REVISED ALTERNATIVES ANALYSIS REPORT & REMEDIAL ACTION WORK PLAN
FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
822 SENECA STREET
BUFFALO, NEW YORK
BCP SITE #C915241

by

Haley & Aldrich of New York
Rochester, New York

On Behalf of
AmeriPride Services Inc.
Minneapolis, MN

for

New York State Department of Environmental Conservation
Buffalo, New York

File No. 37319-053
28 May 2014

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28 May 2014
File No. 37319-053

New York State Department of Environmental Conservation
Division of Environmental Remediation, Region 9
270 Michigan Avenue
Buffalo, New York 14203-2915

Attention: Mr. Jaspal S. Walia

Subject: Revised Alternatives Analysis Report and Remedial Action Work Plan
Former American Linen Supply Company Facility
822 Seneca Street
Buffalo, New York
BCA #C915241

Dear Mr. Walia:

On behalf of AmeriPride Services, Inc. ("AmeriPride"), Haley & Aldrich of New York (Haley & Aldrich) is submitting herewith the Revised Alternatives Analysis Report (AAR) and Remedial Action Work Plan (RAWP) for the above referenced site. This document is submitted in accordance with the Brownfield Cleanup Agreement (BCA) for Site #C915241 between the New York State Department of Environmental Conservation (NYSDEC) and AmeriPride.

The AAR/RAWP presents an analysis of remedial alternatives based on the results of the remedial investigation and interim remedial measure activities and provides a work plan for remedial activities based on the investigation results and conceptual site model.

This report has been developed in accordance with the NYSDEC (6 NYCRR) Part 375 Brownfield Cleanup Regulations dated December 2006, the "Technical Guidance for Site Investigation and Remediation" (DER-10 dated May 2010) and other relevant NYSDEC technical and administrative guidance. This report also incorporates comments from the NYSDEC provided on 5 May 2014 to a previous AAR/RAWP submittal dated 27 February 2014 as described in the letter entitled "Response to Comments on… Alternatives Analysis Report/Remedial Action Work Plan" dated 16 May 2014.

If you have any questions or comments regarding this document, please do not hesitate to contact us.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK

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Enclosures

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1. INTRODUCTION

1.1 Site Description

The site is located at 822 Seneca Street in the City of Buffalo, Erie County, New York. The site is identified on the City of Buffalo tax maps as the parcel within section 122.27, block 1, lot 4, and is approximately 2.91 acres. The site is located on the west side of Lord Street and bound to the north by Seymour Street and the south by Seneca Street, and is approximately one mile north of the Buffalo River. A site location map is included as Figure 1. A figure showing the site boundaries is included as Figure 2.

AmeriPride Services Inc. ("AmeriPride"), formerly American Linen Supply Co, owned the property from 1978 to 2014 and operated an industrial laundry facility on it from 1978 to 2004. Since 2005, the site has been unoccupied. The parcel was formerly developed with a vacant industrial building, which was demolished between 2011 and 2012 as described in Section 2 below. In January 2014, the site was sold to Mill Race Commons, LLC.

1.2 Site History

According to previously prepared reports for the site, including a Phase I Environmental Site Assessment Report by C.T. Male Associates, P.C., dated December 2004, the site building was first developed in 1910. Prior to 1910, the Site is indicated to have been occupied by residential and commercial properties. Between 1910 and 1978, the Site appeared to be used as a book binding and printing facility.

Coverall Service and Supply Co., ("Coverall") a uniform cleaning facility, reportedly first occupied the Site in 1978, and the facility was used for dry cleaning operations until 1985. Available records indicate that dry-cleaning with tetrachloroethylene (PCE) was conducted at the Site between 1978 and 1985; use and/or storage of PCE were not reported after 1985. The laundry operations occupied the first floor of the site building as well as portions of the basement. Thorner Sydney Press occupied the second floor of the site building as well as portions of the basement until 1997. According to a purchase agreement dated 1977, Thorner Sydney Press' lease agreement was initiated in 1965.

In April 2004, laundering operations ceased at the site building. It was used as a laundry depot from April 2004 through spring 2005 and then as a fleet vehicle maintenance shop until July 2005. Operations moved out of the building at the end of July 2005, and the site has been vacant since.

AmeriPride applied for acceptance into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) in January 2011 and submitted both a BCP Application and draft Remedial Investigation Work Plan (RIWP). AmeriPride was accepted into the program in March 2011 and entered into a Brownfield Cleanup Agreement (BCA) with the NYSDEC on 17 May 2011 with site identification number C915241 (refer to Appendix A). A final RIWP was submitted in May 2011 and approved by the NYSDEC on 2 June 2011 (Appendix A). Prior to entrance into the BCP, a Phase I, Phase II, supplemental Phase II and site wide groundwater sampling occurred at the site between 2004 and 2009. Those data were summarized in the RIWP dated May 2011 and used to formulate the RI program.

1.3 Physical Setting

The site is located in an urban area of mixed industrial, commercial, and residential land use and is currently zoned for industrial use. The site is bound to the northeast by residential properties, to the southeast by vacant and commercial properties, to the southwest by vacant and commercial properties, including a BCP site, and to the northwest by residential properties. The residential property (single family home) located at 798 Seneca Street is surrounded by the site on three sides (see Figure 2). A brief summary of the geologic and hydrogeologic setting is provided below. A more detailed description is included in the Remedial Investigation/Interim Remedial Measure Report (RI/IRM) submitted under separate cover.

1.3.1 Geology

The site is generally flat, sloping slightly to the south, and is situated approximately one mile north of the Buffalo River. The overburden materials (fill and soil) encountered at the site range in thickness from approximately 14 to 23 feet thick. With the exception of in the former building basement area, which was filled with imported fill, overburden materials at the site generally consist of some combination of the following.

- *Historic Fill:* Consists of well graded gravel, sand, ash, slag, trace wood and brick, and some clay. A distinct ash fill layer (consisting of approximately 80% ash and slag) is present beneath the former first floor building slab. The fill layer typically ranges from 0.5 to 12 feet below ground surface (bgs). Deeper fill was encountered in proximity of underground storage tanks (USTs).

- *Unconsolidated Clay Fill:* Consists of brown or gray sandy or silty lean clay with sand and trace amounts of wood, ash and brick. This material differs from the historic fill described above in that it is primarily composed of clay with trace amounts of fill constituents.

- *Swamp Deposits:* Swamp deposits containing organic materials were identified in a small area in the center of the former building slab area ranging from approximately 5 to 9 feet bgs prior to the soil removal IRM and 0.4 to 4.6 feet bgs post soil removal IRM[1].

- *Glaciolacustrine Deposits:* Consist of native soil deposits of brown and gray clay with sand and silt. This layer ranges in depth from approximately 1 to 21 feet bgs.

- *Glacial Till:* Consists of clayey and silty sands. This layer ranges in depth from approximately 14 to 23 feet bgs.

The surface of bedrock or drilling refusal was encountered between 14 and 23 feet bgs (El. 563 to El. 572). The site is situated in the Central Lowlands Physiographic Province, characterized by nearly flat-lying rocks of Devonian, Silurian and Ordovician Age. Bedrock underlying the site is mapped as middle Devonian Onondaga Limestone.

[1] Ground surface was lowered in the former slab on grade area as a result of the soil removal IRM.

1.3.2 Hydrogeology

In January 2013, groundwater was encountered between 2.75 and 10.5 feet bgs. Groundwater elevation data suggest that groundwater flows toward the south with approximate hydraulic gradient of between 0.01 and 0.08 feet per foot (ft/ft) (Figure 3). This southward flow direction is consistent with the expectation that groundwater may be locally controlled by the Buffalo River, which is located less than one mile south of the site. Hydraulic conductivity was not measured as part of this RI, however hydraulic conductivities in lacustrine silts and clays in North America range between $1x10^{-4}$ and $1x10^{-8}$ m/day[2].

1.4 Applicable Comparison Criteria

Samples collected as part of the RI and IRM work were analyzed at Pace Analytical Services in Pittsburgh, Pennsylvania and Schenectady, New York (Pace) and analytical results were compared to the following criteria based on media analyzed:

- *Soil:*

  Soil investigation data are compared to the NYSDEC Soil Cleanup Objectives restricted for the protection of groundwater (protection of groundwater SCOs), commercial use (commercial SCOs), and industrial use (industrial SCOs) contained in the December 2006 NYCRR Part 375 and October 2010 NYSDEC Commissioners Policy 51 (CP-51). Imported fill data are compared to the Imported Fill Requirements contained in the May 2010 NYSDEC Technical Guidance for Site Investigation and Remediation (DER-10).

- *Groundwater:*

  Groundwater data are compared to the June 1998 NYSDEC Division of Water Technical and Operational Guidance Series 1.1.1 Ambient Water Quality Standards and Guidance Values, Class GA for the protection of a source of drinking water modified per the April 2000 addendum (TOGS 1.1.1).

- *Soil Vapor:*

  Currently there are no applicable criteria for comparison of soil vapor concentrations in New York. Soil vapor data was evaluated in consideration of the October 2006 New York State Department of Health (NYSDOH) Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York (NYSDOH VI Guidance).

- *Soil Vapor Intrusion Samples (Indoor Air/Sub-Slab Vapor):*

  Soil vapor intrusion (SVI) analytical results were compared to Matrix 1 and Matrix 2 of the NYSDOH VI Guidance.

[2] D.A. Stephenson, et. al, 1988

2. REMEDIAL INVESTIGATION SUMMARY

A brief summary of the RI and IRM activities as well as a summary of the exposure assessment conducted as part of RI activities follows below. RI and IRM activities were conducted according to the NYSDEC-approved 31 May 2011 Remedial Investigation Work Plan, 5 July 2012 Revised Interim Remedial Measure Work Plan and the 18 September 2013 Revised Interim Remedial Measure Work Plan. Refer to the RI/IRM Report for a more detailed account of those activities. Figures summarizing site conditions as described below are included as Figures 4 through 9.

2.1 Summary of RI Activities

Activities conducted during the RI included demolition of the building and remedial subsurface investigations. Initial RI activities were conducted at the site between November 2011 and December 2012. Following the soil removal IRM (discussed below), supplemental RI activities were conducted in December 2013 to complete the Conceptual Site Model (CSM).

Demolition activities included:

- Asbestos abatement and hazardous building material removal
- Removal of the above-grade building structure
- Removal of the first floor building slab
- Basement dewatering and clean out
- Removal of the basement walls to the extent required to meet city code requirements, floor slab, and associated drainage structures
- Removal of the aboveground storage tanks and building equipment
- Removal of transformer pads and bollards
- Backfill of the former basement

Subsurface investigation activities included:

- Basement sub-slab soil investigation
- Test pitting in the former parking lot area, near the former underground storage tanks, and in the first floor slab/former dry cleaning area.
- Soil boring and discrete groundwater investigation in the former dry cleaning area.
- Installation of permanent overburden and bedrock monitoring wells
- Site-wide groundwater sampling
- Offsite soil and groundwater sampling
- Soil vapor investigation
- Post-IRM surface soil confirmation and fill characterization sampling beneath the former basement slab

In addition to the activities listed above, a soil vapor intrusion investigation was conducted at 798 Seneca Street adjacent to the west side of the site. This adjacent property was considered a potential receptor for soil vapor intrusion from dry cleaning related compounds present in soil, groundwater, and soil vapor.

2.2 Summary of Interim Remedial Measure Activities

Two interim remedial measures (IRMs) were conducted concurrently with the RI activities.

- The first IRM was conducted to address oily material encountered beneath the basement floor slab between two former cisterns located in the southwest corner of the basement. The IRM was conducted in accordance with a NYSDEC approved Revised IRM Work Plan dated July 2012. This IRM was completed in 2012 when the oily material was excavated.

- The second IRM was conducted to remove historic fill materials present in the former building slab area to bring the site to level grade per the City of Buffalo demolition code, remove a former waste oil UST, and to excavate areas of shallow soil impacted by target dry cleaning related compounds with concentrations above the protection of groundwater SCOs. The IRM was conducted in accordance with a NYSDEC approved Revised IRM Work Plan dated 18 September 2013. The historic fill materials and the UST removal were completed, and a substantial amount of shallow soil impacts were removed during 2013, but shallow soil impacts remain in some areas of the former slab-on-grade area.

2.3 Summary of Conceptual Site Model

The results of the RI were used to develop the Conceptual Site Model (CSM) as follows. Overall, contaminants of concern (COCs) were detected at concentrations onsite in fill and native soil above commercial and protection of groundwater SCOs and in groundwater at concentrations exceeding groundwater standards and guidance criteria. A summary of soil, groundwater, and soil vapor conditions following completion of the IRM activities is provided below.

2.3.1 Soil Conditions

COCs were identified based on the multiple detection of any one of a broad suite of organic and inorganic substances that are related to the former site operations and are present at concentrations higher than the relevant standards, criteria, and guidelines (SCGs). The SCGs for the site include the Part 375 Restricted Use Soil Cleanup Objectives (SCOs) for protection of groundwater, commercial use, and industrial use; and the NYS Ambient Water Quality Standards and Guidance Values (class GA) specified in NYSDEC TOGS 1.1.1 for groundwater. The COCs identified for the site include:

- Target chlorinated volatile organic compounds (CVOCs): tetrachloroethene (PCE), trichloroethene (TCE), cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), and vinyl chloride in soil.

- Polycyclic aromatic hydrocarbons (PAHs) and heavy metals (arsenic, copper, lead, and mercury) in historic fill.

Prior to soil removal IRM activities, target CVOCs were detected at concentrations exceeding applicable criteria in shallow fill near the former waste oil underground storage tank (UST), and on the southern side of the first floor slab near the former dry cleaning operations proximate to TP-16 and TP-18. Target CVOCs were also identified in deep native soil, likely as a result of impacted groundwater at depth rather than from a source within the soil at or above the sample location.

During the soil removal IRM, the areas of shallow fill impacts (TP-16, TP-18, and the UST) were removed along with 1 to 4.5 feet of soils and historic fill in the former slab-on-grade area. Following IRM activities, confirmation sampling from the ground surface of the slab-on-grade area indicated that soils at the surface and above the water table continue to be impacted with residual target CVOCs (PCE, TCE, and cis-1,2-DCE) on the southwestern portion of the former slab-on-grade area, in what was the former dry cleaning area. Concentrations of total target CVOCs detected in that area ranges from non-detect up to approximately 16 mg/kg, with the exception of one sample location on the southern side of the site, which contained concentrations of total target CVOCs at 302.9 mg/kg (Figure 9).

The PAHs and metals were identified sporadically within historic fill located throughout the top 5 to 12 feet of the overburden in the former parking lot and first floor slab areas. It is anticipated that those constituents are inherent to the fill itself, which is historic fill and not contaminated as a result of historical building operations (Figure 5).

Limited remediation including removal of solid media containing target CVOCs that that have the potential to impact groundwater and placement of a soil cover to restrict contact to historic fill materials are recommended future remedial actions.

2.3.2 Groundwater Conditions

Target CVOCs were also identified in groundwater at concentrations exceeding groundwater standards in two locations on the southern side of the site in and proximate to the former dry cleaning area. Groundwater was encountered from approximately 2.75 and 10.5 feet below ground surface and appears to be flowing in a southerly direction (Figure 3). The highest current total onsite target CVOC concentration is approximately 140 ug/L, which was detected in MW-3 (Figure 4). The groundwater table is present in dense lacustrine and glacial till overburden soils with low hydraulic conductivities.

Target CVOC concentrations detected offsite have been very close to or below the groundwater standards, and are indicative of natural attenuation, and the downgradient edge of groundwater impacts. COCs in offsite groundwater are attenuating naturally and therefore groundwater remediation does not appear to be warranted.

2.3.3 Soil Vapor Conditions

COCs were detected in soil vapor, proximate to the residence at 798 Seneca Street. Target CVOCs and petroleum-related VOCs were detected in two soil vapor samples. However, based on the low detections of those compounds in soil and groundwater proximate to the soil vapor sample collection points, it does not appear that soil or groundwater are acting as a source of those vapor concentrations. It is possible that vapor has accumulated over time below the pavement.

A soil vapor intrusion investigation was conducted in December 2013 in the basement of 798 Seneca Street. The scope was approved by the NYSDEC and NYSDOH on 4 December 2013. The results identified low levels of PCE in the sub-slab vapor, indoor air, and outdoor air and low levels of TCE in the sub-slab vapor and outdoor air. When compared against Matrix 1 and Matrix 2 of the NYSDOH VI Guidance, no further action is recommended or required.

2.4 Summary of Exposure Assessment

Currently, there is no complete exposure pathways identified on site because the site is surrounded by a permanent chain-link fence, the groundwater is not currently used nor is groundwater use planned in the future, and there are no buildings onsite to present a potential for vapor intrusion. However, a long-term potential exposure pathway to COCs in soil will remain and site management and engineering controls are warranted.

3. REMEDIAL GOALS AND REMEDIAL ACTION OBJECTIVES

3.1 Remedial Goal

The remedial project goal is to eliminate or mitigate, to the extent feasible, significant threats to public health and the environment through the proper application of scientific and engineering principles, given the intended use of the site, which is anticipated to be for commercial or industrial purposes. Currently, development is not planned at this time. Specifically, the remedial action goals include to:

- Prevent contact and ingestion of contaminated soil and groundwater.
- Remove the source of groundwater contamination.
- Prevent migration of contaminants via groundwater.

3.2 Remedial Action Objectives

The objectives of the remedy are specifically to:

- Conduct source removal of shallow soils impacted with target CVOCs identified in the former dry cleaning/building slab on grade area present at concentrations that could further impact groundwater as a result of infiltration of surface water in the future.

- Eliminate or reduce potential human exposure to historic fill impacted with PAHs and metals above commercial use SCOs to protect public health and the environment and facilitate future redevelopment of the site.

4. DEVELOPMENT AND ANALYSIS OF ALTERNATIVES

Based on the goals and objectives listed in Section 3 above, possible remedial alternatives were identified and evaluated as described in this section.

4.1 Possible Remedial Action Alternatives - Soil

Based on the nature and extent of contamination at the site, the following possible remedial action alternatives have been identified for the impacted soils are as follows.

4.1.1 Soil Alternative #1: No Action

"No Action" would include no remediation or engineering controls. In lieu of remediation and engineering controls, institutional controls, which would include an environmental easement restricting site usage and prohibiting use of site groundwater, would be implemented. Additionally, a Site Management Plan would be implemented for management of soil during potential future building construction and/or other earthwork during site operations.

4.1.2 Soil Alternative #2: Soil Treatment (Undefined Track)

Treatment of onsite fill and soil materials could be conducted using a combination of in-situ stabilization (metals) and oxidation (PAHs and VOCs). Following a complete treatment program, the metals would be stabilized, and the PAHs and VOCs would be reduced to the extent practicable. Additionally, an environmental easement restricting site usage and prohibiting the use of groundwater would be implemented. A Site Management Plan would be implemented for management of soil during potential future building construction and/or other earthwork during site operations. As a result, the exposure pathways (inhalation, dermal contact, and ingestion) would be reduced by rendering the metals immobile and decreasing the PAH concentrations onsite.

4.1.3 Soil Alternative #3: Residual Impacted Soil Removal and Cover System Installation (Track 4)

This remedy, if completed, would result in the site achieving Track 4: Restricted Use as defined in 6NYCRR § 375 -3.7 (e)(4).

The targeted removal of soils would consist of removing areas of fill and soil materials where the concentrations of target CVOCs are present that may potentially impact the groundwater quality at the site. Additionally, a Site and Soil Management Plan would also be implemented to manage soil during future earthwork.

Remaining historic fill materials and impacted soil present onsite above 15 feet below grade at the site would be covered with pavement or a demarcation layer and NYSDEC approved clean cover. Currently, pavement is in place in areas outside the former building footprint and is acting as a cover system in that area. As part of implementation of this remedy, the pavement would be repaired as needed. The former basement area has been filled with NYSDEC approved clean backfill and no further action is needed at that location. The area not covered in pavement or associated with the former basement would be covered with a demarcation layer and at least one foot of NYSDEC approved clean backfill.

4.1.4 Soil Alternative #4: Removal and offsite disposition of impacted soil/fill (Track 1/Track 2)

The complete removal remedy would involve the excavation, characterization, and offsite disposition of all fill materials and soils impacted by COCs above applicable risk based SCOs 15 feet below ground surface to achieve Track 2 or to bedrock to achieve Track 1. The excavations will be backfilled using NYSDEC approved clean cover material. This remedy would achieve soil remedial Track 1 or 2 with respect to soil impacts per 6NYCRR § 375 -3.7 (e)(2). This alternative represents the least restrictive remedial option that is practicable for the site.

4.2 Possible Remedial Action Alternatives – Groundwater

Based on the nature and extent of contamination at the site, the following potential remedial action alternatives have been identified for the impacted soils are identified as follows.

4.2.1 Groundwater Alternative #1: Groundwater Monitoring

This alternative would involve developing a program to monitor VOC trends and potential migration at the existing monitoring well locations on and offsite. The wells will be sampled routinely and analyzed for VOCs per an approved Site Management Plan. For the purposes of cost estimating, it is assumed that this remedial action would be conducted for a 30-year duration to allow consistency for evaluation purposes. This time frame for cost estimation is based on the EPA's 1998 Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA. Note that the 30 year time frame was used for consistency for cost estimating only, and is not an estimation of the anticipated length of the monitoring program alternative. Groundwater quality should improve over time as a result of residual source removal, and natural attenuation.

4.2.2 Groundwater Alternative #2: In-situ (Substrate Injection) Treatment

In-situ groundwater remediation processes include bioremediation and chemical oxidation, each of which rely on the distribution of an amendment. Typically, bioremediation would consist of injection of an organic carbon substrate into groundwater to enhance the natural breakdown of organic contaminants including dry cleaning solvents. Substrates include but are not limited to lactate, emulsified vegetable oil, polyacetate/acetate esters, chitin, and cheese whey. The in-situ treatment process would involve injection of the substrate either directly using direct push methods or via injection wells in focused areas onsite. Following injection, a groundwater monitoring program will be implemented per a Site Management Plan to evaluate remedial progress. Additional injections may be needed once the substrate is consumed to maintain the enhanced benefit.

Chemical oxidation would consist of injection of a chemical oxidant such as sodium or potassium permanganate, activated persulfate, or Fenton's reagent into groundwater to eliminate organic contaminants.

In order to evaluate the appropriate substrate, feasibility of the alternative, and scope and design of the injection, a pilot test would need to be conducted prior to full-scale remedy implementation.

4.2.3 Groundwater Alternative #3: Ex-Situ (Pumping and Treatment) and Migration Control

Ex-situ treatment is a process that controls the migration of COCs through the pumping of large volumes of groundwater (via multiple extraction points) and treating the extracted groundwater. Ex-situ treatment would involve installation of pumping wells and a treatment system that would be housed onsite in a specially constructed space (e.g. outbuilding or dedicated room inside a future development). The benefits of this treatment option could include hydraulic control of groundwater. At this time while low concentrations of vinyl chloride have been detected immediately offsite, substantial evidence of offsite contaminant migration has not been identified. Ex-situ treatment does not aid in the destruction of CVOCs in the groundwater. Ex-situ treatment processes require routine and continued maintenance of treatment system components. This includes replacing and/or disposing of parts filters, and treatment media (e.g. carbon). In addition, a groundwater monitoring program will be implemented per a Site Management Plan and remedial progress would be continually evaluated.

Due to the geologic conditions at the site, pumping and treatment would need to be evaluated via a pumping test to assess feasibility of the technology and to facilitate proper design of the system. Given the soil conditions (i.e. fine grained silts and glacial tills), it is not anticipated that an ex-situ treatment system would result in effective groundwater recovery at this site.

4.3 Consideration for Future Soil Vapor Intrusion

Currently there are no structures onsite; therefore there is an incomplete exposure pathway for VOC impacted soil vapor and remedial alternatives are not considered in this analysis. Because of the impacts to groundwater, provisions will be included in the Site Management Plan to address the potential for soil vapor intrusion in structures planned for future development. Measures to address the potential for soil vapor intrusion will include analytical testing and installation of engineering controls (e.g. vapor barriers, sub-slab depressurization systems, etc.).

4.4 Evaluation of Alternatives

Per the May 2010 NYSDEC DER-10 guidance and the 6NYCRR Part 375 § 1.8 (f), eight criteria are used to evaluate how the proposed remedy would be protective of public health and the environment:

1. Overall Protection of Human Health and the Environment
2. Compliance with Standards, Criteria and Guidance (SCGs)
3. Long-Term Effectiveness and Permanence
4. Reduction of Toxicity, Mobility or Volume
5. Short-Term Effectiveness
6. Implementability
7. Cost
8. Land Use

DER-10 and Part 375 includes “community acceptance” as a ninth criterion; however this criterion is considered after the public review process of this Alternatives Analysis and as part of the final

NYSDEC approval of the remedy of the site. Therefore, this criterion has not been evaluated as part of this AAR.

Per DER-10, the first two criteria are considered threshold criteria and must be satisfied in order for an alternative to be considered for selection. The following six are balancing criteria, which are used to compare the positive and negative aspects of each of the remedial alternatives, provided the alternative satisfies the threshold criteria. Those that do not satisfy the threshold criteria are rejected and not further evaluated.

Table I includes a matrix of the alternatives described in sections 4.1 and 4.2 above evaluated against the eight criteria.

4.4.1 Evaluation of Threshold Criteria

As shown in Table I, the four soil remedial alternatives and three groundwater remedial alternatives were evaluated against the two threshold criteria (Overall Protection of Human Health and the Environment and Compliance with SCGs). Two out of the four soil alternatives did not meet those criteria and were therefore rejected. All remaining alternatives satisfied those criteria. The rejected alternatives included:

- Soil Alternative #1: No Action
- Soil Alternative #2: Soil Treatment

Specific rationale is described in Table I. In summary, the two alternatives above were not protective of human health and the environment and/or they did not achieve compliance with the SCGs.

4.4.2 Evaluation of Balancing Criteria

The remaining two soil remedial alternatives and three groundwater remedial alternatives that met the threshold criteria were evaluated against the balancing criteria as shown in Table I. The results of the evaluation are summarized below:

- Soil Alternatives

The two remaining alternatives include (a) excavation of all impacted fill materials and soils up to 15 feet below grade (Track 2) or bedrock (Track 1) (primarily the soils remaining in the former parking lot area) and (b) confining those materials below a cover system (Track 4). Both alternatives would allow for redevelopment of the site for commercial and/or industrial use.

Soil Alternative #4 allows more flexibility for future development without premium construction and ongoing maintenance costs; however the costs to implement the removal remedy is significantly higher (several orders of magnitude) than the costs to maintain a cover system. The removal option is also considered less sustainable particularly in the absence of a defined development plan given the need to relocate soil to a landfill and added need for hauling equipment. Furthermore, time to implement the removal remedy would be up to 1-2 years due to the need to characterize the material for landfill acceptance.

- Groundwater Alternatives

All three alternatives involve ongoing monitoring of groundwater. Currently, highest total groundwater concentration of dry cleaning solvent and breakdown compounds is 140 ug/L in MW-3, and it is anticipated that over time those compounds will naturally degrade in the absence of a persistent source of contamination. A specific residual source area (e.g. presence of dense non-aqueous phase liquid (DNAPL) or high concentration of VOCs in saturated soil) contributing to the groundwater contamination has not been identified. The in-situ treatment option and pumping and treatment option aim to actively reduce contamination by introducing a substrate to enhance natural breakdown or oxidize contaminants, or by adding a migration control element, respectively. Each alternative is further evaluated below and in Table I.

In-situ Treatment

In-situ treatment has the potential added benefit of initially degrading the contaminants in the overburden groundwater more rapidly in areas where treatment substrates are delivered. It is anticipated that more than one injection of the treatment may be required to maintain the more rapid remediation pace. Preparation in the form of a pilot test to appropriately design the treatment program and potential installation of addition wells (e.g. injection wells) would be required prior to full implementation. Costs to implement the in-situ treatment program are significantly higher than groundwater monitoring alone. In addition, due to the dense glacial till present at the site, distribution of the substrate within the aquifer may not be feasible.

Ex-situ Treatment (Pumping and Treatment)

Pumping and treatment has the potential added benefit of groundwater migration control; however given the geology of the region and relatively low concentrations of dry cleaning solvents in the water, it is not needed, nor is it anticipated that it would contribute to reducing the volume of target CVOCs in groundwater given the site soil conditions (fine grained silts and glacial tills) which restrict groundwater flow. Furthermore, evidence of continued offsite migration of target CVOCs has not been identified in the data collected to date. Because pumping and treatment includes mechanical systems and removal of groundwater, it would require a high amount of short-term capital to design and install the system, procure discharge permits, etc. and additional capital over the long term for ongoing maintenance and operation of the system. Total capital costs are likely to be over an order of magnitude higher than groundwater monitoring alone. In addition, by removing impacted groundwater from the subsurface for treating, a potential worker exposure pathway is created.

Groundwater Monitoring

Groundwater monitoring alone does not provide any means to expedite remediation. However, given the relatively low concentrations detected in groundwater onsite, the limited evidence of substantial offsite migration of contaminants in groundwater, the current soil conditions limiting groundwater flow due to low hydraulic conductivity, and prohibition of use of the groundwater on the site or surrounding area, this option does present the most cost effective approach for addressing the groundwater conditions in the short and long-term provided continued monitoring indicates that the current groundwater conditions are remaining unchanged or improving. Groundwater quality should improve over time as a result of residual source removal and natural attenuation.

4.5 Recommended Remedy

The remedy recommended for the site is based on the remedial investigation results, remedial objectives for the site as described in Section 3, and the lack of planned future use of the site, which is summarized as follows:

- The remedial investigation indicates that soil contamination is primarily related to former dry cleaning activities on the southwest portion of the site and to urban fill ubiquitous at the site, which consists primarily of relatively immobile (PAHs and metals).

- Contamination is present in groundwater and consists of residual dissolved dry cleaning chemicals (PCE and degradation products) present in concentrations of up to 140 parts per billion. Groundwater migrates towards the south. The overburden consists of dense lacustrine glacial tills, which slows the migration of overburden groundwater due to low hydraulic conductivity. Significant offsite groundwater impacts were not identified.

- At this time, there is no planned future use for the site. Future development is anticipated to be for commercial or industrial use.

Based on the information above, the recommended remedy for the site is residual source removal of shallow soils impacted with target CVOCs that are present in concentrations that may impact groundwater, maintaining a cover system to restrict access to impacted fill and soil materials (Soil Alternative #3), and implementing a groundwater monitoring program to assess VOC trends and the potential continued migration of the impacted groundwater (Groundwater Alternative #1). This remedy was chosen for the following reasons based on the results of the alternatives analysis:

- Given the absence of future planned development at this time, the significant added costs and length of time to implement, the full removal option is prohibitive relative to the site objectives.

- Considering the relatively low concentrations of chlorinated VOCs in the groundwater, the geologic conditions conducive to slowed migration of impacted groundwater, lack of evidence of continued offsite migration, and prohibition of use of groundwater for drinking or other purposes, implementing an in-situ treatment or pumping and treatment system in addition to regular monitoring is not anticipated to provide an appreciable benefit relative to the added time, cost, and ongoing management required to implement and maintain those systems.

5. REMEDIAL ACTION WORK PLAN

5.1 Introduction & Purpose

After two interim remedial measures consisting of the removal of potential residual contaminant source material (including some non-aqueous phase liquid beneath the former basement slab and in contact with groundwater and over 12,000 tons of impacted soil, shallow fill and soils impacted with COCs remain at the site in excess of regulatory standards that could present an exposure risk to human health and the environment. As such, the AAR recommended that a Remedial Action (RA) be conducted to address potential exposure risk. The remedial actions recommended include limited additional CVOC-impacted soil and CVOC-impacted historic fill removal and placement of a soil cover. The RA is intended to address the exposure risks related to target CVOC impacts in soil and potential further impacts to groundwater, and to reduce exposure to historic fill at the site.

The RA work will be conducted with oversight by Haley & Aldrich personnel. All excavations will be screened visually and with a photoionization detector (PID) to facilitate soil/fill segregation for disposal. The management of excavated soil is further detailed in the Soil & Groundwater Management Plan in Appendix A.

Community air monitoring will be conducted in accordance with the New York State Department of Health (NYSDOH) Community Air Monitoring Plan (CAMP) during excavation activities. A copy of the generic CAMP is included in Appendix B. Haley & Aldrich personnel will work under the Health & Safety Plan (HASP) previously prepared for the soil excavation IRM.

5.2 Assessment and Derivation of Site-Specific Protection of Groundwater Standard for PCE and related Target CVOCs.

As described in AAR above, PCE was detected in shallow surface soils up to 280 mg/kg. The current NYSDEC protection of groundwater SCO is 1.3 mg/kg. To date, groundwater does not appear to be adversely impacted to levels coincident with levels currently seen in soil in the former dry cleaning area of the site; however given that the former building and slab have been removed, those impacted soils are no longer restricted from infiltration of surface water and have the potential to impact the groundwater in the future.

A majority of the impacted soil was identified on the southwest portion of the former dry cleaning area. Two detections were noted slightly above the current protection of groundwater SCO (1.6 and 1.7 mg/kg) on the southeastern side of the building slab that appear to be disconnected from the main dry cleaning area. For purposes of this remedial action, we have evaluated the derivation of the current protection of groundwater SCO and understand that it is conservative and based off of the organic carbon partition coefficient value (K_{oc}) of 265 multiplied by the current groundwater standard, an assumed percentage of 1% organic carbon, and dilution attenuation factor of 100 [3]. We understand that the K_{oc} value used is based off of the geometric mean of 15 derived K_{oc} values (177-373) for agricultural land to silt loams (higher K_{oc} values being associated with fine grained soils such as silty loam)[4].

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[3] New York State Department of Environmental Conservation & New York State Department of Health, 2006

[4] US Environmental Protection Agency, 1996

Given that the soils at the site consist of fine grain glacial till material, it is justifiable to utilize a K_{oc} value for a more similar soil type rather than a geometric mean of non-applicable soil type K_{oc} values. As such, we have developed a site-specific cleanup goal of 1.8 mg/kg for PCE, which utilizes the highest derived K_{oc} value (373) provided in the EPA sources referenced in their 1996 Soil Screening Guidance; Technical Document. Using this same analysis and reference sources, the protection of groundwater SCO for TCE has been recalculated to 0.75 mg/kg. The technical documents reviewed did not include multiple Koc values for cis-1,2-DCE or vinyl chloride, therefore the current NYSDEC protection of groundwater SCO is used for those two target CVOCs as a default.

Figure 9 provides a schematic of soil grids that will be excavated as part of the remedial action based on a modified site-specific protection of groundwater standard of 1.8 mg/kg for PCE and 0.75 mg/kg for TCE.

5.3 Site Preparation

The necessary permits from the City of Buffalo and others, as necessary, will be obtained prior to the start of the remedial action.

5.4 Removal of Shallow Fill Soils Impacted with Chlorinated Volatile Organic Compounds

Based on post IRM confirmation surface sampling, an area of fill and soil in the former dry cleaning area was identified to be impacted with PCE, TCE, and/or cis-1,2-DCE above site-specific protection of groundwater SCOs as shown on Figure 9. Depth of the impacted area is unknown. This area will be incrementally sampled and excavated as described below.

Based on the confirmation sample results to date, no additional sampling or excavation is planned for the northern portion of the slab-on-grade area as concentrations of target CVOCs above site-specific protection of groundwater SCOs were not detected.

5.4.1 Soil Excavation Procedure

The former dry cleaning excavation area will be divided into sections and the soil will be excavated from the impacted area shown on Figure 9 in approximately 6 inch-depth increments to the extent practicable. Excavated soil/fill will be segregated in piles comprising soil from their respective section and stockpiled in approximately 100 ton piles for characterization and disposal per the Soil and Groundwater Management Plan in Appendix A. The excavation will continue in approximately 6 inch increments until the following occurs:

Vertically: Confirmation samples indicate that no further excavation is necessary (refer to Section 5.4.2 below); bedrock is encountered; or the practical limits of the excavation have been reached (i.e., maintaining a safe excavation without the use of shoring or without excessive management of groundwater infiltration or the edge of the property line has been reached).

Laterally: The lateral limits of the excavation are shown on Figure 9 and are as follows:

North: The surveyed limit of the impacted soils determined based on post-soil removal IRM confirmation sampling.

South: The property line and surveyed limits of impacted area base on post-soil removal IRM confirmation sampling.
East: The surveyed limit of the impacted area determined based on post-soil removal IRM confirmation sampling.
West: The limits of the slab-on-grade area, previously excavated test pits and the surveyed limit of impacted soils determined based on post-IRM confirmation sampling.

Once the excavation is deemed complete, the excavation will be backfilled and covered as described in Section 5.5 below pending NYSDEC approval.

5.4.2 Confirmation Sampling

After each 6 inch layer of soil is removed from the former dry cleaning area, one set of discrete surface samples will be collected in the center of every 900 square foot (sf) grid or as directed by the NYSDEC field representative. The samples will be analyzed at an ELAP Certified laboratory for target CVOCs (PCE, TCE, cis-1,2-DCE, and vinyl chloride) VOCs via EPA Method 8260.

Excavation will continue within the 900 sf grid based on those results. Following excavation, additional confirmation samples will be collected as described above. The process continues until the excavation is deemed complete per analytical testing.

In the case of Grid 37, in which PCE was detected in the surface (0 to 6-inch interval) at 280 mg/kg during the Post-Soil Removal IRM confirmation sampling, subsurface samples will be collected from 12 and 24 inches prior to excavation to inform the required excavation depth. If excavation is required to go deeper than 24 inches, excavation will continue in 6-inch layers in accordance with the standard process for excavation and confirmation sampling described above.

5.5 Placement of Cover System

Once excavation activities are completed, a cover system will be placed over the site based on the area designation as described below and shown on Figure 10. The cover system is intended to serve as an engineering control for the site in accordance with a Track 4 cleanup scenario per 6 NYCRR Part 375. The cover system will consist of the following:

5.5.1 Impermeable Cover

The pavement and UST areas located on the western side of the site and not formerly covered by the building footprint will have pavement and existing concrete serve as the cover system. Existing pavement will be repaired or replaced in kind. Concrete that was removed as part of the UST excavation during the IRM activities will be replaced with pavement.

5.5.2 Demarcation Layer and One-Foot of Clean Cover

The former slab-on-grade area will be improved with a demarcation layer (e.g., geotextile fabric, snow fencing) over the remaining historic fill materials. One foot of NYSDEC-approved "clean" cover material will be placed over the demarcation layer. Clean cover material is further described in the Soil & Groundwater Management Plan in Appendix A. Depending on the source, the clean cover may require testing prior to being imported to the site as described in Appendix A. Following placement of the clean fill, the area will be seeded for aesthetics and erosion control purposes.

5.5.3 Clean Cover

The former basement footprint was backfilled to grade with approximately 10 feet thickness of NYSDEC-approved clean cover during the demolition activities; therefore a demarcation is not required. This area will also be seeded for aesthetic and erosion control purposes.

5.6 Engineering & Institutional Controls

Following completion of the RA activities the following Engineering and Institutional Controls will be in place or implemented:

- The cover system describe in Section 5.5 above will serve as the Engineering Control for the site.

- A site management plan describing procedures for managing site excavations, adhering to IC/ECs including maintaining the cover system, and future considerations for vapor intrusion if buildings are constructed on the site will be prepared.

- The site management plan (SMP) will include a groundwater monitoring plan and will indicate that periodic indoor air sampling at 798 Seneca Street may be required depending on future groundwater monitoring data. The groundwater monitoring plan will include the analysis of target CVOCs (PCE, TCE, cis-1,2-DCE, and vinyl chloride) as well as the following monitored natural attenuation (MNA) indicators measured in the field during sampling: pH, oxidation/reduction potential (ORP), and dissolved oxygen (DO).

- An environmental easement will be prepared that restricts site use to commercial/industrial use, only and prohibits the use of groundwater at the site.

6. CERTIFICATIONS

I, Mark N. Ramsdell, P.E., certify that I am currently a New York State registered professional engineer as defined in 6 NYCRR Part 375 and that this Alternatives Analysis Report/Remedial Action Work Plan was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Mark N. Ramsdell

STATE OF NEW YORK
MARK N. RAMSDELL
71627
LICENSED PROFESSIONAL ENGINEER

Mark N. Ramsdell, P.E

5/28/14

Date

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7. New York State Department of Health Center for Environmental Health and Bureau of Environmental Exposure Investigation, (2006). Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York, October 2006.

8. "Phase I Environmental Site Assessment, AmeriPride Services Inc. Site, 7 and 8 Lord Street, City of Buffalo, Erie County, New York," dated 8 December 2004. Prepared by C.T. Male Associates, P.C.

9. "Phase II Technical Memorandum," dated 19 October 2005. Prepared by ENSR Corporation.

10. "Supplemental Phase II Investigation Report," dated 21 March 2007. Prepared by ENSR Corporation.

11. Letter Regarding "Groundwater Monitoring – June 2009," dated 23 July 2009. Prepared by Delta Environmental.

12. "Remedial Investigation Work Plan, Former American Linen Supply Laundry Facility, 822 Seneca Street, Buffalo, New York, BCP Site #C915241," dated 31 May 2011. Prepared by Haley & Aldrich of New York.

13. "Revised Interim Remedial Measure Work Plan, Soil Excavation and Oily Material Removal, The Former American Linen Supply Company Facility, Buffalo, Erie County, New York, BCP Site #C915241," dated 5 July 2012. Prepared by Haley & Aldrich of New York.

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(Continued)

14. "Revised Interim Remedial Measure Work Plan, Site Excavation and Grading, The Former American Linen Supply Co. Facility, Buffalo, Erie County, New York," dated 18 September 2013. Prepared by Haley & Aldrich of New York.

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TABLE I
ALTERNATIVES ANALYSIS MATRIX
FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
BUFFALO, NY
BCP SITE #C915241

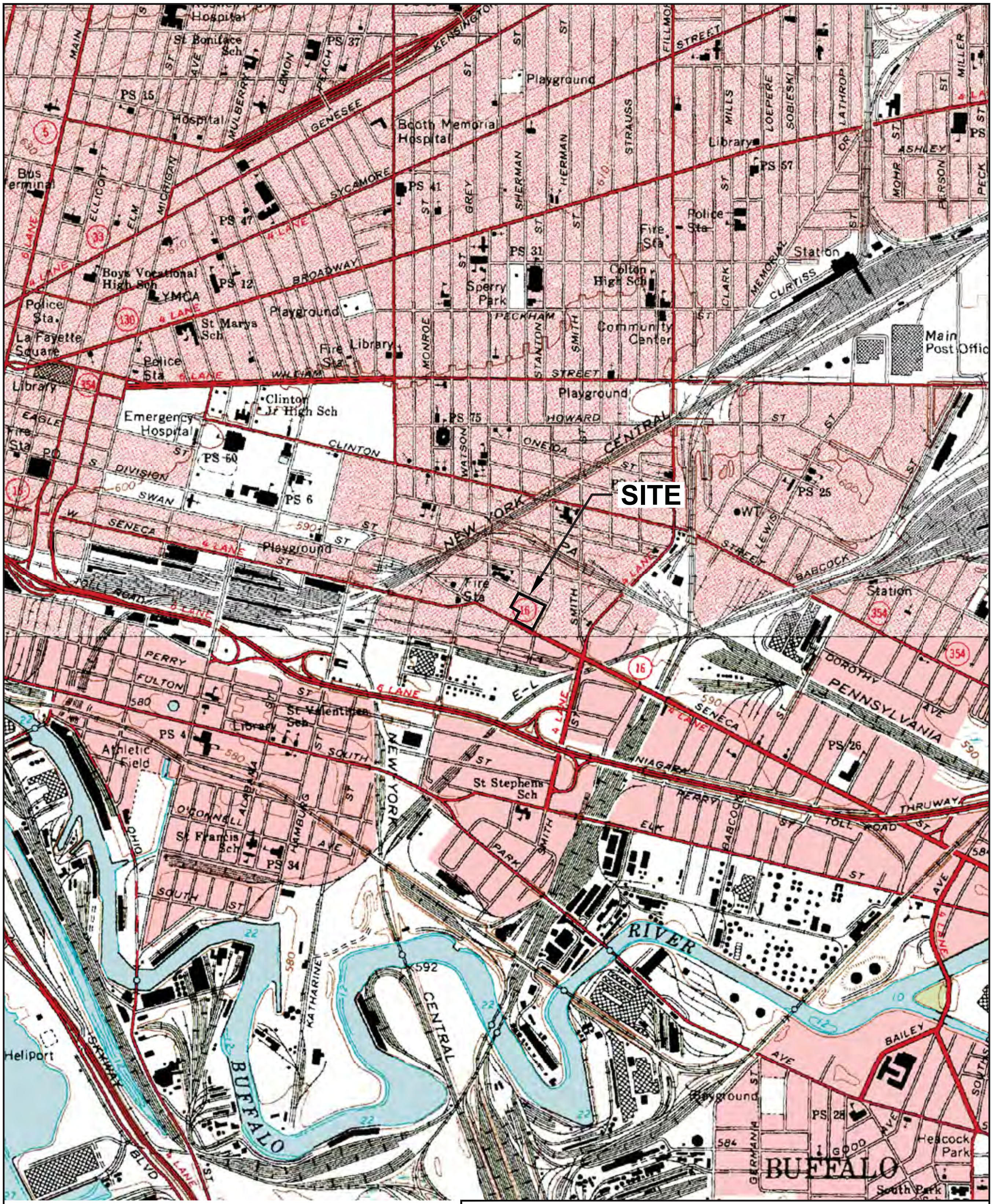
	Media	Soil	
	Contaminants of Concern	Polycyclic Aromatic Hydrocarbons (PAHs) in historic fill Heavy Metals (Arsenic, Barium, Copper, Lead, Mercury) in historic fill Chlorinated Volatile Organic Compounds (SVOCs) shallow soils/fill/ash	
	Treatment Option	No Action	Soil Treatment
Threshold Criteria	Protective of Human Health & Environment	✗ Soils impacted with heavy metals, PAHs, and VOCs were identified in the top 15 feet of soil. "No Action" would not restrict the injestion, dermal absorbtion, or inhalation exposure pathways to future onsite workers or occupants.	✗ Treatment of soils would require a long period of time and high capital cost. Potenital exposure pathways would continue to be present over the short-term. This would preclude redevelopment of the site, which is contradictory to the principal objective of the Brownfield Cleanup Program
	Compliance with Standards, Criteria, and Guidance (SCGs)	✗ Soils impacted with heavy metals, PAHs, and VOCs were identified in the top 15 feet of soil. "No Action" would not restrict the injestion, dermal absorbtion, or inhalation exposure pathways to future onsite workers or occupants.	✗ While some PAH and VOC compounds may be sufficiently removed via oxidation over time, thermal remediation, etc., metals cannot be removed, but would be bound within the soil. In addition, some technologies, such as chemical oxidation, are only effictive on compounds present below the water table. As a result this alternative would not eliminate all exposure pathways.
Balancing Criteria	Long-Term Effectiveness and Permanence	*Alternative rejected after Threshold Evaluation*	*Alternative rejected after Threshold Evaluation*
	Reduction of Toxicity, Mobility or Volume		
	Short-Term Effectiveness		
	Implementability		
	Cost[1]		
	Land Use		

TABLE I
ALTERNATIVES ANALYSIS MATRIX
FORMER AMERICAN LINEN SUPPLY COMPA
BUFFALO, NY
BCP SITE #C915241

	Media	Soil	
	Contaminants of Concern	Polycyclic Aromatic Hydrocarbons (PAHs) in historic fill Heavy Metals (Arsenic, Barium, Copper, Lead, Mercury) in historic fill Chlorinated Volatile Organic Compounds (CVOCs) in soil	
	Treatment Option	Complete Removal of Historic Fill and impacted soil to either 15 feet bgs (Track 2) or bedrock (Track 1)	Source Removal of CVOC impacted soil and installation of a Cover System (Track 4)
Threshold Criteria	Protective of Human Health & Environment	✓ Removal of impacted fill, ash, and soil and backfill with clean cover material would effectively restrict the injestion, dermal absorbtion or inhalation exposure pathways to future onsite workers or occupants	✓ Removing remaining surface soils not currently covered with pavement with known CVOC impacts above what would be protective of groundwater and placement and maintenance of either an impermeable cap or soil layer of sufficient depth and demarcation will reduce or eliminate the injestion, dermal exposure, and inhalation exposure pathways to future site occupants. Breaches in the cover system would be managed under a Site Management Plan.
	Compliance with Standards, Criteria, and Guidance (SCGs)	✓ Removal of impacted fill, ash, and soil above 15 feet below ground surface would achieve the SCGs for a Track 2 soil cleanup. Removal of impacted fill, ash, and soil above bedrock would achieving the SCGs for a Track 1 soil cleanup.	✓ Removal of soils with target CVOCs above protection of groundwater SCOs with implementation of a cover system as an engineering control will meet the SCGs for a Track 4 cleanup. Residual contamination (PAHs, Metals) left in place in the soil will be contained beneath the cover.
Balancing Criteria	Long-Term Effectiveness and Permanence	Removal of impacted fill, ash, and soil would be a permanent measure and remove the source of historic fill and CVOCs onsite. Significant threats and exposure pathways would be limited or removed.	Partial removal of impacted soil and maintenance of a cover system is a permanent measure that is both adequate and reliable. Significant threats and exposure pathways would be limited or removed.
	Reduction of Toxicity, Mobility or Volume	The mobility and volume of metals and PAHs in fill and VOCs in the soil would be reduced both in mobility and toxicity by removing them from the site. Regarding a track 2 scenario where impacted soils below 15 feet may remain, toxicity of VOCs in soil below 15 feet bgs would be attenuated over time.	PAHs and heavy metals present in fill have relatively low mobility and were not identified consistently in site groundwater. Additionally, toxicity of biodegradable PAHs and VOCs (not removed as part of IRM excavation) in soil will will attenuate over time.
	Short-Term Effectiveness	This remedy would require the characterization and disposition of all soil materials onsite above 15 feet bgs or above bedrock. The anticipated time to implement this remedy would be up to 1-2 years.	Pavement is currently in place over the northwestern side of the site that already serves as a cover system. The pavement can be repaired/replaced in the short-term. Exposed impacted soils in the former slab on grade area can have a cover system (demarcation layer and clean cover) installed over them within three months of construction.
	Implementability	Removal of impacted fill, ash, and soil would be a permanent measure and would remove the source of historic fill and source of CVOCs onsite. Significant threats and exposure pathways would be limited or removed.	Excavation and cover of soils can be implemented using coventional construction equipment and permitted disposal facilities where applicable. Specialized or new technologies will not be employed to implement the remedy.
	Cost[1]	This method would necessitate a large volume of replacement fill, and would consume substantial volumes of offsite landfill capacity.Based on experience at other sites, and cost estimate information from nearby sites, it is anticipated that characterization, removal, offsite dispostion of all fill materials, and importing clean fill would cost between $5 million and $10 million which includes the potential to encounter and subsequently require disposal of soils that will require premium disposal cost.	Pavement is already covering a portion of the site. Cost to repair the pavement as needed, and additional costs for removal of soil materials and placement of clean soil and demarcation layers as needed is anticipated to be between $250,000 and and $500,000 which includes the potential to encounter and subsequently require disposal of soils that will require premium disposal costs.
	Land Use	The site is currently zoned industrial use. Presumed future use is anticipated to be commercial or industrial use. This remedial option would allow for such uses without engineering controls.	The site is currently zoned industrial use. Presumed future use is anticipated to be commercial or industrial use. This remedial option would allow for such uses. Future development that would breach the cover system or disturb impacted soils can be done under a Site Management Plan.

TABLE I
ALTERNATIVES ANALYSIS MATRIX
FORMER AMERICAN LINEN SUPPLY COMP/
BUFFALO, NY
BCP SITE #C915241

	Media	Groundwater		
	Contaminants of Concern	Chlorinated Volatile Organic Compounds (CVOCs)		
	Treatment Option	Groundwater Monitoring	In-situ Treatment (Bioremediation or Chemical Oxidation)	Ex-situ Treatment (Pumping & Treatment)
Threshold Criteria	Protective of Human Health & Environment	✓ Onsite groundwater is not used for drinking, pumping, or industrial purposes. Furthermore, use of the groundwater for public consuption is restricted by the City of Buffalo. Other than small amounts of groundwater generated for monitoring purposes (purge water), groundwater monitoring would not create exposure pathways that would impact future site occupants.	✓ Onsite groundwater is not used for drinking, pumping, or industrial purposes. Furthermore, use of the groundwater for public consuption is restricted by the City of Buffalo. Other than small amounts of groundwater generated for monitoring purposes (purge water), In-situ treatment would not likely create exposure pathways that would impact future site occupants.	✓ Onsite groundwater is not used for drinking, pumping, or industrial purposes. Furthermore, use of the groundwater for public consuption is restricted by the City of Buffalo. In order to be treated, groundwater will be pumped to the surface and discharged to the municipal sewer following treatment. This would be a closed loop system that would limit exposure, however the potential for exposure is greater than with methods that do not generate waste water.
	Compliance with Standards, Criteria, and Guidance (SCGs)	✓ Over time, CVOCs will naturally attenuate and degrade in the absense of a persistent source.	✓ Over time, CVOCs will naturally attenuate and degrade in the absense of a persistent source. In-situ treatment may initially accelerate the process of breakdown of CVOCs via the introduction of a chemical oxidation or reductive dechlorination substrate.	✓ Over time, CVOCs will naturally attenuate and degrade in the absense of a persistant source. Ex-situ treatment will aid in reducing groundwater migration via a groundwater depression caused by pumping and contaminant reduction.
Balancing Criteria	Long-Term Effectiveness and Permanence	Groundwater contamination does not currently present a risk to human health and the environment as it is not used as a water supply source, and continued offsite contaminant migration is not evident nor anticipated given the soil conditions and absence of a source. Monitoring will be effective in the long-term in documenting and analyzing the nature and stability of the plume.	Because substrates are readily consumed, the effects of enhanced degradation by introduction of a substrate are anticipated to be short term. To continue to see the benefit over the long-term, it is anticipated the substrate will have to be periodically re-injected. Furthermore, enhanced reductive dechlorination is less effective in bedrock.	Ex-situ treatment requires the design and installation of long-term mechanical and/or electrical components. In addition, discharge permits are required for discharge of generated wastewater. Such equipment has the potential to malfunction/breakdown and will require continued maintenance. While this technology is effective at controlling groundwater migration, it will not likely aid in reaching SCGs beyond natural attenuation.
	Reduction of Toxicity, Mobility or Volume	This alternative relies upon the natural attenuation of contaminants with time. Based on the dense soil conditions, it is not anticipated that the CVOCs in groundwater will continue to be mobile. This would continually be evaluated as part of the monitoring program.	In addition to natural attenuation of CVOCs with time, areas that are within the area of injection of the biological substrate are anticipated to have an accelerated reduction of CVOCs until the substrate is consumed. The enhanced reductive dechlorination process does however have the potential to increase solubilization/mobilization of the CVOCs from the subsurface matrix. In addition, if the enhanced reductive dechlorination pathway is incomplete, there is a potential for increase in vinyl chloride migration.	The act of pumping groundwater creates a hydrologic depression, which may influence the mobility of groundwater. Pumping and treatment is intended to reduce the volume of CVOCs in groundwater, however given the geology of the region (dense glacial till) and relatively low concentrations of CVOCs (up to 140 parts per billion), it is not likely that pumping and treatment will contribute to significant reduction of CVOC concentrations.
	Short-Term Effectiveness	Groundwater monitoring is a long-term remedy. Since groundwater is not currently nor is it planned to be used onsite and there is no evidence of continued offsite contaminant migration, short-term remediation is not necessary.	In-situ treatment is a long-term remedy. Assuming aquifer conditions are favorable to reductive dechlorination or chemical oxidation, target CVOC degredation is anticipated to be enhanced in the short term while the injected substrate is consumed, however complete remediation of the groundwater will still rely on natural attenuation over time.	Given the geology of the region (dense glacial till) and relatively low concentrations of CVOCs (up to 2 140 parts per billion), it is not likely that ex-situ treatment will contribute to significant reduction of CVOC concentrations in the short-term. Short-term effects would include altering groundwater migration via mechanical pumping.
	Implementability	Implementation of groundwater monitoring can be done with conventional equipment and minimal set up time. Set up and maintenance would include installation and/or rehabiliation of site monitoring wells per a Site Management Plan. Routine monitoring would be conducted per the Site Management Plan.	Implementation can be done with conventional drilling equipment and once implemented, does not require continued operations and maintenance of a system. However, in order to properly design the in-situ treatment system and select the most appropriate substrate, a lenthy pilot testing process may be required prior to implemenation requiring multiple field mobilization, and up to several months of data analysis prior to actual full implementation. Once implemented, regular maintenance of the wells and monitoring would be conducted per a Site Management Plan. It is noted that in order for this system to remain effective over time, additional injection(s) of substrate may be required.	Implementation of an ex-situ pumping and treatment system requires installation of wells, design and construction of a treatment system, and procurement of treatment media as well as some limited buildign construction to house filters and system components. Once implemented, the system will require periodic maintenance, which can include replacing and/or disposing of parts, filters, and treatment media (e.g. carbon drums). In addition, regular maintenance and monitoring of the groundwater wells would need to be conducted per a Site Management Plan. Given the site soil conditions, effective pumping of groundwater may not be feasible. A pump test would need to be performed prior to implementation to assess feasibilty.
	Cost[1]	Total capital costs for this alternative are anticipated to be between \$10,000 and \$50,000 per year depending on the need to install additional monitoring wells. Operations and maintenance costs of an assumed 30 year monitoring period are anticipated to be \$300,000 to \$500,000.	Total capital costs for this alternative are anticipated to be approximately \$300,000. Operations and maintenance costs of an assumed 30 year monitoring period are anticipated to be between \$400,000 and \$650,000.	Total capital costs for this alternative are anticipated to be approximately \$250,000. Operations and maintenance costs of an assumed 30 year monitoring period are anticipated to be over \$3,000,000.
	Land Use	The site is currently zoned industrial use. Presumed future use is anticipated to be commercial or industrial use. This remedial option would allow for such a use with continued monitoring per a Site Management Plan.	The site is currently zoned industrial use. Presumed future use is anticipated to be commercial or industrial use. This remedial option would allow for such a use with continued monitoring per a Site Management Plan.	The site is currently zoned industrial use. Presumed future use is anticipated to be commercial or industrial use. This remedial option would allow for such a use with continued monitoring per a Site Management Plan.



SITE COORDINATES: 78°50'48.28"W, 42°52'34.00"

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U.S.G.S. QUADRANGLE: BUFFALO NE, NEW YORK

HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY
822 SENECA STREET
BUFFALO, NEW YORK

PROJECT LOCUS

SCALE: 1:24000
FEBRUARY 2014

FIGURE 1

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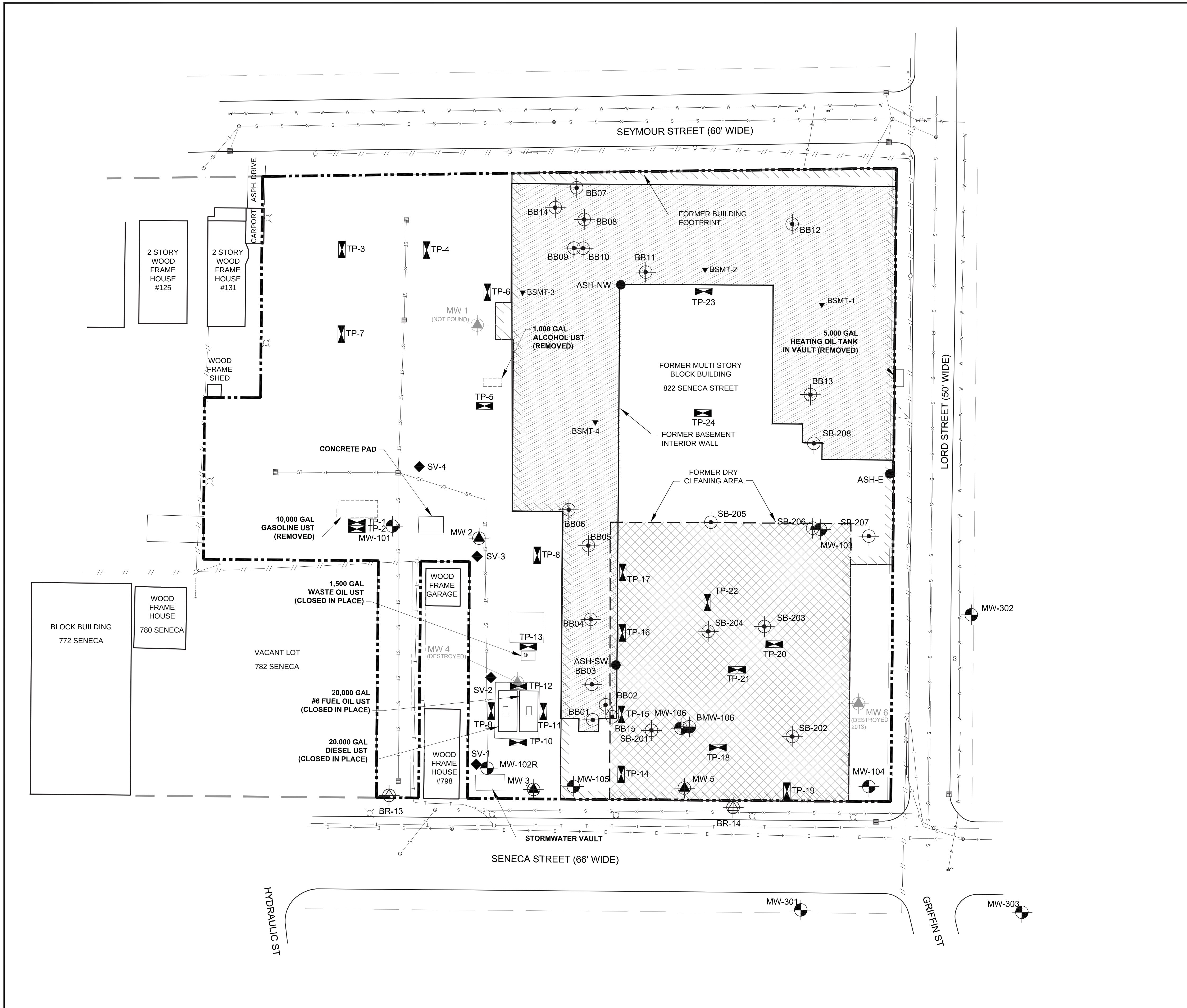

LEGEND

	PROPERTY LINE
BMW-106	SURVEYED LOCATION OF BEDROCK MONITORING WELL INSTALLED IN 2012
MW-102	SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2012
MW-301	SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2013
SV-2	SURVEYED LOCATION OF SOIL VAPOR SAMPLING POINT INSTALLED IN 2012
TP-24	APPROXIMATE LOCATION OF TEST PIT INSTALLED IN 2011 AND 2012
MW-2	SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY ENSR IN DECEMBER 2005.
BR-14	SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY OTHERS FOR ADJACENT PROPERTY.
SB-207	APPROXIMATE LOCATION OF SOIL BORING INSTALLED IN 2012
BB10	APPROXIMATE LOCATION OF BASEMENT SOIL BORING INSTALLED IN 2012
BSMT-2	APPROXIMATE LOCATION OF BASEMENT GRAB SAMPLE COLLECTED IN 2012
ASH-E	APPROXIMATE LOCATION OF PRE-CHARATERIZATION GRAB SAMPLE OF ASH LAYER COLLECTED IN 2012
ST	STORM SEWER LINE
//	OVERHEAD POWER
S	SANITARY SEWER
T	UNDERGROUND TELEPHONE
E	UNDERGROUND ELECTRIC

NOTES

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, SOIL BORING LOCATIONS, INTERIOR WELL LOCATIONS, SAMPLING LOCATIONS, INTERIOR BUILDING FEATURES, AND BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP (INCLUDING BEDROCK MONITORING WELL, MONITORING WELL, SOIL VAPOR SAMPLING POINTS, SOIL BORINGS, TEST PITS, CONFIRMATION SAMPLES, AND OTHER REMEDIAL INVESTIGATION AND IRM FEATURES) IS BASED ON ELECTRONIC CAD FILES FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK, OF WHICH THE MOST RECENT VERSION IS DATED 22 JANUARY 2014.

0 30 60 90 120
SCALE IN FEET

HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY
822 SENECA STREET
BUFFALO, NEW YORK

INITIAL PRE-SOIL REMOVAL IRM SITE INVESTIGATION LOCATION PLAN

SCALE: AS SHOWN
FEBRUARY 2014

FIGURE 2

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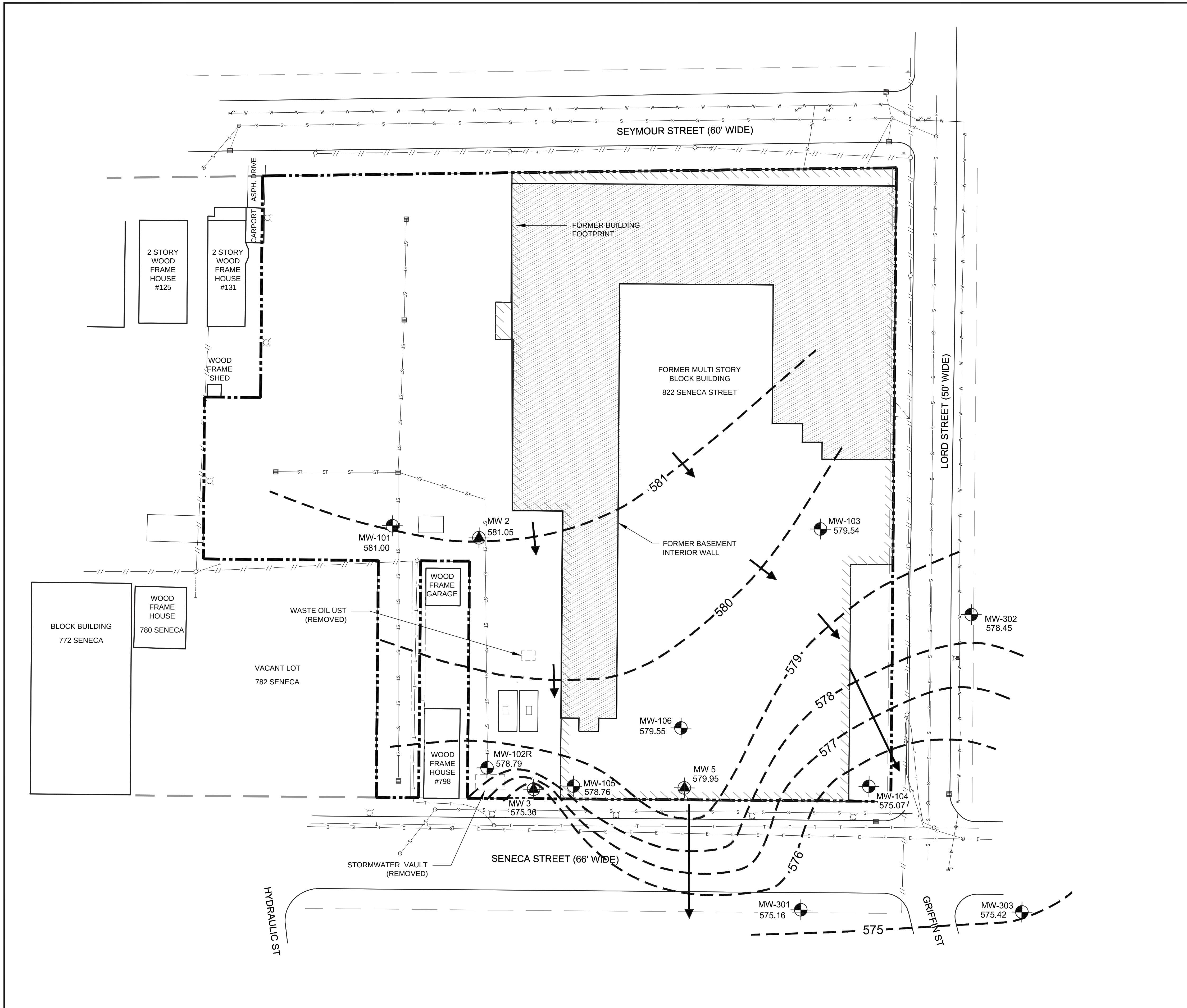

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LEGEND

- PROPERTY LINE
- BMW-106 — SURVEYED LOCATION OF BEDROCK MONITORING WELL INSTALLED IN 2012
- MW-102 — SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2012
- MW-301 — SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2013
- MW-2 — SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY ENSR IN DECEMBER 2005.
- 579.16 — ELEVATION OF WATER TABLE WITHIN MONITORING WELL
- 580 — GROUNDWATER CONTOUR LINE
- GROUNDWATER FLOW DIRECTION
- STORM SEWER LINE
- OVERHEAD POWER
- SANITARY SEWER
- UNDERGROUND TELEPHONE
- UNDERGROUND ELECTRIC

NOTES

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, SOIL BORING LOCATIONS, INTERIOR WELL LOCATIONS, PROPOSED SAMPLING LOCATIONS, INTERIOR BUILDING FEATURES, AND BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP (INCLUDING BEDROCK MONITORING WELL, MONITORING WELL, SOIL VAPOR SAMPLING POINTS, SOIL BORINGS, TEST PITS, CONFIRMATION SAMPLES, AND OTHER REMEDIAL INVESTIGATION AND IRM FEATURES) IS BASED ON ELECTRONIC CAD FILES FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK, OF WHICH THE MOST RECENT VERSION IS DATED 22 JANUARY 2014..
3. MW-102 REPLACED IN DECEMBER 2013 AND IS UPDATED WITH JANUARY 2014 DATA.
4. CONTOUR ELEVATIONS ARE EXPRESSED IN FT MSL.

N E S W

0 30 60 90 120
SCALE IN FEET

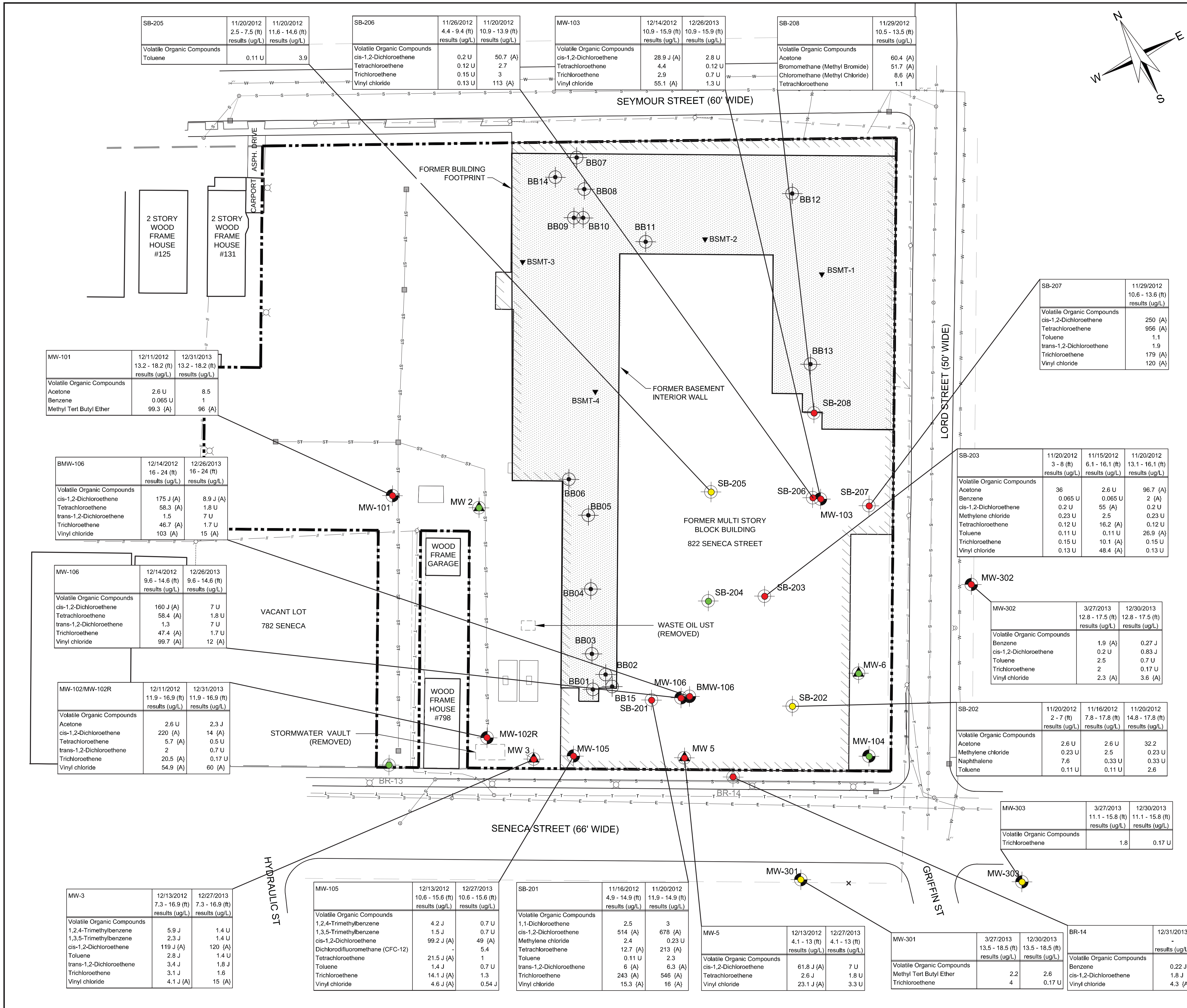
HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY
822 SENECA STREET
BUFFALO, NEW YORK

GROUNDWATER CONTOUR MAP (JANUARY 2014)

SCALE: AS SHOWN
FEBRUARY 2014

FIGURE 3



SB-205	11/20/2012 2.5 - 7.5 (ft) results (ug/L)	11/20/2012 11.6 - 14.6 (ft) results (ug/L)
Volatile Organic Compounds		
Toluene	0.11 U	3.9

SB-206	11/26/2012 4.4 - 9.4 (ft) results (ug/L)	11/20/2012 10.9 - 13.9 (ft) results (ug/L)
Volatile Organic Compounds		
cis-1,2-Dichloroethene	0.2 U	50.7 {A}
Tetrachloroethene	0.12 U	2.7
Trichloroethene	0.15 U	3
Vinyl chloride	0.13 U	113 {A}

MW-103	12/14/2012 10.9 - 15.9 (ft) results (ug/L)	12/26/2013 10.9 - 15.9 (ft) results (ug/L)
Volatile Organic Compounds		
cis-1,2-Dichloroethene	28.9 J {A}	2.8 U
Tetrachloroethene	4.4	0.12 U
Trichloroethene	2.9	0.7 U
Vinyl chloride	55.1 {A}	1.3 U

SB-208	11/29/2012 10.5 - 13.5 (ft) results (ug/L)
Volatile Organic Compounds	
Acetone	60.4 {A}
Bromomethane (Methyl Bromide)	51.7 {A}
Chloromethane (Methyl Chloride)	8.6 {A}
Tetrachloroethene	1.1

MW-101	12/11/2012 13.2 - 18.2 (ft) results (ug/L)	12/31/2013 13.2 - 18.2 (ft) results (ug/L)
Volatile Organic Compounds		
Acetone	2.6 U	8.5
Benzene	0.065 U	1
Methyl Tert Butyl Ether	99.3 {A}	96 {A}

BMW-106	12/14/2012 16 - 24 (ft) results (ug/L)	12/26/2013 16 - 24 (ft) results (ug/L)
Volatile Organic Compounds		
cis-1,2-Dichloroethene	175 J {A}	8.9 J {A}
Tetrachloroethene	58.3 {A}	1.8 U
trans-1,2-Dichloroethene	1.5	7 U
Trichloroethene	46.7 {A}	1.7 U
Vinyl chloride	103 {A}	15 {A}

MW-106	12/14/2012 9.6 - 14.6 (ft) results (ug/L)	12/26/2013 9.6 - 14.6 (ft) results (ug/L)
Volatile Organic Compounds		
cis-1,2-Dichloroethene	160 J {A}	7 U
Tetrachloroethene	58.4 {A}	1.8 U
trans-1,2-Dichloroethene	1.3	7 U
Trichloroethene	47.4 {A}	1.7 U
Vinyl chloride	99.7 {A}	12 {A}

MW-102/MW-102R	12/11/2012 11.9 - 16.9 (ft) results (ug/L)	12/31/2013 11.9 - 16.9 (ft) results (ug/L)
Volatile Organic Compounds		
Acetone	2.6 U	2.3 J
cis-1,2-Dichloroethene	220 {A}	14 {A}
Tetrachloroethene	5.7 {A}	0.5 U
trans-1,2-Dichloroethene	2	0.7 U
Trichloroethene	20.5 {A}	0.17 U
Vinyl chloride	54.9 {A}	60 {A}

SB-207	11/29/2012 10.6 - 13.6 (ft) results (ug/L)
Volatile Organic Compounds	
cis-1,2-Dichloroethene	250 {A}
Tetrachloroethene	956 {A}
Toluene	1.1
trans-1,2-Dichloroethene	1.9
Trichloroethene	179 {A}
Vinyl chloride	120 {A}

SB-203	11/20/2012 3 - 8 (ft) results (ug/L)	11/15/2012 6.1 - 16.1 (ft) results (ug/L)	11/20/2012 13.1 - 16.1 (ft) results (ug/L)
Volatile Organic Compounds			
Acetone	36	2.6 U	96.7 {A}
Benzene	0.065 U	0.065 U	2 {A}
cis-1,2-Dichloroethene	0.2 U	55 {A}	0.2 U
Methylene chloride	0.23 U	2.5	0.23 U
Tetrachloroethene	0.12 U	16.2 {A}	0.12 U
Toluene	0.11 U	0.11 U	26.9 {A}
Trichloroethene	0.15 U	10.1 {A}	0.15 U
Vinyl chloride	0.13 U	48.4 {A}	0.13 U

MW-302	3/27/2013 12.8 - 17.5 (ft) results (ug/L)	12/30/2013 12.8 - 17.5 (ft) results (ug/L)
Volatile Organic Compounds		
Benzene	1.9 {A}	0.27 J
cis-1,2-Dichloroethene	0.2 U	0.83 J
Toluene	2.5	0.7 U
Trichloroethene	2	0.17 U
Vinyl chloride	2.3 {A}	3.6 {A}

SB-202	11/20/2012 2 - 7 (ft) results (ug/L)	11/16/2012 7.8 - 17.8 (ft) results (ug/L)	11/20/2012 14.8 - 17.8 (ft) results (ug/L)
Volatile Organic Compounds			
Acetone	2.6 U	2.6 U	32.2
Methylene chloride	0.23 U	2.5	0.23 U
Naphthalene	7.6	0.33 U	0.33 U
Toluene	0.11 U	0.11 U	2.6

MW-303	3/27/2013 11.1 - 15.8 (ft) results (ug/L)	12/30/2013 11.1 - 15.8 (ft) results (ug/L)
Volatile Organic Compounds		
Trichloroethene	1.8	0.17 U

MW-3	12/13/2012 7.3 - 16.9 (ft) results (ug/L)	12/27/2013 7.3 - 16.9 (ft) results (ug/L)
Volatile Organic Compounds		
1,2,4-Trimethylbenzene	5.9 J	1.4 U
1,3,5-Trimethylbenzene	2.3 J	1.4 U
cis-1,2-Dichloroethene	119 J {A}	120 {A}
Toluene	2.8 J	1.4 U
trans-1,2-Dichloroethene	3.4 J	1.8 J
Trichloroethene	3.1 J	1.6
Vinyl chloride	4.1 J {A}	15 {A}

MW-105	12/13/2012 10.6 - 15.6 (ft) results (ug/L)	12/27/2013 10.6 - 15.6 (ft) results (ug/L)
Volatile Organic Compounds		
1,2,4-Trimethylbenzene	4.2 J	0.7 U
1,3,5-Trimethylbenzene	1.5 J	0.7 U
cis-1,2-Dichloroethene	99.2 J {A}	49 {A}
Dichlorodifluoromethane (CFC-12)	-	5.4
Tetrachloroethene	21.5 J {A}	1
Toluene	1.4 J	0.7 U
Trichloroethene	14.1 J {A}	1.3
Vinyl chloride	4.6 J {A}	0.54 J

SB-201	11/16/2012 4.9 - 14.9 (ft) results (ug/L)	11/20/2012 11.9 - 14.9 (ft) results (ug/L)
Volatile Organic Compounds		
1,1-Dichloroethene	2.5	3
cis-1,2-Dichloroethene	514 {A}	678 {A}
Methylene chloride	2.4	0.23 U
Tetrachloroethene	12.7 {A}	213 {A}
Toluene	0.11 U	2.3
trans-1,2-Dichloroethene	6 {A}	6.3 {A}
Trichloroethene	243 {A}	546 {A}
Vinyl chloride	15.3 {A}	16 {A}

MW-5	12/13/2012 4.1 - 13 (ft) results (ug/L)	12/27/2013 4.1 - 13 (ft) results (ug/L)
Volatile Organic Compounds		
cis-1,2-Dichloroethene	61.8 J {A}	7 U
Tetrachloroethene	2.6 J	1.8 U
Vinyl chloride	23.1 J {A}	3.3 U

MW-301	3/27/2013 13.5 - 18.5 (ft) results (ug/L)	12/30/2013 13.5 - 18.5 (ft) results (ug/L)
Volatile Organic Compounds		
Methyl Tert Butyl Ether	2.2	2.6
Trichloroethene	4	0.17 U

BR-14	12/31/2013 - results (ug/L)
Volatile Organic Compounds	
Benzene	0.22 J
cis-1,2-Dichloroethene	1.8 J
Vinyl chloride	4.3 {A}

LEGEND

- PROPERTY LINE
- BMW-106 — SURVEYED LOCATION OF BEDROCK MONITORING WELL INSTALLED IN 2012
- MW-102 — SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2012
- MW-301 — SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2013
- MW-1 — SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY ENSR IN DECEMBER 2005.
- SB-203 — SURVEYED LOCATION OF SOIL BORINGS INSTALLED IN 2012
- RED DOT INDICATES ONE OR MORE COMPOUNDS HAVE EXCEEDED CRITERIA
- YELLOW DOT INDICATES THAT COMPOUNDS DID NOT EXCEED CRITERIA
- GREEN DOT INDICATES THAT COMPOUNDS WERE NOT DETECTED

NOTES

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, SOIL BORING LOCATIONS, INTERIOR WELL LOCATIONS, PROPOSED SAMPLING LOCATIONS, INTERIOR BUILDING FEATURES, AND BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP (INCLUDING BEDROCK MONITORING WELL, MONITORING WELL, SOIL VAPOR SAMPLING POINTS, SOIL BORINGS, TEST PITS, CONFIRMATION SAMPLES, AND OTHER REMEDIAL INVESTIGATION AND IRM FEATURES) IS BASED ON ELECTRONIC CAD FILES FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK, OF WHICH THE MOST RECENT VERSION IS DATED 22 JANUARY 2014.
3. ONLY VOLATILE ORGANIC COMPOUNDS WHICH WERE DETECTED ARE SHOWN IN DATABOXES.
4. DEPTHS SHOWN ARE BASED ON POST-SOIL REMOVAL IRM GROUND SURFACE MEASUREMENTS.
5. RESULTS SHOWN WITH AN IDENTIFIER {A} EXCEED THE FOLLOWING CRITERIA:

VOLATILE ORGANIC COMPOUND	NYSDEC TOGS 1.1.1 Class GA (ug/L)
1,1-Dichloroethene	5
Acetone	50
Benzene	1
Bromomethane (Methyl Bromide)	5
Chloromethane (Methyl Chloride)	5
cis-1,2-Dichloroethene	5
Methyl Tert Butyl Ether	10
Methylene chloride	5
Naphthalene	10
Tetrachloroethene	5
Toluene	5
trans-1,2-Dichloroethene	5
Trichloroethene	5
Vinyl chloride	2

0 30 60 90 120
SCALE IN FEET

HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY
822 SENECA STREET
BUFFALO, NEW YORK

VOLATILE ORGANIC COMPOUNDS IN GROUNDWATER

SCALE: AS SHOWN
FEBRUARY 2014

FIGURE 4

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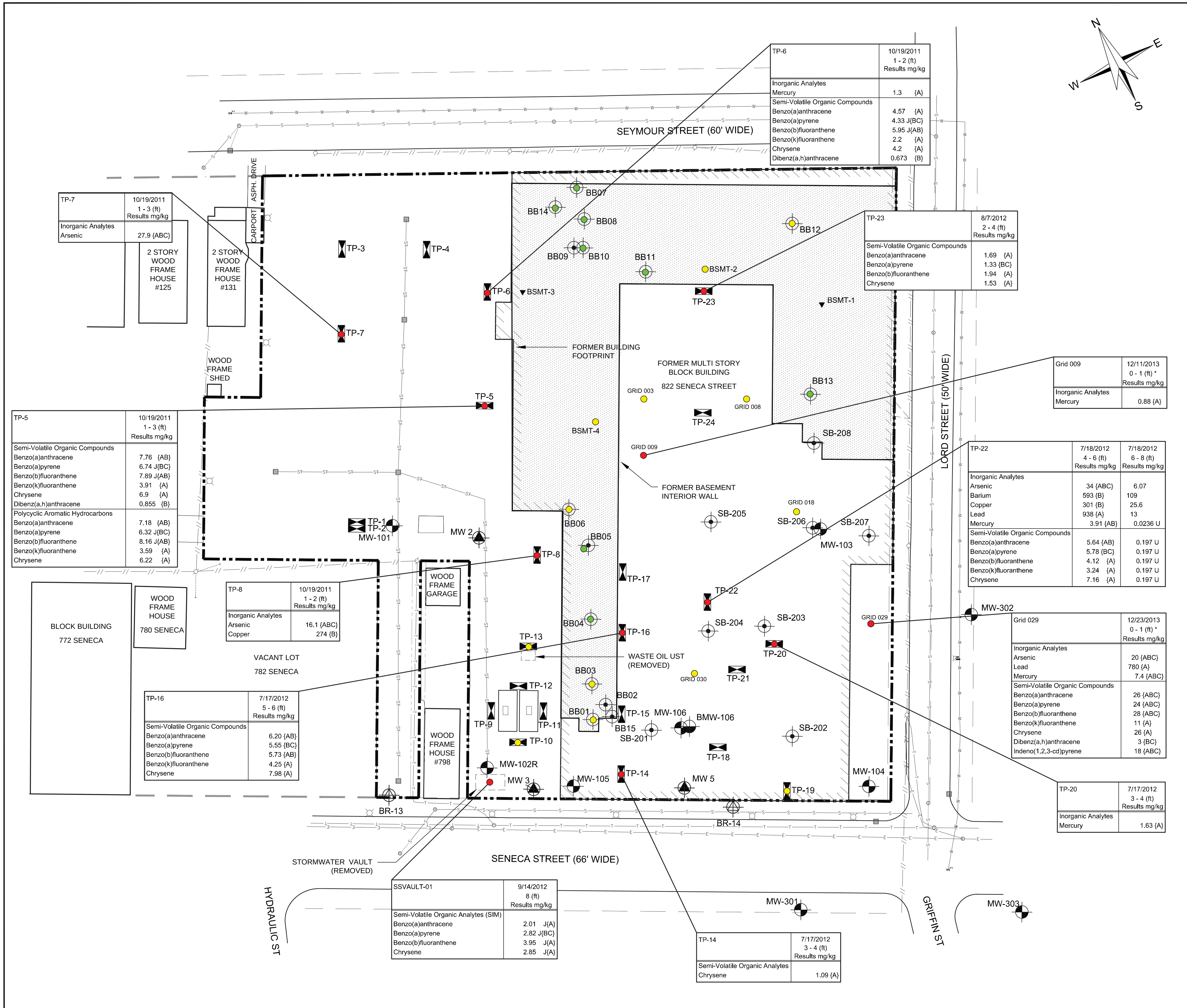

TP-6	10/19/2011 1 - 2 (ft) Results mg/kg
Inorganic Analytes	
Mercury	1.3 {A}
Semi-Volatile Organic Compounds	
Benzo(a)anthracene	4.57 {A}
Benzo(a)pyrene	4.33 J{BC}
Benzo(b)fluoranthene	5.95 J{AB}
Benzo(k)fluoranthene	2.2 {A}
Chrysene	4.2 {A}
Dibenz(a,h)anthracene	0.673 {B}

TP-7	10/19/2011 1 - 3 (ft) Results mg/kg
Inorganic Analytes	
Arsenic	27.9 {ABC}

TP-23	8/7/2012 2 - 4 (ft) Results mg/kg
Semi-Volatile Organic Compounds	
Benzo(a)anthracene	1.69 {A}
Benzo(a)pyrene	1.33 {BC}
Benzo(b)fluoranthene	1.94 {A}
Chrysene	1.53 {A}

TP-5	10/19/2011 1 - 3 (ft) Results mg/kg
Semi-Volatile Organic Compounds	
Benzo(a)anthracene	7.76 {AB}
Benzo(a)pyrene	6.74 J{BC}
Benzo(b)fluoranthene	7.89 J{AB}
Benzo(k)fluoranthene	3.91 {A}
Chrysene	6.9 {A}
Dibenz(a,h)anthracene	0.855 {B}
Polycyclic Aromatic Hydrocarbons	
Benzo(a)anthracene	7.18 {AB}
Benzo(a)pyrene	6.32 J{BC}
Benzo(b)fluoranthene	8.16 J{AB}
Benzo(k)fluoranthene	3.59 {A}
Chrysene	6.22 {A}

Grid 009	12/11/2013 0 - 1 (ft) * Results mg/kg
Inorganic Analytes	
Mercury	0.88 {A}

TP-22	7/18/2012 4 - 6 (ft) Results mg/kg	7/18/2012 6 - 8 (ft) Results mg/kg
Inorganic Analytes		
Arsenic	34 {ABC}	6.07
Barium	593 {B}	109
Copper	301 {B}	25.6
Lead	938 {A}	13
Mercury	3.91 {AB}	0.0236 U
Semi-Volatile Organic Compounds		
Benzo(a)anthracene	5.64 {AB}	0.197 U
Benzo(a)pyrene	5.78 {BC}	0.197 U
Benzo(b)fluoranthene	4.12 {A}	0.197 U
Benzo(k)fluoranthene	3.24 {A}	0.197 U
Chrysene	7.16 {A}	0.197 U

TP-8	10/19/2011 1 - 2 (ft) Results mg/kg
Inorganic Analytes	
Arsenic	16.1 {ABC}
Copper	274 {B}

Grid 029	12/23/2013 0 - 1 (ft) * Results mg/kg
Inorganic Analytes	
Arsenic	20 {ABC}
Lead	780 {A}
Mercury	7.4 {ABC}
Semi-Volatile Organic Compounds	
Benzo(a)anthracene	26 {ABC}
Benzo(a)pyrene	24 {ABC}
Benzo(b)fluoranthene	28 {ABC}
Benzo(k)fluoranthene	11 {A}
Chrysene	26 {A}
Dibenz(a,h)anthracene	3 {BC}
Indeno(1,2,3-cd)pyrene	18 {ABC}

TP-16	7/17/2012 5 - 6 (ft) Results mg/kg
Semi-Volatile Organic Compounds	
Benzo(a)anthracene	6.20 {AB}
Benzo(a)pyrene	5.55 {BC}
Benzo(b)fluoranthene	5.73 {AB}
Benzo(k)fluoranthene	4.25 {A}
Chrysene	7.98 {A}

TP-20	7/17/2012 3 - 4 (ft) Results mg/kg
Inorganic Analytes	
Mercury	1.63 {A}

SSVAULT-01	9/14/2012 8 (ft) Results mg/kg
Semi-Volatile Organic Analytes (SIM)	
Benzo(a)anthracene	2.01 J{A}
Benzo(a)pyrene	2.82 J{BC}
Benzo(b)fluoranthene	3.95 J{A}
Chrysene	2.85 J{A}

TP-14	7/17/2012 3 - 4 (ft) Results mg/kg
Semi-Volatile Organic Analytes	
Chrysene	1.09 {A}

LEGEND

(line)	PROPERTY LINE
BMW-106	SURVEYED LOCATION OF BEDROCK MONITORING WELL INSTALLED IN 2012
MW-102	SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2012
MW-301	SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2013
BB10	APPROXIMATE LOCATION OF BASEMENT SOIL BORING INSTALLED IN 2012
BSMT-2	APPROXIMATE LOCATION OF BASEMENT EXCAVATION GRAB SAMPLE COLLECTED IN 2012
TP-24	APPROXIMATE LOCATION OF INSTALLED TEST PIT - INSTALLED IN 2011 AND 2012
TP-23	APPROXIMATE LOCATION OF INSTALLED TEST PIT WHERE FILL CHARACTERIZATION SAMPLE WAS COLLECTED AND ANALYZED IN 2011 AND 2012
MW-2	SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY ENSR IN DECEMBER 2005
	SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY OTHERS FOR ADJACENT PROPERTY
GRID 008	GRID SAMPLE LOCATIONS (SHOWN ONLY WHERE COMPOUNDS ANALYZED) COLLECTED IN 2013
(red dot)	RED DOT INDICATES ONE OR MORE ANALYTES HAVE EXCEEDED CRITERIA
(yellow dot)	YELLOW DOT INDICATES THAT ANALYTES DID NOT EXCEED CRITERIA
(green dot)	GREEN DOT INDICATES THAT ANALYTES WERE NOT DETECTED
—ST—ST—	STORM SEWER LINE
—//—//—	OVERHEAD POWER
—S—S—	SANITARY SEWER
—T—T—	UNDERGROUND TELEPHONE
—E—E—	UNDERGROUND ELECTRIC

NOTES

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, SOIL BORING LOCATIONS, INTERIOR WELL LOCATIONS, PROPOSED SAMPLING LOCATIONS, INTERIOR BUILDING FEATURES, AND BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP (INCLUDING BEDROCK MONITORING WELL, MONITORING WELL, SOIL VAPOR SAMPLING POINTS, SOIL BORINGS, TEST PITS, CONFIRMATION SAMPLES, AND OTHER REMEDIAL INVESTIGATION AND IRM FEATURES) IS BASED ON ELECTRONIC CAD FILES FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK, OF WHICH THE MOST RECENT VERSION IS DATED 22 JANUARY 2014.
3. UNITS SHOWN IN mg/kg.
4. RESULTS SHOWN WITH AN IDENTIFIER {A, B, C} EXCEED THE FOLLOWING NYSDEC SOIL CLEANUP OBJECTIVES:

   {A} - GROUNDWATER PROTECTION
   {B} - COMMERCIAL
   {C} - INDUSTRIAL
5. ALL DEPTHS SHOWN ARE PRE-SOIL REMOVAL IRM WITH THE EXCEPTION OF GRID SAMPLES DENOTED WITH AN (*). GRID SAMPLES WERE COLLECTED FROM THE SURFACE POST-IRM.

0 30 60 90 120
SCALE IN FEET

HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
822 SENECA STREET
BUFFALO, NEW YORK

INORGANIC & SEMI-VOLATILE ORGANIC ANALYTES IN SOIL (PRE- AND POST-SOIL REMOVAL IRM)

SCALE: AS SHOWN
FEBRUARY 2014

FIGURE 5

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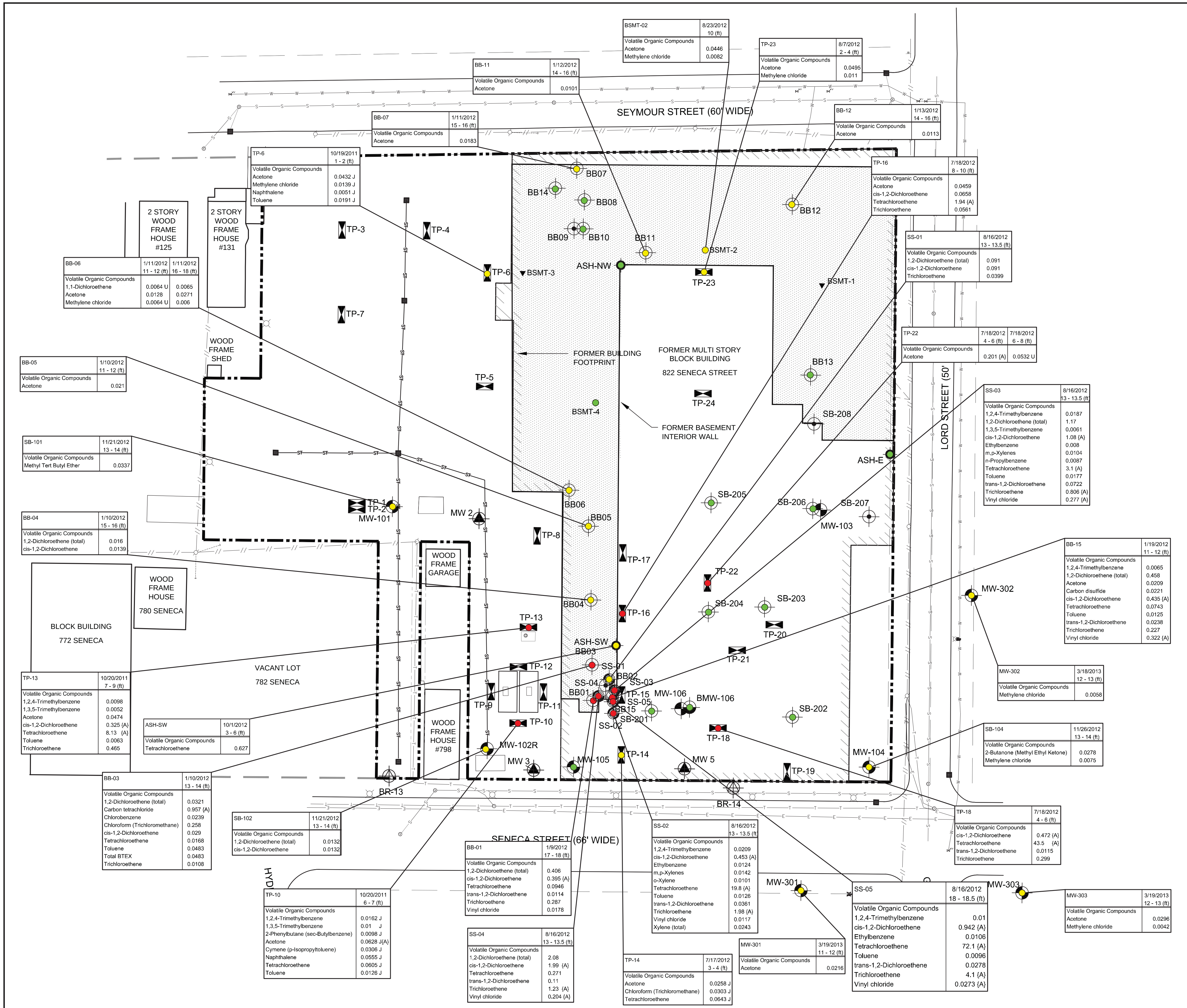

BSMT-02	8/23/2012 10 (ft)
Volatile Organic Compounds	
Acetone	0.0446
Methylene chloride	0.0082

TP-23	8/7/2012 2 - 4 (ft)
Volatile Organic Compounds	
Acetone	0.0495
Methylene chloride	0.011

BB-11	1/12/2012 14 - 16 (ft)
Volatile Organic Compounds	
Acetone	0.0101

BB-07	1/11/2012 15 - 16 (ft)
Volatile Organic Compounds	
Acetone	0.0183

BB-12	1/13/2012 14 - 16 (ft)
Volatile Organic Compounds	
Acetone	0.0113

TP-6	10/19/2011 1 - 2 (ft)
Volatile Organic Compounds	
Acetone	0.0432 J
Methylene chloride	0.0139 J
Naphthalene	0.0051 J
Toluene	0.0191 J

TP-16	7/18/2012 8 - 10 (ft)
Volatile Organic Compounds	
Acetone	0.0459
cis-1,2-Dichloroethene	0.0658
Tetrachloroethene	1.94 {A}
Trichloroethene	0.0561

SS-01	8/16/2012 13 - 13.5 (ft)
Volatile Organic Compounds	
1,2-Dichloroethene (total)	0.091
cis-1,2-Dichloroethene	0.091
Trichloroethene	0.0399

BB-06	1/11/2012 11 - 12 (ft)	1/11/2012 16 - 18 (ft)
Volatile Organic Compounds		
1,1-Dichloroethene	0.0064 U	0.0065
Acetone	0.0128	0.0271
Methylene chloride	0.0064 U	0.006

TP-22	7/18/2012 4 - 6 (ft)	7/18/2012 6 - 8 (ft)
Volatile Organic Compounds		
Acetone	0.201 {A}	0.0532 U

BB-05	1/10/2012 11 - 12 (ft)
Volatile Organic Compounds	
Acetone	0.021

SS-03	8/16/2012 13 - 13.5 (ft)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	0.0187
1,2-Dichloroethene (total)	1.17
1,3,5-Trimethylbenzene	0.0061
cis-1,2-Dichloroethene	1.08 {A}
Ethylbenzene	0.008
m,p-Xylenes	0.0104
n-Propylbenzene	0.0087
Tetrachloroethene	3.1 {A}
Toluene	0.0177
trans-1,2-Dichloroethene	0.0722
Trichloroethene	0.806 {A}
Vinyl chloride	0.277 {A}

SB-101	11/21/2012 13 - 14 (ft)
Volatile Organic Compounds	
Methyl Tert Butyl Ether	0.0337

BB-04	1/10/2012 15 - 16 (ft)
Volatile Organic Compounds	
1,2-Dichloroethene (total)	0.016
cis-1,2-Dichloroethene	0.0139

BB-15	1/19/2012 11 - 12 (ft)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	0.0065
1,2-Dichloroethene (total)	0.458
Acetone	0.0209
Carbon disulfide	0.0221
cis-1,2-Dichloroethene	0.435 {A}
Tetrachloroethene	0.0743
Toluene	0.0125
trans-1,2-Dichloroethene	0.0238
Trichloroethene	0.227
Vinyl chloride	0.322 {A}

MW-302	3/18/2013 12 - 13 (ft)
Volatile Organic Compounds	
Methylene chloride	0.0058

TP-13	10/20/2011 7 - 9 (ft)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	0.0098
1,3,5-Trimethylbenzene	0.0052
Acetone	0.0474
cis-1,2-Dichloroethene	0.325 {A}
Tetrachloroethene	8.13 {A}
Toluene	0.0063
Trichloroethene	0.465

ASH-SW	10/1/2012 3 - 6 (ft)
Volatile Organic Compounds	
Tetrachloroethene	0.627

SB-104	11/26/2012 13 - 14 (ft)
Volatile Organic Compounds	
2-Butanone (Methyl Ethyl Ketone)	0.0278
Methylene chloride	0.0075

BB-03	1/10/2012 13 - 14 (ft)
Volatile Organic Compounds	
1,2-Dichloroethene (total)	0.0321
Carbon tetrachloride	0.957 {A}
Chlorobenzene	0.0239
Chloroform (Trichloromethane)	0.258
cis-1,2-Dichloroethene	0.029
Tetrachloroethene	0.0168
Toluene	0.0483
Total BTEX	0.0483
Trichloroethene	0.0108

SB-102	11/21/2012 13 - 14 (ft)
Volatile Organic Compounds	
1,2-Dichloroethene (total)	0.0132
cis-1,2-Dichloroethene	0.0132

TP-18	7/18/2012 4 - 6 (ft)
Volatile Organic Compounds	
cis-1,2-Dichloroethene	0.472 {A}
Tetrachloroethene	43.5 {A}
trans-1,2-Dichloroethene	0.0115
Trichloroethene	0.299

BB-01	1/9/2012 17 - 18 (ft)
Volatile Organic Compounds	
1,2-Dichloroethene (total)	0.406
cis-1,2-Dichloroethene	0.395 {A}
Tetrachloroethene	0.0946
trans-1,2-Dichloroethene	0.0114
Trichloroethene	0.287
Vinyl chloride	0.0178

SS-02	8/16/2012 13 - 13.5 (ft)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	0.0209
cis-1,2-Dichloroethene	0.453 {A}
Ethylbenzene	0.0124
m,p-Xylenes	0.0142
o-Xylene	0.0101
Tetrachloroethene	19.8 {A}
Toluene	0.0126
trans-1,2-Dichloroethene	0.0361
Trichloroethene	1.98 {A}
Vinyl chloride	0.0117
Xylene (total)	0.0243

TP-10	10/20/2011 6 - 7 (ft)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	0.0162 J
1,3,5-Trimethylbenzene	0.01 J
2-Phenylbutane (sec-Butylbenzene)	0.0098 J
Acetone	0.0628 J{A}
Cymene (p-Isopropyltoluene)	0.0306 J
Naphthalene	0.0555 J
Tetrachloroethene	0.0605 J
Toluene	0.0126 J

SS-05	8/16/2012 18 - 18.5 (ft)
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	0.01
cis-1,2-Dichloroethene	0.942 {A}
Ethylbenzene	0.0106
Tetrachloroethene	72.1 {A}
Toluene	0.0096
trans-1,2-Dichloroethene	0.0278
Trichloroethene	4.1 {A}
Vinyl chloride	0.0273 {A}

MW-303	3/19/2013 12 - 13 (ft)
Volatile Organic Compounds	
Acetone	0.0296
Methylene chloride	0.0042

SS-04	8/16/2012 13 - 13.5 (ft)
Volatile Organic Compounds	
1,2-Dichloroethene (total)	2.08
cis-1,2-Dichloroethene	1.99 {A}
Tetrachloroethene	0.271
trans-1,2-Dichloroethene	0.11
Trichloroethene	1.23 {A}
Vinyl chloride	0.204 {A}

MW-301	3/19/2013 11 - 12 (ft)
Volatile Organic Compounds	
Acetone	0.0216

TP-14	7/17/2012 3 - 4 (ft)
Volatile Organic Compounds	
Acetone	0.0258 J
Chloroform (Trichloromethane)	0.0303 J
Tetrachloroethene	0.0643 J

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LEGEND

- PROPERTY LINE
- BMW-106 SURVEYED LOCATION OF BEDROCK MONITORING WELL INSTALLED IN 2012
- MW-102 SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2012
- MW-301 SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2013
- BB10 APPROXIMATE LOCATION OF INSTALLED BASEMENT SOIL BORING
- BSMT-2 APPROXIMATE LOCATION OF BASEMENT EXCAVATION GRAB SAMPLE
- SS-01 APPROXIMATE LOCATION OF BASEMENT IRM SOIL CONFIRMATION SAMPLE COLLECTED IN 2012
- ASH-E APPROXIMATE LOCATION OF PRE-CHARATERIZATION GRAB SAMPLE OF ASH LAYER COLLECTED IN 2012
- TP-24 APPROXIMATE LOCATION OF INSTALLED TEST PIT
- MW-2 SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY ENSR IN DECEMBER 2005
- BR-14 SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY OTHERS FOR ADJACENT PROPERTY
- RED DOT INDICATES ONE OR MORE COMPOUNDS HAVE EXCEEDED CRITERIA
- YELLOW DOT INDICATES THAT COMPOUNDS DID NOT EXCEED CRITERIA
- GREEN DOT INDICATES THAT COMPOUNDS WERE NOT DETECTED
- STORM SEWER LINE
- OVERHEAD POWER
- SANITARY SEWER
- UNDERGROUND TELEPHONE
- UNDERGROUND ELECTRIC

NOTES

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, SOIL BORING LOCATIONS, INTERIOR WELL LOCATIONS, PROPOSED SAMPLING LOCATIONS, INTERIOR BUILDING FEATURES, AND BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP (INCLUDING BEDROCK MONITORING WELL, MONITORING WELL, SOIL VAPOR SAMPLING POINTS, SOIL BORINGS, TEST PITS, CONFIRMATION SAMPLES, AND OTHER REMEDIAL INVESTIGATION AND IRM FEATURES) IS BASED ON ELECTRONIC CAD FILES FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK, OF WHICH THE MOST RECENT VERSION IS DATED 22 JANUARY 2014.
3. UNITS SHOWN IN mg/kg.
4. RESULTS SHOWN WITH AN IDENTIFIER {A, B, C} EXCEED THE FOLLOWING NYSDEC SOIL CLEANUP OBJECTIVES:

{A} - GROUNDWATER PROTECTION
{B} - COMMERCIAL
{C} - INDUSTRIAL

N E S W

0 30 60 90 120
SCALE IN FEET

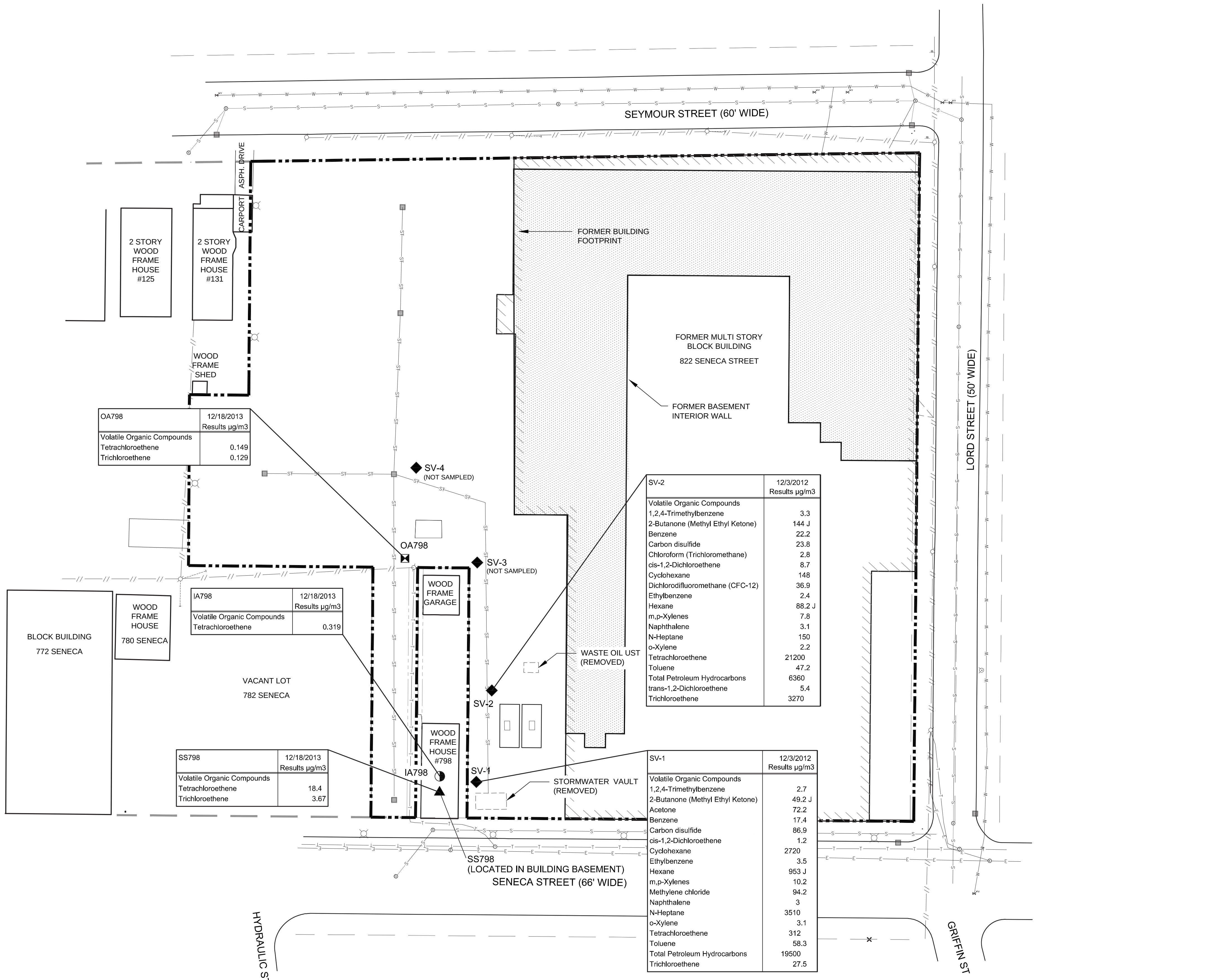
HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY
822 SENECA STREET
BUFFALO, NEW YORK

PRE-SOIL REMOVAL IRM VOLATILE ORGANIC COMPOUNDS IN SOIL

SCALE: AS SHOWN
FEBRUARY 2014

FIGURE 6



OA798	12/18/2013 Results µg/m3
Volatile Organic Compounds	
Tetrachloroethene	0.149
Trichloroethene	0.129

IA798	12/18/2013 Results µg/m3
Volatile Organic Compounds	
Tetrachloroethene	0.319

SS798	12/18/2013 Results µg/m3
Volatile Organic Compounds	
Tetrachloroethene	18.4
Trichloroethene	3.67

SV-2	12/3/2012 Results µg/m3
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	3.3
2-Butanone (Methyl Ethyl Ketone)	144 J
Benzene	22.2
Carbon disulfide	23.8
Chloroform (Trichloromethane)	2.8
cis-1,2-Dichloroethene	8.7
Cyclohexane	148
Dichlorodifluoromethane (CFC-12)	36.9
Ethylbenzene	2.4
Hexane	88.2 J
m,p-Xylenes	7.8
Naphthalene	3.1
N-Heptane	150
o-Xylene	2.2
Tetrachloroethene	21200
Toluene	47.2
Total Petroleum Hydrocarbons	6360
trans-1,2-Dichloroethene	5.4
Trichloroethene	3270

SV-1	12/3/2012 Results µg/m3
Volatile Organic Compounds	
1,2,4-Trimethylbenzene	2.7
2-Butanone (Methyl Ethyl Ketone)	49.2 J
Acetone	72.2
Benzene	17.4
Carbon disulfide	86.9
cis-1,2-Dichloroethene	1.2
Cyclohexane	2720
Ethylbenzene	3.5
Hexane	953 J
m,p-Xylenes	10.2
Methylene chloride	94.2
Naphthalene	3
N-Heptane	3510
o-Xylene	3.1
Tetrachloroethene	312
Toluene	58.3
Total Petroleum Hydrocarbons	19500
Trichloroethene	27.5

LEGEND

- PROPERTY LINE
- SV-3 ◆ SURVEYED LOCATION OF SOIL VAPOR SAMPLING POINT INSTALLED IN 2012
- SS798 ▲ APPROXIMATE LOCATION OF SOIL VAPOR SAMPLING POINT INSTALLED IN 2013
- IA798 ◑ APPROXIMATE LOCATION OF INDOOR AIR SAMPLE IN 2013
- OA798 APPROXIMATE LOCATION OF AMBIENT AIR SAMPLE IN 2013
- ST—ST STORM SEWER LINE
- //—// OVERHEAD POWER
- S—S SANITARY SEWER
- T—T UNDERGROUND TELEPHONE
- E—E UNDERGROUND ELECTRIC

NOTES

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, SOIL BORING LOCATIONS, INTERIOR WELL LOCATIONS, PROPOSED SAMPLING LOCATIONS, INTERIOR BUILDING FEATURES, AND BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP (INCLUDING BEDROCK MONITORING WELL, MONITORING WELL, SOIL VAPOR SAMPLING POINTS, SOIL BORINGS, TEST PITS, CONFIRMATION SAMPLES, AND OTHER REMEDIAL INVESTIGATION AND IRM FEATURES) IS BASED ON ELECTRONIC CAD FILES FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK, OF WHICH THE MOST RECENT VERSION IS DATED 22 JANUARY 2014.
3. UNITS SHOWN IN µg/m^3.
4. DETECTED CHEMICALS SHOWN IN DATABOXES.
5. SV-1 THROUGH SV-4 WERE INSTALLED AS PART OF THE 2012 FIELD ACTIVITIES. SV-3 AND SV-4 DID NOT YIELD SOIL VAPOR SAMPLES DUE TO THE APPARENT PRESENCE OF WATER IN THE SAMPLE PORT.

HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY
822 SENECA STREET
BUFFALO, NEW YORK

VOLATILE ORGANIC COMPOUNDS IN SOIL VAPOR, SUB-SLAB VAPOR, INDOOR AIR, AND OUTDOOR AIR

SCALE: AS SHOWN
FEBRUARY 2014

FIGURE 7

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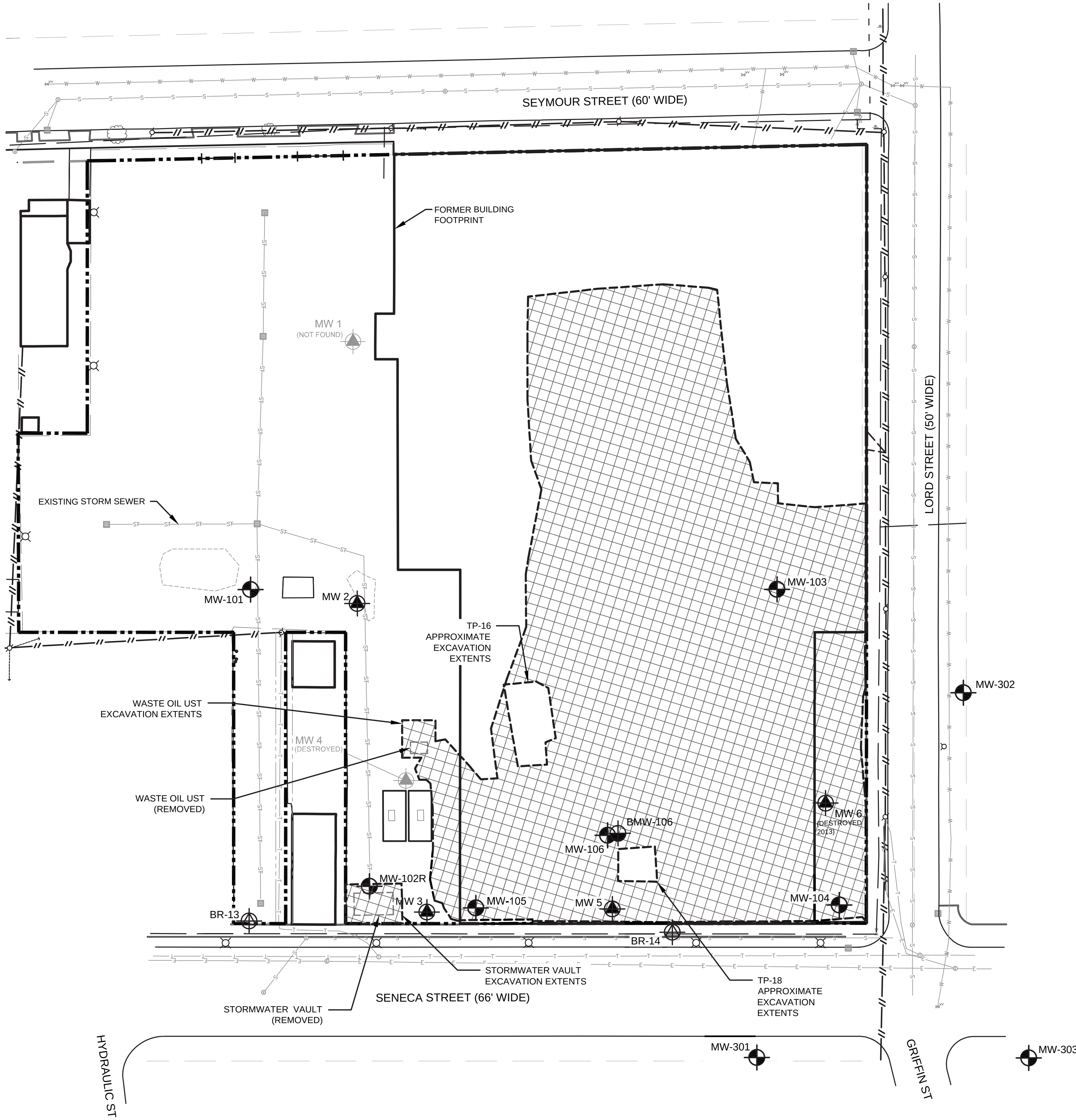
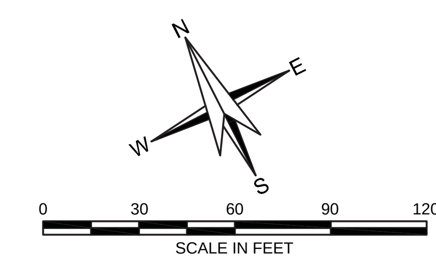


LEGEND

- PROPERTY LINE
- STORM SEWER LINE
- OVERHEAD POWER
- SANITARY SEWER
- UNDERGROUND TELEPHONE
- UNDERGROUND ELECTRIC
- APPROXIMATE EXTENTS OF IRM EXCAVATION AREA AND DISTURBANCE
- BMW-106 SURVEYED LOCATION OF BEDROCK MONITORING WELL INSTALLED IN 2012
- MW-102 SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2012
- MW-301 SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2013
- MW-2 SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY ENSR IN DECEMBER 2005.
- BR-13 SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY OTHERS FOR ADJACENT PROPERTY.

NOTES

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, SOIL BORING LOCATIONS, INTERIOR WELL LOCATIONS, PROPOSED SAMPLING LOCATIONS, INTERIOR BUILDING FEATURES, AND BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP (INCLUDING BEDROCK MONITORING WELL, MONITORING WELL, SOIL VAPOR SAMPLING POINTS, SOIL BORINGS, TEST PITS, CONFIRMATION SAMPLES, AND OTHER REMEDIAL INVESTIGATION AND IRM FEATURES) IS BASED ON ELECTRONIC CAD FILES FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK, OF WHICH THE MOST RECENT VERSION IS DATED 22 JANUARY 2014."



HALEY & ALDRICH

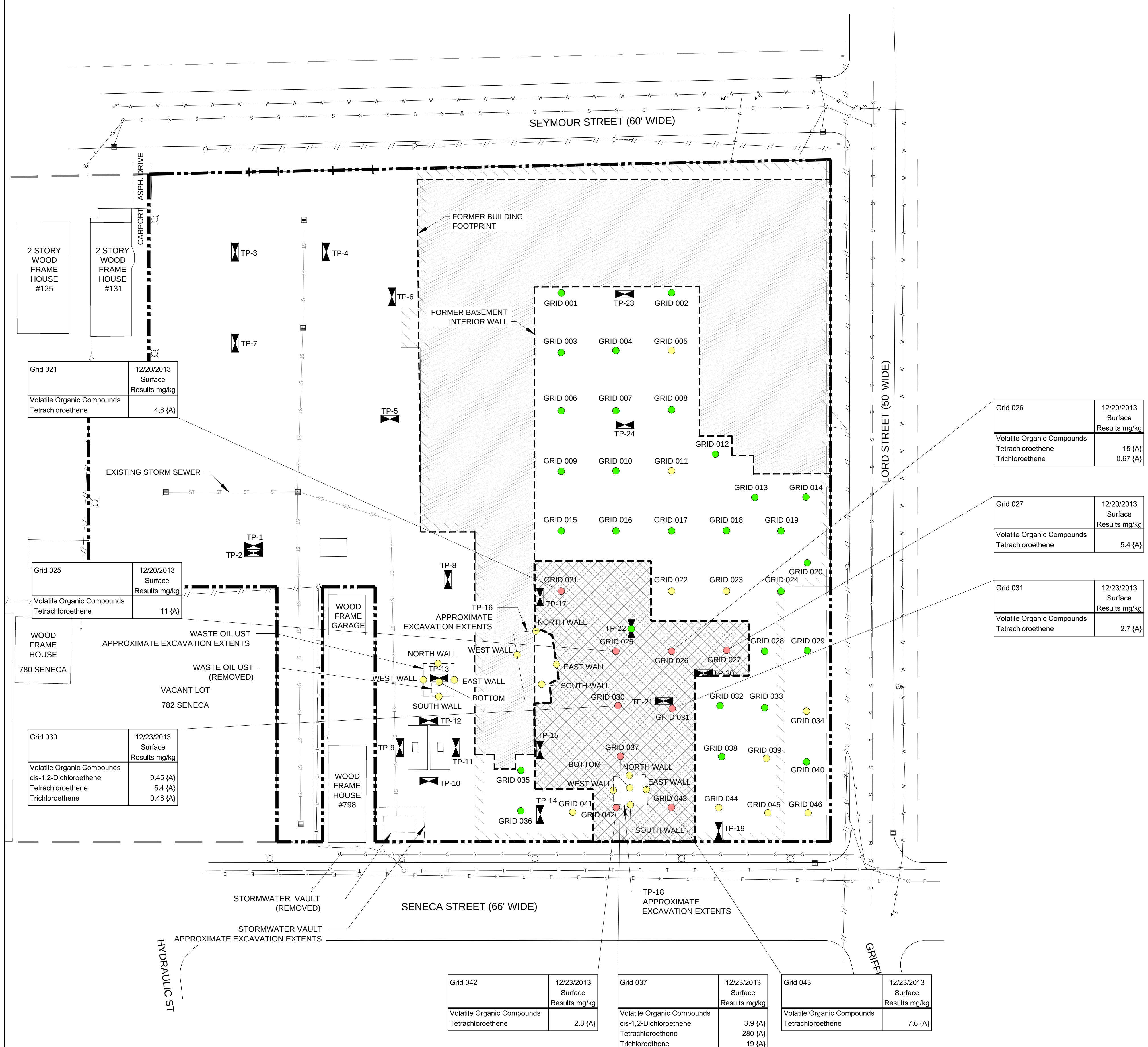
FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
822 SENECA STREET
BUFFALO, NEW YORK

POST-SOIL REMOVAL IRM EXTENT OF EXCAVATION

SCALE: AS SHOWN
FEBRUARY 2014

FIGURE 8

G:\37319\053\CAD\37319-053-GSE_CONTS [2014].DWG



Grid 021	12/20/2013 Surface Results mg/kg
Volatile Organic Compounds	
Tetrachloroethene	4.8 {A}

Grid 025	12/20/2013 Surface Results mg/kg
Volatile Organic Compounds	
Tetrachloroethene	11 {A}

Grid 030	12/23/2013 Surface Results mg/kg
Volatile Organic Compounds	
cis-1,2-Dichloroethene	0.45 {A}
Tetrachloroethene	5.4 {A}
Trichloroethene	0.48 {A}

Grid 026	12/20/2013 Surface Results mg/kg
Volatile Organic Compounds	
Tetrachloroethene	15 {A}
Trichloroethene	0.67 {A}

Grid 027	12/20/2013 Surface Results mg/kg
Volatile Organic Compounds	
Tetrachloroethene	5.4 {A}

Grid 031	12/23/2013 Surface Results mg/kg
Volatile Organic Compounds	
Tetrachloroethene	2.7 {A}

Grid 042	12/23/2013 Surface Results mg/kg
Volatile Organic Compounds	
Tetrachloroethene	2.8 {A}

Grid 037	12/23/2013 Surface Results mg/kg
Volatile Organic Compounds	
cis-1,2-Dichloroethene	3.9 {A}
Tetrachloroethene	280 {A}
Trichloroethene	19 {A}

Grid 043	12/23/2013 Surface Results mg/kg
Volatile Organic Compounds	
Tetrachloroethene	7.6 {A}

LEGEND

- PROPERTY LINE
- ST — STORM SEWER LINE
- // — OVERHEAD POWER
- S — SANITARY SEWER
- T — UNDERGROUND TELEPHONE
- E — UNDERGROUND ELECTRIC
- TP-24 — APPROXIMATE LOCATION OF INSTALLED TEST PIT
- GRID 001 — APPROXIMATE LOCATION OF GRID SAMPLES
- RED DOT INDICATES APPROXIMATE LOCATION OF SAMPLE COLLECTED DURING THE RI/IRM WHERE ONE OR MORE TARGET CVOC COMPOUNDS WERE DETECTED ABOVE CRITERIA AS SHOWN.
- YELLOW DOT INDICATES APPROXIMATE LOCATION OF SAMPLE COLLECTED DURING THE RI/IRM WHERE TARGET CVOC COMPOUNDS WERE NOT DETECTED ABOVE CRITERIA.
- GREEN DOT INDICATES APPROXIMATE LOCATION OF SAMPLE COLLECTED DURING THE RI/IRM WHERE TARGET CVOC COMPOUNDS WERE NOT DETECTED.
- POTENTIAL REMEDIAL ACTION EXCAVATION AREAS, BASED ON 2013 SOIL REMOVAL IRM CONFIRMATION SAMPLING RESULTS. APPROXIMATE AREA : 13,500 SQ.FT.

NOTES

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, SOIL BORING LOCATIONS, INTERIOR WELL LOCATIONS, PROPOSED SAMPLING LOCATIONS, INTERIOR BUILDING FEATURES, AND BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP (INCLUDING BEDROCK MONITORING WELL, MONITORING WELL, SOIL VAPOR SAMPLING POINTS, SOIL BORINGS, TEST PITS, CONFIRMATION SAMPLES, AND OTHER REMEDIAL INVESTIGATION AND IRM FEATURES) IS BASED ON ELECTRONIC CAD FILES FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK, OF WHICH THE MOST RECENT VERSION IS DATED 22 JANUARY 2014.
3. SURFACE SAMPLES WERE COLLECTED FROM THE 0 TO 6-INCH INTERVAL, BASED ON POST-IRM GROUND SURFACE ELEVATIONS
4. ONLY CHEMICALS SCREENED AGAINST CRITERIA INCLUDE TETRACHLOROETHENE, TRICHLOROETHENE, CIS-1,2-DICHLOROETHENE, AND VINYL CHLORIDE.
5. ONLY RESULT THAT EXCEED CRITERIA ARE SHOWN ON FIGURE.
6. RESULTS SHOWN WITH AN IDENTIFIER {A} EXCEED THE FOLLOWING NYSDEC SOIL CLEANUP OBJECTIVES (SCOs):
   {A} - SITE SPECIFIC GROUNDWATER PROTECTION

VOLATILE ORGANIC COMPOUND	SITE SPECIFIC PROTECTION OF GROUNDWATER SCOs (MG/KG)
TETRACHLOROETHENE	1.8
TRICHLOROETHENE	0.75
CIS-1,2-DICHLOROETHENE	0.25
VINYL CHLORIDE	0.02

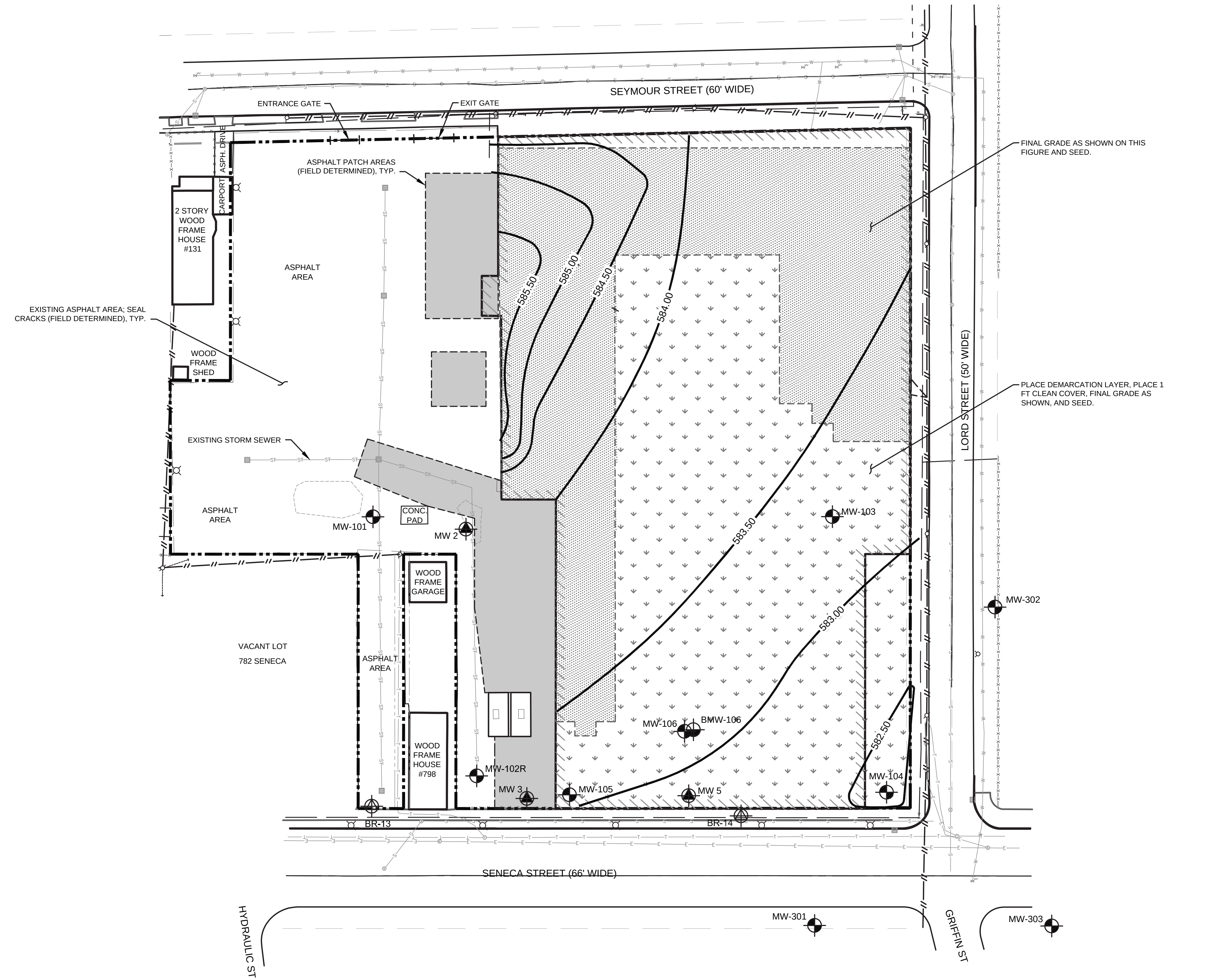
HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
822 SENECA STREET
BUFFALO, NEW YORK

POST-SOIL REMOVAL IRM CONFIRMATION SAMPLES AND PROPOSED EXCAVATION PLAN

SCALE: AS SHOWN
MAY 2014

FIGURE 9

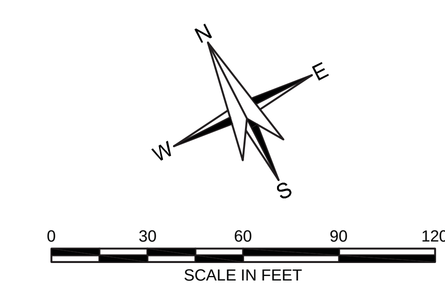


LEGEND

- PROPERTY AND FENCE LINE
- FORMER BUILDING FOOTPRINT
- AREA (PREVIOUSLY BACKFILLED TO GRADE) FOR FINAL GRADING & SEED ; DEMARCATION LAYER NOT REQUIRED
- AREA FOR PLACEMENT OF DEMARCATION LAYER & 1 FT CLEAN COVER, & SEED
- ASPHALT PATCH AREA (FIELD DETERMINED)
- STORM SEWER LINE
- SANITARY SEWER LINE
- WATER LINE
- UNDERGROUND TELEPHONE LINE
- OVERHEAD TELEPHONE LINE
- ELECTRICAL LINE
- SURVEYED LOCATION OF BEDROCK MONITORING WELL INSTALLED IN 2012
- MW-103 SURVEYED LOCATION OF MONITORING WELL INSTALLED IN 2012 AND 2013
- MW-303 SURVEYED LOCATION OF OFF-SITE MONITORING WELL INSTALLED IN 2013
- SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY ENSR IN DECEMBER 2005
- SURVEYED LOCATION OF MONITOR WELLS INSTALLED BY OTHERS FOR ADJACENT PROPERTY.

NOTES

1. ONSITE UTILITY LOCATIONS, TANK LOCATIONS, FORMER BUILDING FEATURES, AND FORMER BASEMENT DIMENSIONS ARE APPROXIMATE UNLESS NOTED OTHERWISE.
2. BASEMAP (INCLUDING BEDROCK MONITORING WELL, MONITORING WELL, SOIL VAPOR SAMPLING POINTS, SOIL BORINGS, TEST PITS, CONFIRMATION SAMPLES, AND OTHER REMEDIAL INVESTIGATION AND IRM FEATURES) IS BASED ON ELECTRONIC CAD FILES FROM HOFFMAN LAND SURVEYING & GEOMATICS OF ONTARIO, NEW YORK, OF WHICH THE MOST RECENT VERSION IS DATED 22 JANUARY 2014.



HALEY & ALDRICH

FORMER AMERICAN LINEN SUPPLY COMPANY FACILITY
822 SENECA STREET
BUFFALO, NEW YORK

PROPOSED FINAL GRADING PLAN

SCALE: AS SHOWN
FEBRUARY 2014

FIGURE 10

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APPENDIX A

Soil & Groundwater Management Plan

APPENDIX A

SOIL & GROUNDWATER MANAGEMENT PLAN

I. Introduction

The following Soil & Groundwater Management Plan provides guidance for managing excavations, soil, and groundwater at the Former American Linen Supply Co. Facility BCP site during the Remedial Action (RA) activities. The guidance herein is a companion to the Remedial Action Work Plan (RAWP) and complies with the criteria for a Track 4 – commercial use cleanup track. This guidance is based on the May 2010 DER-10 Technical Guidance for Site Investigation and Remediation.

The RA work will be conducted with oversight by Haley & Aldrich personnel. All excavations will be screened visually and with a photoionization detector (PID) to facilitate soil/fill segregation for disposal, or analytical testing for potential onsite reuse.

Community air monitoring will be conducted in accordance with the New York State Department of Health (NYSDOH) Community Air Monitoring Plan (CAMP) during excavation activities. A copy of the generic CAMP is included in Appendix B. Haley & Aldrich personnel will work under the existing Health & Safety Plan (HASP) completed for the Soil Excavation Interim Remedial Measure conducted in October 2013 through January 2014.

II. Stockpiling Methods

Soil will be placed in approximately 100 ton stockpiles comprised of materials from designated sections as described in the RAWP. The piles will be sampled and analyzed for offsite disposal per Section III below.

III. Sampling Methods

Sample frequency and procedure will be done as follows. Sample results will be compared to the NYSDEC commercial use soil cleanup objectives (SCOs), protection of groundwater SCOs (including the site-specific derived protection of groundwater SCO for PCE), EPA Maximum Concentrations of Contaminants for the Toxicity Characteristic (TCLP metals, only), and/or the TAGM 3028 contained-in thresholds (VOCs, only). The regulatory standards are shown in the attached Table A-1. Sampling will occur as follows:

a. Excavated impacted materials will be stockpiled in approximately 100 ton piles. For each stockpile, the following samples will be collected:
    i. Two (2) discrete samples for VOCs from each pile
    ii. One (1) composite sample for TCLP Metals from multiple piles totaling up to 500 tons.
b. The samples will be analyzed at the laboratory and disposed according to Section IV below. If necessary, and based on the results, approval for contained-in determination will be obtained from the NYSDEC if VOC results indicate that pile is a listed hazardous waste but the concentrations are below NYSDEC TAGM 3028 thresholds.
c. Note that additional sample parameters may be required by the receiving facility.

IV. Disposal Methods

The NYSDOH CAMP will be enacted during materials load out for disposal. Stockpiles will be disposed of offsite based on the analytical results from Section III above as follows:

a. If TCLP results indicate that the materials are characteristically hazardous and/or VOCs are detected above TAGM 3028 thresholds, dispose offsite as hazardous waste in accordance with disposal facility requirements.

b. If TCLP results indicate that the materials are characteristically non-hazardous, and VOC sampling indicated dry cleaning solvents detected but below TAGM 3028 thresholds, submit the results to the NYSDEC for TAGM 3028 contained-in approval and dispose offsite at a non-hazardous waste landfill once approved per disposal facility requirements. If the VOC results do not meet the TAGM 3028 thresholds, dispose at a hazardous waste landfill.

c. If TCLP results indicate that the materials are characteristically non-hazardous, and dry cleaning solvent related VOCs are not detected (i.e. the material is not a listed hazardous waste), dispose of offsite at a non-hazardous waste landfill in accordance with disposal facility requirements.

Disposal weight tickets, bills of lading/manifests will be collected by Haley & Aldrich field personnel for inclusion in the Final Engineering Report.

V. Excavation Dewatering

Water encountered in the excavation will be staged in tanks, tested, treated if necessary, and discharged to the City of Buffalo Sewer via a Temporary Discharge Permit.

VI. Backfill

Backfill may consist of the following materials described in the sections below based on their intended use.

a. <u>*Clean Cover*</u> – The following materials meeting the criteria for Clean Cover and may be used onsite above the demarcation layer.
    i. Onsite, non-impacted material (Section II.b above) tested in accordance with Section III.a above that meet lesser of the protection of groundwater or commercial use SCOs.
    ii. Gravel, rock, or stone, consisting of virgin material from a permitted mine or quarry.
    iii. Imported soil or cover, other than described in VI.a.ii above, that meets the testing requirements from the May 2010 DER-10 section 5.4(e)3.
    iv. Non-impacted concrete (Section II.a above) or recycled concrete or brick from a NYSDEC registered construction and demolition debris processing facility if the material conforms to the requirements of Section 304 of the New York State Department of Transportation *Standard Specifications Construction and Materials Volume 1 (2002)*.

b. *Materials below the demarcation layer or pavement* – Non-impacted material (Section II.b) that when tested in accordance with Section III.a above meet the protection of groundwater SCOs but may not meet the commercial use SCOs (e.g. elevated concentrations of metals) may be reused onsite below the demarcation layer or pavement layer.

TABLE A-1 -
APPLICABLE REGULATORY TESTING CRITERIA
FORMER AMERICAN LINEN SUPPLY CO. FACILITY
BUFFALO, NEW YORK
NYSDEC SITE # C915241

	Soil Cleanup/Reuse Criteria			Disposal Criteria for Potentially Hazardous Waste[4]	
	NYSDEC Soil Cleanup Objectives (Restricted Use)		Eastern United States Background Levels (mg/kg)	EPA Regulatory Level *(TCLP Metals, Only)* (mg/L)	TAGM 3028 *(VOCs, Only)* (mg/kg)
	Protection of Groundwater (mg/kg)	Commercial Use Criteria (mg/kg)			
Metals					
Arsenic	16 [2]	16 [2]	3-12	5	--
Barium	820	400	15-600	100	--
Beryllium	47	590	0-1.75	--	--
Cadmium	7.5	9.3	0.1-1	1	--
Chromium, hexavalent[1]	19	400	1.5-40	--	--
Chromium, trivalent[1]	--	1500	1.5-40	5	--
Copper	1720	270	1-50	--	--
Total Cyanide[1]	40	27	--	--	--
Lead	450	1000	200-500	5	--
Manganese	2000 [2]	10000	50-5000	--	--
Total Mercury	0.73	2.8	0.001-0.2	0.2	--
Nickel	130	310	0.5-25	--	--
Selenium	4 [2]	1500	0.1-3.9	1	--
Silver	8.3	1500	--	5	--
Zinc	2480	10000	9-50	--	--
Volatile Organic Compounds					
1,1,1-Trichloroethane	0.68	500	--	--	7000
1,1-Dichloroethane	0.27	240	--	--	8000
1,1-Dichloroethene	0.33	500	--	--	120
1,2-Dichlorobenzene	1.1	500	--	--	7000
1,2-Dichloroethane	0.02 [2]	30	--	--	7.7
cis-1,2-Dichloroethene	0.25	500	--	--	800
trans-1,2-Dichloroethene	0.19	500	--	--	2000
1,3-Dichlorobenzene	2.4	280	--	--	--
1,4-Dichlorobenzene	1.8	130	--	--	29
1,4-Dioxane	0.1 [3]	130	--	--	64
Acetone	0.05	500	--	--	8000
Benzene	0.06	44	--	--	24
Butylbenzene	12	500	--	--	--
Carbon tetrachloride	0.76	22	--	--	5.4
Chlorobenzene	1.1	500	--	--	2000
Chloroform	0.37	350	--	--	110
Ethylbenzene	1	390	--	--	6000
Hexachlorobenzene	3.2	6	--	--	0.41
Methyl ethyl ketone	0.12	500	--	--	4000
Methyl tert-butyl ether	0.93	500	--	--	--
Methylene Chloride	0.05	500	--	--	93
n-Propylbenzene	3.9	500	--	--	--
sec-Butylbenzene	11	500	--	--	--
tert-Butylbenzene	5.9	500	--	--	--
Tetrachloroethane	1.3	150	--	--	14
Toluene	0.7	500	--	--	20000
Trichloroethene	0.47	200	--	--	640
1,2,4-Trimethylbenzene	3.6	190	--	--	--
1,3,5-Trimethylbenzene	8.4	190	--	--	--
Vinyl Chloride	0.02	13	--	--	0.36
Xylene (mixed)	1.6	500	--	--	200000

TABLE A-1 -
APPLICABLE REGULATORY TESTING CRITERIA
FORMER AMERICAN LINEN SUPPLY CO. FACILITY
BUFFALO, NEW YORK
NYSDEC SITE # C915241

NOTES & ABBREVIATIONS:

-- = No Standard or Value

**The soil cleanup objectives herein are from the 6 NYCRR Part 375-6.8(b) dated 14 December 2006.

The EPA regulatory levels are from the Code of Federal Regulations Maximum Concentration of Contaminants for Toxisity Characteristics.

TAGM 3028 Action Leves are from the 30 November 1992 Memorandum 3028 regarding "Contained-In" Criteria for Environmental Media

1. The SCO for this specific compound (or family of compounds) is considered to be met if the analysis for the total species of the contaminant is below the SCC
2. For consituants where the calculated SCO was lower than the rural soil background concentration determined by the Department and Department of Health rural soil survey, the rural soil background concentration is used as the Track 2 SCO value for this use of the site.
3. For constituents were the calculated SCO was lower than the contract required quantitation limit (CRQL), the CRQL is used as the SCO value.
4. Additional sampling criteria may be required by the receiving facility.

APPENDIX B

NYSDOH Generic Community Air Monitoring Plan

HALEY & ALDRICH

New York State Department of Health
Generic Community Air Monitoring Plan

A Community Air Monitoring Plan (CAMP) requires real-time monitoring for volatile organic compounds (VOCs) and particulates (i.e., dust) at the downwind perimeter of each designated work area when certain activities are in progress at contaminated sites. The CAMP is not intended for use in establishing action levels for worker respiratory protection. Rather, its intent is to provide a measure of protection for the downwind community (i.e., off-site receptors including residences and businesses and on-site workers not directly involved with the subject work activities) from potential airborne contaminant releases as a direct result of investigative and remedial work activities. The action levels specified herein require increased monitoring, corrective actions to abate emissions, and/or work shutdown. Additionally, the CAMP helps to confirm that work activities did not spread contamination off-site through the air.

The generic CAMP presented below will be sufficient to cover many, if not most, sites. Specific requirements should be reviewed for each situation in consultation with NYSDOH to ensure proper applicability. In some cases, a separate site-specific CAMP or supplement may be required. Depending upon the nature of contamination, chemical-specific monitoring with appropriately-sensitive methods may be required. Depending upon the proximity of potentially exposed individuals, more stringent monitoring or response levels than those presented below may be required. Special requirements will be necessary for work within 20 feet of potentially exposed individuals or structures and for indoor work with co-located residences or facilities. These requirements should be determined in consultation with NYSDOH.

Reliance on the CAMP should not preclude simple, common-sense measures to keep VOCs, dust, and odors at a minimum around the work areas.

Community Air Monitoring Plan

Depending upon the nature of known or potential contaminants at each site, real-time air monitoring for volatile organic compounds (VOCs) and/or particulate levels at the perimeter of the exclusion zone or work area will be necessary. Most sites will involve VOC and particulate monitoring; sites known to be contaminated with heavy metals alone may only require particulate monitoring. If radiological contamination is a concern, additional monitoring requirements may be necessary per consultation with appropriate NYSDEC/NYSDOH staff.

Continuous monitoring will be required for all <u>ground intrusive</u> activities and during the demolition of contaminated or potentially contaminated structures. Ground intrusive activities include, but are not limited to, soil/waste excavation and handling, test pitting or trenching, and the installation of soil borings or monitoring wells.

Periodic monitoring for VOCs will be required during non-intrusive activities such as the collection of soil and sediment samples or the collection of groundwater samples from existing monitoring wells. "Periodic" monitoring during sample collection might reasonably consist of taking a reading upon arrival at a sample location, monitoring while opening a well cap or overturning soil, monitoring during well baling/purging, and taking a reading prior to leaving a sample location. In some instances, depending upon the proximity of potentially exposed individuals, continuous monitoring may be required during sampling activities. Examples of such situations include groundwater sampling at wells on the curb of a busy urban street, in the midst of a public park, or adjacent to a school or residence.

VOC Monitoring, Response Levels, and Actions

Volatile organic compounds (VOCs) must be monitored at the downwind perimeter of the immediate work area (i.e., the exclusion zone) on a **continuous** basis or as otherwise specified. Upwind concentrations should be measured at the start of each workday and periodically thereafter to establish background conditions. The monitoring work should be performed using equipment appropriate to measure the types of contaminants known or suspected to be present. The equipment should be calibrated at least daily for the contaminant(s) of concern or for an appropriate surrogate. The equipment should be capable of calculating 15-minute running average concentrations, which will be compared to the levels specified below.

- If the ambient air concentration of total organic vapors at the downwind perimeter of the work area or exclusion zone exceeds 5 parts per million (ppm) above background for the 15-minute average, work activities must be temporarily halted and monitoring continued. If the total organic vapor level readily decreases (per instantaneous readings) below 5 ppm over background, work activities can resume with continued monitoring.

- If total organic vapor levels at the downwind perimeter of the work area or exclusion zone persist at levels in excess of 5 ppm over background but less than 25 ppm, work activities must be halted, the source of vapors identified, corrective actions taken to abate emissions, and monitoring continued. After these steps, work activities can resume provided that the total organic vapor level 200 feet downwind of the exclusion zone or half the distance to the nearest potential receptor or residential/commercial structure, whichever is less - but in no case less than 20 feet, is below 5 ppm over background for the 15-minute average.

- If the organic vapor level is above 25 ppm at the perimeter of the work area, activities must be shutdown.

All 15-minute readings must be recorded and be available for State (DEC and DOH) personnel to review. Instantaneous readings, if any, used for decision purposes should also be recorded.

Particulate Monitoring, Response Levels, and Actions

Particulate concentrations should be monitored **continuously** at the upwind and downwind perimeters of the exclusion zone at temporary particulate monitoring stations. The particulate monitoring should be performed using real-time monitoring equipment capable of measuring particulate matter less than 10 micrometers in size (PM-10) and capable of integrating over a period of 15 minutes (or less) for comparison to the airborne particulate action level. The equipment must be equipped with an audible alarm to indicate exceedance of the action level. In addition, fugitive dust migration should be visually assessed during all work activities.

- If the downwind PM-10 particulate level is 100 micrograms per cubic meter (mcg/m^3) greater than background (upwind perimeter) for the 15-minute period or if airborne dust is observed leaving the work area, then dust suppression techniques must be employed. Work may continue with dust suppression techniques provided that downwind PM-10 particulate levels do not exceed 150 mcg/m^3 above the upwind level and provided that no visible dust is migrating from the work area.

- If, after implementation of dust suppression techniques, downwind PM-10 particulate levels are greater than 150 mcg/m^3 above the upwind level, work must be stopped and a re-evaluation of activities initiated. Work can resume provided that dust suppression measures and other controls are successful in reducing the downwind PM-10 particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

All readings must be recorded and be available for State (DEC and DOH) personnel to review.

June 20, 2000

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