



**11 Crown Street
Meriden, CT**

Remedial Action Plan

Prepared For:

**City of Meriden
142 East Main Street
Meriden, CT 06450**

June 2014



Bureau of Water Protection and Land Reuse
Remediation Division

Date Stamp
(DEP Use Only)

Remedial Action Plan Transmittal Form

This form is a cover to transmit a remedial action plan. When the use of this transmittal form is required or requested by the Commissioner, a remedial action plan approved in writing by the LEP, a copy of public notification of remediation, as well as all other documentation which demonstrates all applicable laws and regulations have been complied with, is to be attached to this transmittal form to document that remediation of the establishment has been initiated.

Part I of this form must be completed and signed by the Party responsible to submit a remedial action plan for the remediation of the parcel in accordance with the remediation standards. Part II of this form is to be completed and signed and sealed by a licensed environmental professional (LEP).

All sections of this form must be filled out, as applicable.

PART I: GENERAL INFORMATION

Remediation ID No. (Rem#): []

Site Identification

Establishment Name (as on Form III): 11 Crown Street
Establishment Address: 11 Crown Street
City/Town: Meriden State: CT Zip Code: 06450
Description in Property Deed:
Recorded on page 242 of volume 4907 of the Town of Meriden
land records, as lot 16 block 0001 on map 0042 in the Tax Assessor's Office.

Check the box indicating under which program this documentation is being submitted:
[] Connecticut General Statutes (CGS) section 22a-134a(a)-(e), Property Transfer filing
[X] CGS section 22a-133x, Voluntary Remediation
[] Other (specify)

Submit this completed form to:

REMEDATION DIVISION, 2ND FLOOR,
BUREAU OF WATER PROTECTION AND LAND REUSE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
79 ELM STREET, HARTFORD, CT 06106 - 5127

Remedial Action Plan Transmittal Form (continued)

Rem#:

PART I: GENERAL INFORMATION (continued)


The following documentation must be attached to this form. Check boxes, as applicable, to verify that the documentation has been submitted with this form.

<input checked="" type="checkbox"/> REMEDIAL ACTION PLAN - in accordance with CGS Section 22a-134a(g)(1)	
Dated:	Prepared by: Tighe & Bond, Inc.
<input checked="" type="checkbox"/> PUBLIC NOTICE OF REMEDIATION - in accordance with CGS Section 22a-134a(i)	
<input checked="" type="checkbox"/> copy of published notice in newspaper	
<input checked="" type="checkbox"/> copy of notice to local Director of Health	
Check the applicable box if additional public notice requirements were implemented and provide documentation.	<input checked="" type="checkbox"/> sign erected on establishment <input type="checkbox"/> copies of the notice of remediation mailed to abutting property owners
<i>Note: Certifying Party must provide copies of any written public comments and responses.</i>	

List Additional Documentation (as applicable) and attach to this form.

DOCUMENT	DATED	PREPARED BY

Certifying Party Certification

"I submit this form and attached remedial action plan approved by a licensed environmental professional. I shall apply for all permits and approvals that are necessary to carry out the remedial actions, and I shall ensure that any necessary permit applications are complete and that the issuance of any such permit and/or approval will be diligently pursued."	
Lawrence J. Kendzior <hr/> Printed Name of Authorized Signatory	City Manager <hr/> Title
	7-8-14 <hr/> Date
Representing (Name of Company): City of Meriden. Address: 142 East Main Street City/Town: Meriden Phone: 203 630 4152	
State: CT Zip Code: 06450	

PART II: REMEDIAL ACTION PLAN SUMMARY

To be completed by the LEP

Groundwater Class: GB		
Soil: Concentrations of Pollutants in Excess of RSR Criteria:		
Criterion Exceeded	Remedial Measure	COC
<input checked="" type="checkbox"/> PMC	<input type="checkbox"/> in-situ	<input type="checkbox"/> non-chlorinated VOCs
<input type="checkbox"/> GA	<input type="checkbox"/> excavation / on-site re-use	<input type="checkbox"/> Chlorinated VOCs
<input checked="" type="checkbox"/> GB	<input checked="" type="checkbox"/> excavation & removal	<input checked="" type="checkbox"/> Metals
	<input type="checkbox"/> Engineered control	<input checked="" type="checkbox"/> PAHs
<input checked="" type="checkbox"/> DEC	Date of Commissioner Approval:	<input type="checkbox"/> SVOCs
<input checked="" type="checkbox"/> Res	<input checked="" type="checkbox"/> ELUR	<input type="checkbox"/> PCBs
<input checked="" type="checkbox"/> I / C	<input type="checkbox"/> RSR exemption	<input checked="" type="checkbox"/> ETPH
	<input type="checkbox"/> RSR Alternative Criteria	<input type="checkbox"/> Pesticides
	Date of Commissioner Approval:	<input type="checkbox"/> Other (specify):
	<input type="checkbox"/> Other (specify):	
Groundwater: Concentrations of Pollutants in Excess of RSR Criteria:		
Criterion Exceeded	Remedial Measure	COC
	<input type="checkbox"/> Pump & Treat	<input type="checkbox"/> non-chlorinated VOCs
<input type="checkbox"/> GWPC	<input type="checkbox"/> Air Sparging / Vapor extraction	<input type="checkbox"/> Chlorinated VOCs
<input type="checkbox"/> Volatilization	<input type="checkbox"/> Dual-Phase	<input type="checkbox"/> Metals
<input type="checkbox"/> SWPC	<input type="checkbox"/> Monitored natural attenuation	<input type="checkbox"/> PAHs
	<input type="checkbox"/> ELUR	<input type="checkbox"/> SVOCs
	<input type="checkbox"/> RSR exemption	<input type="checkbox"/> PCBs
	<input type="checkbox"/> RSR Alternative Criteria	<input type="checkbox"/> ETPH
	Date of Commissioner Approval:	<input type="checkbox"/> Pesticides
	<input type="checkbox"/> Other (specify):	<input type="checkbox"/> Other (specify):

Remedial Action Plan Transmittal Form (continued)

Rem#:

PART II: REMEDIAL ACTION PLAN SUMMARY (continued)

Vapor Intrusion:			
Remedial Measure	<input type="checkbox"/>	sub-slab depressurization	
	<input type="checkbox"/>	vapor barrier	
	<input type="checkbox"/>	indoor-air monitoring	
Date of DPH Commissioner Approval of such plan:			
NAPL present:	<input type="checkbox"/>	Overburden	<input type="checkbox"/> Bedrock <input checked="" type="checkbox"/> None
Other (specify):			

LEP Approval

"I have personally examined and am familiar with the information in the remedial action plan summary of this transmittal form, and I approve the attached remedial action plan. My professional services have been rendered in accordance with the 'Rules of Professional Conduct' (Section 22a-133v-6 of the Regulations of Connecticut State Agencies)."

James T. Olsen

 Printed Name of LEP

178

 License Number

James T. Olsen

 Signature of LEP

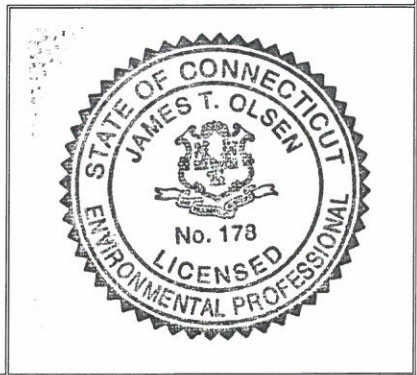
7/16/14

 Date

Company: Tighe & Bond
 Address: 213 Court Street
 City/Town: Middletown
 Phone: 860-704-4761

State: CT Zip Code: 06457-3346

Affix Seal Here



M-0817
June 27, 2014

Juliet Burdelski
Director of Economic Development
City of Meriden
142 East Main Street
Meriden, CT 06450

Re: **Remedial Action Plan
11 Crown Street
Meriden, Connecticut**

Dear Ms. Burdelski:

Please find enclosed the Remedial Action Plan (RAP) and RAP Transmittal Form for the property at 11 Crown Street, Meriden, CT. This RAP was prepared in accordance with our proposal dated March 24, 2014.

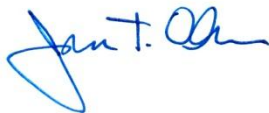
If you have any questions or comments, please contact Jim Olsen at (860) 704-4761.

Very truly yours,

TIGHE & BOND, INC.



Jill L. Libby
Environmental Scientist



James T. Olsen, LEP
Vice President

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Section 1

Introduction

This Remedial Action Plan (RAP) has been prepared for the City of Meriden (City) to analyze remediation alternatives for Areas of Concern (AOCs) at the property located at 11 Crown Street in Meriden, Connecticut (the site). Tighe & Bond and others have conducted various Environmental Site Assessments (ESAs) for the site. Results of previous ESAs identified hazardous building materials, fill material, lead impacted soils, and petroleum impacted soils due to paving activities at the site. Soil sampling results from investigations have identified contaminant concentrations that require remediation; as the City intends to redevelop the property, this RAP has been prepared to evaluate applicable remedial actions and recommend the most appropriate actions. At this time, the City is evaluating multiple redevelopment scenarios including building demolition and renovation.

Section 2

Site Background

The site, depicted on Figure 1, consists of 1.67 acres of land at the intersection of Perkins Street and Crown Street. The site is located in close proximity to the downtown area and Meriden Railroad Station. The area surrounding the site consists of mixed uses including residential and commercial properties. The site location and surrounding area is shown on Figure 1 (Appendix A). A site map depicting current site use and improvements is shown on Figure 2.

2.1 Site Description

The site, currently owned by the City, is located at the intersection of Crown Street and Perkins Street. The site is bounded to the west by South Colony Street. The northern portion of the site is developed with a multi-story commercial building that is approximately 33,814-square feet. The original portion of the building was constructed in circa 1905 and was then expanded on several occasions until 1979. The building is currently occupied by The Record-Journal Publishing Company (Record-Journal) newspaper offices, is heated by natural gas, and is connected to the public water and municipal sanitary sewer systems.

2.2 Site Operations and History

Current Use: The site currently consists of a multi-story building, occupied by the Record-Journal, and associated parking areas. The current aerial photograph of the site is included as Figure 2.

Previous Uses: Historically, the site has been occupied by several printing companies including Record-Journal, The Meriden Record Company, Kelsey Printing, and Republican Publishing. Prior to the 1960's, portions of the site were developed as a foundry and machine shop that manufactured printing presses, an automotive repair garage, a blacksmith, a wallpaper and paint store, and various commercial businesses and residential properties.

2.3 Regulatory Program Summary

The site was entered into the Abandoned Brownfield Cleanup (ABC) Program (CGS Section 32-768) on May 15, 2014. The ABC Program is administered by the Department of Economic and Community Development (DECD). As part of the ABC Program the site will be exempt from the Property Transfer Program and cleanup of pre-existing off-site contamination. On-site contamination must be prevented from migrating off-site and cleanup conducted under the Voluntary Cleanup Program (CSG Section 22a-133x).

2.4 Site Geology & Hydrogeology

According to the Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS) data for the State of Connecticut (NRCS Webpage, 2009), the site is identified as containing Udorthents-Urban land soils. Urban land soils is defined by NRCS as land mostly covered by streets, parking lots, buildings, and other structures of urban areas. Udorthents soils are defined as land that has had the original cover removed and replaced with fill material.

According to the *Surficial Materials Map of Connecticut* (United States Geological Survey/Department of Environmental Protection, Connecticut Geological and Natural History Survey, 1992), and CTDEEP Geographic Information Systems (GIS) surficial materials data, soils beneath the site are classified as sands and gravel in individual or alternating beds. Layers are well to poorly sorted; bedding may be distorted and faulted due to post-depositional collapse.

According to the *Bedrock Geologic Map of Connecticut* (U.S. Geological Survey, 1985), and CTDEEP Geology GIS data, the site is located within the New Haven Arkose formation. Specifically, the site is underlain by a reddish, poorly sorted arkose. Refusal was encountered between 2 and 12 feet across the site, rock fragments encountered during refusal were inferred to be bedrock. Rock fragments encountered were observed to be Arkose.

These descriptions are consistent with observations made during the Phase II and Phase III ESA investigations. In addition, fill material, consisting of primarily sand with some asphalt, and brick was identified across the site to depths of 0-6 feet below ground surface (bgs). The brick and asphalt are likely remnants of the former on-site buildings that were historically demolished.

A review of the Federal Emergency Management Agency (FEMA) Flood Insurance Mapping of New Haven, Connecticut; Map 09009C; indicates that the site is located in an area determined to be in the 100-year floodplain for Harbor Brook.

According to the National Wetlands Inventory and CTDEEP Wetlands GIS databases, there are no wetlands present on the site. Current CTDEEP GIS data for Aquifer Protection Areas (APAs) in Meriden, CT does not include any final or preliminary APAs within the site area.

The CT DEEP environmental GIS Data (dated August 14, 2012) depicts the groundwater classification for the area as GB. The GB classification indicates that the groundwater is in a highly urbanized area and has been adversely impacted by waste discharges, spills or leaks of chemicals, or land use impacts. The groundwater is not presumed suitable for direct human consumption and a public water supply is available. The Site is not located within an aquifer protection area.

The topography of the Site slopes steeply downward to the west and northwest, in the direction of nearby Harbor Brook. Based upon the topography of the area, it is inferred that surface water runoff and groundwater flow towards the west/northwest. No overburden groundwater was encountered during drilling; bedrock groundwater was only encountered in the northwestern corner of the site.

The closest surface water body to the site is Harbor Brook, which is located on the western portion of the site. Harbor Brook runs through an underground culvert approximately 200 feet west of the site which could have an impact on groundwater flow at the site.

2.5 Conceptual Site Model

A conceptual site model (CSM) is a representation of an environmental system at a site that is used as a tool to identify releases, pathways of migrations, potential receptors, and ultimately risk. The CSM is used to develop work plans and provide a framework to address issues that arise during the investigation of a site. The CSM is refined

throughout the site characterization process as new data are acquired. The final CSM will fully define the environmental system at a site and validate the hypotheses regarding the environmental fate of released contaminants.

The CSM includes the following:

- Nature and extent of contaminants
- Potential release mechanisms for such contaminants
- Evaluation of migration pathways and locations at which environmental media are most likely to have been impacted by a release
- Identification of AOCs at which releases have occurred as well as AOCs at which no releases have occurred
- Data and rationale to support the conclusion

The conceptual site model for AOCs slated for remediation is presented below. AOC locations are shown on Figure 2. A complete CSM discussing each AOCs identified at the site is presented in the Phase III ESA, prepared by Tighe & Bond and dated April 2014. A summary of all AOCs at the site is included in Table 1 (Appendix B).

2.5.1 AOC-8: Southeastern Parking Lot

During the Phase II ESA one soil boring (B-10) was advanced within the southeastern parking lot along Crown Street. The sample was submitted to the laboratory for analysis of PAHs, ETPH, and total RCP metals. The sample was reported as having concentrations of Benz(a)anthracene, Benzo(a)pyrene, Benzo(b)fluoranthene, Benzo(k)fluoranthene, and Pyrene above at least one RSR criterion. Benzo(a)pyrene was reported at 32 mg/Kg, above the Significant Environmental Hazard Notification (SEHN) threshold concentration of 30 mg/Kg. The laboratory reported significant amounts of fine soft black material, inferred to be asphalt, present in the sample. Re-analysis of the sample reported concentration of Benzo(a)pyrene to be 13 mg/Kg, below the SEHN reportable concentration.

During the Phase III ESA four additional borings were advanced around B-10 to confirm the detection of PAHs and delineate the horizontal and vertical extent of impacted fill. Four soil samples (B-102 (0-2'), B-103 (0-1.5'), B-107 (0-2), and B-108 (0-2')) were collected surrounding the previously advanced soil boring B-10. During courier transport of the samples to the laboratory, B-108 was broken and was unable to be salvaged for analysis. The remaining three samples were submitted for analysis of total and SPLP PAHs and for B-102, ETPH and lead.

ETPH and total PAHs were not detected at concentrations above laboratory detection limits in the soil samples analyzed. SPLP PAHs were detected in B-102, but were significantly lower than applicable RSR criteria. Lead was detected in B-102 below applicable RSR criteria and at levels consistent with background concentrations.

Based on the exceedances only occurring at B-10, it is likely that the exceedances are due to incidental sources of asphalt due to normal paving and maintenance activities.

2.5.2 AOC 9: Site-Wide Fill Material

Site-wide fill material was added to the CSM during the Phase III ESA based on fill material observed in borings throughout the site and similar RSR exceedances overlapping AOCs. Two unique types of fill material were observed at different depths across the site. Fill material "A" was observed between 4 to 8 feet below the ground

surface (bgs) and consisted as brick, asphalt, and coal ash. Fill material "B" was observed between 0 to 2 feet below ground surface and consisted of black sand on top of crushed gravel.

Fill material "A" was observed in the northwestern corner of the site. Three soil samples (B-3 (4-6'), B-8(4.5-5.5') and B-106 (6-7.5')) were collected from this fill material and had detections of PAHs exceeding the DEC and/or GB PMC. Low level SPLP PAHs were detected in three of the borings; they were well below applicable RSR criteria.

Fill material "B" was observed south of the above mentioned fill, along the western portion of the site. This fill material is located on top of the crushed gravel which was placed on top of the fill material previously mentioned. Two soil samples (B-4 and B-100) were collected from this fill material. Both soil sample had a detections of total lead above RES DEC and I/C DEC, SPLP lead was not detected above laboratory reporting limits

Section 3

Remedial Objective & Applicable Criteria

3.1 Objective

Contaminants of concern have been detected at concentrations above applicable RSR cleanup criteria. The City intends to redevelop of the site and renovate or demolish the building. There are hazardous building materials associated with the on-site building and site-wide fill material that may need to be managed during redevelopment. Additionally, Tighe & Bond conducted a Hazardous Building Materials Inspection (HBMI) of the site dated April 10, 2014. The report summarizes hazardous building materials encountered and a preliminary Opinion of Probable Abatement Cost.

The goal of this RAP is to discuss removal actions that are protective of human health and the environment. Selected removal actions are intended to 1) mitigate exposure risks to current and future tenants associated with contaminants in the soil, 2) eliminate or minimize potential contaminant migration, and 3) prevent future degradation of groundwater quality.

3.2 Remedial Areas

The following release areas require remediation during redevelopment activities in order to be in compliance with the RSRs.

- RA – 1: Southeastern Parking Lot (AOC-8)
- RA – 2: Site-Wide Fill Material (AOC-9)

The locations of these items are included on Figures 3.

3.3 Remediation Standard Regulations

Analytical results reported in previous investigations were compared to remediation criteria listed in the CTDEEP RSRs as amended. CTDEEP's intent in developing the RSRs was to define the following:

- Minimum remediation performance standards
- Specific numeric clean-up criteria
- A process for establishing alternative site-specific standards, if warranted

In general, RSR criteria are used as the cleanup goal when remediating contaminated environmental media (i.e., soils, groundwater, and soil vapor). RSR criteria are not specifically applicable to building interiors and sediment.

The RSRs apply to efforts to remediate contaminated soil, surface water, soil vapors, or a groundwater plume at or emanating from a release area or AOC, provided that the remedial action is required by the following:

- CGS Chapter 445 (Hazardous Waste) or Chapter 446K (Water Pollution Control)
- Relevant subsections of CGS 22a-133 (Voluntary Clean-up) or 22a-134 (Property Transfer) including but not limited, any such action required to be taken or

verified by a Licensed Environmental Professional (LEP), except as otherwise provided in the regulations.

The site is not enrolled in any of the CTDEEP formal remediation programs. Previous investigations conducted for the site did not identify COCs at concentrations above RSR criteria. Confirmatory soil samples will be collected following demolition of the building(s), removal of USTs, and excavation of coal ash. These confirmatory samples will be analyzed for COCs, and analytical results will be compared to the following RSR criteria to determine if additional remedial actions are required.

3.3.1 Soil Remediation Criteria

The CTDEEP soil remediation criteria integrate two risk-based goals: (1) Direct Exposure Criteria (DEC) to protect human health and the environment from risks associated with direct exposure (ingestion) to contaminated soil; and (2) Pollutant Mobility Criteria (PMC) to protect groundwater quality from contaminants that migrate or leach from the soil to groundwater. Soils to which both criteria apply must be remediated to a level, which is equal to the more stringent criteria.

3.3.1.1 Direct Exposure Criteria

Specific numeric exposure criteria for a broad range of contaminants in soil have been established by the CTDEEP, based on exposure assumptions relative to incidental ingestion of contaminants in soils. The DEC applies to accessible soil to a depth of 15'. The DEC for substances other than PCBs does not apply to inaccessible soil at a release area provided that, if such inaccessible soil is less than 15' below the ground surface, an environmental land-use restriction (ELUR) is in effect with respect to the subject release area. Inaccessible soil generally means polluted soil, which is the following:

- More than 4' below the ground surface
- More than 2' below a paved surface comprised of a minimum of three inches of bituminous pavement or concrete
- Directly beneath bituminous pavement with contaminant restrictions
- Beneath an existing building
- Beneath another permanent structure(s) approved by the CTDEEP Commissioner. Buildings can be constructed and/or clean fill can be placed over contaminated soils rendering them inaccessible

The CTDEEP has established two sets of DEC using exposure assumptions appropriate for residential land use (RES DEC) or for industrial and certain commercial land use (I/C DEC). In general, all sites are required to be remediated to the residential criteria. If the I/C land use criteria are applicable and used, an ELUR notification is required in accordance with the RSRs.

3.3.1.2 Pollutant Mobility Criteria

The PMC that will apply to remediation of a site depends on the groundwater classification of the site. The site is located in a GB classified area. The purpose of the PMC criteria is to prevent contamination to groundwater in GB classified areas, and to prevent unacceptable further degradation to groundwater in GA classified areas. The PMC generally apply to all soil in the unsaturated zone, from the ground surface to the seasonal low water table in GA classified areas. The criteria do not apply to environmentally isolated soils that are polluted with substances other than VOCs provided that an Environmental Land Use Restriction (ELUR) is recorded for the release

area which ensures that such soils will not be exposed (unless approved in writing by the CTDEEP Commissioner).

Remediation based upon the listed PMC requires that a substance, other than an inorganic substance or PCB, in soil be remediated to at least that concentration at which the results of a mass analysis of soil for such substances does not exceed the PMC applicable to the groundwater classification (i.e., GA or GB) of the area in which the soil is located. An inorganic substance (metals) or PCBs in soil must be remediated to at least that concentration at which the analytical results of leachate produced from either the Toxicity Characteristic Leaching Procedure (TCLP) or the Synthetic Precipitation Leaching Procedure (SPLP) does not exceed the PMC applicable to the groundwater classification of the area in which the soil is located.

According to CGS 22a-133k-2(c)(2)(D), impacted soils at or above the seasonal low water table in a GA area may alternatively be remediated to a level at which the results of a TCLP or SPLP analysis do not exceed the groundwater protection criterion (GWPC) for any such substance 1) multiplied by 10, 2) multiplied by the ratio of the areas downgradient and upgradient of the release area to the release area, provided that the ratio does not exceed 500, or 3) multiplied by an alternative factor approved by the Commissioner of the CTDEEP.

According to CGS 22a-133k-2(c)(4)(C); the PMC does not apply to substances, other than volatile substances, in soil at a release area provided the sole pollutant is coal ash that was not illegally deposited, does not contain VOCs, and is not affecting quality of existing or potential water supply resources.

3.3.2 Groundwater Remediation Criteria

Groundwater remediation requirements are dependent upon the groundwater classification of the site. The objectives of these standards are the following:

- Protect and preserve groundwater in GA areas as a natural resource
- Protect existing use of groundwater regardless of the area's groundwater classification
- Prevent further degradation of groundwater quality
- Prevent degradation of surface water from discharges of contaminated groundwater
- Protect human health

Portions of the RSRs regulate remediation of groundwater based on each substance present in a plume and by each distinct plume of contamination. Several factors influence the remediation goal at a given site, including background water quality, groundwater classification, proximity of nearby surface water, existing groundwater uses, and existing buildings and their use. When assessing general groundwater remediation requirements, all of these factors must be considered in conjunction with the major numeric components of the RSRs.

The site is situated within a GB classified area by the CTDEEP. Therefore, Groundwater Protection Criteria (GWPC) Surface Water Protection Criteria (SWPC) and Volatilization Criteria (VC) would apply to the site.

3.3.2.1 Ground Water Protection Criteria

The GWPC applies to all groundwater except for areas within a zone of influence of a groundwater discharge permitted by the Commissioner. The GWPC ensure the

groundwater contamination resulting from on-site sources, which exceed background, is remediated to levels that adequately protect groundwater water quality. In general, compliance with the GWPC is achieved when the concentration of a substance in groundwater emanating from a site is equal to or less than the background concentration for groundwater of the substance. Compliance with GWPC can also be achieved if prior to any groundwater remediation, the concentration of a substance in groundwater is equal to or less than the GWPC provided that; the background concentration is less than the GWPC, public water supply is available within 200 feet of the site, the plume is not located in an aquifer protection area or located in the area of influence of any public water supply wells, the extent of the groundwater plume is not increasing over time and the concentration of the substance is not increasing at any point over time.

Groundwater was not encountered during the Phase II Investigation. Since impacted soils requiring remediation were not identified at the site it is unlikely that groundwater impacts have resulted from on-site AOCs.

3.3.2.2 Surface Water Protection Criteria

The SWPC applies to all groundwater that discharges to surface water, therefore the SWPC will apply to the site. The SWPC ensure the groundwater contamination resulting from on-site sources, which exceed background, is remediated to levels that adequately protect surface water quality. In general, compliance with the SWPC is achieved when the average concentration of a compound in groundwater emanating from a site is equal to or less than the SWPC established by the CTDEEP or an alternative SWPC established in accordance with the RSRs.

3.3.2.3 Volatilization Criteria

The VC apply to all groundwater contaminated with a VOC within 15 feet of the ground surface or a building. According to the regulations, the VOC of concern will be remediated to a concentration that is equal to or less than the applicable residential volatilization criterion for groundwater. If groundwater contaminated with a VOC is below a building used solely for industrial or commercial activity, groundwater may be remediated such that the concentration of the substance is equal to or less than the applicable I/C VC in lieu of the RES VC for groundwater, provided that an ELUR is in effect with respect to the parcel (or portion of the parcel covered by the building). The ELUR must also ensure that the parcel (or portion thereof beneath the building) will not be used for any residential purpose in the future and that future use is limited to industrial or commercial activity

Section 4

Remedial Strategies

Remedial actions will be required for the following release areas to achieve compliance with the SEHN and RSRs:

- RA-1: Southeastern Parking Lot (AOC-8)
- RA-2: Site-Wide Fill Material (AOC-9)

This RAP was prepared under the assumption that the site building is remaining as is. During the Phase II and Phase III ESAs, investigation of soils beneath the building was limited due to access restrictions and the thickness of the concrete slab. It is likely that the southern portion of the building was constructed directly on top of bedrock. If the building is demolished to facilitate redevelopment of the site, additional investigations should be conducted to evaluate sub-slab soils.

4.1 Evaluation

In order to comply with the regulatory programs associated with the site, remedial options were evaluated. As part of this evaluation, Tighe & Bond assessed applicable remedial actions and recommend the most appropriate option to satisfy the requirements of the SEHN and RSRs. This section evaluates potential remedial actions for each release area identified at the site with contaminant concentrations above RSR criteria. The evaluation consists of an assessment of the following criteria:

- Overall protection of human health and the environment
- Compliance with RSRs
- Reduction of toxicity, mobility or volume
- Implementability
- Cost

The proposed remedial actions are based on the results of the evaluation, contaminant type and concentration, and the area and volume of impacted media. Based on a review of the analytical data, the constituents of concern (COCs) for each release area under evaluation are summarized as follows:

Release Area	Identified COCs	Impacted AOCs	Impacted Media to be Remediated
RA-1: Southeastern Parking Lot	ETPH and PAHs	8	Soil
RA-2: Site-Wide Fill Material	PAHs and Lead	1 - 9	Soil

4.2 Remedial Options

This section is intended to summarize the recommended remedial options for the release areas identified at the site. Options for each release area are summarized below. Release areas and remediation plans are shown on Figure 3.

4.2.1 RA-1 Southeastern Parking Lot (AOC-8)

Impacted fill material observed from zero to two feet below ground surface at AOC-8 (southeastern parking lot) is the source of PAH and ETPH exceedances at soil boring B-10. Based on the fact that exceedances were only identified at B-10, it is likely that the exceedances can be attributed to localized material due to normal paving materials. The ETPH and PAHs detected in the southeastern parking lot were above RSR criteria; additionally Benzo(a)pyrene was detected above the SEHN threshold concentration.

The approximate excavation area for RA-1 is approximately 40 cubic yards of soil surrounding soil boring B-10. Depth of excavation is from the surface to bedrock; which is approximately 2 feet.

4.2.2 RA-2 Site-Wide Fill Material (AOC-9)

Fill material "A", observed from four to six feet below ground surface (bgs) in the northwestern portion of the site, is the source of polycyclic aromatic hydrocarbons (PAHs).

Section 22a-133k-1(a)(32) of the Connecticut Remediation Standard Regulations (RSRs) states that the DEC does not apply to "inaccessible soils". The RSRs define such soils as "polluted fill beneath a bituminous concrete or concrete surface comprised of a minimum of three inches of bituminous concrete or concrete if such fill is polluted in excess of applicable direct exposure criteria only by semi-volatile substances or petroleum hydrocarbons that are normal constituents of bituminous concrete, and polluted by metals in concentrations not in excess of two times the applicable DEC." Section 22a-133k-1(c)(2)(D) of the RSRs describes polluted soils in a GB area. Compliance with the GB PMC is achieved when "the results of a SPLP analysis of such soil does not exceed the ground-water protection for any such substance (i)(aa) multiplied by 10."

Based on these definitions by the RSRs, compliance with the DEC and GB PMC can be achieved for this fill material. An Environmental Land Use Restriction (ELUR) would have to be filed on the land records for the site to ensure soils will not be exposed as a result of excavation, demolition, or other activities and pavement is maintained in good condition. If this fill is disturbed as part of site redevelopment a soil management plan would have to be developed to handle the soil.

Fill material "B", observed from zero to two feet below ground surface (bgs) along the western portion of the site, is the source of two reported lead exceedances. The impacted fill material has a lead exceedance in excess of two times the DEC, and requires remediation to achieve compliance.

The excavation area for RA-2 is estimated to be 200 cubic yards. Soils are recommended to be excavated for off-site disposal; however, if the building will be demolished, the soils can be relocated and capped with future buildings as part of site redevelopment. In order to better estimate the area requiring excavation four additional borings are required.

The anticipated limits of RA-2 are shown on Figure 3.

Section 5

Remedial Action Tasks

5.1 Health & Safety Plan

In accordance with 29 CFR 1910.120, a health and safety plan (HASP) will be prepared by the remediation contractor for use during remediation activities. The HASP will include responsibilities of on-site personnel, training requirements, site control, emergency contact information, personal protective equipment, exposure monitoring, and decontamination procedures. It may also be necessary for personnel observing remediation work to have an independent HASP.

5.2 Utility Clearance

Prior to excavation, the proposed areas will be marked and the Connecticut Call Before You Dig (CBYD) service will be contacted to locate public utilities. The remediation contractor will also contact the site owner to determine exact locations of known private utilities prior to commencement of excavation activities. Additionally, a private utility locating contractor may be used to locate utilities.

5.3 Notifications

In accordance with CGS Section 22a-134a, a public notice of the proposed remedial actions will be required 30 days prior to the start of remediation activities. Public notice of the remediation will include:

- an announcement in a newspaper having a substantial circulation in the area affected by the establishment
- notification the director of health of the municipality where the site is located of the remediation
- Erecting and maintaining for at least thirty days a sign in a legible condition not less than six feet by four feet on the Site, which sign shall be clearly visible from the public highway, and shall include the words "ENVIRONMENTAL CLEAN-UP IN PROGRESS AT THIS SITE. FOR FURTHER INFORMATION CONTACT:" and include a telephone number for an office from which any interested person may obtain additional information about the remediation

5.5 Soil Management

Soil will be disturbed during excavation activities. To prevent migration of contaminants, access to open excavations and exposed soils will be limited by a fence during remediation activities. Measures will be taken to control soil erosion and surface water runoff during soil removal including installation of silt fencing and hay bales or other measures deemed necessary. If stockpiling is necessary prior to off-site removal, all soils will be placed on top of and covered with plastic sheeting and secured. If backfill materials are necessary, the remedial contractor will provide representative analytical data to certify that the fill material used on the site is clean.

5.6 Soil Removal Plan

Soil removal will be conducted at RA-1 and RA-2. Soil will be removed to the extents and depths detailed in Section 4 and shown on Figure 3. Upon completion of soil removal, post-remediation soil samples will be collected from the side walls and base of the excavations. Soil samples will be collected at a rate of one per 20 linear feet at the side walls and one per 100 square feet at the base of the excavation. A minimum of one sample will be collected from each sidewall and excavation bottom regardless of the excavations size.

5.7 Environmental Land Use Restriction

ELURs will be filed on the applicable land records to document the Engineered Controls used at the site.

5.8 Hazardous Building Materials

Tighe & Bond completed an HBMI report for the site dated April 10, 2014. The report including a preliminary Opinion of Probable Cost and outlined the hazardous building materials present at the site. The City will develop a demolition and abatement plan as needed for the site.

Section 6 Compliance Monitoring

6.1 Groundwater Monitoring

In accordance with the amended RSRs and upon completion of the soil remediation, compliance groundwater monitoring will be completed to demonstrate the effectiveness of the remediation and compliance with the RSRs. Groundwater monitoring will consist of sampling representative monitoring wells located in proximity to and down grade of identified release areas. The installation of at least two additional bedrock groundwater wells will be required. Groundwater samples will be collected on a quarterly basis for a period of one year following the completion of all remediation work at the site. If analytical data indicates compliance with the RSRs, groundwater monitoring will be discontinued. If the analytical data indicates the groundwater does not comply with the RSRs, groundwater monitoring will be continued for an additional year. The existing monitoring well network is shown on Figure 2.

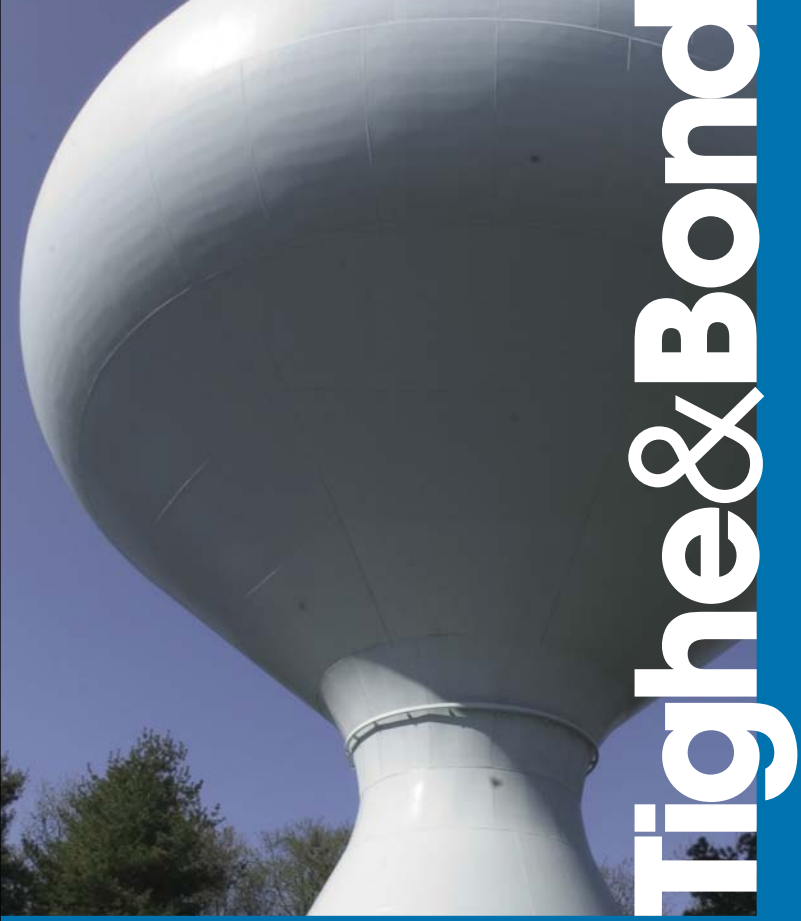
Groundwater samples will be collected from the wells using low-flow sampling techniques in general accordance with *EPA Region 1 Low Stress (low flow) Purging and Sampling Procedure for the Collection of Ground Water Samples from Monitoring Well*, July 30, 1996 and revised on January 19, 2010. Selected groundwater samples will be analyzed for the COCs identified at each AOC/RA. Water level measurements will be recorded during sampling. Groundwater elevation data will be used to determine groundwater flow direction during each sampling event. Quarterly groundwater monitoring reports will be submitted to the CTDEEP.

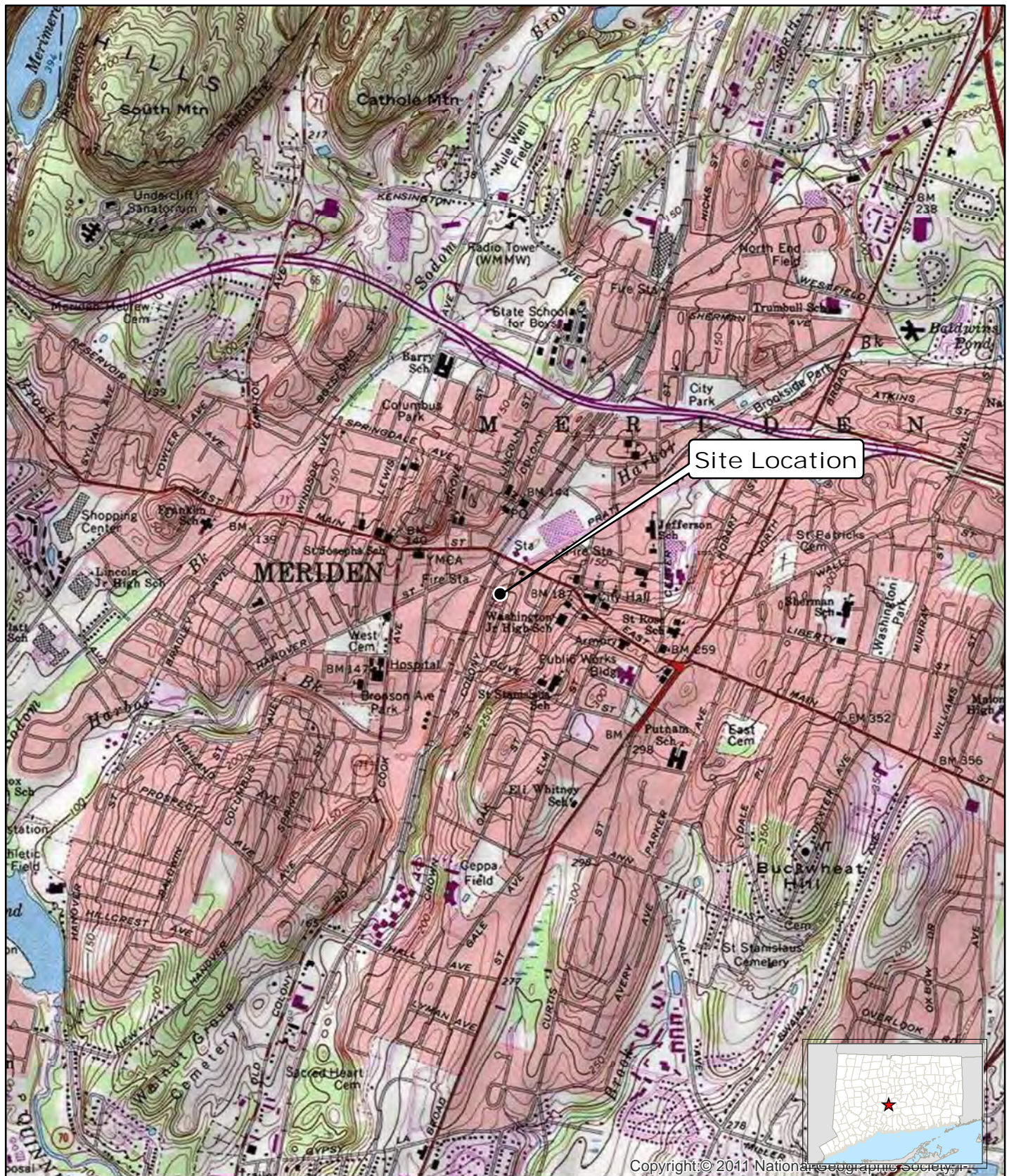
Section 7

Implementation Schedule

Implementation of the remedial actions is contingent upon the City receiving brownfields funding. Once the funds are received by the City, a schedule will be prepared for submittal to the CTDEEP.

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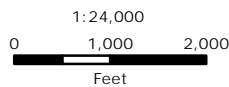
LEGEND

- Site Location

FIGURE 1
SITE LOCATION MAP
 11 Crown Street
 Meriden, Connecticut











Source: U.S. Geological Survey, in cooperation with CTDEEP, Office of Information Management
 Based on USGS Topographic Map for Meriden, CT, Rev. 1992, 1:24,000
 Map Date: June 2014



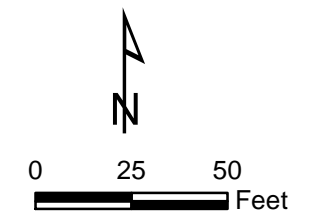
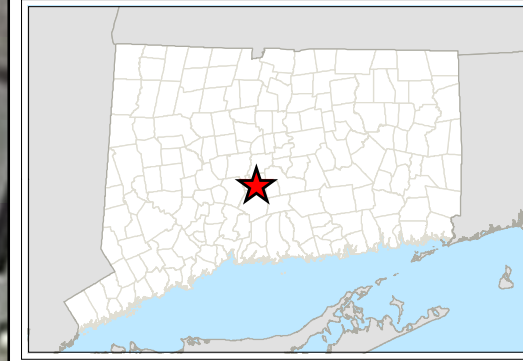
June 2014

FIGURE 2
SITE PLAN &
AREAS OF CONCERN

LEGEND

-  Approximate Site Boundary
 -  Approximate Parcel Boundary
 - Phase II Activities**
 -  Boring Location
 -  Sub-Slab Location
 - Phase III Activities**
 -  Monitoring Well
 -  Boring Location
 -  Sub-Slab Location
 -  Boring Location
- Areas of Concern (AOCs)**

LOCUS MAP



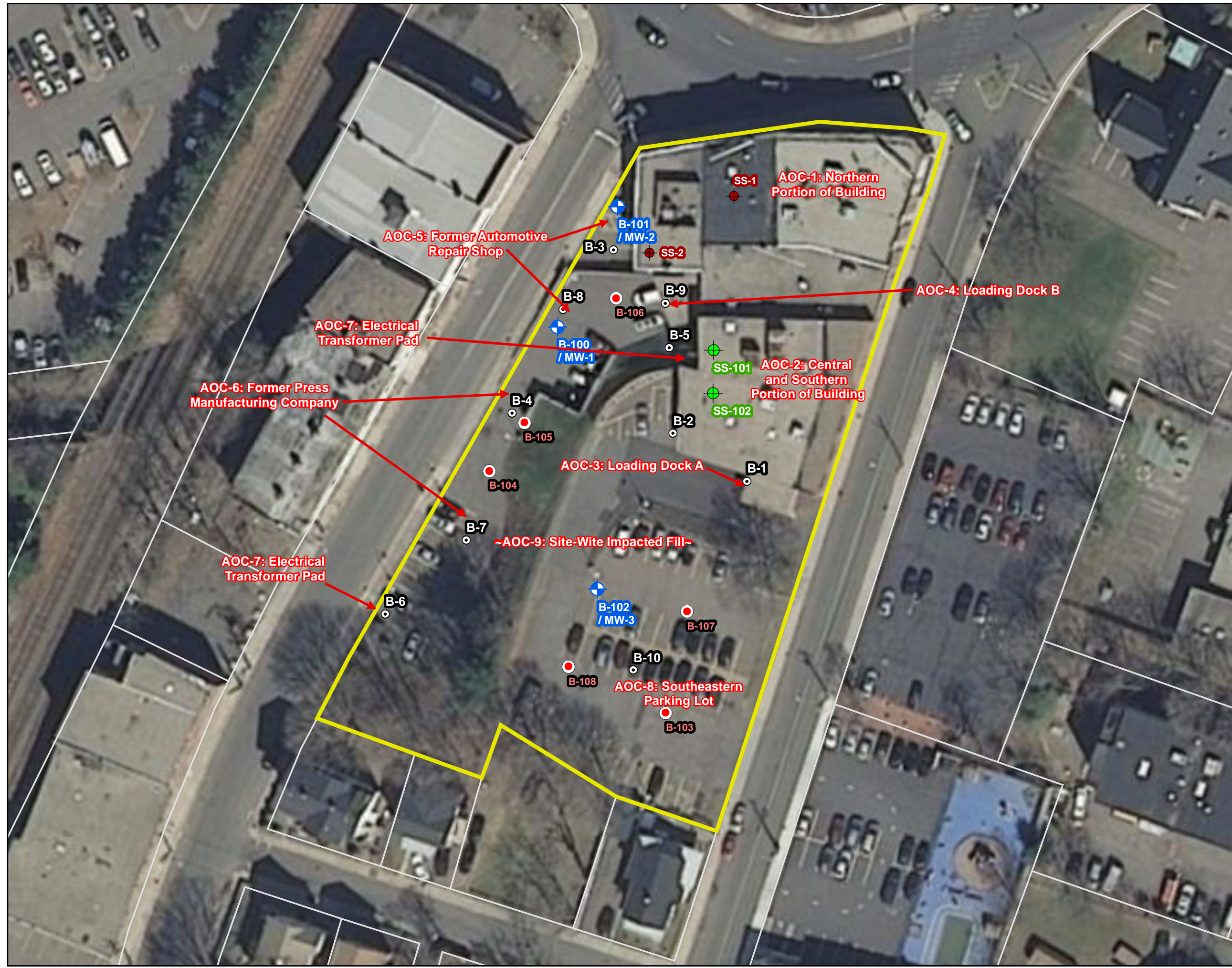
Map Scale: 1" = 50'

Notes:
AOCs interpreted from Sanborn Fire Insurance Maps from CT State Library

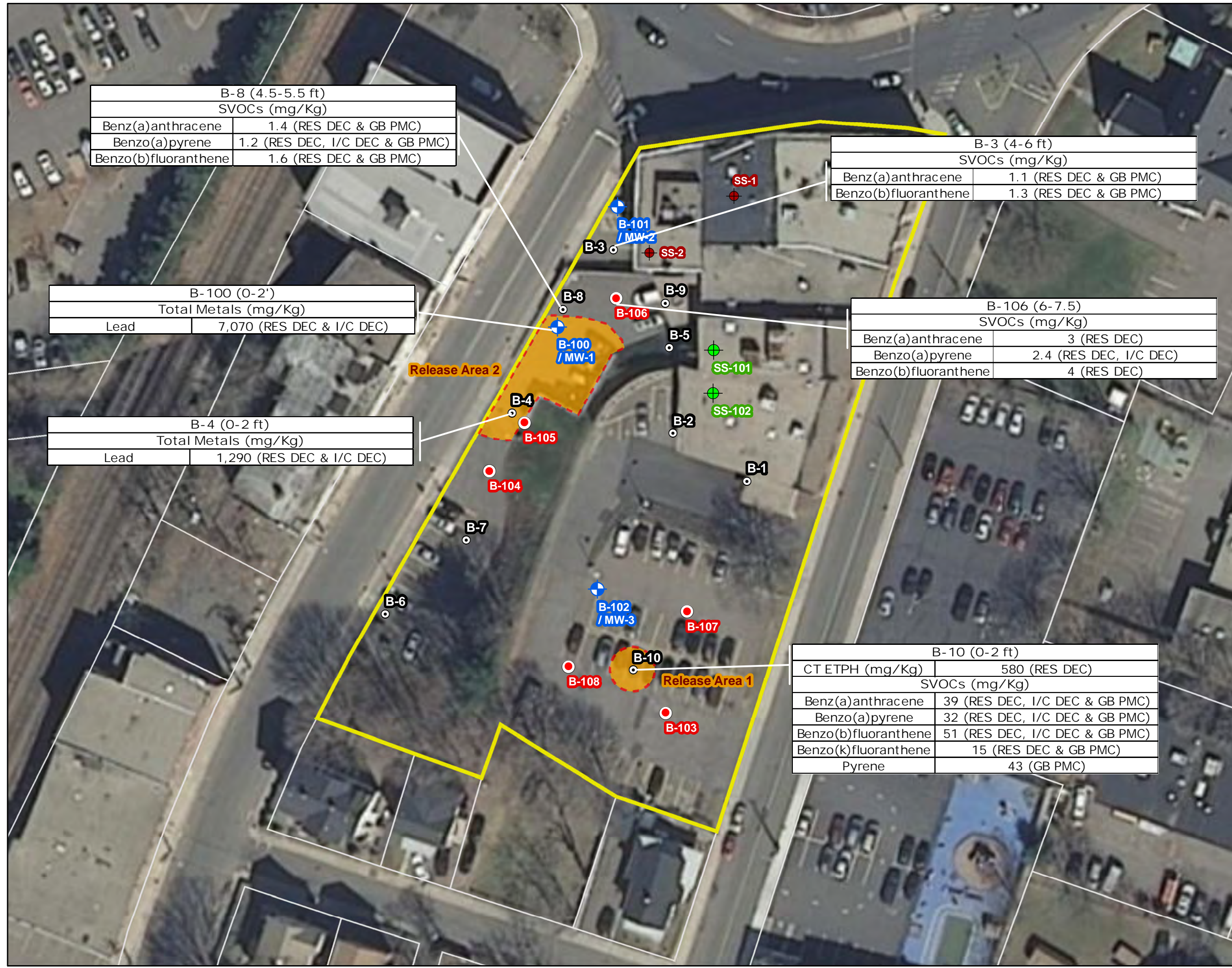
Source:
Ortho Base Map: State of Connecticut 2012 aerial imagery with 1-ft ground resolution provided by CTECO
GIS data layers displayed on this map were obtained from CTDEEP's data library (<http://www.ct.gov/deep>).

11 CROWN STREET
MERIDEN, CONNECTICUT

Map Date: June 2014		FIGURE 2
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**FIGURE 3
SOIL EXCEEDENCE &
EXCAVATION AREA MAP**



B-8 (4.5-5.5 ft)	
SVOCs (mg/Kg)	
Benz(a)anthracene	1.4 (RES DEC & GB PMC)
Benzo(a)pyrene	1.2 (RES DEC, I/C DEC & GB PMC)
Benzo(b)fluoranthene	1.6 (RES DEC & GB PMC)

B-3 (4-6 ft)	
SVOCs (mg/Kg)	
Benz(a)anthracene	1.1 (RES DEC & GB PMC)
Benzo(b)fluoranthene	1.3 (RES DEC & GB PMC)

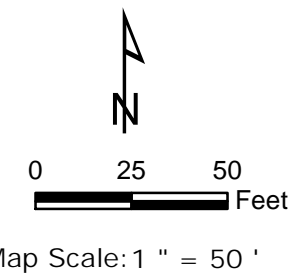
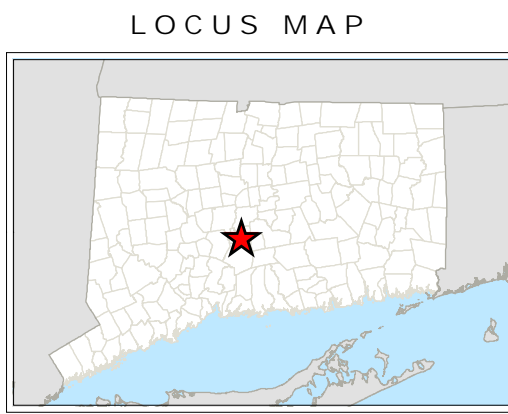
B-100 (0-2')	
Total Metals (mg/Kg)	
Lead	7,070 (RES DEC & I/C DEC)

B-106 (6-7.5)	
SVOCs (mg/Kg)	
Benz(a)anthracene	3 (RES DEC)
Benzo(a)pyrene	2.4 (RES DEC, I/C DEC)
Benzo(b)fluoranthene	4 (RES DEC)

B-4 (0-2 ft)	
Total Metals (mg/Kg)	
Lead	1,290 (RES DEC & I/C DEC)

B-10 (0-2 ft)	
CT ETPH (mg/Kg)	580 (RES DEC)
SVOCs (mg/Kg)	
Benz(a)anthracene	39 (RES DEC, I/C DEC & GB PMC)
Benzo(a)pyrene	32 (RES DEC, I/C DEC & GB PMC)
Benzo(b)fluoranthene	51 (RES DEC, I/C DEC & GB PMC)
Benzo(k)fluoranthene	15 (RES DEC & GB PMC)
Pyrene	43 (GB PMC)

- LEGEND**
- Approximate Site Boundary
 - Approximate Parcel Boundary
 - Approximate Release Area (To Be Excavated During Remediation)
 - Phase III Activities**
 - Monitoring Well
 - Boring Location
 - Sub-Slab Location
 - Phase II Activities**
 - Boring Location
 - Sub-Slab Location



Notes:
AOCs interpreted from Sanborn Fire Insurance Maps from CT State Library

Source:
Ortho Base Map: State of Connecticut 2012 aerial imagery with 1-ft ground resolution provided by CTECO
GIS data layers displayed on this map were obtained from CTDEEP's data library (<http://www.ct.gov/deep>).

**11 CROWN STREET
MERIDEN, CONNECTICUT**

Map Date: June 2014	Tighe & Bond Consulting Engineers Environmental Specialists	FIGURE 3
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Tighe & Bond

Table 1
 Conceptual Site Model
 11 Crown Street
 Meriden, Connecticut

AOC	AOC Description	Potential COCs	Confirmed COCs	Potential Release Mechanisms and Pathways	Potential Receptors	Status	Sampling Locations	Rationale
							Soil Borings	
1	Northern Portion of Building	VOCs, PAHs, Metals	None	Releases onto the ground surface. Migration through building slab to sub-slab soils.	Direct human exposure through construction activities or demolition. Areas currently capped with asphalt or buildings as noted. Ecological Receptors	No Significant Release was Identified, Fill Material Identified	SS-1 and SS-2	Significant releases of COCs to the environment as a results of former chemical storage and the printing press located in the northern portion of the building were not identified. However, fill material was identified beneath the building slab in these areas and is likely the cause of elevated PAHs and lead concentrations.
2	Central and Southern Portion of Building	VOCs, PAHs, Metals	None	Releases onto the ground surface. Migration through building slab to sub-slab soils.	Direct human exposure through construction activities or demolition. Areas currently capped with asphalt or buildings as noted. Ecological Receptors	No Significant Release was Identified	SS-101 and SS-102	Significant release of COCs to the environment as a result of former paper storage and print press located in the southern and central portion of the building were not identified.
3	Loading Dock A (South of Building)	ETPH, VOCs, PAHs, Metals	None	Releases onto the ground surface. Migration through asphalt to soils.	Direct human exposure through construction activities or demolition. Areas currently capped with asphalt or buildings as noted. Ecological Receptors	No Significant Release was Identified	SB-1 and SB-2	Significant releases related to chemical or petroleum releases were not identified at loading dock A. However, fill material 2 feet thick was identified with elevated COCs.
4	Loading Dock B (West of Building)	ETPH, VOCs, PAHs, Metals	None	Releases onto the ground surface. Migration through asphalt to soils.	Direct human exposure through construction activities or demolition. Areas currently capped with asphalt or buildings as noted. Ecological Receptors	No Significant Release was Identified, Fill Material Identified	SB-9	Significant releases related to chemical or petroleum releases were not identified at loading dock B. However, 8 feet of gravel and 1 foot of fill material was identified but did not result in elevated COCs.
5	Former Automotive Repair Shop	ETPH, VOCs, PAHs, Metals	None	Releases onto the ground surface. Migration through asphalt or building slab to soils.	Direct human exposure through construction activities or demolition. Areas currently capped with asphalt or buildings as noted. Ecological Receptors	No Significant Release was Identified, Impacted Fill Material Identified	SB-3, SB-8, B-100, B-101, and B-104	Significant releases related to the former automotive repair shop were not identified during site activities. Two types of fill from 0 to 2 feet and 4 to 6 feet was identified during site activities that resulted in elevated concentrations of PAHs and lead.
6	Former Press Manufacturing	VOCs, PAHs, Metals	None	Releases onto the ground surface. Migration through asphalt or building slab to soils.	Direct human exposure through construction activities or demolition. Areas currently capped with asphalt or buildings as noted. Ecological Receptors	No Significant Release was Identified, Fill Material Identified	SB-4, SB-7, B-105, and B-106	No significant releases related to the former Press Manufacturing buildings were identified. Fill material was identified in the borings from 0 to 2 feet that resulted in an elevated concentration of lead.
7	Transformer Pads	PCBs	None	Releases onto the ground surface.	Direct human exposure through construction activities or demolition. Areas currently capped with asphalt or buildings as noted. Ecological Receptors	No Significant Release was Identified	SB-5 and SB-6	No significant releases were identified from transformer leaks.
8	Southwestern Parking Lot	ETPH, VOCs, PAHs	None	Releases onto the ground surface. Migration through asphalt to soils.	Direct human exposure through construction activities or demolition. Areas currently capped with asphalt or buildings as noted. Ecological Receptors	No Significant Release was Identified, Impacted Fill Material Identified	SB-10, B-102, B-103, B-107 and B-108	Significant releases related to a former release on Crown Street were not identified during site activities. Fill material limited to B-10 was identified during site activities that resulted in elevated concentrations of ETPH and PAHs.
9	Site-Wide Fill Material	VOCs, PAHs, ETPH, and metals	PAHs, ETPH, and metals	Deposition of Fill Material	Direct human exposure through construction activities or demolition. Areas currently capped with asphalt or buildings as noted. Ecological Receptors	Impacted Fill Material Identified	All Borings	Site-wide impacted fill was identified that resulted in elevated levels of PAHs and lead. Two types of impacted fill material were identified in the northern and western portions of the site, fill material from 4 to 6 feet resulted in elevated PAHs and fill material from 0 to 2 feet resulted in elevated concentrations of lead. In the southeastern portion of the site fill material from 0 to 2 feet of fill material resulted in elevated concentrations of PAHs and ETPH.