	2,852	2,375	
Tons of soil exceeding PMC (tons)	4,278	3,563	conversion of 1.5 tons/cubic yard
Perimeter of PMC excavation (ft)	600	-	
Cubic yards of soil on adjacent property (yd3)	1,907	-	

Permitting	LBG - Permitting										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	6	hours	=	$ 420.00		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00		
									Sub-total	$ 6,120.00	
	Wetland Scientist										
									$ 2,500.00		
									Sub-total	$ 2,675.00	
										Permitting Sub-total	$ 8,795.00
RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Sub-total	$ 10,057.20

Appendix XII -TABLE 3

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 3 - Excavation/Disposal of GB PMC Soil and Soil Cover

Section	Task	Item	Rate	Unit		Quantity	Unit		Amount	Sub-total	Total
Contractor Procurement	LBG - Contractor Procurement										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 4,855.20	
									Contractor Procurement Sub-total		$ 4,855.20
Pre-Remediation Investigation - ROW Disposal Area	Drilling Contractor		$ 1,750.00	per day	x	6	days	=	$ 10,500.00		
									Sub-total	$ 11,235.00	
	Remedial Contractor - Test pits		$ 1,200.00	per day	x	2	days	=	$ 2,400.00		
									Sub-total	$ 2,568.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	20	hours	=	$ 2,800.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	60	hours	=	$ 5,400.00		
		Hydro II	$ 80.00	per hour	x	140	hours	=	$ 11,200.00		
		Hydro I	$ 70.00	per hour	x	60	hours	=	$ 4,200.00		
		Drafting	$ 75.00	per hour	x	10	hours	=	$ 750.00		
		Clerical	$ 60.00	per hour	x	20	hours	=	$ 1,200.00		
									Sub-total	$ 26,061.00	
	Laboratory - Investigation										
		ETPH	$ 65.00	per sample	x	100	samples	=	$ 6,500.00		
		VOCs	$ 83.00	per sample	x	20	samples	=	$ 1,660.00		
		Metals	$ 65.00	per sample	x	120	samples	=	$ 7,800.00		
		SPLP lead	$ 45.00	per sample	x	70	samples	=	$ 3,150.00		
		PAHs	$ 95.00	per sample	x	50	samples	=	$ 4,750.00		
									Sub-total	$ 23,860.00	
									Pre-Remediation Investigation Subtotal		$ 63,724.00
Pre-Remediation Investigation - Industrial Fill Portion of Railroad Disposal Area	Drilling Contractor					2	days		$ 3,745.00		
									Sub-total	$ 3,745.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00		
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -		
									Sub-total	$ 3,258.90	
	Laboratory - Investigation										
		ETPH	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		VOCs	$ 83.00	per sample	x	24	samples	=	$ 1,992.00		
		Metals	$ 65.00	per sample	x	30	samples	=	$ 1,950.00		
		PAHs	$ 95.00	per sample	x	24	samples	=	$ 2,280.00		
									Sub-total	$ 7,782.00	
									Pre-Remediation Investigation Subtotal		$ 14,785.90

Appendix XII -TABLE 3

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 3 - Excavation/Disposal of GB PMC Soil and Soil Cover

Remedial Action	Remedial Action Contractor										
		E&S controls							$ 15,000.00		
		Clearing and grubbing	$ 2,000.00	/acre	x	1.34	acre	=	$ 2,674.01		
		Excavate, screen & load	$ 45.00	/yd3	x	5,227	yd3	=	$ 235,230.00		
		Hauling & disposal (bulky waste)	$ 182.65	/ton	x	534	tons	=	$ 97,623.38		
		Hauling & disposal (regulated)	$ 182.65	/ton	x	4,278	tons	=	$ 781,336.11		
		Hauling & disposal (haz)	$ 272.65	/ton	x	3,563	tons	=	$ 971,512.54		
		Pull back soil onto property and grade	$ 30.00	/yd3	x	1,907	yd3	=	$ 57,222.22		
		Backfill	$ 15.00	/yd3	x	13,438	yd3	=	$ 201,571.50		
		Spread backfill	$ 10.00	/yd3	x	13,438	yd3	=	$ 134,381.00		
		Compact backfill	$ 5.00	/yd3	x	2,540	yd3	=	$ 12,700.83		
		Restoration (seeding)							$ 15,000.00		
									Sub-total	$ 2,524,251.60	
	Laboratory - Remedial Action										
		Waste Profiling	$ 550.00	per sample	x	34	samples	=	$ 18,426.06		
		Clean soil Profiling	$ 550.00	per sample	x	54	samples	=	$ 29,563.82		
									Sub-total	$ 47,989.88	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	12	hours	=	$ 1,680.00		
		Associate	$ 130.00	per hour	x	12	hours	=	$ 1,560.00		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	276	hours	=	$ 22,081.71		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	19	days	=	$ 1,866.90		
		Expenses	$ 30.00	per day	x	31	days	=	$ 920.07		
									Sub-total	$ 31,508.47	
										Remedial Action Sub-total	$ 2,603,749.96
ELUR Documents	LBG - Prepare ELUR Documents										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	20	hours	=	$ 2,600.00		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	10	hours	=	$ 800.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	2	hours	=	$ 150.00		
		Clerical	$ 60.00	per hour	x	3	hours	=	$ 180.00		
									Sub-total	$ 6,211.80	
	Surveyor (ELUR)								$ 6,000.00		
									Sub-total	$ 6,420.00	
	Attorney (ELUR)								$ 7,500.00		
									Sub-total	$ 7,500.00	
										ELUR Sub-total	$ 20,131.80

Appendix XII -TABLE 3

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 3 - Excavation/Disposal of GB PMC Soil and Soil Cover

Well construction	Driller (construct down-gradient monitoring wells for remediation monitoring)					6	wells		$ 7,222.50		
									Sub-total	$ 7,222.50	
	LBG - Drilling oversight, well development, survey										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	8	hours	=	$ 720.00		
		Hydro II	$ 80.00	per hour	x	12	hours	=	$ 960.00		
		Hydro I	$ 70.00	per hour	x	48	hours	=	$ 3,360.00		
		Equip & exp	$ 200.00	per day	x	3	days	=	$ 600.00		
									Sub-total	$ 6,056.40	
										Well Construction Sub-total	$ 13,278.90
GW Monitoring and reporting	Laboratory - GW monitoring										
		ETPH	$ 65.00	per sample	x	72	samples	=	$ 4,680.00		
		VOCs	$ 83.00	per sample	x	72	samples	=	$ 5,976.00		
		Metals	$ 65.00	per sample	x	72	samples	=	$ 4,680.00		
		PAHs	$ 95.00	per sample	x	72	samples	=	$ 6,840.00		
									Sub-total	$ 22,176.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
		Equip & exp	$ 200.00	per event	x	12	events		$ 2,400.00		
									Sub-total	$ 13,291.20	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
		Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
									Sub-total	$ 11,566.80	
										GW Monitoring & Reporting Sub-total	$ 47,034.00
Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
		Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
		Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
		Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
									Sub-total	$ 19,747.20	
										FRAR Sub-total	$ 19,747.20
Contingency		Remedial Action and Disposal	20%	of remedial contractor costs							$ 504,850.32
		Other	20%	of all other costs							$ 56,381.51
										TOTAL	$ 3,367,390.99

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Fill - Soil Remedial Cost Estimate Alternative 4 - Excavation/Disposal of Fill from Below Water Table

Excavation and off-site disposal of PMC impacted soil and render DEC impacted soil inaccessible

Excavate impacted soil exceeding PMC from Right-of-way (ROW) Disposal Area and the industrial fill portion of the Railroad Spur Disposal Area for off-site disposal
Soil from ROW Disposal Area to be disposed as CT regulated waste
Soil from industrial fill portion of the Railroad Spur Disposal Area to be disposed as hazardous waste (TCLP lead)
Cost for disposal based on Veolia Environmental Services quote dated July 9, 2007
Fuel surcharge of 26% added to disposal costs per Veolia Environmental Services quote dated July 9, 2007
Quotes from local waste transporters and disposal facilities will be obtained during Contractor Procurement phase
Remedial work will take a total of 5 days

Variables	ROW Disposal Area	Industrial Fill Portion of Railroad Disposal Area	
Surface Area (ft2)	45,723	12,517	
Cubic yards of impacted soil beneath water table (yd3)	447	368	
Tons of impacted soil beneath water table (tons)	671	552	
Volume of soil exceeding PMC (yd3)	2,600	3,326	
Tons of soil exceeding PMC (tons)	3,900	4,989	conversion of 1.5 tons/cubic yard
Perimeter of PMC excavation (ft)	600	520	
Cubic yards of soil on adjacent property (yd3)	1,907	-	

Permitting	LBG - Permitting										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	6	hours	=	$ 420.00		
		Drafting	$ 75.00	per hour	x	2	hours	=	$ 150.00		
		Clerical	$ 60.00	per hour	x	2	hours	=	$ 120.00		
									Sub-total	$ 1,540.20	
										Permitting Sub-total	$ 1,540.20
Remedial Action	Remedial Action Contractor										
		Excavate, screen & load	$ 40.00	/yd3	x	815	yd3	=	$ 32,611.85		
		Hauling & disposal (regulated)	$ 182.65	/ton	x	671	tons	=	$ 122,588.59		
		Hauling & disposal (haz)	$ 272.65	/ton	x	552	tons	=	$ 150,442.21		
		Backfill	$ 15.00	/yd3	x	1,060	yd3	=	$ 15,898.28		
		Spread backfill	$ 10.00	/yd3	x	1,060	yd3	=	$ 10,598.85		
		Dewatering							$ 30,000.00		
									Sub-total	$ 362,139.78	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	4	hours	=	$ 520.00		
		Senior Hydro	$ 90.00	per hour	x	10	hours	=	$ 900.00		
		Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,536.48		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	3	days	=	$ 291.18		
		Expenses	$ 30.00	per day	x	3	days	=	$ 87.35		
									Sub-total	$ 6,024.26	
										Remedial Action Sub-total	$ 368,164.05
Contingency		Remedial Action and Disposal	20%	of remedial contractor costs							$ 72,427.96
		Other	20%	of all other costs							$ 1,512.89
										TOTAL	$ 443,645.10

Appendix XII - TABLE 5

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Assumptions Used in Developing Fill Area Soil Remedial Alternative Cost Estimates

Alternative	Assumptions	Approximate Cost
1 - Excavation, Engineered Control and Soil Cover	Proposed engineered control is an impermeable cap	$ 1,431,860.35
	Engineered control requires CTDEP review and approval	
	2,852 cubic yards (4,278 tons) of impacted soil exceeds GBPMC in ROW Disposal Area	
	2.375 cubic yards (3,563 tons) of impacted soil exceeds GBPMC in industrial fill portion of the Railroad Spur Disposal Area	
	Conversion factor of 1.5 tons per cubic yard of soil	
	Disposal costs based on Veolia Environmental Services quote dated July 9, 2007	
	Engineered control is 29,000 square feet	
	Bulky waste screened from excavated soil disposed at non-hazardous waste costs	
	Four feet of clean soil cover in ROW Disposal Area	
	ELUR prohibiting: 1) disturbance of soil in disposal areas; 2) residential use of property; 3) use of ground water for drinking or other domestic purposes; and 4) demolition of building in ROW Disposal Area will be accepted by City or current property owner at time of remediation	
	Post-remediation ground-water monitoring or a period of 3 years	
	Cap monitoring for a period of 5 years	
	Cap inspection and maintenance for a period of 30 years	
	Remedial work will take approximately 22 days	
	20% contingency	
2 - Excavation and Disposal of All Impacted Soil	Excavate and dispose of all impacted soil including below the seasonal high water table	$ 4,999,082.20
	6,824 cubic yards (10,236 tons) of impacted soil in ROW Disposal Area	
	2,743 cubic yards (4,115 tons) of impacted soil in industrial fill portion of the Railroad Spur Disposal Area	
	Conversion factor of 1.5 tons per cubic yard of soil	
	Disposal costs based on Veolia Environmental Services quote dated July 9, 2007	
	Bulky waste screened from excavated soil disposed at non-hazardous waste costs	
	Two feet of clean soil cover in ROW Disposal Area	
	ELUR prohibiting: 1) residential use of property; 2) demolition of building in ROW Disposal Area; and 3) use of ground water for drinking or other purposes will be accepted by City or current property owner at time of remediation	
	Post-remediation ground-water monitoring or a period of 3 years	
	Remedial work will take approximately 46 days	
	20% contingency	
3 - Selective Disposal and Soil Cover	Excavate and dispose of impacted soil exceeding GBPMC above the seasonal high water table	$ 3,367,390.99
	6,824 cubic yards (10,236 tons) of impacted soil in ROW Disposal Area	
	2,375 cubic yards (3,563 tons) of impacted soil in industrial fill portion of the Railroad Spur Disposal Area	
	Conversion factor of 1.5 tons per cubic yard of soil	
	Disposal costs based on Veolia Environmental Services quote dated July 9, 2007	
	Bulky waste screened from excavated soil disposed at non-hazardous waste costs	
	Four feet of clean soil cover in ROW Disposal Area	
	ELUR prohibiting: 1) disturbance of soil in disposal areas; 2) residential use of property; 3) use of ground water for drinking or other domestic purposes; and 4) demolition of building in ROW Disposal Area will be accepted by City or current property owner at the time of remediation	
	Post-remediation ground-water monitoring or a period of 3 years	
	Remedial work will take approximately 31 days	
	20% contingency	
4 - GBPMC Soil Beneath the Seasonal High Water Table	Excavate and dispose of impacted soil exceeding GBPMC below the seasonal high water table	$ 443,645.10
	447 cubic yards (671 tons) of impacted soil exceeding GBPMC in ROW Disposal Area	
	368 cubic yards (552 tons) of impacted soil exceeding GBPMC in industrial fill portion of the Railroad Spur Disposal Area	
	Disposal costs based on Veolia Environmental Services quote dated July 9, 2007	
	Remedial work will take approximately 5 days if completed at the same time as other alternatives	
	20% contingency	

Appendix XII -TABLE 6

UNISYS COR. ΓΙΟΝ
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - Soil Remedial Cost Estimate Alternative 1 - Excavation and Offsite Disposal

TCE Release Areas - Excavate and Dispose Offsite

Pre-remediation investigation in AEI No. 16 and AEI No. 21 to delineate extent of impacted soil
E&S controls consist of anti-tracking pad and silt fencing
Excavate ALL impacted soil from AEI 16 and 21 for off-site disposal
Saw cut concrete slab in Building No. 5 to access impacted soil
Disposal estimate assumes that 75% of the soil will be disposed as non-hazardous waste
Disposal estimate assumes that 25% of the soil will be disposed as hazardous waste
Fuel surcharge of 26% added to disposal costs per Veolia Environmental Services quote
Quotes from local waste transporters and disposal facilities will be obtained during Contractor Procurement phase
Volume estimate assumes 30% compaction of soil.
Backfill around existing building and driveway for structural concerns
Backfill original grade
Prepare Final Remedial Action Report
Prepare and record ELUR (includes cost for surveyor and attorney in ELUR process) assumes City or the property owner at the time of the remediation will accept ELUR.
Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Remedial work will take a total of 5 days
Contingency 20%

Variables	Loading Dock/Bldg 1A	Building No. 5
Cubic yards of impacted soil (yd3)	311	74
Tons of impacted soil above water table (tons)	467	111
Perimeter of excavation (ft)	160	80
Surface area of disposal area (ft2)	1,200	400

RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Subtotal	$ 10,057.20

Appendix XII -TABLE 6

UNISYS CORF .ION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - Soil Remedial Cost Estimate Alternative 1 - Excavation and Offsite Disposal

Phase	Category	Item	Rate	Unit		Qty	Unit		Amount	Sub-total	Total
Pre-Remediation Investigation	Drilling Contractor		$ 1,750.00	per day	x	3	days	=	$ 5,250.00		
									Sub-total	$ 5,250.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	30	hours	=	$ 2,400.00		
		Hydro I	$ 70.00	per hour	x	20	hours	=	$ 1,400.00		
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00		
		Clerical	$ -	per hour	x	0	hours	=	$ -		
									Sub-total	$ 4,788.90	
	Laboratory - Investigation										
		VOCs	$ 83.00	per sample	x	30	samples	=	$ 2,490.00		
									Sub-total	$ 2,490.00	
									Pre-Remediation Investigation Subtotal		$ 12,528.90
Contractor Procurement	LBG - Contractor Procurement										
		Principal	$ 140.00	per hour	x	6	hours	=	$ 840.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	12	hours	=	$ 1,080.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	2	hours	=	$ 150.00		
		Clerical	$ 60.00	per hour	x	2	hours	=	$ 120.00		
									Sub-total	$ 2,233.80	
									Contractor Procurement Sub-total		$ 2,233.80
Remedial Action	Remedial Action Contractor										
		E&S controls							$ 1,000.00		
		Saw cut concrete	$ 1,250.00	day	x	1	days	=	$ 1,250.00		
		Excavation, screening & loading	$ 45.00	/yd3	x	385	yd3	=	$ 17,333.33		
		Hauling & disposal (regulated)	$ 182.65	/ton	x	433	tons	=	$ 79,148.33		
		Hauling & disposal (haz)	$ 272.65	/ton	x	144	tons	=	$ 39,382.78		
		Backfill	$ 15.00	/yd3	x	501	yd3	=	$ 7,511.11		
		Spread backfill	$ 10.00	/yd3	x	501	yd3	=	$ 5,007.41		
		Compact backfill	$ 5.00	/yd3	x	501	yd3	=	$ 2,503.70		
		Dewatering							$ 7,500.00		
		Restoration (concrete repair & seeding)							$ 3,000.00		
									Sub-total	$ 163,636.67	
	Laboratory - Remedial Action										
		Waste Profiling	$ 550.00	per sample	x	2	samples	=	$ 1,271.11		
		Clean soil Profiling	$ 550.00	per sample	x	2	samples	=	$ 1,101.63		
									Sub-total	$ 2,372.74	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	6	hours	=	$ 840.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	50	hours	=	$ 4,000.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	5	days	=	$ 500.00		
		Expenses	$ 30.00	per day	x	5	days	=	$ 150.00		
									Sub-total	$ 7,088.10	
									Remedial Action Sub-total		$ 173,097.51

Appendix XII -TABLE 6

UNISYS COR. .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - Soil Remedial Cost Estimate Alternative 1 - Excavation and Offsite Disposal

ELUR	LBG - Prepare ELUR										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	20	hours	=	$ 2,600.00		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	10	hours	=	$ 800.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	2	hours	=	$ 150.00		
		Clerical	$ 60.00	per hour	x	3	hours	=	$ 180.00		
									Sub-total	$ 6,211.80	
	Surveyor (ELUR)								$ 6,000.00		
									Sub-total	$ 6,420.00	
	Attorney (ELUR)								$ 7,500.00		
									Sub-total	$ 7,500.00	
										ELUR Sub-total	$ 20,131.80
GW Monitoring and reporting	Laboratory - GW monitoring										
		VOCs	$ 83.00	per sample	x	72	samples	=	$ 5,976.00		
									Sub-total	$ 5,976.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
		Equip & exp	$ 200.00	per event	x	12	events		$ 2,400.00		
									Sub-total	$ 13,291.20	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
		Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
									Sub-total	$ 11,566.80	
									GW Monitoring & Reporting Sub-total		$ 30,834.00

Appendix XII -TABLE 6

UNISYS COR .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - Soil Remedial Cost Estimate Alternative 1 - Excavation and Offsite Disposal

Final Remedial Action Report	LBG - Final Remedial Action Report									
	Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
	Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
	Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
	Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
	Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
	Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
	Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
								Sub-total	$ 19,747.20	
									FRAR Sub-total	$ 19,747.20
Contingency										
	Remedial Action and Disposal	20%	of remedial contractor costs							$ 32,727.33
	Other	20%	of all other costs							$ 20,998.75
									TOTAL	**$ 322,356.49**

Appendix XII -TABLE 7

UNISYS COR ·ION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - Soil Remedial Cost Estimate Alternative 2 - High Vacuum Extraction

TCE Release Areas - High Vacuum Extraction for Unsaturated Soil

Pre-remediation investigation to delineate impacted soil in AEI No. 21 (Building No. 5)
Assumes HVE is used for ground-water remedial action
Conduct a soil boring program to document compliance with soil criteria
Assumes ground-water monitoring conducted during ground-water remedial action
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Contingency 20%

Pre-Remediation Investigation	Drilling Contractor		$ 1,750.00	per day	x	2	days	=	$ 3,500.00		
									Sub-total	$ 3,500.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00		
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -		
									Sub-total	$ 3,258.90	
	Laboratory - Investigation										
		VOCs	$ 83.00	per sample	x	16	samples	=	$ 1,328.00		
									Sub-total	$ 1,328.00	
								Pre-Remediation Investigation Subtotal			$ 8,086.90
Confirmation Soil Boring Program	Drilling Contractor		$ 1,750.00	per day	x	3	days	=	$ 5,250.00		
									Sub-total	$ 5,250.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	30	hours	=	$ 2,400.00		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00		
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -		
									Sub-total	$ 4,074.90	
	Laboratory - Investigation										
		VOCs	$ 83.00	per sample	x	24	samples	=	$ 1,992.00		
									Sub-total	$ 1,992.00	
								Confirmation Soil Boring Program Subtotal			$ 11,316.90
Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	8	hours	=	$ 640.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	4	hours	=	$ 240.00		
									Sub-total	$ 3,978.00	
										FRAR Sub-total	$ 3,978.00
Contingency		Other	20%	of all other costs							$ 4,676.36
										TOTAL	$ 28,058.16

Appendix XII - TABLE 8

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Assumptions Used in Developing TCE Area Soil Remedial Alternative Cost Estimates

Alternative	Assumptions	Approximate Cost
1 - Excavate and Offsite Disposal	Pre-remediation investigation in AEI No. 16 and AEI No. 21 to delineate extent of impacted soil	$ 322,356.49
	E&S controls consist of anti-tracking pad and silt fencing	
	Excavate ALL impacted soil from AEI No. 16 (467 tons) and AEI No. 21 (11 tons) for off-site disposal	
	Saw cut concrete slab in Building No. 5 to access impacted soil	
	Disposal estimate assumes that 75% of the soil will be disposed as non-hazardous waste	
	Disposal estimate assumes that 25% of the soil will be disposed as hazardous waste	
	Fuel surcharge of 26% added to disposal costs per Veolia Environmental Services quote	
	Quotes from local waste transporters and disposal facilities will be obtained during Contractor Procurement phase	
	Volume estimate assumes 30% compaction of soil.	
	Backfill around existing building and driveway for structural concerns	
	Backfill original grade	
	Prepare Final Remedial Action Report	
	Prepare and record ELUR (includes cost for surveyor and attorney in ELUR process) assumes City or the property owner at the time of the remediation will accept ELUR.	
	Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)	
	Remedial work will take a total of 5 days	
	Contingency 20%	
2 - High Vacuum Extraction for Unsaturated Soil	Pre-remediation investigation to delineate impacted soil in AEI No. 21 (Building No. 5)	$ 28,058.16
	Assumes HVE is used for ground-water remedial action	
	Conduct a soil boring program to document compliance with soil criteria	
	Assumes ground-water monitoring conducted during ground-water remedial action	
	Contingency 20%	

Appendix XII -TABLE 9

UNISYS COR.   .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 1 - High Vacuum Extraction

TCE Release Areas - High Vacuum Extraction Systems

Permitting for system discharge
Pilot test for system design
Pre-remediation investigation for down-gradient water quality
Trenches backfilled with excavated soil
Utility contractor to install separate electric service
Concrete pads for sheds (total 2)
Steel cargo box remediation system sheds (total 2)
Assumes 10 HVE wells for AEI No. 16
Assumes 6 HVE wells for AEI No. 13
Assumes 4 HVE wells for AEI No. 21
Two HVE systems (1 for AEI No. 16, 1 for AEI No. 13 and No. 21)
Water treatment using liquid phase carbon
O&M for 10 years (includes electric, bi-monthly O&M visits, monthly effluent samples, semi-annual influent screening)
Prepare Final Remedial Action Report
Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Remedial work will take a total of 26 days (5 days pilot test, 21 days construction)
Contingency 20%

Permitting	LBG - Permitting										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	12	hours	=	$ 1,560.00		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	6	hours	=	$ 420.00		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00		
									Sub-total	$ 6,079.20	
										Permitting Sub-total	$ 6,079.20
RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Subtotal	$ 10,057.20

Appendix XII -TABLE 9

UNISYS COR   .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 1 - High Vacuum Extraction

Pilot Test	Drilling Contractor		$ 2,250.00	per day	x	2	days	=	$ 4,500.00		
									Sub-total	$ 4,815.00	
	Remedial Contractor - Pilot Test Equipment		$ 1,200.00	per day	x	3	days	=	$ 3,600.00		
									Sub-total	$ 3,852.00	
	LBG - Drilling & Pilot Test Oversight										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	40	hours	=	$ 3,200.00		
		Hydro I	$ 70.00	per hour	x	50	hours	=	$ 3,500.00		
		Equip	$ 100.00	per day	x	5	days	=	$ 500.00		
		Expenses	$ 30.00	per day	x	5	days	=	$ 150.00		
									Sub-total	$ 11,658.60	
	Laboratory - Pilot Test										
		VOCs	$ 83.00	per sample	x	12	samples	=	$ 996.00		
									Sub-total	$ 996.00	
										Pilot Test Subtotal	$ 21,321.60
Pre-Remediation Investigation	Drilling Contractor		$ 1,750.00	per day	x	2	days	=	$ 3,500.00		
									Sub-total	$ 3,500.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00		
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -		
									Sub-total	$ 3,258.90	
	Laboratory - Investigation										
		VOCs	$ 83.00	per sample	x	8	samples	=	$ 664.00		
									Sub-total	$ 664.00	
									Pre-Remediation Investigation Subtotal		$ 7,422.90
Final System Design	LBG - Final System Design										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	24	hours	=	$ 3,120.00		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 6,466.80	
										Final System Design Subtotal	$ 6,466.80
Contractor Procurement	LBG - Contractor Procurement										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 4,855.20	
									Contractor Procurement Sub-total		$ 4,855.20

Appendix XII -TABLE 9

UNISYS CORP[illegible]ION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 1 - High Vacuum Extraction

Phase	Item		Unit cost	Unit		Quantity	Unit		Amount	Sub-total	Total
Remedial Action	Drilling Contractor		$ 2,250.00	per day	x	7	days	=	$ 15,750.00		
									Sub-total	$ 15,750.00	
	Remedial Action Contractor										
		Trenching and backfilling	$ 50.00	/ft	x	2,300	ft	=	$ 115,000.00		
		Piping	$ 15.00	/ft	x	2,300	ft	=	$ 34,500.00		
		Well head construction	$ 1,000.00	each	x	20	wells	=	$ 20,000.00		
		Liquid ring pump (accessories)	$ 25,000.00	each	x	2		=	$ 50,000.00		
		Valves and fittings	$ 10,000.00		x	2		=	$ 20,000.00		
		Tanks and pumps	$ 5,000.00		x	2		=	$ 10,000.00		
		Water treatment	$ 12,000.00		x	2		=	$ 24,000.00		
		Controls and instrumentation	$ 5,000.00		x	2		=	$ 10,000.00		
		Shed	$ 10,000.00		x	2		=	$ 20,000.00		
		Electrical	$ 7,500.00		x	2		=	$ 15,000.00		
		Concrete Pad	$ 2,500.00		x	2		=	$ 5,000.00		
		Connection to sanitary sewer	$ 5,000.00		x	2		=	$ 10,000.00		
		Contractor labor to install system components	$ 12,000.00		x	2		=	$ 24,000.00		
		Utility Contractor							$ 15,000.00		
									Sub-total	$ 372,500.00	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	210	hours	=	$ 16,800.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	21	days	=	$ 2,100.00		
		Expenses	$ 30.00	per day	x	21	days	=	$ 630.00		
									Sub-total	$ 24,735.30	
										Remedial Action Sub-total	$ 397,235.30
Operation and Maintenance	LBG - O&M										
		Principal	$ 140.00	per hour	x	200	hours	=	$ 28,000.00		
		Associate	$ 130.00	per hour	x	400	hours	=	$ 52,000.00		
		Senior Hydro	$ 90.00	per hour	x	0	hours	=	$ -		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	960	hours	=	$ 67,200.00		
		Equip	$ 100.00	per day	x	240	days	=	$ 24,000.00		
		Expenses	$ 30.00	per day	x	240	days	=	$ 7,200.00		
									Sub-total	$ 181,968.00	
	Electrical Service		$ 2,200.00	per month	x	120	months	=	$ 264,000.00		
									Sub-total	$ 282,480.00	
	Laboratory - System monitoring										
		ETPH	$ 65.00	per sample	x	140	samples	=	$ 9,100.00		
		VOCs	$ 83.00	per sample	x	140	samples	=	$ 11,620.00		
		Metals	$ 65.00	per sample	x	20	samples	=	$ 1,300.00		
		PAHs	$ 95.00	per sample	x	140	samples	=	$ 13,300.00		
									Sub-total	$ 35,320.00	
										O&M Sub-total	$ 499,768.00
	Laboratory - GW monitoring										
		ETPH	$ 65.00	per sample	x	72	samples	=	$ 4,680.00		
		VOCs	$ 83.00	per sample	x	72	samples	=	$ 5,976.00		
		Metals	$ 65.00	per sample	x	72	samples	=	$ 4,680.00		
		PAHs	$ 95.00	per sample	x	72	samples	=	$ 6,840.00		
									Sub-total	$ 22,176.00	

Appendix XII -TABLE 9

UNISYS C(₹ATION
FORMER REMINGı ON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 1 - High Vacuum Extraction

GW Monitoring and reporting	LBG - Quarterly GW monitoring									
	Principal	$ 140.00	per hour	x	0	hours	=	$ -		
	Associate	$ 130.00	per hour	x	0	hours	=	$ -		
	Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
	Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
	Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
	Equip & exp	$ 200.00	per event	x	12	events		$ 2,400.00		
								Sub-total	$ 13,291.20	
	LBG - Quarterly GW monitoring reporting									
	Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
	Associate	$ 130.00	per hour	x	0	hours	=	$ -		
	Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
	Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
	Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
	Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
	Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
								Sub-total	$ 11,566.80	
								GW Monitoring & Reporting Sub-total		$ 47,034.00
Final Remedial Action Report	LBG - Final Remedial Action Report									
	Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
	Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
	Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
	Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
	Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
	Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
	Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
								Sub-total	$ 19,747.20	
									FRAR Sub-total	$ 19,747.20
Contingency	Remedial Action	20%	of remedial contractor costs							$ 74,500.00
	Other	20%	of all other costs							$ 129,497.48
									TOTAL	$ 1,223,984.88

Appendix XII -TABLE 10

UNISYS COI .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 2 - In-Situ Remedial Technology

TCE Release Areas - In-Situ Remedial Technology

- Permitting for wetlands and injection
- Bench scale test for product selection
- Pre-remediation investigation for down-gradient water quality
- Injection via direct-push borings
- Assumes two injections of same product to achieve compliance
- Temporary pump and treat system for down-gradient hydraulic control for a period of 12 weeks after each injection event
- Operation and Maintenance of system for 12 weeks after each injection
- Three progress ground-water monitoring events after each injection
- Prepare Final Remedial Action Report
- Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)
- No markup for remedial contractor or lab (contracted directly)
- 7% admin on other subs (driller, wetland scientist, surveyor)
- 5% admin on expenses/2% admin on labor
- Remedial work will take a total of 30 days (15 days for each set of injections)
- Contingency 20%

Permitting	LBG - Permitting										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	40	hours	=	$ 5,200.00		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	6	hours	=	$ 420.00		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00		
									Sub-total	$ 11,424.00	
	Wetland Scientist								$ 2,500.00		
									Sub-total	$ 2,675.00	
										Permitting Sub-total	$ 14,099.00
RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Subtotal	$ 10,057.20

Appendix XII -TABLE 10

UNISYS CORI ,ON
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 2 - In-Situ Remedial Technology

Bench Scale Test	Bench Tests									$ 7,500.00		
										Sub-total	$ 8,025.00	
	LBG - Oversight											
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00			
		Associate	$ 130.00	per hour	x	8	hours	=	$ 1,040.00			
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00			
		Hydro II	$ 80.00	per hour	x	12	hours	=	$ 960.00			
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -			
		Equip	$ 100.00	per day	x	1	days	=	$ 100.00			
		Expenses	$ 30.00	per day	x	1	days	=	$ 30.00			
									Sub-total	$ 4,212.60		
										Bench Test Subtotal	$	12,237.60
Pre-Remediation Investigation	Drilling Contractor		$ 1,750.00	per day	x	2	days	=	$ 3,500.00			
									Sub-total	$ 3,500.00		
	LBG - Drilling Oversight											
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00			
		Associate	$ 130.00	per hour	x	0	hours	=	$ -			
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00			
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00			
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00			
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00			
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -			
									Sub-total	$ 3,258.90		
	Laboratory - Investigation											
		VOCs	$ 83.00	per sample	x	8	samples	=	$ 664.00			
									Sub-total	$ 664.00		
										Pre-Remediation Investigation Subtotal	$	7,422.90
Final Injection Design	LBG - Injection Design											
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00			
		Associate	$ 130.00	per hour	x	24	hours	=	$ 3,120.00			
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00			
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -			
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -			
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00			
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00			
									Sub-total	$ 6,466.80		
										Final Injection Design Subtotal	$	6,466.80
Contractor Procurement	LBG - Contractor Procurement											
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00			
		Associate	$ 130.00	per hour	x	0	hours	=	$ -			
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00			
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -			
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -			
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00			
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00			
									Sub-total	$ 4,855.20		
										Contractor Procurement Sub-total	$	4,855.20

Appendix XII -TABLE 10

UNISYS COR[illegible]ION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 2 - In-Situ Remedial Technology

Remedial Action	Injection Contractor										
		Equipment & labor (2 injections)	$ 5,000.00	per day	x	30	days	=	$ 150,000.00		
		Injection Product	$ 25,000.00		x	2		=	$ 50,000.00		
									Sub-total	$ 200,000.00	
	Remedial Action Contractor										
		Temporary P&T System	$ 1,500.00	per week	x	24	weeks	=	$ 36,000.00		
		Temporary Power	$ 250.00	per week	x	24	weeks	=	$ 6,000.00		
									Sub-total	$ 42,000.00	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	32	hours	=	$ 2,880.00		
		Hydro II	$ 80.00	per hour	x	270	hours	=	$ 21,600.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	30	days	=	$ 3,000.00		
		Expenses	$ 30.00	per day	x	30	days	=	$ 900.00		
									Sub-total	$ 32,328.60	
										Remedial Action Sub-total	$ 274,328.60
Operation and Maintenance	LBG - O&M										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	24	hours	=	$ 3,120.00		
		Senior Hydro	$ 90.00	per hour	x	32	hours	=	$ 2,880.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	96	hours	=	$ 6,720.00		
		Equip	$ 100.00	per day	x	12	days	=	$ 1,200.00		
		Expenses	$ 30.00	per day	x	12	days	=	$ 360.00		
									Sub-total	$ 15,708.00	
	Laboratory - Temporary System Effluent										
		ETPH	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		VOCs	$ 83.00	per sample	x	24	samples	=	$ 1,992.00		
		Metals	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		PAHs	$ 95.00	per sample	x	24	samples	=	$ 2,280.00		
									Sub-total	$ 7,392.00	
										O&M Sub-total	$ 23,100.00
Progress GW Monitoring	Laboratory - GW monitoring										
		VOCs	$ 83.00	per sample	x	24	samples	=	$ 1,992.00		
									Sub-total	$ 1,992.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	68	hours	=	$ 5,440.00		
		Hydro I	$ 70.00	per hour	x	60	hours	=	$ 4,200.00		
		Equip & exp	$ 200.00	per event	x	6	events		$ 1,200.00		
									Sub-total	$ 13,867.20	
	LBG - Progress GW monitoring reporting										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00		
									Sub-total	$ 5,446.80	
										Progress GW Monitoring & Reporting Sub-total	$ 21,306.00

Appendix XII -TABLE 10

UNISYS COR[illegible]ION
FORMER REMINGTO[illegible] RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 2 - In-Situ Remedial Technology

GW Monitoring and reporting	Laboratory - GW monitoring										
		ETPH	$ 65.00	per sample	x	72	samples	=	$ 4,680.00		
		VOCs	$ 83.00	per sample	x	72	samples	=	$ 5,976.00		
		Metals	$ 65.00	per sample	x	72	samples	=	$ 4,680.00		
		PAHs	$ 95.00	per sample	x	72	samples	=	$ 6,840.00		
									Sub-total	$ 22,176.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
		Equip & exp	$ 200.00	per event	x	12	events		$ 2,400.00		
									Sub-total	$ 13,291.20	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
		Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
									Sub-total	$ 11,566.80	
									GW Monitoring & Reporting Sub-total		$ 47,034.00
Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
		Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
		Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
		Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
									Sub-total	$ 19,747.20	
										FRAR Sub-total	$ 19,747.20
Contingency		Remedial Action	20%	of remedial contractor costs							$ 48,400.00
		Other	20%	of all other costs							$ 39,730.90
										TOTAL	**$ 528,785.40**

Appendix XII -TABLE 11

UNISYS CORI ION
FORMER REMINGTU.. .AND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 3 - Monitored Natural Attenuation

TCE Release Areas - Monitored Natural Attenuation
- Well construction for CALC or AALC compliance evaluation
- Conduct 15 years of MNA
- Prepare Final Remedial Action Report
- Conduct 2 years of quarterly GW monitoring (1 each for CM and PRM)
- No markup for remedial contractor or lab (contracted directly)
- 7% admin on other subs (driller, wetland scientist, surveyor)
- 5% admin on expenses/2% admin on labor
- Remedial work will take a total of 30 days (15 days for each set of injections)
- Contingency 20%

RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Subtotal	$ 10,057.20
Well Construction for CALC or AALC Compliance Evaluation	Drilling Contractor		$ 1,750.00	per day	x	3	days	=	$ 5,250.00		
									Sub-total	$ 5,250.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	12	hours	=	$ 1,080.00		
		Hydro II	$ 80.00	per hour	x	30	hours	=	$ 2,400.00		
		Hydro I	$ 70.00	per hour	x	30	hours	=	$ 2,100.00		
		Equip	$ 100.00	per day	x	3	days	=	$ 300.00		
		Expenses	$ 30.00	per day	x	3	days	=	$ 90.00		
									Sub-total	$ 6,375.00	
	Laboratory - Investigation										
		VOCs	$ 83.00	per sample	x	24	samples	=	$ 1,992.00		
									Sub-total	$ 1,992.00	
										Compliance Evaluation Subtotal	$ 13,617.00
GW Monitoring Plan	LBG - MNA Plan										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	24	hours	=	$ 3,120.00		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 6,466.80	
										GW Monitoring Plan Subtotal	$ 6,466.80

Appendix XII -TABLE 11

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 3 - Monitored Natural Attenuation

MNA Progress GW Monitoring	Laboratory - GW monitoring										
		VOCs	$ 83.00	per sample	x	240	samples	=	$ 19,920.00		
									Sub-total	$ 19,920.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	60	hours	=	$ 5,400.00		
		Hydro II	$ 80.00	per hour	x	308	hours	=	$ 24,640.00		
		Hydro I	$ 70.00	per hour	x	300	hours	=	$ 21,000.00		
		Equip & exp	$ 200.00	per event	x	30	events		$ 6,000.00		
									Sub-total	$ 58,932.00	
	LBG - Progress GW monitoring reporting										
		Principal	$ 140.00	per hour	x	60	hours	=	$ 8,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	120	hours	=	$ 10,800.00		
		Hydro II	$ 80.00	per hour	x	120	hours	=	$ 9,600.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	90	hours	=	$ 6,750.00		
		Clerical	$ 60.00	per hour	x	120	hours	=	$ 7,200.00		
									Sub-total	$ 43,605.00	
								Progress GW Monitoring & Reporting Sub-total			$ 122,457.00
GW Compliance and Post-Remediation Monitoring and reporting	Laboratory - GW monitoring										
		VOCs	$ 83.00	per sample	x	48	samples	=	$ 3,984.00		
									Sub-total	$ 3,984.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	80	hours	=	$ 5,600.00		
		Equip & exp	$ 200.00	per event	x	8	events		$ 1,600.00		
									Sub-total	$ 8,860.80	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	32	hours	=	$ 2,560.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	8	hours	=	$ 600.00		
		Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
									Sub-total	$ 7,711.20	
									GW Monitoring & Reporting Sub-total		$ 20,556.00
Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
		Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
		Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
		Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
									Sub-total	$ 19,747.20	
										FRAR Sub-total	$ 19,747.20
Contingency		Other	20%	of all other costs							$ 38,580.24
										TOTAL	$ 231,481.44

Appendix XII -TABLE 12

UNISYS COR ,TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 4 - Sub-Slab Depressurization System

TCE Release Areas - Sub-Slab Depressurization System

Collecting of soil vapor samples to determine the need for a SSDS
Assumes that concentration of CVOCs in soil vapor samples will exceed the proposed I/C SVVC
Construct SSDS for AEI No. 13 and AEI No. 21
Continue O&M of existing system for AEI No. 16
One conbined system for AEI No. 13 and 21
O&M for 5 years (includes electric, monthly O&M visits, annual sub-slab vacuum confirmation)
Separate electric service for Unisys
Prepare Progress Report
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Remedial work will take a total of 8 days
Contingency 20%

Pre-Remediation Investigation	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	6	hours	=	$ 780.00		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Equip	$ 100.00	per day	x	2	days	=	$ 200.00		
		Expenses	$ 30.00	per day	x	2	days	=	$ 60.00		
									Sub-total	$ 4,251.00	
	Laboratory - Investigation										
		VOCs	$ 250.00	per sample	x	6	samples	=	$ 1,500.00		
									Sub-total	$ 1,500.00	
									Pre-Remediation Investigation Subtotal		$ 5,751.00
RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
									RAP and HASP Subtotal		$ 10,057.20

Appendix XII -TABLE 12

UNISYS CORI .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 4 - Sub-Slab Depressurization System

Pilot Test and System Design	Remedial Action Contractor										
		Diagnostic test equipment	$ 1,000.00	day	x	2	days	=	$ 2,000.00		
		Construct suction points	$ 250.00	per point	x	2	pts	=	$ 500.00		
									Sub-total	$ 2,500.00	
	LBG - Pilot Test & System Design										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	24	hours	=	$ 3,120.00		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	18	hours	=	$ 1,260.00		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
		Equip	$ 100.00	per day	x	2	days	=	$ 200.00		
		Expenses	$ 30.00	per day	x	2	days	=	$ 60.00		
									Sub-total	$ 8,025.00	
										Final System Design Subtotal	$ 10,525.00
Contractor Procurement	LBG - Contractor Procurement										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 4,855.20	
										Contractor Procurement Sub-total	$ 4,855.20
Remedial Action	Remedial Action Contractor										
		Suction point construction	$ 250.00	per point	x	8	pts	=	$ 2,000.00		
		Piping	$ 15.00	/ft	x	1,420	ft	=	$ 21,300.00		
		Fan/Blower	$ 4,500.00	each	x	1	fans	=	$ 4,500.00		
		Valves and fittings	$ 300.00		x	10	points	=	$ 3,000.00		
		Separator Tank	$ 1,000.00		x	1		=	$ 1,000.00		
		Controls and instrumentation	$ 2,000.00		x	1		=	$ 2,000.00		
		Electrical	$ 6,000.00		x	1		=	$ 6,000.00		
		Shed	$ 2,500.00		x	1		=	$ 2,500.00		
		Concrete Pad	$ 1,500.00		x	1		=	$ 1,500.00		
		Contractor labor to install system components	$ 2,500.00		x	1		=	$ 2,500.00		
		Utility contractor							$ 15,000.00		
									Sub-total	$ 61,300.00	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	8	hours	=	$ 720.00		
		Hydro II	$ 80.00	per hour	x	72	hours	=	$ 5,760.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	8	days	=	$ 800.00		
		Expenses	$ 30.00	per day	x	8	days	=	$ 240.00		
									Sub-total	$ 10,394.40	
										Remedial Action Sub-total	$ 71,694.40

Appendix XII -TABLE 12

UNISYS COR ,TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TCE - GW Remedial Cost Estimate Alternative 4 - Sub-Slab Depressurization System

Operation and Maintenance	LBG - O&M									
		Principal	$ 140.00	per hour	x	40	hours	=	$ 5,600.00		
		Associate	$ 130.00	per hour	x	120	hours	=	$ 15,600.00		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	240	hours	=	$ 16,800.00		
		Equip	$ 100.00	per day	x	60	days	=	$ 6,000.00		
		Expenses	$ 30.00	per day	x	60	days	=	$ 1,800.00		
									Sub-total	$ 49,153.20	
	Electrical Service		$ 1,000.00	per month	x	60	months	=	$ 60,000.00		
									Sub-total	$ 64,200.00	
										O&M Sub-total	$ 113,353.20
Reporting	LBG - Report										
		Principal	$ 140.00	per hour	x	40	hours	=	$ 5,600.00		
		Associate	$ 130.00	per hour	x	80	hours	=	$ 10,400.00		
		Senior Hydro	$ 90.00	per hour	x	120	hours	=	$ 10,800.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	20	hours	=	$ 1,500.00		
		Clerical	$ 60.00	per hour	x	20	hours	=	$ 1,200.00		
									Sub-total	$ 30,090.00	
										Reporting Sub-total	$ 30,090.00
Contingency		Remedial Action	20%	of remedial contractor costs							$ 12,260.00
		Other	20%	of all other costs							$ 37,005.20
										TOTAL	**$ 295,591.20**

Appendix XII - TABLE 13

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Assumptions Used in Developing TCE Area Ground-Water Remedial Alternative Cost Estimates

Alternative	Assumptions	Approximate Cost
1 - High Vacuum Extraction	Permitting for system discharge Pilot test for system design Pre-remediation investigation for down-gradient water quality Trenches backfilled with excavated soil Utility contractor to install separate electric service Concrete pads for sheds (total 2) Steel cargo box remediation system sheds (total 2) Assumes 10 HVE wells for AEI No. 16 Assumes 6 HVE wells for AEI No. 13 Assumes 4 HVE wells for AEI No. 21 Two HVE systems (1 for AEI No. 16, 1 for AEI No. 13 and No. 21) Water treatment using liquid phase carbon O&M for 10 years (includes electric, bi-monthly O&M visits, monthly effluent samples, semi-annual influent screening) Prepare Final Remedial Action Report Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM) Remedial work will take a total of 26 days (5 days pilot test, 21 days construction) Contingency 20%	$ 1,223,984.88
2 - In-Situ Remedial Technology	Permitting for wetlands and injection Bench scale test for product selection Pre-remediation investigation for down-gradient water quality Injection via direct-push borings Assumes two injections of same product to achieve compliance Temporary pump and treat system for down-gradient hydraulic control for a period of 12 weeks after each injection event Operation and Maintenance of system for 12 weeks after each injection Three progress ground-water monitoring events after each injection Prepare Final Remedial Action Report Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM) Remedial work will take a total of 30 days (15 days for each set of injections) Contingency 20%	$ 528,785.40
3 - Monitored Natural Attenuation	Well construction for CALC or AALC compliance evaluation Conduct 15 years of MNA Prepare Final Remedial Action Report Conduct 2 years of quarterly GW monitoring (1 each for CM and PRM) Remedial work will take a total of 30 days (15 days for each set of injections) Contingency 20%	$ 231,481.44
4 - Sub-Slab Depressurization	Collecting of soil vapor samples to determine the need for a SSDS Assumes that concentration of CVOCs in soil vapor samples will exceed the proposed I/C SVVC Construct SSDS for AEI No. 13 and AEI No. 21 Continue O&M of existing system for AEI No. 16 One conbined system for AEI No. 13 and 21 O&M for 5 years (includes electric, monthly O&M visits, annual sub-slab vacuum confirmation) Separate electric service for Unisys Prepare Progress Report Remedial work will take a total of 8 days Contingency 20%	$ 295,591.20

Appendix XII -TABLE 14

UNISYS CORF ION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - Soil Remedial Cost Estimate Alternative 1 - Excavation and Offsite Disposal

TPH Release Areas - Excavation and off-site disposal of accessible impacted soil

- Wetland permitting (including wetlands flagging)
- Pre-remediation investigation to delineate impacted soil in AEI No. 3, No. 5, No. 8 and No. 12
- E&S controls consist of anti-tracking pad and silt fencing
- Excavate impacted soil outside the footprint of the building into the water table for off-site disposal
- Soil from to be disposed as non-hazardous CT-regulated waste per Veolia Environmental Services quote dated July 9, 2007
- Dewatering required to excavate soil in water table
- Fuel surcharge of 26% added to disposal costs per Veolia Environmental Services quote
- Quotes from local waste transporters and disposal facilities will be obtained during Contractor Procurement phase
- Backfill volume estimate assumes 30% compaction of soil.
- Backfill around existing building and driveway for structural concerns
- Backfill areas to original grade
- Construct ground-water monitoring wells down-gradient of AEI No. 12, AEI No. 5 and AEI No. 3
- Prepare Final Remedial Action Report
- Prepare and record ELUR (includes cost for surveyor and attorney in ELUR process) assumes City or the property owner at the time of the remediation will accept ELUR.
- Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)
- No markup for remedial contractor or lab (contracted directly)
- 7% admin on other subs (driller, wetland scientist, surveyor)
- 5% admin on expenses/2% admin on labor
- Remedial work will take a total of 9 days
- Contingency 20%

Variables	Suspect UST-5	Suspect UST-2 and Switching Station	UST-4	AST-2
Cubic yards of impacted soil (yd3)	1,111	741	59	37
Tons of impacted soil above water table (tons)	1,667	1,111	89	56
Perimeter of excavation (ft)	320	260	80	60
Surface area of disposal area (ft2)	6,000	4,000	400	200

Permitting	LBG - Permitting										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	6	hours	=	$ 420.00		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00		
									Sub-total	$ 6,120.00	
	Wetland Scientist								$ 2,500.00		
									Sub-total	$ 2,675.00	
										Permitting Sub-total	$ 8,795.00
RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Subtotal	$ 10,057.20

Appendix XII -TABLE 14

UNISYS COR\ /ION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - Soil Remedial Cost Estimate Alternative 1 - Excavation and Offsite Disposal

Pre-Remediation Investigation	Drilling Contractor		$ 1,750.00	per day	x	2	days	=	$ 3,500.00		
									Sub-total	$ 3,500.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00		
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -		
									Sub-total	$ 3,258.90	
	Laboratory - Investigation										
		VOCs	$ 65.00	per sample	x	12	samples	=	$ 780.00		
		ETPH	$ 65.00	per sample	x	40	samples	=	$ 2,600.00		
		Lead	$ 12.00	per sample	x	12	samples	=	$ 144.00		
		PAHs	$ 95.00	per sample	x	40	samples	=	$ 3,800.00		
									Sub-total	$ 7,324.00	
									Pre-Remediation Investigation Subtotal		$ 14,082.90
Contractor Procurement	LBG - Contractor Procurement										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 4,855.20	
									Contractor Procurement Sub-total		$ 4,855.20

Appendix XII -TABLE 14

UNISYS COR .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - Soil Remedial Cost Estimate Alternative 1 - Excavation and Offsite Disposal

Remedial Action	Remedial Action Contractor										
		E&S controls							$ 5,000.00		
		Excavation, screening & loading	$ 45.00	/yd3	x	1,948	yd3	=	$ 87,666.67		
		Hauling & disposal (regulated)	$ 182.65	/ton	x	2,922	tons	=	$ 533,743.89		
		Backfill	$ 15.00	/yd3	x	2,533	yd3	=	$ 37,988.89		
		Spread backfill	$ 10.00	/yd3	x	2,533	yd3	=	$ 25,325.93		
		Compact backfill	$ 5.00	/yd3	x	2,533	yd3	=	$ 12,662.96		
		Dewatering							$ 12,500.00		
		Restoration (seeding)							$ 5,000.00		
									Sub-total	$ 719,888.33	
	Laboratory - Remedial Action										
		Waste Profiling	$ 550.00	per sample	x	12	samples	=	$ 6,428.89		
		Clean soil Profiling	$ 550.00	per sample	x	10	samples	=	$ 5,571.70		
									Sub-total	$ 12,000.59	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	75	hours	=	$ 5,969.52		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	9	days	=	$ 900.00		
		Expenses	$ 30.00	per day	x	9	days	=	$ 270.00		
									Sub-total	$ 9,357.41	
										Remedial Action Sub-total	$ 741,246.34
ELUR	LBG - Prepare ELUR										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	20	hours	=	$ 2,600.00		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	10	hours	=	$ 800.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	2	hours	=	$ 150.00		
		Clerical	$ 60.00	per hour	x	3	hours	=	$ 180.00		
									Sub-total	$ 6,211.80	
	Surveyor (ELUR)								$ 6,000.00		
									Sub-total	$ 6,420.00	
	Attorney (ELUR)								$ 7,500.00		
									Sub-total	$ 7,500.00	
										ELUR Sub-total	$ 20,131.80

Appendix XII -TABLE 14

UNISYS CC ATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - Soil Remedial Cost Estimate Alternative 1 - Excavation and Offsite Disposal

Well construction	Driller (construct down-gradient monitoring wells for remediation monitoring)					6	wells		$ 2,407.50		
									Sub-total	$ 2,407.50	
	LBG - Drilling oversight, well development, survey										
		Principal	$ 140.00	per hour	x	1	hours	=	$ 140.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	8	hours	=	$ 720.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	30	hours	=	$ 2,100.00		
		Equip & exp	$ 200.00	per day	x	3	days	=	$ 600.00		
									Sub-total	$ 3,649.20	
										Well Construction Sub-total	$ 6,056.70
GW Monitoring and reporting	Laboratory - GW monitoring										
		VOCs	$ 83.00	per sample	x	12	samples	=	$ 996.00		
		Lead	$ 12.00	per sample	x	12	samples	=	$ 144.00		
		PAHs	$ 95.00	per sample	x	96	samples	=	$ 9,120.00		
									Sub-total	$ 10,260.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
		Equip & exp	$ 200.00	per event	x	12	events		$ 2,400.00		
									Sub-total	$ 13,291.20	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
		Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
									Sub-total	$ 11,566.80	
										GW Monitoring & Reporting Sub-total	$ 35,118.00
Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
		Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
		Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
		Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
									Sub-total	$ 19,747.20	
										FRAR Sub-total	$ 19,747.20
Contingency											
		Remedial Action and Disposal	20%	of remedial contractor costs							$ 143,977.67
		Other	20%	of all other costs							$ 28,040.40
										TOTAL	$ 1,032,108.41

Appendix XII -TABLE 15

UNISYS CO. ATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - Soil Remedial Cost Estimate Alternative 2 - Selective Excavation and Disposal

TPH Release Areas - Selective excavation and off-site disposal of impacted soil

Wetland permitting (including wetlands flagging)
Pre-remediation investigation to delineate impacted soil in AEI 3, No. 5, No. 8 and No. 12
E&S controls consist of anti-tracking pad and silt fencing
Excavate impacted soil outside the footprint of the building to the seasonal high water table for off-site disposal
Ground-water remedial technology potentially required to address impacted ground water and PMC exceedances
Soil from to be disposed as non-hazardous CT-regulated waste per Veolia Environmental Services quote dated July 9, 2007
Quotes from local waste transporters and disposal facilities will be obtained during Contractor Procurement phase
Fuel surcharge of 26% added to disposal costs per Veolia Environmental Services quote
Backfill volume estimate assumes 30% compaction of soil.
Backfill around existing building and driveway for structural concerns
Backfill areas to original grade
Construct 2 ground-water monitoring wells down-gradient of AEI No. 12
Prepare Final Remedial Action Report
Prepare and record ELUR (includes cost for surveyor and attorney in ELUR process) assumes City or the property owner at the time of the remediation will accept ELUR.
Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Remedial work will take a total of 7 days
Contingency 20%

Variables	Suspect UST-5	Suspect UST-2 and Switching Station	UST-4	AST-2
Cubic yards of impacted soil (yd3)	778	519	52	26
Tons of impacted soil above water table (tons)	1,167	778	78	39
Perimeter of excavation (ft)	320	260	80	60
Surface area of disposal area (ft2)	6,000	4,000	400	200

Permitting	LBG - Permitting											
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00			
		Associate	$ 130.00	per hour	x	0	hours	=	$ -			
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00			
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00			
		Hydro I	$ 70.00	per hour	x	6	hours	=	$ 420.00			
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00			
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00			
									Sub-total	$ 6,120.00		
	Wetland Scientist								$ 2,500.00			
									Sub-total	$ 2,675.00		
										Permitting Sub-total	$	8,795.00
RAP and HASP	LBG - RAP and HASP											
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00			
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00			
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00			
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00			
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -			
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00			
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00			
									Sub-total	$ 10,057.20		
										RAP and HASP Subtotal	$	10,057.20

Appendix XII -TABLE 15

UNISYS COR .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - Soil Remedial Cost Estimate Alternative 2 - Selective Excavation and Disposal

Pre-Remediation Investigation	Drilling Contractor		$ 1,750.00	per day	x	3	days	=	$ 5,250.00		
									Sub-total	$ 5,250.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	30	hours	=	$ 2,400.00		
		Hydro I	$ 70.00	per hour	x	20	hours	=	$ 1,400.00		
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00		
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -		
									Sub-total	$ 4,788.90	
	Laboratory - Investigation										
		VOCs	$ 65.00	per sample	x	12	samples	=	$ 780.00		
		ETPH	$ 65.00	per sample	x	40	samples	=	$ 2,600.00		
		Lead	$ 12.00	per sample	x	12	samples	=	$ 144.00		
		PAHs	$ 95.00	per sample	x	24	samples	=	$ 2,280.00		
									Sub-total	$ 5,804.00	
									Pre-Remediation Investigation Subtotal		$ 15,842.90
Contractor Procurement	LBG - Contractor Procurement										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 4,855.20	
									Contractor Procurement Sub-total		$ 4,855.20
Remedial Action	Remedial Action Contractor										
		E&S controls							$ 5,000.00		
		Excavation, screening & loading	$ 45.00	/yd3	x	1,374	yd3	=	$ 61,833.33		
		Hauling & disposal (regulated)	$ 182.65	/ton	x	2,061	tons	=	$ 376,461.94		
		Backfill	$ 15.00	/yd3	x	1,786	yd3	=	$ 26,794.44		
		Spread backfill	$ 10.00	/yd3	x	1,786	yd3	=	$ 17,862.96		
		Compact backfill	$ 5.00	/yd3	x	1,786	yd3	=	$ 8,931.48		
		Restoration (seeding)							$ 5,000.00		
									Sub-total	$ 501,884.17	
	Laboratory - Remedial Action										
		Waste Profiling	$ 550.00	per sample	x	8	samples	=	$ 4,534.44		
		Clean soil Profiling	$ 550.00	per sample	x	7	samples	=	$ 3,929.85		
									Sub-total	$ 8,464.30	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	56	hours	=	$ 4,493.33		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	7	days	=	$ 700.00		
		Expenses	$ 30.00	per day	x	7	days	=	$ 210.00		
									Sub-total	$ 7,578.70	
									Remedial Action Sub-total		$ 517,927.16

Appendix XII -TABLE 15

UNISYS CORI ⁄ION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - Soil Remedial Cost Estimate Alternative 2 - Selective Excavation and Disposal

ELUR	LBG - Prepare ELUR										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	20	hours	=	$ 2,600.00		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	10	hours	=	$ 800.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	2	hours	=	$ 150.00		
		Clerical	$ 60.00	per hour	x	3	hours	=	$ 180.00		
									Sub-total	$ 6,211.80	
	Surveyor (ELUR)								$ 6,000.00		
									Sub-total	$ 6,420.00	
	Attorney (ELUR)								$ 7,500.00		
									Sub-total	$ 7,500.00	
										ELUR Sub-total	$ 20,131.80
Well construction	Driller (construct down-gradient monitoring wells for remediation monitoring)					2	wells		$ 2,407.50		
									Sub-total	$ 2,407.50	
	LBG - Drilling oversight, well development, survey										
		Principal	$ 140.00	per hour	x	1	hours	=	$ 140.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	4	hours	=	$ 360.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Equip & exp	$ 200.00	per day	x	1	days	=	$ 200.00		
									Sub-total	$ 1,434.00	
										Well Construction Sub-total	$ 3,841.50
GW Monitoring and reporting	Laboratory - GW monitoring										
		VOCs	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		Lead	$ 12.00	per sample	x	24	samples	=	$ 288.00		
		PAHs	$ 95.00	per sample	x	96	samples	=	$ 9,120.00		
									Sub-total	$ 9,120.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
		Equip & exp	$ 200.00	per event	x	12	events		$ 2,400.00		
									Sub-total	$ 13,291.20	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
		Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
									Sub-total	$ 11,566.80	
										GW Monitoring & Reporting Sub-total	$ 33,978.00

Appendix XII -TABLE 15

UNISYS COR ATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - Soil Remedial Cost Estimate Alternative 2 - Selective Excavation and Disposal

Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
		Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
		Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
		Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
									Sub-total	$ 19,747.20	
										FRAR Sub-total	$ 19,747.20
Contingency											
		Remedial Action and Disposal	20%	of remedial contractor costs							$ 100,376.83
		Other	20%	of all other costs							$ 26,658.36
										TOTAL	$ 762,211.16

Appendix XII -TABLE 16

UNISYS CORP[illegible]ON
FORMER REMINGTO[illegible]RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - Soil Remedial Cost Estimate Alternative 3 - High Vacuum Extraction

TPH Release Areas - Hgh Vacuum Extraction

Pre-remediation investigation to delineate impacted soil in AEI No. 12 (Suspect UST-5)
Assumes HVE is selected for ground-water remedial action
Conduct a soil boring program to document compliance with soil criteria
Assumes ground-water monitoring conducted during ground-water remedial action
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Contingency 20%

Pre-Remediation Invvestigation	Drilling Contractor		$ 1,750.00	per day	x	2	days	=	$ 3,500.00		
									Sub-total	$ 3,500.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00		
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -		
									Sub-total	$ 3,258.90	
	Laboratory - Investigation										
		ETPH	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		PAHs	$ 95.00	per sample	x	24	samples	=	$ 2,280.00		
									Sub-total	$ 3,840.00	
									Pre-Remediation Investigation Subtotal		$ 10,598.90
Confirmation Soil Boring Program	Drilling Contractor		$ 1,750.00	per day	x	4	days	=	$ 7,000.00		
									Sub-total	$ 7,000.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00		
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -		
									Sub-total	$ 3,258.90	
	Laboratory - Investigation										
		ETPH	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		PAHs	$ 95.00	per sample	x	24	samples	=	$ 2,280.00		
									Sub-total	$ 3,840.00	
									Confirmation Soil Boring Program Subtotal		$ 14,098.90
Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	8	hours	=	$ 640.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	4	hours	=	$ 240.00		
									Sub-total	$ 3,978.00	
										FRAR Sub-total	$ 3,978.00
Continger		Other	20%	of all other costs							$ 5,735.16
										TOTAL	$ 34,410.96

Appendix XII - TABLE 17

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Assumptions Used in Developing TPH Area Soil Remedial Alternative Cost Estimates

Alternative	Assumptions	Approximate Cost
1 - Excavate and Offsite Disposal	Wetland permitting (including wetlands flagging)	$ 1,032,108.41
	Pre-remediation investigation to delineate impacted soil in AEI No. 3, No. 5, No. 8 and No. 12	
	E&S controls consist of anti-tracking pad and silt fencing	
	Excavate impacted soil outside the footprint of the building into the water table for off-site disposal (AEI No. 12 - 1,667 tons, No. 3 - 1,111 tons, No. 5 - 89 tons, and No. 8 - 56 tons)	
	Soil from to be disposed as non-hazardous CT-regulated waste per Veolia Environmental Services quote dated July 9, 2007	
	Dewatering required to excavate soil in water table	
	Fuel surcharge of 26% added to disposal costs per Veolia Environmental Services quote	
	Quotes from local waste transporters and disposal facilities will be obtained during Contractor Procurement phase	
	Backfill volume estimate assumes 30% compaction of soil.	
	Backfill around existing building and driveway for structural concerns	
	Backfill areas to original grade	
	Construct ground-water monitoring wells down-gradient of AEI No. 12, AEI No. 5 and AEI No. 3	
	Prepare Final Remedial Action Report	
	Prepare and record ELUR (includes cost for surveyor and attorney in ELUR process) assumes City or the property owner at the time of the remediation will accept ELUR.	
	Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)	
	Remedial work will take a total of 9 days	
	Contingency 20%	
2- Selective Excavation and Offsite Disposal	Wetland permitting (including wetlands flagging)	$ 762,211.16
	Pre-remediation investigation to delineate impacted soil in AEI No. 3, No. 5, No. 8, and No. 12	
	E&S controls consist of anti-tracking pad and silt fencing	
	Excavate impacted soil outside the footprint of the building to the seasonal high water table for off-site disposal (AEI No. 12 - 1,167 tons, No. 3 - 778 tons, No. 5 - 78 tons, and No. 8 - 39 tons)	
	Ground-water remedial technology potentially required to address impacted ground water and PMC exceedances	
	Soil from to be disposed as non-hazardous CT-regulated waste per Veolia Environmental Services quote dated July 9, 2007	
	Quotes from local waste transporters and disposal facilities will be obtained during Contractor Procurement phase	
	Fuel surcharge of 26% added to disposal costs per Veolia Environmental Services quote	
	Backfill volume estimate assumes 30% compaction of soil.	
	Backfill around existing building and driveway for structural concerns	
	Backfill areas to original grade	
	Construct 2 ground-water monitoring wells down-gradient of AEI No. 12	
	Prepare Final Remedial Action Report	
	Prepare and record ELUR (includes cost for surveyor and attorney in ELUR process) assumes City or the property owner at the time of the remediation will accept ELUR.	
	Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)	
	Remedial work will take a total of 7 days	
	Contingency 20%	
3 - High Vacuum Extraction	Pre-remediation investigation to delineate impacted soil in AEI No. 12 (Suspect UST-5)	$ 34,410.96
	Assumes HVE is selected for ground-water remedial action	
	Conduct a soil boring program to document compliance with soil criteria	
	Assumes ground-water monitoring conducted during ground-water remedial action	
	Contingency 20%	

Appendix XII -TABLE 18

UNISYS CORI .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 1 - High Vacuum Extraction

TPH Release Areas - High Vacuum Extraction Systems

- Permitting for wetlands and system discharge
- Pilot test for system design
- Pre-remediation investigation for down-gradient water quality
- Trenches backfilled with excavated soil
- Utility contractor to install separate electric service
- Concrete pads for shed
- Steel cargo box remediation system shed
- Assumes 6 HVE wells for AEI No. 12
- Assumes 2 HVE wells for AEI No. 3
- One HVE system for both AEI
- Water treatment using liquid-phase carbon
- O&M for 5 years (includes electric, bi-monthly O&M visits, monthly effluent samples, semi-annual influent screening)
- Prepare Final Remedial Action Report
- Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)
- No markup for remedial contractor or lab (contracted directly)
- 7% admin on other subs (driller, wetland scientist, surveyor)
- 5% admin on expenses/2% admin on labor
- Remedial work will take a total of 19 days (3 days pilot test, 16 days construction)
- Contingency 20%

Permitting	LBG - Permitting										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	12	hours	=	$ 1,560.00		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	6	hours	=	$ 420.00		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00		
									Sub-total	$ 7,711.20	
	Wetland Scientist								$ 2,500.00		
									Sub-total	$ 2,675.00	
										Permitting Sub-total	$ 10,386.20
RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Subtotal	$ 10,057.20

Appendix XII -TABLE 18

UNISYS COR. .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 1 - High Vacuum Extraction

Pilot Test	Drilling Contractor		$ 2,250.00	per day	x	1	days	=	$ 2,250.00			
									Sub-total	$ 2,407.50		
	Remedial Contractor - Pilot Test Equipment		$ 1,200.00	per day	x	2	days	=	$ 2,400.00			
									Sub-total	$ 2,568.00		
	LBG - Drilling Oversight & Pilot Test											
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00			
		Associate	$ 130.00	per hour	x	8	hours	=	$ 1,040.00			
		Senior Hydro	$ 90.00	per hour	x	8	hours	=	$ 720.00			
		Hydro II	$ 80.00	per hour	x	30	hours	=	$ 2,400.00			
		Hydro I	$ 70.00	per hour	x	40	hours	=	$ 2,800.00			
		Equip	$ 100.00	per day	x	3	days	=	$ 300.00			
		Expenses	$ 30.00	per day	x	3	days	=	$ 90.00			
									Sub-total	$ 8,068.20		
	Laboratory - Pilot Test Samples											
		VOCs	$ 65.00	per sample	x	4	samples	=	$ 260.00			
		TPH	$ 65.00	per sample	x	4	samples	=	$ 260.00			
		PAHs	$ 95.00	per sample	x	4	samples	=	$ 380.00			
									Sub-total	$ 900.00		
										Pilot Test Subtotal	$	13,943.70
Pre-Remediation Investigation	Drilling Contractor		$ 1,750.00	per day	x	2	days	=	$ 3,500.00			
									Sub-total	$ 3,500.00		
	LBG - Drilling Oversight											
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00			
		Associate	$ 130.00	per hour	x	0	hours	=	$ -			
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00			
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00			
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00			
		Drafting	$ 75.00	per hour	x	1	hours	=	$ 75.00			
		Clerical	$ 60.00	per hour	x	0	hours	=	$ -			
									Sub-total	$ 3,258.90		
	Laboratory - Investigation											
		PAHs	$ 95.00	per sample	x	4	samples	=	$ 380.00			
									Sub-total	$ 380.00		
									Pre-Remediation Investigation Subtotal		$	7,138.90
Final System Design	LBG - Final System Design											
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00			
		Associate	$ 130.00	per hour	x	24	hours	=	$ 3,120.00			
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00			
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -			
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -			
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00			
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00			
									Sub-total	$ 6,466.80		
										Final System Design Subtotal	$	6,466.80

Appendix XII -TABLE 18

UNISYS CO[illegible]ATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 1 - High Vacuum Extraction

Contractor Procurement	LBG - Contractor Procurement										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 4,855.20	
									Contractor Procurement Sub-total		$ 4,855.20
Remedial Action	Drilling Contractor		$ 2,250.00	per day	x	4	days	=	$ 9,000.00		
									Sub-total	$ 9,000.00	
	Remedial Action Contractor										
		Trenching and backfilling	$ 50.00	/ft	x	700	ft	=	$ 35,000.00		
		Piping	$ 15.00	/ft	x	700	ft	=	$ 10,500.00		
		Well head construction	$ 1,000.00	each	x	8	wells	=	$ 8,000.00		
		Liquid ring pump (accessories)	$ 25,000.00	each	x	1		=	$ 25,000.00		
		Valves and fittings	$ 10,000.00		x	1		=	$ 10,000.00		
		Tanks and pumps	$ 5,000.00		x	1		=	$ 5,000.00		
		Water treatment	$ 12,000.00		x	1		=	$ 12,000.00		
		Controls and instrumentation	$ 5,000.00		x	1		=	$ 5,000.00		
		Shed	$ 10,000.00		x	1		=	$ 10,000.00		
		Electrical	$ 5,000.00		x	1		=	$ 5,000.00		
		Concrete Pad	$ 2,500.00		x	1		=	$ 2,500.00		
		Connection to sanitary sewer	$ 3,000.00		x	1		=	$ 3,000.00		
		Contractor labor to install system components	$ 7,500.00		x	1		=	$ 7,500.00		
		Utility Contractor							$ 15,000.00		
									Sub-total	$ 153,500.00	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	160	hours	=	$ 12,800.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	16	days	=	$ 1,600.00		
		Expenses	$ 30.00	per day	x	16	days	=	$ 480.00		
									Sub-total	$ 19,972.80	
									Remedial Action Sub-total		$ 173,472.80

Appendix XII -TABLE 18

UNISYS COR. TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 1 - High Vacuum Extraction

Operation and Maintenance	LBG - O&M										
		Principal	$ 140.00	per hour	x	100	hours	=	$ 14,000.00		
		Associate	$ 130.00	per hour	x	200	hours	=	$ 26,000.00		
		Senior Hydro	$ 90.00	per hour	x	0	hours	=	$ -		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	480	hours	=	$ 33,600.00		
		Equip	$ 100.00	per day	x	120	days	=	$ 12,000.00		
		Expenses	$ 30.00	per day	x	120	days	=	$ 3,600.00		
									Sub-total	$ 90,984.00	
	Electrical Service		$ 1,600.00	per month	x	60	months	=	$ 96,000.00		
									Sub-total	$ 102,720.00	
	Laboratory - System monitoring										
		TPH	$ 65.00	per sample	x	70	samples	=	$ 4,550.00		
		VOCs	$ 83.00	per sample	x	70	samples	=	$ 5,810.00		
		Metals	$ 65.00	per sample	x	10	samples	=	$ 650.00		
		PAHs	$ 95.00	per sample	x	70	samples	=	$ 6,650.00		
									Sub-total	$ 17,660.00	
										O&M Sub-total	$ 211,364.00
Well construction	Driller (construct down-gradient monitoring wells for remediation monitoring)					6	wells		$ 7,222.50		
									Sub-total	$ 7,222.50	
	LBG - Drilling oversight, well development, survey										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	8	hours	=	$ 720.00		
		Hydro II	$ 80.00	per hour	x	12	hours	=	$ 960.00		
		Hydro I	$ 70.00	per hour	x	48	hours	=	$ 3,360.00		
		Equip & exp	$ 200.00	per day	x	3	days	=	$ 600.00		
									Sub-total	$ 6,056.40	
										Well Construction Sub-total	$ 13,278.90

Appendix XII -TABLE 18

UNISYS CO[illegible]TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 1 - High Vacuum Extraction

Section	Task	Item	Rate	Unit		Qty	Units		Cost	Sub-total	Total
GW Monitoring and reporting	Laboratory - GW monitoring										
		VOCs	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		PAHs	$ 95.00	per sample	x	72	samples	=	$ 6,840.00		
									Sub-total	$ 8,400.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
		Equip & exp	$ 200.00	per event	x	12	events		$ 2,400.00		
									Sub-total	$ 13,291.20	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
		Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
									Sub-total	$ 11,566.80	
									GW Monitoring & Reporting Sub-total		$ 33,258.00
Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
		Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
		Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
		Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
									Sub-total	$ 19,747.20	
										FRAR Sub-total	$ 19,747.20
Contingency											
		Remedial Action	20%	of remedial contractor costs							$ 30,700.00
		Other	20%	of all other costs							$ 70,093.78
										TOTAL	**$ 604,762.68**

Appendix XII -TABLE 19

UNISYS CO[illegible]TION
FORMER REMING[illegible] RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 2 - In-Situ Bioremediation

TPH Release Areas - In-Situ Bioremediation

Permitting for wetlands and injection
Pre-remediation investigation for down-gradient water quality
Injection via direct-push borings
Temporary pump and treat system for down-gradient hydraulic control for a period of 12 weeks after each injection event
Assumes two injections of same product to achieve compliance
Three progress ground-water monitoring events after each injection
Operation and Maintenance of system for 12 weeks after each injection
Prepare Final Remedial Action Report
Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Remedial work will take a total of 30 days (15 days for each set of injections)
Contingency 20%

Permitting	LBG - Permitting										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	40	hours	=	$ 5,200.00		
		Senior Hydro	$ 90.00	per hour	x	20	hours	=	$ 1,800.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	6	hours	=	$ 420.00		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00		
									Sub-total	$ 11,424.00	
	Wetland Scientist								$ 2,500.00		
									Sub-total	$ 2,675.00	
										Permitting Sub-total	$ 14,099.00
RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Subtotal	$ 10,057.20

Appendix XII -TABLE 19

UNISYS COR[illegible]ION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 2 - In-Situ Bioremediation

Pre-Remediation Invvestigation	Drilling Contractor		$ 1,750.00	per day	x	2	days	=	$ 3,500.00		
									Sub-total	$ 3,500.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	6	hours	=	$ 540.00		
		Hydro II	$ 80.00	per hour	x	20	hours	=	$ 1,600.00		
		Hydro I	$ 70.00	per hour	x	10	hours	=	$ 700.00		
		Equip	$ 100.00	per day	x	2	days	=	$ 200.00		
		Expenses	$ 30.00	per day	x	2	days	=	$ 60.00		
									Sub-total	$ 3,447.60	
	Laboratory - Investigation										
		PAHs	$ 95.00	per sample	x	24	samples	=	$ 2,280.00		
									Sub-total	$ 2,280.00	
									Pre-Remediation Investigation Subtotal		$ 9,227.60
Final Injection Design	LBG - Injection Design										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	24	hours	=	$ 3,120.00		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 6,466.80	
									Final Injection Design Subtotal		$ 6,466.80
Contractor Procurement	LBG - Contractor Procurement										
		Principal	$ 140.00	per hour	x	10	hours	=	$ 1,400.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	30	hours	=	$ 2,700.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 4,855.20	
									Contractor Procurement Sub-total		$ 4,855.20
Remedial Action	Injection Contractor										
		Equipment & labor (2 injections)	$ 5,000.00	per day	x	30	days	=	$ 150,000.00		
		Injection Product	$ 3,500.00		x	2		=	$ 7,000.00		
									Sub-total	$ 157,000.00	
	Remedial Action Contractor										
		Temporary P&T System	$ 1,500.00	per week	x	24	weeks	=	$ 36,000.00		
		Temporary Power	$ 250.00	per week	x	24	weeks	=	$ 6,000.00		
									Sub-total	$ 42,000.00	
	LBG - Remedial Action Oversight										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	32	hours	=	$ 2,880.00		
		Hydro II	$ 80.00	per hour	x	270	hours	=	$ 21,600.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Equip	$ 100.00	per day	x	30	days	=	$ 3,000.00		
		Expenses	$ 30.00	per day	x	30	days	=	$ 900.00		
									Sub-total	$ 32,328.60	
									Remedial Action Sub-total		$ 231,328.60

Appendix XII -TABLE 19

UNISYS CO[illegible]TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 2 - In-Situ Bioremediation

Operation and Maintenance	LBG - O&M										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	24	hours	=	$ 3,120.00		
		Senior Hydro	$ 90.00	per hour	x	32	hours	=	$ 2,880.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	96	hours	=	$ 6,720.00		
		Equip	$ 100.00	per day	x	12	days	=	$ 1,200.00		
		Expenses	$ 30.00	per day	x	12	days	=	$ 360.00		
									Sub-total	$ 15,708.00	
	Laboratory - Temporary System Effluent										
		TPH	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		VOCs	$ 83.00	per sample	x	24	samples	=	$ 1,992.00		
		Metals	$ 65.00	per sample	x	24	samples	=	$ 1,560.00		
		PAHs	$ 95.00	per sample	x	24	samples	=	$ 2,280.00		
									Sub-total	$ 7,392.00	
										O&M Sub-total	$ 23,100.00
Progress GW Monitoring	Laboratory - GW monitoring										
		PAHs	$ 95.00	per sample	x	24	samples	=	$ 2,280.00		
									Sub-total	$ 2,280.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	68	hours	=	$ 5,440.00		
		Hydro I	$ 70.00	per hour	x	60	hours	=	$ 4,200.00		
		Equip & exp	$ 200.00	per event	x	6	events		$ 1,200.00		
									Sub-total	$ 13,867.20	
	LBG - Progress GW monitoring reporting										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	8	hours	=	$ 480.00		
									Sub-total	$ 5,446.80	
									Progress GW Monitoring & Reporting Sub-total		$ 21,594.00

Appendix XII -TABLE 19

UNISYS CO[illegible]TION
FORMER REMING[illegible]RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 2 - In-Situ Bioremediation

Well construction	Driller (construct down-gradient monitoring wells for remediation monitoring)					6	wells		$ 7,222.50		
									Sub-total	$ 7,222.50	
	LBG - Drilling oversight, well development, survey										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	8	hours	=	$ 720.00		
		Hydro II	$ 80.00	per hour	x	12	hours	=	$ 960.00		
		Hydro I	$ 70.00	per hour	x	48	hours	=	$ 3,360.00		
		Equip & exp	$ 200.00	per day	x	3	days	=	$ 600.00		
									Sub-total	$ 6,056.40	
										Well Construction Sub-total	$ 13,278.90
GW Monitoring and reporting	Laboratory - GW monitoring										
		PAHs	$ 95.00	per sample	x	72	samples	=	$ 6,840.00		
									Sub-total	$ 6,840.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	120	hours	=	$ 8,400.00		
		Equip & exp	$ 200.00	per event	x	12	events		$ 2,400.00		
									Sub-total	$ 13,291.20	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
		Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
									Sub-total	$ 11,566.80	
										GW Monitoring & Reporting Sub-total	$ 31,698.00
Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
		Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
		Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
		Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
									Sub-total	$ 19,747.20	
										FRAR Sub-total	$ 19,747.20
Contingency		Remedial Action	20%	of remedial contractor costs							$ 39,800.00
		Other	20%	of all other costs							$ 37,290.50
										TOTAL	**$ 462,543.00**

Appendix XII -TABLE 20

UNISYS COI ATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 3 - Monitored Natural Attenuation

TPH Release Areas - Monitored Natural Attenuation

Construct wells for CALC or AALC compliance evaluation
Conduct 8 years of MNA
Prepare Final Remedial Action Report
Conduct 2 years of quarterly GW monitoring (1 each for CM and PRM)
No markup for remedial contractor or lab (contracted directly)
7% admin on other subs (driller, wetland scientist, surveyor)
5% admin on expenses/2% admin on labor
Contingency 20%

RAP and HASP	LBG - RAP and HASP										
		Principal	$ 140.00	per hour	x	16	hours	=	$ 2,240.00		
		Associate	$ 130.00	per hour	x	16	hours	=	$ 2,080.00		
		Senior Hydro	$ 90.00	per hour	x	40	hours	=	$ 3,600.00		
		Hydro II	$ 80.00	per hour	x	16	hours	=	$ 1,280.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 10,057.20	
										RAP and HASP Subtotal	$ 10,057.20
Well Construction for CALC and AALC compliance evaluation	Drilling Contractor		$ 1,750.00	per day	x	3	days	=	$ 5,250.00		
									Sub-total	$ 5,250.00	
	LBG - Drilling Oversight										
		Principal	$ 140.00	per hour	x	2	hours	=	$ 280.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	12	hours	=	$ 1,080.00		
		Hydro II	$ 80.00	per hour	x	30	hours	=	$ 2,400.00		
		Hydro I	$ 70.00	per hour	x	30	hours	=	$ 2,100.00		
		Equip	$ 100.00	per day	x	3	days	=	$ 300.00		
		Expenses	$ 30.00	per day	x	3	days	=	$ 90.00		
									Sub-total	$ 6,375.00	
	Laboratory - Investigation										
		PAHs	$ 95.00	per sample	x	21	samples	=	$ 1,995.00		
									Sub-total	$ 1,995.00	
										Compliance Evaluation Subtotal	$ 13,620.00

Appendix XII -TABLE 20

UNISYS COR .TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 3 - Monitored Natural Attenuation

GW Monitoring Plan	LBG - Prepare Plan										
		Principal	$ 140.00	per hour	x	8	hours	=	$ 1,120.00		
		Associate	$ 130.00	per hour	x	24	hours	=	$ 3,120.00		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	4	hours	=	$ 300.00		
		Clerical	$ 60.00	per hour	x	6	hours	=	$ 360.00		
									Sub-total	$ 6,466.80	
										GW Monitoring Plan Subtotal	$ 6,466.80
MNA Progress GW Monitoring	Laboratory - GW monitoring										
		PAHs	$ 95.00	per sample	x	96	samples	=	$ 9,120.00		
									Sub-total	$ 9,120.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	4	hours	=	$ 560.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	32	hours	=	$ 2,880.00		
		Hydro II	$ 80.00	per hour	x	168	hours	=	$ 13,440.00		
		Hydro I	$ 70.00	per hour	x	160	hours	=	$ 11,200.00		
		Equip & exp	$ 200.00	per event	x	16	events		$ 3,200.00		
									Sub-total	$ 32,001.60	
	LBG - Progress GW monitoring reporting										
		Principal	$ 140.00	per hour	x	32	hours	=	$ 4,480.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	64	hours	=	$ 5,760.00		
		Hydro II	$ 80.00	per hour	x	64	hours	=	$ 5,120.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	48	hours	=	$ 3,600.00		
		Clerical	$ 60.00	per hour	x	64	hours	=	$ 3,840.00		
									Sub-total	$ 23,256.00	
										Progress GW Monitoring & Reporting Sub-total	$ 64,377.60

Appendix XII -TABLE 20

UNISYS CORI TION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

TPH - GW Remedial Cost Estimate Alternative 3 - Monitored Natural Attenuation

GW Compliance and Post-Remediation Monitoring and reporting	Laboratory - GW monitoring										
		PAHs	$ 95.00	per sample	x	48	samples	=	$ 4,560.00		
									Sub-total	$ 4,560.00	
	LBG - Quarterly GW monitoring										
		Principal	$ 140.00	per hour	x	0	hours	=	$ -		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	16	hours	=	$ 1,440.00		
		Hydro II	$ 80.00	per hour	x	0	hours	=	$ -		
		Hydro I	$ 70.00	per hour	x	80	hours	=	$ 5,600.00		
		Equip & exp	$ 200.00	per event	x	8	events		$ 1,600.00		
									Sub-total	$ 8,860.80	
	LBG - Quarterly GW monitoring reporting										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	0	hours	=	$ -		
		Senior Hydro	$ 90.00	per hour	x	24	hours	=	$ 2,160.00		
		Hydro II	$ 80.00	per hour	x	48	hours	=	$ 3,840.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	12	hours	=	$ 900.00		
		Clerical	$ 60.00	per hour	x	18	hours	=	$ 1,080.00		
									Sub-total	$ 11,566.80	
									GW Monitoring & Reporting Sub-total		$ 24,987.60
Final Remedial Action Report	LBG - Final Remedial Action Report										
		Principal	$ 140.00	per hour	x	24	hours	=	$ 3,360.00		
		Associate	$ 130.00	per hour	x	48	hours	=	$ 6,240.00		
		Senior Hydro	$ 90.00	per hour	x	48	hours	=	$ 4,320.00		
		Hydro II	$ 80.00	per hour	x	44	hours	=	$ 3,520.00		
		Hydro I	$ 70.00	per hour	x	0	hours	=	$ -		
		Drafting	$ 75.00	per hour	x	16	hours	=	$ 1,200.00		
		Clerical	$ 60.00	per hour	x	12	hours	=	$ 720.00		
									Sub-total	$ 19,747.20	
										FRAR Sub-total	$ 19,747.20
Continger											
		Other	20%	of all other costs							$ 27,851.28
										TOTAL	$ 167,107.68

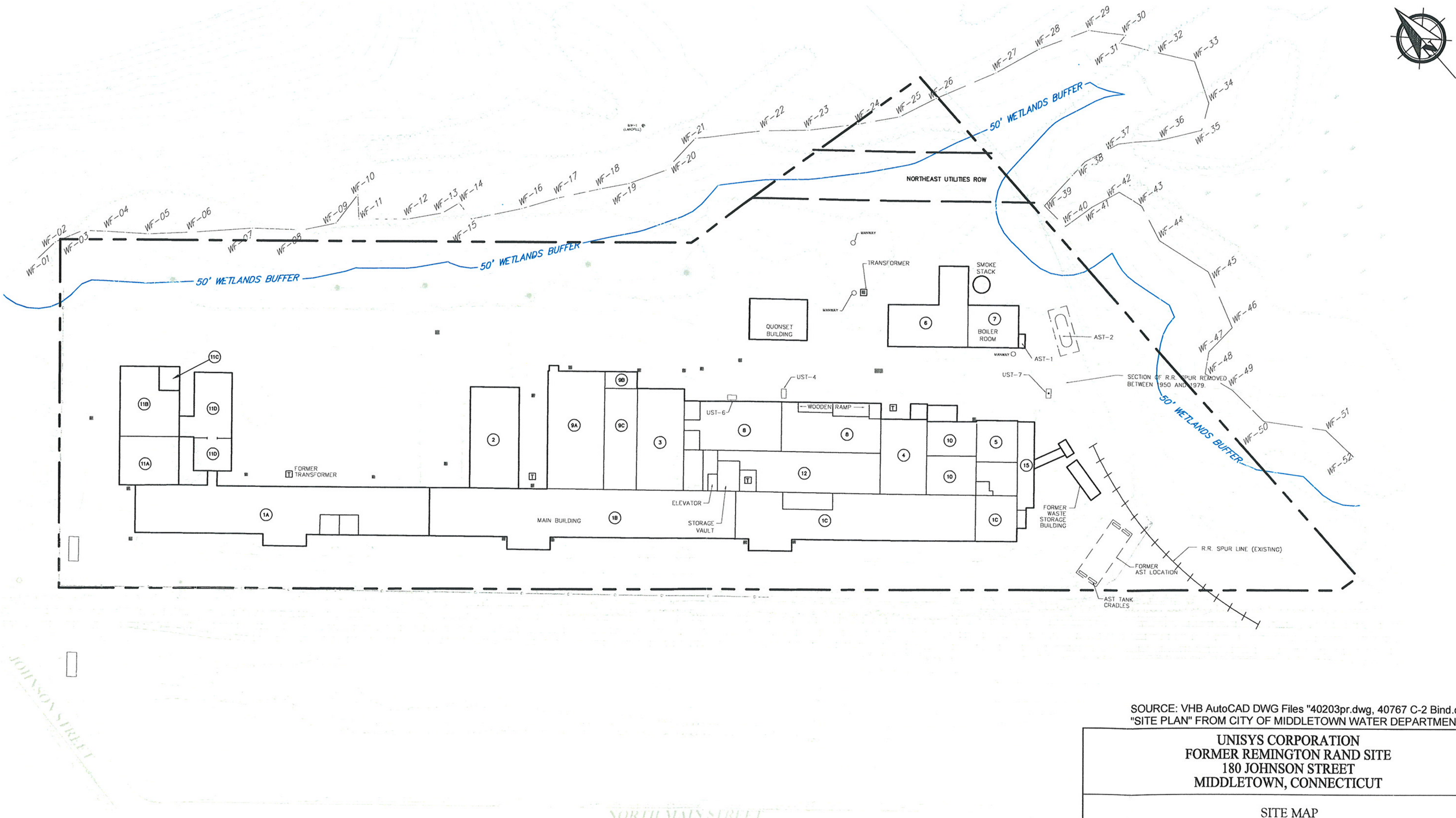
Appendix XII - TABLE 21

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

Summary of Assumptions Used in Developing TPH Area Ground-Water Remedial Alternative Cost Estimates

Alternative	Assumptions	Approximate Cost
1 - High Vacuum Extraction	Permitting for wetlands and system discharge	$ 604,762.68
	Pilot test for system design	
	Pre-remediation investigation for down-gradient water quality	
	Trenches backfilled with excavated soil	
	Utility contractor to install separate electric service	
	Concrete pads for shed	
	Steel cargo box remediation system shed	
	Assumes 6 HVE wells for AEI No. 12	
	Assumes 2 HVE wells for AEI No. 3	
	One HVE system for both AEI	
	Water treatment using shallow tray air stripper	
	O&M for 5 years (includes electric, bi-monthly O&M visits, monthly effluent samples, semi-annual influent screening)	
	Prepare Final Remedial Action Report	
	Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)	
	Remedial work will take a total of 19 days (3 days pilot test, 16 days construction)	
	Contingency 20%	
2 - In-Situ Bioremediation	Permitting for wetlands and injection	$ 462,543.00
	Pre-remediation investigation for down-gradient water quality	
	Injection via direct-push borings	
	Temporary pump and treat system for down-gradient hydraulic control for a period of 12 weeks after each injection event	
	Assumes two injections of same product to achieve compliance	
	Three progress ground-water monitoring events after each injection	
	Operation and Maintenance of system for 12 weeks after each injection	
	Prepare Final Remedial Action Report	
	Conduct 3 years of quarterly GW monitoring (1 each for MNA, CM and PRM)	
	Remedial work will take a total of 30 days (15 days for each set of injections)	
	Contingency 20%	
3 - Monitored Natural Attenuation	Construct wells for CALC or AALC compliance evaluation	$ 167,107.68
	Conduct 8 years of MNA	
	Prepare Final Remedial Action Report	
	Conduct 2 years of quarterly GW monitoring (1 each for CM and PRM)	
	Contingency 20%	

PLATES



SOURCE: VHB AutoCAD DWG Files "40203pr.dwg, 40767 C-2 Bind.dwg". "SITE PLAN" FROM CITY OF MIDDLETOWN WATER DEPARTMENT.

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

SITE MAP

DATE	REVISED	PREPARED BY:
		LEGGETTE, BRASHEARS & GRAHAM, INC. Professional Ground-Water and Environmental Engineering Services 4 Research Drive Suite 301 Shelton, Connecticut 06484 (203) 929-8555

DRAWN: RAC | CHECKED: JZ | DATE: 09/04/08 | FIGURE: 2

0 100
SCALE IN FEET

LEGEND

- CATCH BASIN
- BUILDING NUMBER
- FENCE
- RAILROAD
- TRANSFORMER
- PROPERTY LINE
- WETLAND BOUNDARY

Site Map, 9/.. 4:10:26 PM

SOURCES: VHB AutoCAD DWG Files "40203pr.dwg, 40767 C-2 Bind.dwg".
SOIL SCIENCE AND ENVIRONMENTAL SERVICES,
PHASE 1, APRIL 6, 1993.
SANBORNS 1901, 1907, 1913, 1924, 1950
"SITE PLAN" FROM CITY OF MIDDLETOWN WATER DEPARTMENT.

LEGEND

- PRE-1900
- PRE-1924
- 1926
- 1934
- 1935
- PRE-1950
- FORMER OUTBUILDINGS WITH DATES AS NOTED

0 100
SCALE IN FEET

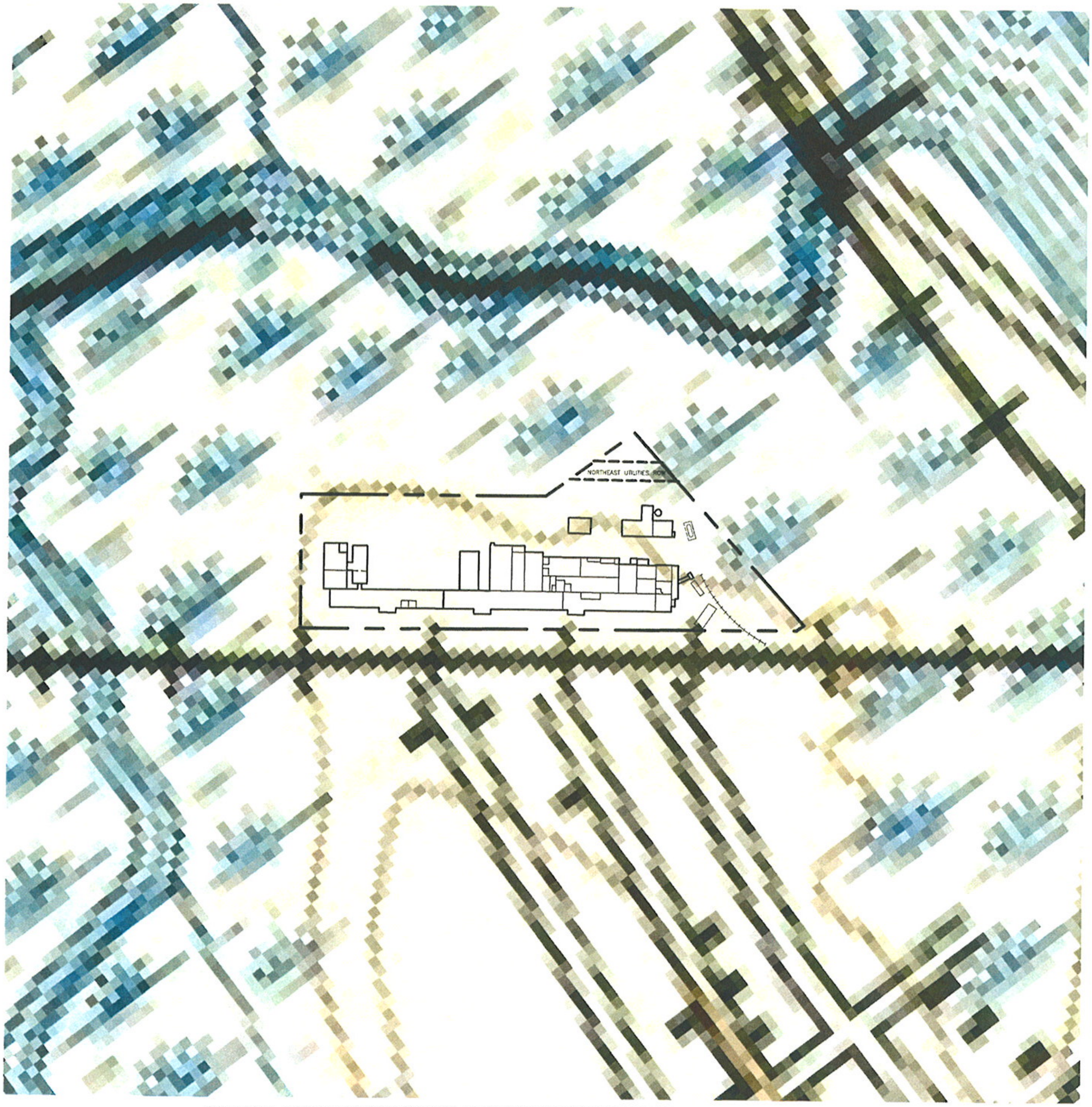
UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

SITE BUILDING HISTORY

DATE	REVISED	PREPARED BY: LEGGETTE, BRASHEARS & GRAHAM, INC. Professional Ground-Water and Environmental Engineering Services 4 Research Drive Suite 301 Shelton, Connecticut 06484 (203) 929-8555

DRAWN:	RAC	CHECKED:	JZ	DATE:	09/04/08	FIGURE:	3

Building Hi... /30/2008 4:09:41 PM



SOURCE: USGS TOPOGRAPHIC QUADRANGLE MIDDLETOWN, CONNECTICUT (1893), VHB AutoCAD DWG Files "40203pr.dwg" AND "SITE PLAN" FROM CITY OF MIDDLETOWN WATER DEPARTMENT.

NOTE: PROPERTY LINE AND SITE BUILDINGS AND FEATURES ARE DEPICTED AT THEIR APPROXIMATE PRESENT LOCATIONS.

0 400

SCALE IN FEET

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

1893 USGS TOPOGRAPHIC MAP

DATE	REVISED	PREPARED BY:
		LEGGETTE, BRASHEARS & GRAHAM, INC.
		Professional Ground-Water and Environmental Engineering Services
		4 Research Drive Suite 301 Shelton, Connecticut 06484 (203) 929-8555

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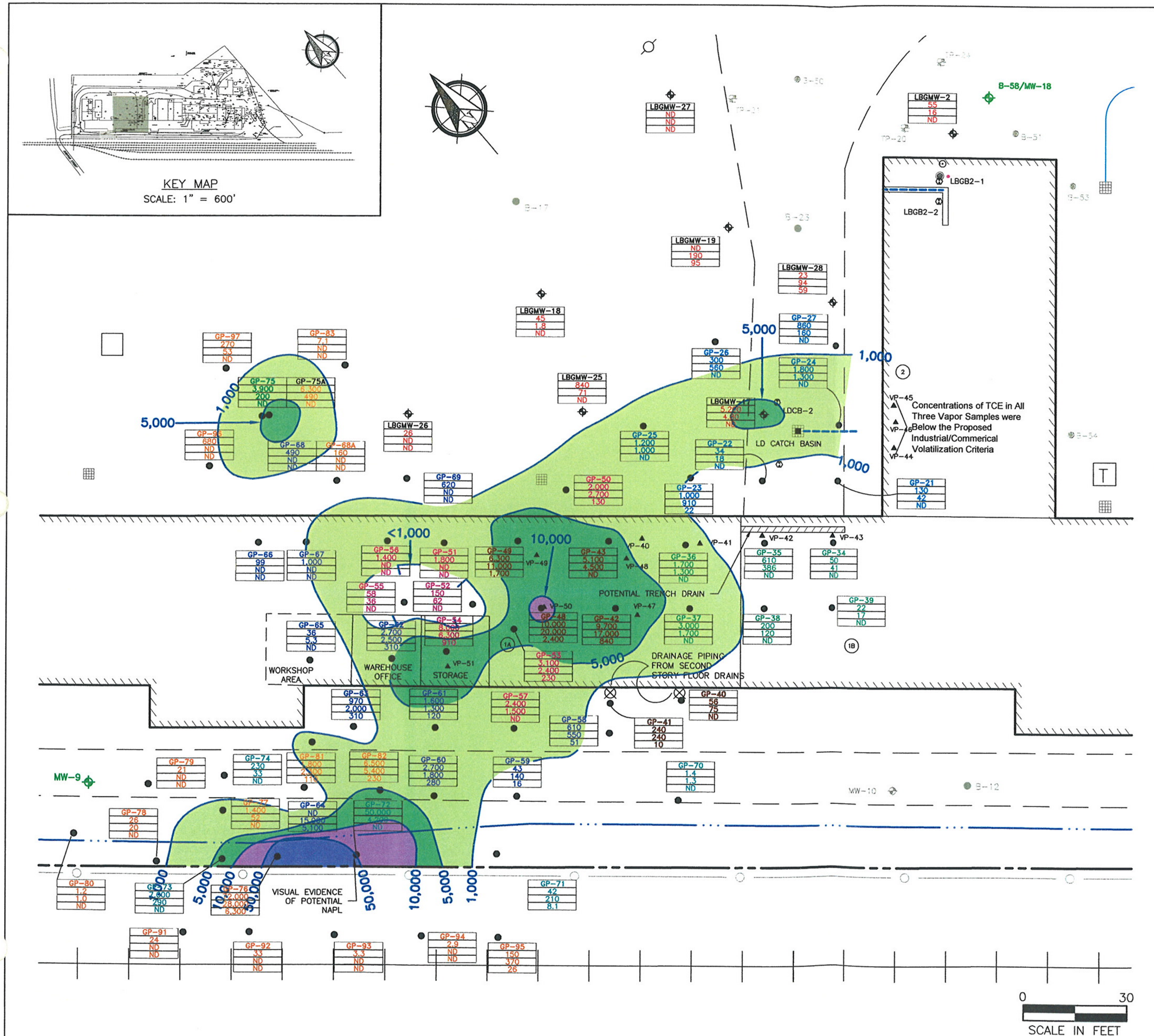

LEGEND

(2)	BUILDING NUMBER
	EXTENT OF PAVED AREA
	PROPERTY BOUNDARY
	FENCE
	APPROXIMATE LOCATION OF EXISTING WATER LINE
	CATCH BASIN
	POTENTIAL UNDERGROUND PIPE CHASE (LOCATED BY GPR)
LBGMW-30	LBG MONITORING WELL LOCATION
B-58/MW-18	VHB MONITORING WELL LOCATION (NOT LOCATED OR DAMAGED)
LDCB-2	LBG BORING LOCATION
VP-40	LBG SOIL-VAPOR SAMPLING LOCATION
	LBG GEOPROBE® BORING LOCATION
LD CATCH BASIN	LBG HAND-AUGER LOCATION
1,000	TCE CONCENTRATION CONTOUR IN MICROGRAMS PER LITER (ug/l) (DASHED WHERE INFERRED)

LBGMW-17	SAMPLE ID
5,200	TRICHLOROETHYLENE
4,800	CIS-1,2 DICHLOROETHENE
ND	VINYL CHLORIDE

CONCENTRATIONS OF VOCs IN GROUND-WATER SAMPLES IN MICROGRAMS PER LITER (ug/l)

1,800	SAMPLES COLLECTED JUNE 24, 2004
5,200	SAMPLES COLLECTED NOVEMBER 29, 2004
3,000	SAMPLES COLLECTED NOVEMBER 24, 2004
5,100	SAMPLES COLLECTED MARCH 17, 2005
1,800	SAMPLES COLLECTED AUGUST 1 AND 3, 2005
1,600	SAMPLES COLLECTED MARCH 7 AND 8, 2006
7,000	SAMPLES COLLECTED JULY 12, 2006
7,200	SAMPLES COLLECTED APRIL 2 – 6, 2007

SOURCE: VHB AutoCAD DWG Files "40203pr.dwg, 40767 C-2 Bind.dwg".

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

ISOCONCENTRATION MAP OF TRICHOLORETHYLENE (TCE) IN GROUND-WATER BENEATH AND ADJACENT TO BUILDINGS 1A AND 1B AND BENEATH CTDOT PROPERTY

DATE	REVISED

PREPARED BY: LEGGETTE, BRASHEARS & GRAHAM, INC.
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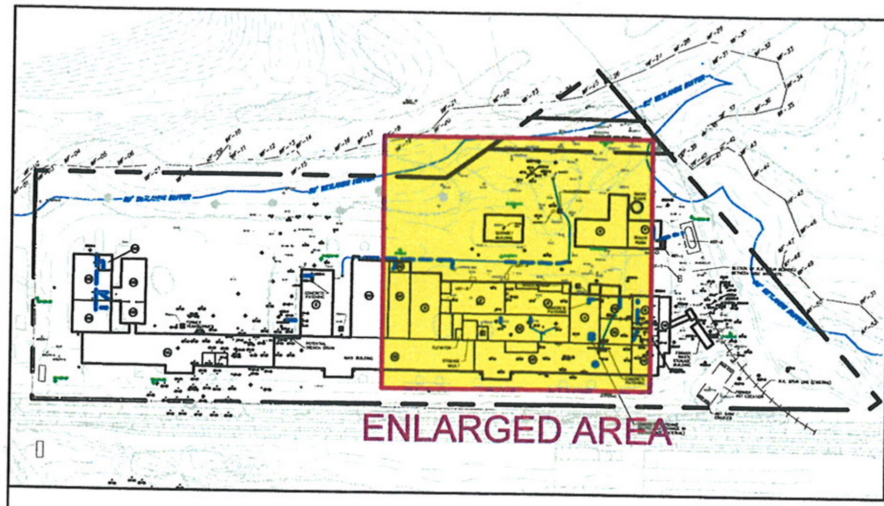

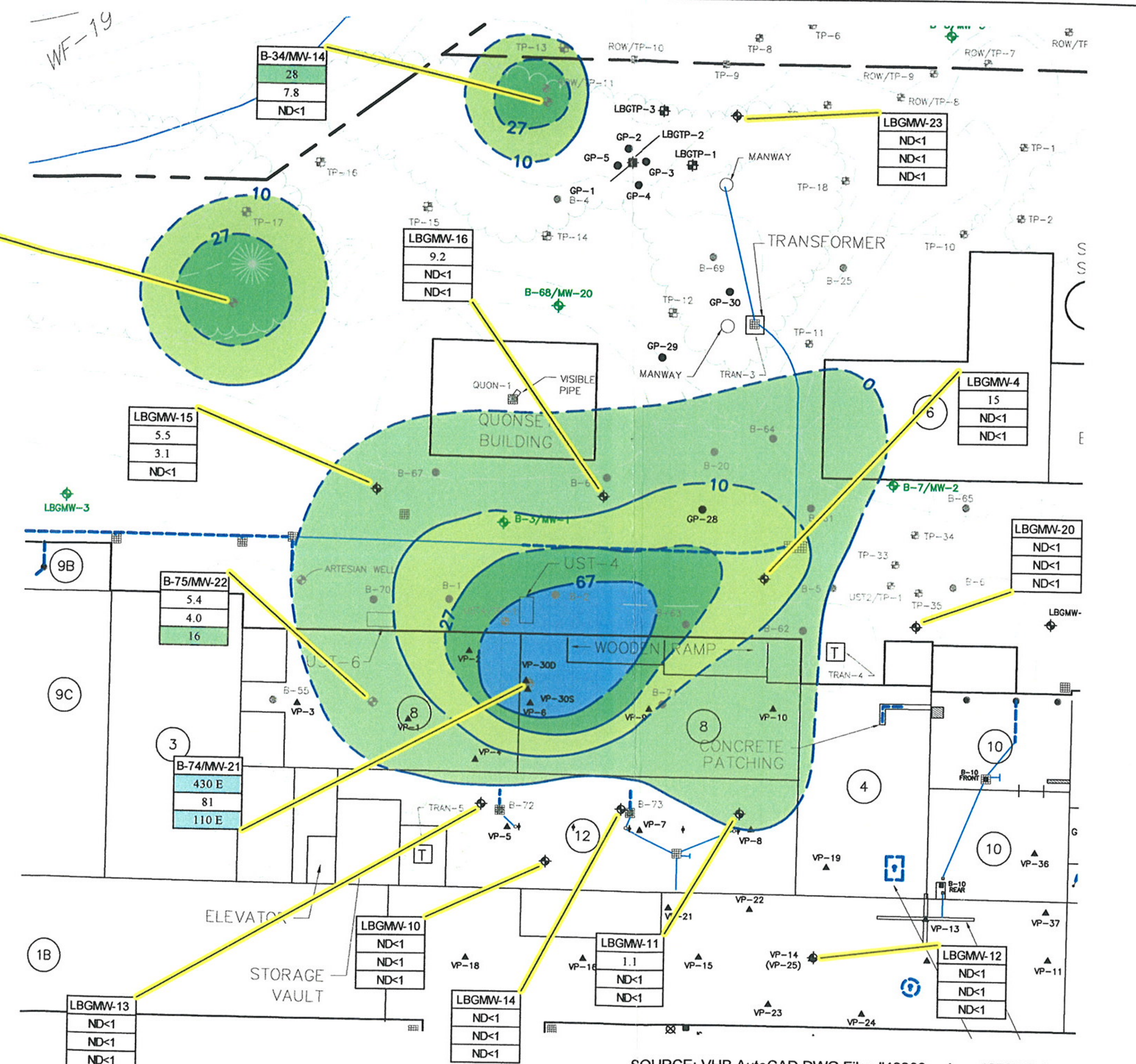

LEGEND

LBGMW-13	WELL ID
ND<1	TRICHLOROETHYLENE *
ND<1	CIS-1,2 DICHLOROETHENE *
ND<1	VINYL CHLORIDE *
(green)	EXCEEDS THE RESIDENTIAL GROUND WATER VOLATILIZATION CRITERIA
(blue)	EXCEEDS THE RESIDENTIAL AND INDUSTRIAL/COMMERCIAL GROUND WATER VOLATILIZATION CRITERIA AND ALTERNATIVE AQUATIC LIFE CRITERIA
67 — —	TCE CONCENTRATION CONTOUR IN MICROGRAMS PER LITER (ug/L) (DASHED WHERE INFERRED)
E	ESTIMATED RESULT, DETECTED CONCENTRATION EXCEEDS CALIBRATION RANGE.
ND>1	LESS THAN LABORATORY REPORTING LIMIT, AS INDICATED
B-55	VHB BORING LOCATION
B74/MW-21	VHB MONITORING WELL LOCATION
TP-33	VHB TEST PIT LOCATION
	DRAINAGE PIPING FROM SECOND STORY FLOOR DRAIN
LBGMW-3	LBG MONITORING WELL LOCATION
LBGTP-3	LBG TEST PIT LOCATION
VP-35	LBG SOIL-VAPOR SAMPLING LOCATION
GP-4	LBG GEOPROBE BORING
B-10 FRONT	LBG HAND AUGER LOCATION
LBGMW-3	MONITORING WELL LOCATION (NOT LOCATED OR DAMAGED)
	POTENTIAL UNDERGROUND PIPE CHASE (LOCATED BY GPR)
	CONFIRMED UNDERGROUND PIPE CHASE (LOCATED BY BEACON TRACING)
	UNKNOWN ANOMALY DETECTED BY GPR
	CATCH BASIN
T	TRANSFORMER
1B	BUILDING NUMBER
	SUPPORT BEAM
	FLOOR DRAIN
	PIPE EXITING THROUGH FLOOR
	SMALL HOLE
	DRAIN PIPE
	PROPERTY LINE
	METAL PLATE

* CONCENTRATIONS OF DETECTED CONSTITUENTS IN MICROGRAMS PER LITER (ug/L)

SOURCE: VHB AutoCAD DWG Files "40203pr.dwg, 40767 C-2 Bind.dwg".
"SITE PLAN" FROM CITY OF MIDDLETOWN WATER DEPARTMENT.

0 50
SCALE IN FEET

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

ISOCONCENTRATION MAP OF TRICHLOROETHYLENE (TCE) IN GROUND-WATER
AEI No. 13: SOLVENT RELEASE AREA - SAMPLES COLLECTED MAY 1-3, 2007

DATE	REVISED

PREPARED BY: LEGGETTE, BRASHEARS & GRAHAM, INC.
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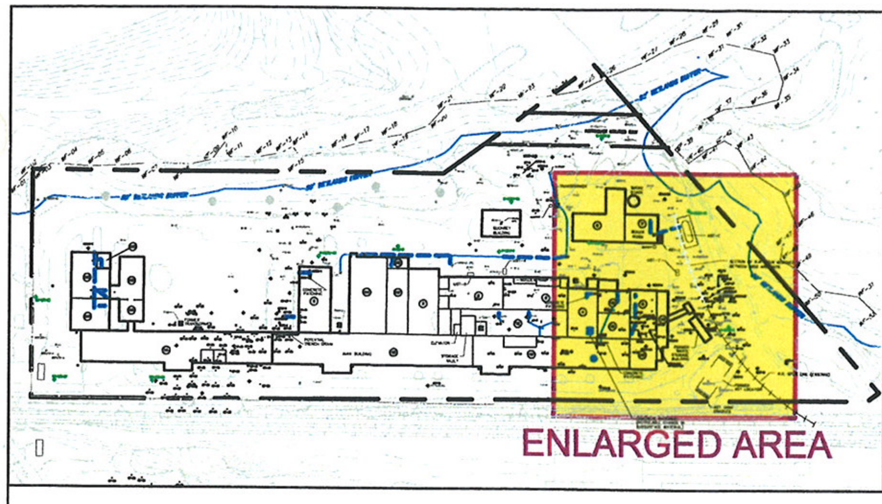

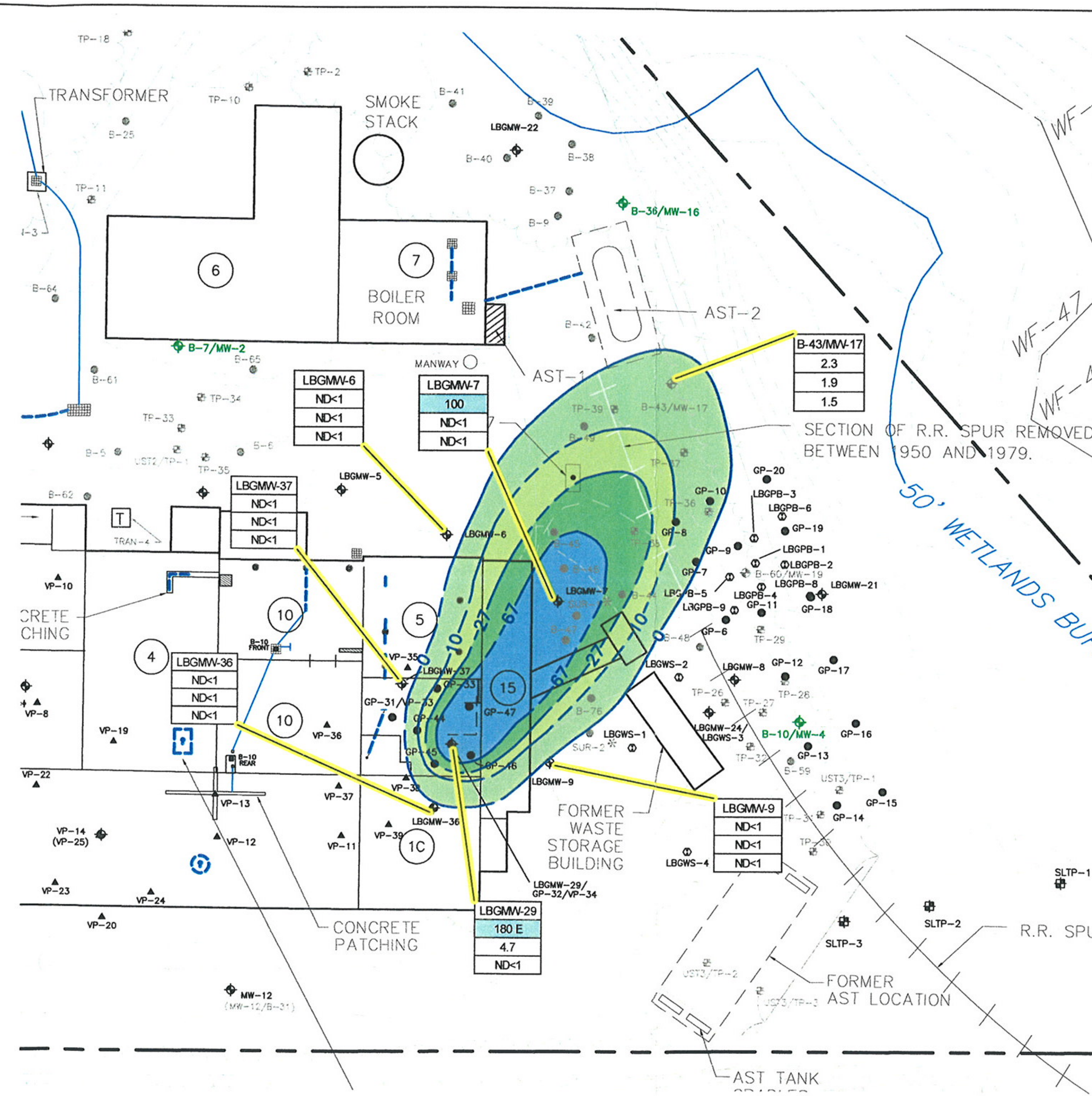

SOURCE: VHB AutoCAD DWG Files "40203pr.dwg, 40767 C-2 Bind.dwg". "SITE PLAN" FROM CITY OF MIDDLETOWN WATER DEPARTMENT.

LEGEND

LBGMW-6 / ND<1 / ND<1 / ND<1	WELL ID TRICHLOROETHYLENE * CIS-1,2 DICHLOROETHENE * VINYL CHLORIDE *
(shaded box)	EXCEEDS THE RESIDENTIAL AND INDUSTRIAL/COMMERCIAL GROUND WATER VOLATILIZATION CRITERIA
67 — —	TCE CONCENTRATION CONTOUR IN MICROGRAMS PER LITER (ug/L) (DASHED WHERE INFERRED)
E	ESTIMATED RESULT, DETECTED CONCENTRATION EXCEEDS CALIBRATION RANGE.
ND>1	LESS THAN LABORATORY REPORTING LIMIT, AS INDICATED
B-45	VHB BORING LOCATION
B43/MW-17	VHB MONITORING WELL LOCATION
TP-30	VHB TEST PIT LOCATION
LBGMW-6	LBG MONITORING WELL LOCATION
LBGWS-2	LBG BORING LOCATION
SLTP-3	LBG TEST PIT LOCATION
VP-35	LBG SOIL-VAPOR SAMPLING LOCATION
GP-8	LBG GEOPROBE BORING
B-10 FRONT	LBG HAND AUGER LOCATION
B-10/MW-4	MONITORING WELL LOCATION (NOT LOCATED OR DAMAGED)
- - - - -	POTENTIAL UNDERGROUND PIPE CHASE (LOCATED BY GPR)
——	CONFIRMED UNDERGROUND PIPE CHASE (LOCATED BY BEACON TRACING)
	UNKNOWN ANOMALY DETECTED BY GPR

	CATCH BASIN
T	TRANSFORMER
1B	BUILDING NUMBER
	SUPPORT BEAM
	FLOOR DRAIN
	PIPE EXITING THROUGH FLOOR
	DRAIN PIPE
— — —	PROPERTY LINE
	METAL PLATE

* CONCENTRATIONS OF DETECTED CONSTITUENTS IN MICROGRAMS PER LITER (ug/L)

0 50
SCALE IN FEET

UNISYS CORPORATION
FORMER REMINGTON RAND SITE
180 JOHNSON STREET
MIDDLETOWN, CONNECTICUT

ISOCONCENTRATION MAP OF TRICHLOROETHYLENE (TCE) IN GROUND-WATER
AEI No. 21: BUILDING No. 5 - SAMPLES COLLECTED APRIL 30 - MAY 2, 2007

DATE	REVISED	PREPARED BY:
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