Sustainable Development, Inc.
166 Woodside Avenue, Harrison, New York 10604 Tel: (914) 220-2404

July 9, 2012

Mr. Randy Whitcher
New York State Department of Environmental Conservation
Division of Environmental Remediation
625 Broadway, 11th Floor
Albany, New York 12233-7014

RE: Brownfield Cleanup Program
Soil Vapor Intrusion - Operation, Maintenance & Monitoring Plan Submittal
NYSDEC Site No: C203053
295 Locust Avenue, Bronx, New York

Dear Mr. Whitcher:

Sustainable Development, Inc. (SDI), on behalf of 295 Locust Avenue LLC, is pleased to provide the New York State Department of Environmental Conservation (NYSDEC) with the attached *"Soil Vapor Intrusion – Operation, Maintenance & Monitoring Plan"* (SVI OM&M). As you know, an SVI mitigation system was installed at the subject site, per NYSDEC approval, as an interim remedial measure. The SVI OM&M was developed at the request of the NYSDEC and New York State Department of Health (NYSDOH) to identify the activities necessary to confirm effectiveness of the SVI mitigation system and to ensure that the system is operated consistent with the design intent and regulatory obligations.

Also as required by the NYSDEC, an electronic copy (sans attachments due to document size) of the SVI OM&M is being provided to you via email (rjwhitch@gw.dec.state.ny.us), as well as to Ms. Krista Anders (kma06@health.state.ny.us) of the NYSDOH. A complete electronic copy of this document is included on the attached CD. Lastly, a copy of this submittal letter only is also being provided via email to Mr. John Nehila, Esq. (jxnehila@gw.dec.state.ny.us) of the NYSDEC's Office of General Counsel.

Please do not hesitate to call me at 914.261.0314 or Al Nesheiwat at 914.220.2404 with any questions.

Sincerely,

SUSTAINABLE DEVELOPMENT, INC.

Michael Schmidt
Project Hydrogeologist

Cc: Krista Anders, NYSDOH (via email)
John Nehila, Esq., NYSDEC (w/o attachment; via email)
Joseph Kelleher, 295 Locust Avenue LLC (via email)
James J. Periconi, Esq., Periconi, LLC (via email)
Al Nesheiwat, SDI (via email)

SOIL VAPOR INTRUSION
OPERATION, MAINTENANCE & MONITORING PLAN

295 LOCUST AVENUE
TAX MAP PARCEL NO 2-2598-46
NYSDEC SITE NO. C203053
BRONX, NEW YORK

Prepared for:

Mr. Al Nesheiwat
Sustainable Development Inc.
166 Woodside Avenue
West Harrison, New York 10604

and

Mr. Randy Whitcher
NYSDEC
Div. of Env. Remediation
625 Broadway, 11th Floor
Albany, New York 12233-7014

John Nehila, Esq.
NYSDEC
Office of General Counsel
1 Hunters Point Plaza, 47-40 21st St.
Long Island City, New York 11101

Ms. Krista Anders
Bureau of Environmental Exposure
NYS Department of Health
Flanagan Square, 547 River Street
Troy, New York 12180-2216

July 9, 2012

TechSolutions Engineering, P.C
52 Oceanview Boulevard
Manorville, New York 11949
Phone: (914) 319-9375
techsolnpc@gmail.com

TABLE OF CONTENTS:

Page No.

FIGURES:

Figure 1: Site Plan

APPENDICES:

Appendix A: RI Report Data Summary Tables and Figures (URS April 2011)

Appendix B: Sub-Slab Depressurization System (SSDS) Design Drawings

Appendix C: Blower System Documentation and Operating Manual

SOIL VAPOR INTRUSION
OPERATION, MAINTENANCE & MONITORING PLAN

295 LOCUST AVENUE
TAX MAP PARCEL NO 2-2598-46
NYSDEC SITE NO. C203053
BRONX, NEW YORK

1.0 INTRODUCTION AND BACKGROUND INFORMATION

The subject property is located at 295 Locust Avenue, between East 139th Street and East 140th Street, in Bronx, New York. On or about May 23, 2012, the 295 Locust Avenue site was accepted into the New York State Department of Environmental Conservation (NYSDEC) Brownfield Cleanup Program (BCP) as Site No. C203053-05-12. The applicant, 295 Locust Associates, LLC, is participating in the BCP as a Volunteer as defined in Environmental Conservation Law (ECL) 27-1405(1)(b).

Under the BCP, the Volunteer has agreed to undertake certain environmental actions, including the installation of Soil Vapor Intrusion (SVI) mitigation system and the Operation, Maintenance and Monitoring (OM&M) of the system to ensure that it is meeting the objective of protecting site occupants and guests from sub-slab vapors that could potentially enter structures on the Subject Property. The SVI mitigation system was designed in February 2012 and installed in April and May 2012 after receiving informal (i.e., verbal) NYSDEC design acceptance. The SVI mitigation system has been operating since installation concurrently with finalization of the BCP Agreement. At the request of the NYSDEC and the New York State Department of Health (NYSDOH), the Volunteer has developed this OM&M Plan to identify the activities necessary to confirm effectiveness of the SVI mitigation system and to ensure that the system is operated consistent with the design intent and regulatory obligations.

Given the complicated history of operations at the site and the former use as an Manufactured Gas Plant (MGP) site, it is important to distinguish the roles and responsibilities of the Volunteer (295 Locust Associates, LLC) from the responsibilities of others including but not limited to Consolidated Edison of New York, Inc. (Con Ed). Based upon information provided to TechSolutions Engineering, P.C. (TechSolutions) by representatives of the Volunteer, it is understood that Con Edison is taking the lead on former MGP contamination underlying the site and 295 Locust Associates, LLC is taking the lead on chlorinated VOC impacts. While there will be a beneficial overlap in future remedial actions at the site, this OM&M Plan focuses solely on the SVI mitigation related to chlorinated VOCs underlying the Subject Property.

1.1 Site Location and Description

The Property is located in an industrial area of the Port Morris section of the Bronx and designated as Block 2598, Lot 46 on the Tax Map of the City of New York for the Borough and County of the Bronx. The Property is currently operated as a warehousing / distribution center and comprises a one-square city block portion of the former East 138th Street Works Site. ***Figure 1*** indicates the warehouse building that presently occupies the Subject Property and the approximate locations of the MGP structures formerly located on it.

The Property presently consists of a multi-story warehouse building with a footprint of approximately 70,000 square feet (sf). Based upon record drawings of the warehouse building, it was constructed with a one-foot thick reinforced concrete structural slab supported by a system of pile caps and concrete grade beams. The floor of the warehouse building is situated approximately five feet above the grade of the adjacent street. Ten loading docks leading to exterior rollup doors are present on the southeastern portion of the warehouse building along Locust Avenue. Another loading dock and rollup door opens to East 140th Street. Office space is located in a mezzanine area above the loading docks. The recently installed SVI system blowers and main valve manifolds are located in the mezzanine area. The exterior walls of the warehouse building are constructed of concrete and sheet metal.

The building contains storage racks and aisles configured to support automated operation of warehousing functions. The majority of the concrete slab along the perimeter of the building is underlain by a storm water detention system and sprinkler system recharge trough. The storm water detention system is a water-tight concrete trough that is generally three to four feet deep by six feet wide and collects storm water from the roof via drain pipes which run through the interior perimeter wall of the building. The storm water detention system is reportedly connected to the municipal sewer system at the northern and western corners of the building along Rose Feiss Boulevard (Roux, May 2009). The building's sprinkler system recharge is located along the southeastern portion of the building parallel to East 139thStreet, and is constructed of two parallel and water-tight concrete troughs. Due to the presence of the stormwater and fire water system troughs, it is not possible to install any SVI extraction well points along the interior perimeter of the building. All SVI extraction well points were therefore installed along the central portions of the building in the vicinity of support columns that serve as a means of conveyance for SVI system piping.

Floor drains within the building also connect to the sanitary sewer. There is a small maintenance storage room in the southern portion of the warehouse. A dry cleaning facility (Modern Tech Dry Cleaners) is located at 874 East 139th Street across the street and to the south of the Property.

1.2 Site History

The following information regarding the historical operations conducted on the Property is derived from the Phase II ESA that was prepared by Roux Associates, Inc. (Roux, June 2009) for Locust East 140th Street L.P., a former owner of the Property, and the East 138th Street Works Site Manufactured Gas Plant History Report that was prepared by GEI Consultants, Inc., for Con Edison in connection with the Voluntary Cleanup Application (VCA[1]).

1.2.1 Site Ownership

Based upon the above-referenced reports and the information derived from the New York City Department of Finance's Automated City Register Information System, the former owners of record of the Property include:

- 6/22/2011 to present 295 Locust Associates LLC
- 5/23/2004 to 6/22/2011 Locust East 140th Street L.P.
- 12/21/2001 to 5/23/2004 NYC Industrial Development Agency
- 6/29/1999 to 12/21/2000 Locust East 140th Street L.P.
- 4/5/1996 to 6/29/1999 275 – 295 Locust Ave Realty Corp.
- 1/10/1996 to 4/5/1996 Port Morris Development Corp
- 10/27/1986 to 1/10/1996 Sycamore Hill Corp.
- 6/20/1984 to 10/27/1986 Manhattan Beer Distributors, Inc.,
- 9/3/1963 to 6/20/1984 B.I.M. Realty Company
- 7/11/1963 to 9/31963 Astra Garage Corp.
- 10/25/1954 to 7/11/1963 Universal Builders Supply Co., Inc.
- 2/1/1952 to 10/25/1954 Julia S. O'Callaghan
- 12/21/1946 to 2/1/1952 Burndy Engineering Co., Inc.
- 6/4/1946 to 12/21/1946 485 E. 133rd St. Corp.
- Prior to 12/21/1946 Con Edison as successor to Central Union Gas Co.

[1] *The VCA is a predecessor of the current BCP.*

1.2.2 Past Site Operations

The following is a summary of historic site operations as reported by others:

The earliest noted development on the Property was two residences shown on the 1891 Sanborn fire insurance map. By 1908, a portion of the Property was developed with several MGP features including a 2,630,000 cubic foot (cf) gas holder, a water gas purifier house, an oxide storage area, a pit, and a scrubber house used as part of Central Union Gas Company's (a Con Edison predecessor) East 138th Street Works. ***Figure 1*** indicates the approximate locations of the former MGP structures on the Property overlain on the current site layout. The East 138th Street Works was reportedly constructed between 1869 and 1879 and initially produced oven gas using the coal carbonization process. In 1892, the East 138th Street Works was expanded by the addition of Lowe carbureted water gas sets. Carbureted water gas (CWG) is a form of manufactured gas made from coke/coal and water (as steam) and enriched for candlepower by light petroleum oils. The CWG was created by passing steam through a bed of incandescent coke or coal, resulting in "blue gas". This was then passed through two chambers containing hot firebrick into which oil was sprayed and the oil volatilized into gaseous hydrocarbons. The resulting mixture of blue gas and gaseous hydrocarbons was then passed through a super heater where the gaseous hydrocarbons were cracked. Wastes generated by the coal carbonization and CWG processes include coal tar, spent lime and other scrubber materials.

By the 1930s, it appears the MGP facility was decommissioned and above-ground structures were removed. Historical Sanborn fire insurance maps no longer indicated the presence of an MGP facility. Following decommissioning, the northern portion of the Subject Property was developed with a truck storage yard with refueling facilities, including a motor fueling station with storage tanks, until the 1990s. The approximate location of the former fueling station is shown on ***Figure 1***. The southeastern portion of the Property contained three adjoining warehouse-style buildings occupied throughout the 1900s by a variety of facilities including: a motor freight facility, a lumber storage facility, an iron clamp storage facility, a building supplies facility, a refrigerator warehouse, a woodworking facility, a metal storage facility, a tire storage facility, and a furniture manufacturing facility (GEI, 2003). Construction of the existing warehouse building at the Property began in 2000, with demolition of the previous buildings, and was completed in 2002.

1.3 Previous Investigations and Environmental Studies

Several investigations have previously been conducted for the Subject Property and surrounding area including:

- *Design Summary Report, Soil Vapor Intrusion Mitigation System*, TechSolutions Engineering, P.C. (TechSolutions) for Sustainable Development, LLC, February 2012;

- *Remedial Investigation of the 295 Locust Avenue (Block 2598 / Lot 46) Portion of the East 138th Street Works Former MGP Site, Site # V00551, Bronx, New York*, URS Corporation (URS) for Consolidated Edison of New York, Inc. (Con Ed), August 2011;

- *Phase II Environmental Site Assessment: 295 Locust Avenue (Former Distribution Center) and 901-903 East 140th Street (Former Parking Lot) Bronx, New York*, Roux Associates, Inc. (Roux) for Locust East 140th L.P, June, 2009;

- *Phase I Environmental Site Assessment: 295 Locust Avenue (Former Distribution Center) and 901-903 East 140th Street (Former Parking Lot) Bronx, New York* Roux for Locust East 140th L.P., May, 2009;

- *Indoor Air Sampling Summary Letter Report – Murray Feiss Import Corp., Bronx, NY*, Environ International Corp. (Environ), April, 2004;

- *Environmental Review of Murray Feiss Import Corp., Bronx, NY*, Environ, March, 2004;

- *Manufactured Gas Plant History: East 138th Street Works and East 137th Street Station, Bronx, NY*, GEI Consultants, Inc. (GEI) for Con Ed, January, 2003; and,

- *Phase I Environmental Site Assessment (ESA) – Murray Feiss Distribution Center 275-295 Locust Avenue – Bronx, NY*, prepared by Environmental Planning & Management, Inc. (EPM), November 1998.

Of the documents prepared by others, only the URS RI Report and the Phase I ESA were provided to TechSolutions for development of this OM&M Plan. However, the URS RI report provided a summary of work completed by others prior to their 2011 report. The following sections of this OM&M Plan summarize historic environmental studies completed at the site as presented by URS.

1.4 Previous Investigation Results

The following is a brief summary of historic environmental site studies that have formed the basis for the installation of SVI mitigation measures at the site.

1.4.1 Phase I ESA's and Screening Studies (1989-2004)

The Phase I Environmental Site Assessment for the Property prepared by EPM, dated November 10, 1998, indicated the presence of petroleum-related contamination in soil and groundwater discovered during the in-place closure of fifteen (15) on-site 550-gallon diesel/gasoline underground storage tanks (USTs) (NYSDEC Spill No. 9005051) related to the former filling station. The USTs were removed in 1995, along with 50 cubic yards (cy) of petroleum- contaminated soil. Following completion of the UST removal and soil

excavation and disposal, the NYSDEC issued a closure letter on November 16, 1995. The approximate location of USTs is shown on ***Figure 1*** as the former refueling station.

The Environmental Review of the Murray Feiss Import Corporation prepared by Environ, dated March 2004, identified that the subsurface at the Property is contaminated due to the presence of former onsite MGP operations, onsite contamination documented during removal of USTs, and potential for impacts from off-site industrial properties within the surrounding area. The subsequent Indoor Air Sampling Report prepared by Environ International Corporation, dated April 2004, indicated that while two petroleum-related compounds exceeded the highest published background level in indoor air at the Property, these levels were below the Permissible Exposure Limits (PELs) established by the Occupational Safety and Health Administration (OSHA). Environ concluded the concentrations did not pose a concern to human health.

1.4.2 Expanded Site Investigations (2009)

The Phase I ESA was conducted by Roux in 2009. Based upon information gathered as a result of the Phase I ESA, Roux identified the following recognized environmental conditions (RECs) in connection with the Property:

- The presence of petroleum-related soil and groundwater contamination as documented in 1995 during a previously completed subsurface investigation following removal of fifteen USTs from the Property (see Figure 1);
- The material threat of contamination posed by the former East 138th Street Works former MGP;
- Documentation that USTs may still be present beneath the Former Parking Lot and Property, as indicated in historical Sanborn fire insurance maps. The condition of these USTs is unknown and, therefore, they present a material threat to the subsurface. However, as previously stated these USTs were removed along with 50 cubic yards of contaminated soil in 1995 and a NFA was issued by the NYSDEC.

Although not defined as RECs, Roux also identified a list of potential environmental concerns that could potentially impact subsurface conditions at the Property:

- Other nearby off-site industrial facilities and facilities with USTs with documented releases and impacts to groundwater may have impacted subsurface conditions at the Property. These releases may have migrated beneath the Property and included a dry cleaning facility located at 874 East 139th Street.
- An active NYSDEC spill incident pertaining to the Property identified as "Murray Feiss/Former Hertz Rental," listed under NYSDEC Spill No. 0650009. The spill pertains to a Con Edison report concerning the presence of a "light fuel oil" within their manhole located on Locust Avenue. This oil has not been observed since that initial report. It is not clear why this spill is associated with the subject property.

- An unrelated former MGP, located northeast of the Subject Property immediately across Locust Avenue along the East River was identified as the Pintsch Gas Facility. This facility was not owned or operated by Con Edison or its predecessor companies, but based on available Sanborn map appears related to the former New York Central and Harlem River Rail Road Company. It contained numerous oil tanks that supplied purified naptha necessary for the Pintsch Gas Process. Contamination concerns similar to coal gas MGP sites are often present at Pintsch Gas Process sites.

The Phase II ESA fieldwork performed by Roux was conducted in April, 2009. Work completed as part of the Phase II ESA included the installation of ten soil borings to depths of 10 to 20 feet bgs, five of which were converted to monitoring wells, and the collection of ten soil samples, five groundwater samples, four sub-slab vapor samples, four indoor air ambient samples, and one outdoor air sample. Analytical results indicated the following:

Soil

The only volatile organic compounds (VOCs) detected in soil at a concentration exceeding its respective Part 375 commercial or industrial use criteria was tetrachloroethene (PCE) in one sample (MWRX-2 at a depth of 7-8 feet). PCE is used extensively in the dry-cleaning industry as well as a solvent in various manufacturing operations and may have been related to the neighboring dry cleaner site operations.

Semi-volatile organic compounds (SVOCs), predominantly polycyclic aromatic hydrocarbons (PAHs) were detected in several soil samples at concentrations exceeding Part 375 commercial or industrial criteria. Cyanide was detected above the commercial criteria in one soil sample (SBRX-1). No coal tar was detected in any soil borings.

Groundwater

Groundwater samples from all five of the monitoring wells installed as part of the Phase II ESA were found to contain two or more VOCs at concentrations that exceeded Class GA (April 2000) standards including PCE and its degradation products (trichloroethene, cis-1,2-dichloroethene, 1,1-dichloroethene, vinyl chloride), and petroleum-related compounds (benzene, toluene, ethylbenzene, xylenes, isopropylbenzene, methyl-tert butyl ether [MTBE])(Roux, 2009). The highest detections of VOCs (including PCE at 39,000 ug/L) were detected in the southern portion of the Property in groundwater monitoring well MWRX-2, closest to the dry cleaners located across East 139th Street.

SVOCs exceeded groundwater criteria in four of the five monitoring wells, the majority of which were low-level PAH exceedances in MWRX-5 located in the Former Parking Lot (situated northeast across East 140th Street and not part of the former MGP Site). Naphthalene, acenaphthalene, and/or phenol exceeded criteria in three of the four monitoring wells within and adjacent to the Property.

Sub-Slab Vapor and Ambient Air

Concentrations of VOCs were detected in all sub-slab vapor samples. Roux concluded that the indoor air VOC concentrations were significantly lower than the VOC concentrations in the sub-slab samples; therefore, the sub-slab VOC concentrations were not impacting indoor air quality.

1.4.3 Remedial Investigation (2011)

In August 2011, URS issued a Remedial Investigation (RI) Report that focused on the Subject Property. The RI Report summarized work completed historically by others and also included supplemental studies completed by URS in the spring and summer of 2011 for Con Edison who is reportedly the responsible party for the former MGP operations areas of the site. Summary figures and tables from the RI Report are provided in ***Appendix A*** to represent the most recent site conditions and the basis for the SVI mitigation system designed and installed in 2012. A summary of recent subsurface data related to SVI system installation, operation maintenance and monitoring (i.e., VOC and to a lesser degree, SVOC data) is provided below. Additional information is available in the references cited in ***Section 1.3***

Soil:

There were numerous exceedances of NYSDEC 6 NYCRR Part 275 Unrestricted Use Soil Cleanup Objectives (SCOs) in RI soil samples. It is very important to note that that Unrestricted Use criteria are being discussed herein only as a conservative point of reference. Nothing in this OM&M Plan is intended to imply that Unrestricted Use criteria are or are not the only use criteria that are applicable at the site. Other restricted criteria (i.e., less conservative cleanup objectives) may also be directly applicable depending upon multiple factors related to future site use, deed restrictions, institutional controls, etc.

Most contaminant exceedances were located in the western portion of the Property although detections were also noted elsewhere (see ***Appendix A***) The primary VOC detections included benzene, toluene, ethylbenzene, and xylenes (BTEX) compounds and chlorinated hydrocarbons. Chlorinated hydrocarbons are not known MGP feed stocks or residuals and are not typically associated with former MGP sites. Historical research of site uses has also not revealed any use of chlorinated hydrocarbons during other site operations at the Subject Property.

Maximum concentrations of chlorinated VOCs (CVOCs) exceeding unrestricted use criteria included:

- PCE (77 mg/kg in SBMF-04 45.5-46"), TCE (8.6 mg/kg in SBMF-23 3.5-4.5);

- 1,2-Dichloroethane (0.51 mg/kg in SBMF-09 40.5-41.5“);
- *cis*-1,2-Dichloroethene (70 mg/kg in SBMF-23 3.5-4.5“);
- *trans*-1,2-Dichloroethene (0.91 mg/kg in SBMF-23 3.5-4.5); and,
- Vinyl Chloride (1.2 mg/kg in SBMF-23 14.2-15“).

The CVOCs are likely attributable to off-site discharges associated with the neighboring dry cleaning establishment and/or other off-site industrial facilities where PCE is / was used. The other CVOCs are daughter products of PCE and likely formed through reductive dechlorination. In general, CVOCs were detected most frequently and at the highest concentrations along East 139th Street closer to the mid-block, and within the former gas holder #4, and the western side of the Property.

Although the Volunteer is focused on CVOC impacts, it is not possible to selectively design a cost-effective SVI mitigation system that will address CVOCs without consideration of non-chlorinated VOCs and MGP related contaminants of concern. Therefore, the nature and extent of non-chlorinated VOCs in soil was also considered as part of SVI mitigation system design and operation. Maximum concentrations of BTEX compounds exceeding unrestricted use criteria included:

- Benzene (630 mg/kg in SBMF-04 45.5-46“);
- Ethylbenzene (260 mg/kg in SBMF-01 9-10“);
- Toluene (1,200 mg/kg in SBMF-04 45.5-46“); and,
- Xylenes (1,900 mg/kg in SBMF-13 5-6“).

The BTEX compounds were more widespread than the CVOCs, with the highest concentrations generally reported within and near the former gas holder #4 at deeper depths where NAPL was observed. Lower concentrations were generally reported at shallower depths across the entire Property.

There were numerous exceedances in RI soil samples for SVOCs, especially PAHs, as compared to unrestricted use criteria in the western portion of the Property and in some areas within the former MGP structures at various depths. In general, there were fewer or no SVOC exceedances in the eastern portion of the Property. PCBs were not detected above unrestricted use criteria.

Groundwater:

Groundwater results exceeding NYSDEC TOGS No. 1.1.1 Class GA groundwater criteria are indicated in ***Appendix A***. Groundwater contamination in the overburden can be characterized as a generally diffuse plume spread across the Subject Property and is present along the sidegradient and downgradient edges of the site.

The majority of VOCs detected in RI groundwater samples exceeding Class GA Groundwater Quality Standards (Class GA GWQSs) and at the highest concentrations occurred along East 139th Street, Rose Feiss Blvd, and the mid-block to Rose Feiss Blvd section of East 140th Street. Analytes exceeding criteria included CVOCs (PCE and its degradation products TCE, cis-1,2-dichloroethene, 1,1-dichloroethene, and vinyl chloride), BTEX compounds (total BTEX maximum 34,300 ug/L in MWMF-04), MTBE (maximum 110 ug/L in MWMF-05), and isopropylbenzene (maximum 250 ug/L in MWMF-08). Lower levels of BTEX compounds and isopropylbenzene exceeding Class GA GWQSs were detected in groundwater samples from the eastern portion of the Subject Property.

The highest concentration of PCE (22,000 ug/L) was detected in (Roux) MWRX-02, nearest to the dry cleaners operating across East 139th Street. PCE degradation products were detected at their greatest concentrations in MWRX-02 (TCE max. 3,800 ug/L, cis-1,2-dichloroethene max. 37,000 ug/L, vinyl chloride max. 6,900 ug/L) and adjacent monitoring well MWMF-04.

SVOCs, including 1,1"-biphenyl (max. 29 ug/L in MWMF-04), methylphenol isomers (max. 400 ug/L 2,4-dimethylphenol in MWMF-04), and MGP-related contaminants naphthalene (max. 9,300 ug/L in MWMF-08), acenaphthalene (max. 140 ug/L in MWMF-05), and phenol (max. 130 ug/L in MWMF-04), were detected above Class GA GWQSs across all but the southeastern portion of the Subject Property. The greatest concentrations of SVOCs, naphthalene in particular, were detected in monitoring wells east, north and south of former gas holder #4.

Soil Vapor:

Sub-slab soil vapor analytical results from samples collected during the RI are shown in ***Appendix A***.

Soil vapor sample results indicated a mixture of MGP- and petroleum-related compounds, and chlorinated solvents. MGP-related compounds included benzene, trimethylbenzene isomers, indane, endene, naphthalene, and thiopene. Petroleum-related compounds included include: benzene, toluene, ethylbenzene, xylenes, cyclohexane, isopropylbenzene, isooctane, n-heptane, n-hexane, and MTBE. Chlorinated solvents include PCE and its degradation products (trichloroethene, cis-1,2-dichloroethene, 1,1-dichloroethene, vinyl chloride).

Soil vapor sample locations during the RI included the following:

- Sample SVMF-01 was collected from within former gas holder #4;
- Samples SVMF-02 and SVMF-03 were collected from just outside the gas holder;
- Sample SVMF-04 was collected within the former purifying house;

- Sample SVMF-05 was collected in the eastern portion of the site; and,
- Sample SVMF-06 was collected in the vicinity of the former MGP scrubber house.

The ambient air sample contained relatively low concentrations of VOCs (total VOCs 53 µg/m3) including a mixture of compounds associated with both MGP and petroleum sites. The highest concentrations of VOCs were detected in sample SVMF-04 (total VOCs 1,897,931 µg/m^3), which included high concentration of pentane and cyclohexane isomers, and PCE degradation products (*cis*- 1,2-dichloroethene and vinyl chloride). High concentrations of VOCs were detected in sample SVMF-06 (total VOCs 569,542 µg/m^3), the majority of which was comprised of pentane isomers. Total VOC concentrations were similar in samples in SVMF-02 (total VOCs 221,541 µg/m^3), and SVMF-03 (total VOCs 160,503 µg/m^3), and included high concentrations of pentane isomers in addition to lower concentrations of PCE and its degradation products (TCE, VC, cis-1,2-dichloroethene). SVMF-01 had a similar total VOCs concentration (203,221 µg/m^3); however, highest concentrations detected included PCE and its degradation products and relatively low levels of BTEX and MTBE (no pentane and/or hexane isomers detected). The lowest concentration of VOCs were detected in SVMF-05 (total VOCs 981 µg/m^3) consisting of low levels of all VOCs.

RI sub-slab soil vapor analytical results were compared to guidance values presented in the Soil Vapor/Indoor Air Decision Matrices provided in the NYSDOH Guidance for Evaluating Soil Vapor Intrusion in the State of New York, dated October, 2006 (NYSDOH SVI Guidance) with updates provided in 2008 to include additional VOCs to the Decision Matrices as follows:

- Air Matrix 1: trichloroethene, carbon tetrachloride, vinyl chloride
- Air Matrix 2: tetrachloroethene, 1,1,1-trichloroethene, 1,1-dichlorochloroethene, cis-1,2-dichloroethene.

The levels of chlorinated compounds detected in soil vapor samples during the RI were at levels above the NYSDOH SVI Guidance recommended action level to mitigate. Some of the RI conclusions noted by URS were inconsistent with the former conclusion of Roux in the Phase II ESA completed in 2009.

2.0 SVI MITIGATION SYSTEM OVERVIEW

Due to the presence of sub-slab vapors and elevated groundwater concentrations of chlorinated and non-chlorinated VOCs, a Sub-Slab Depressurization System (SSDS) was designed in February 2012 and installed in the spring of 2012. SSDS Design Drawings are provided in ***Appendix B***. The following is a detailed description of the installed SSDS mitigation system as installed.

2.1 Basis for SSDS Design

The SVI mitigation system was designed as a SSDS in order to prevent vapors related to historic site activities or contaminants migrating underneath the Subject Site from off-site sources from entering the facility. Based upon review of data developed by others, it is understood that the contaminants of concern are primarily chlorinated volatile organic compounds (VOCs) and former manufactured gas plant (MGP) related chemicals such as pentane and hexane-based compounds. The soil gas data available indicate that the highest levels of concern are located underlying the warehouse section of the facility near the center and western sides of the property. No significant contamination was detected on the eastern side of the site at levels warranting SVI mitigation. As a result, the SVI mitigation design focused on the central and western portions of the facility (see ***Sheet 1 of Appendix B)***.

Given the fact that the property is located close to surface waters, includes stormwater and fire water troughs around much of the perimeter, and is built on piles with a very shallow water table (as shallow as 5 feet below grade at some portions of the site), there were limited options for installation of a successful SVI mitigation system. The building design is unique in that it contains underground vaults for storage of storm water and / or fire water along the East 139th Street, East 140th Street, and Rose Feiss Boulevard sides of the building which prevents SSDS extraction well installation within approximately 20 to 40 feet of the exterior walls on the north, south and west sides of the property (see ***Sheet 2 of Appendix B***). The building owner has also restricted trenching in the slab to limited areas along the building centerline where columns leading to the roof are present and where grade beams will not be intersected in order to preserve the structural integrity of the floor slab which is supported by piles.

With this information and these technical design constraints, it was determined that the most effective SSDS design would encompass a series of SSDS extraction wells placed along the centerline of the building immediately adjacent to the roof columns and pile caps. Five (5) SVI mitigation extraction wells (SVI-1 through SVI-5) were installed as indicated in ***Sheet 2 of Appendix B***. Assuming an effective radius of influence of about 75 feet (common for SVI systems with similar geology), this array of SVI mitigation wells was intended to cover over 90% of the area of concern and reduce sub-slab pressure by creating a vacuum that limits movement of contaminated vapors into the structure. It is

very important to note that the 75 foot radius of influence is realistic for a SSDS and should not be compared to the radius of influence necessary for Soil Vapor Extraction (SVE) designed to remediate contamination which is typically much smaller (i.e., 30 to 50 feet). The intent of the SSDS system is solely to create a pressure differential between the subsurface and the interior of the building and it is not to remove contaminant mass. As such, much smaller blowers are necessary and the effective radius of influence for SSDS systems is much greater than for SVE systems.

It should also be noted that TechSolutions considered the possibility of installing additional SVI mitigation wells along the exterior of the property to obtain slightly better areal coverage along East 139th Street and East 140th Street. However, the depth to water in these locations was actually higher than the pile cap depth and as such, there was no unsaturated zone available for effective depressurization underlying the interior of the building utilizing exterior wells.

All elements of the design were completed in general accordance with the requirements of the New York State Department of Health (NYSDOH) "*Guidance for Evaluating Soil Vapor Intrusion in the State of New York*", October 2006 (as amended).

2.2 SVI Well Design:

Five (5) SVI extraction wells were installed to create sub-slab depressurization. The well locations are indicated in ***Sheet 2 of Appendix B*** and the details including screened intervals and piping to bring the wells to the surface at each location are indicated in ***Sheet 3 of Appendix B***. The screened interval design was critical in this project given that the depth to water is very shallow (typically between 10 and 12 feet below grade under the building and only about 4 to 5 feet below grade along the building exterior) and the pile caps and grade beams extend between two and three feet below the finished floor slab. Therefore, it was necessary to screen the SVI mitigation wells (SVI-1 through SVI-5) from approximately 3 feet to 8 feet below grade to ensure the full radius of influence can be realized without short-circuiting created by pile caps or the elevated water table.

SVI mitigation wells were located approximately 50 feet apart as indicated on ***Sheet 2 of Appendix B***. This design provided a substantial overlap in coverage area along the center of the building and in the areas where soil gas readings have indicated the highest levels of impact. This design also minimized trenching as the wells are all located within 10 feet of the columns leading to the roof which was used for supporting manifold piping. Each SVI mitigation well was designed to run approximately 50 cubic feet per minute (cfm) and in actuality higher flows may be obtained as head losses in the manifold system have been minimized through short piping runs and increasing pipe diameter as the extracted vapors flow toward the SVI system blowers. SVI mitigation wells were

constructed as 3 inch diameter stainless steel wells. Smaller diameter, steel wells were necessary to address structural integrity concerns for the floor slab raised by the client.

2.3 Vapor Monitoring Probes:

The existing vapor monitoring probe network was incorporated into the design of the SVI system. However, review of construction logs for the existing vapor probe design indicated that the depth was not appropriate for proper SVI mitigation system monitoring (i.e., it did not extend below the grade beam depth). Therefore, the TechSolutions design included modification of four (4) of the seven (7) existing vapor monitoring probes to extend the depth to below the grade beams. The remaining existing vapor monitoring probes remained in place to assist in evaluating actual vacuum response as a function of depth and the absence or presence of grade beams near monitoring probe locations. The locations of the proposed vapor monitoring probes are indicated in ***Sheet 2 of Appendix B*** and the screen and construction details are provided in ***Sheet 3 of Appendix B***. The upgraded vapor monitoring probe locations have been selected to ensure monitoring in the following areas:

- One (1) probe in an area that should definitely be under strong vacuum influence in close location to multiple SVI mitigations wells (SVFM-02);
- One (1) probe in an area along the periphery of the anticipated radius of influence of the SVI wells and within an area where elevated soil gas concentrations have been noted by others (SVFM-06);
- One (1) probe along the edge of the SSDS in an area where the anticipated radius of influence will be minimal to help evaluate system effectiveness and determine the actual radius of influence under operations. This probe location will also serve as confirmation of protection of the loading dock areas along Locust Avenue (SVFM-05); and,
- One (1) probe located in an area anticipated to be outside / at the extreme periphery of the radius of influence to see if better than anticipated performance is occurring and to evaluate the protectiveness of the system in the corners of the building furthest from SVI mitigation wells. (SVFM-1).

In addition, existing vapor monitoring probes SVFM-3, SVFM-4, and H-AA-01 remain for monitoring. H-AA-01 will be useful to serve as an indicator of ambient conditions.

2.4 Interior and Ceiling Manifold System:

As indicated in ***Sheet 3 of Appendix B***, the piping leaving the wells was 3” diameter steel and the piping was notched into the existing floor slab rather than a classical trench design. This was done to minimize cuts all the way through the finished floor and to eliminate any intersections with grade beams or other structural elements. Steel was used as a measure of precaution to provide more integrity than plastic piping within the floor slab. The 3" steel from the extraction well points was transitioned to 4” steel piping

as it emerged from sub-grade. A ball valve was provided at each SVI well location to allow flow and vacuum regulation so that the system can be optimized during operation as necessary. It should be noted that the original design indicated a transition to PVC piping after the manifold from each well reached a height of 20 feet above the finished floor to balance costs with protection of equipment. Two changes to the original design were made during installation to accommodate requests from the City of New York Fire Marshal and to comply with local Building Codes. Steel piping was continued up the center support columns until 25 feet above the finished floor rather than 20 feet to protect it from accidental damage related to warehouse operations (i.e., forklifts, etc.), and chlorinated PVC (CPVC) piping was used in lieu of PVC piping throughout the design due to its higher melt point and better structural properties. These changes will have no impact upon the design intent or operation of the SVI mitigation system.

By running piping from individual wells directly up the adjacent roof support columns at the building centerline, the clients design restriction to minimize trenching and prevent crossing of grade beams was realized and impacts to the pile cap system were avoided.

In order to minimize roof penetrations and system head losses, individual laterals from each of the five (5) SVI mitigation wells were individually run as 6" diameter CPVC lines to dedicated blower systems (i.e., "homerun" piping with one blower for each SVI) which were installed on the mezzanine at the east end of the building along Locust Avenue. The ceiling manifold plan is provided in ***Sheet 4 of Appendix B***. This design allows great operational flexibility and also ensures that in the event of one blower failure, the majority of the building will still be under the influence of the other blower systems to provide an added measure of protection to site occupants. In addition, the effective radius of influence will be improved due to the additional blower capacity at each SVI well. The roof plan (***Sheet 5 of Appendix B***) indicates the approximate location of the new blower systems. The complete piping systems are indicated in the piping and instrumentation diagram (***Sheet 6 of Appendix B***).

2.5 Blower Systems and Rooftop Piping:

No roof penetrations were permitted for this project by the site owner. Therefore, the effluent lines from the blower systems were manifolded into a common 8" diameter effluent line that exits the exterior wall along Locust Avenue, approximately ten (10) feet below the roof line. The discharge piping then runs along the exterior side of the wall up to the roof where it terminates approximately five (5) feet above the roof line. All piping and wall penetrations were performed by licensed contractors and the exterior wall repair was completed in strict accordance with architect and wall material manufacturer recommendations to ensure a liquid tight seal.

The five (5) blowers (B-1 through B-5 corresponding to SVI-1 through SVI-5, respectively) were installed on the mezzanine along the Locust Avenue wall (see ***Sheet 4***

of Appendix B). Five, Radonaway RP380 Blower systems (B-1 through B-5) were utilized. The design installation details for the blower systems and the piping and controls necessary are indicated on ***Sheet 3*** and ***Sheet 6 of Appendix B***, respectively. However, a field change was required during installation to eliminate the run indicator panel. Alternatively, daily inspections will be completed to document that the system is running. Each of the five blowers is powered by a 120VAC, 60Hz receptacle within several feet of the blower. The receptacles were installed in accordance with all New York City Codes and were designed assuming explosive vapors may exist within the SVI extraction system.

As indicated on ***Sheet 6 of Appendix B***, emissions controls systems including the installation of two, 55-gallon drum type, vapor granular activated carbon vessels piped in series can be added if necessary based upon OM&M data review. Vessels can be provided for series installation so that once breakthrough is detected in the lead vessel, arrangements for GAC replacement can be made before breakthrough in the lag vessel, thereby preventing discharge of contaminants to the atmosphere.

After leaving the GAC vessels (if necessary), the 8" discharge piping exits the exterior wall at Locust Avenue and then extend to the roof top. The discharge piping extends approximately five (5) feet above the roofline and was placed away from any fresh air intakes for the building. A rain cap was fitted on the discharge. Since piping leaves the interior of the building and then runs along the exterior, there is the potential for condensate buildup. Low point vents for condensate removal as appropriate can be fitted into the system.

3.0 SYSTEM START-UP AND TESTING

Although the system has been running for several months as a precautionary measure while the BCP Agreement was finalized, a more formal start-up event including collection of indoor air quality and sub-slab vapor samples, as well as documentation of pressure / vacuum differentials and flow rates is proposed during the summer cooling season. The following is a summary of the proposed start-up of the SVI mitigation system.

3.1 Preliminary Reconnaissance

During formal start-up, a site reconnaissance will be completed to identify any substances in the building containing hazardous materials that may bias indoor air quality (IAQ) and sub-slab vapor sampling. As part of this study, Material Safety Data Sheets (MSDSs) of materials present in the warehouse will be reviewed if provided by site operators. Quantities of chemicals of concern, if any, will also be noted if inventory records are provided. In the absence of formal inventory records, rough estimates of quantities will be noted during the site reconnaissance with special emphasis on any open containers where VOC emissions are more significant.

3.2 Mechanical System Data Collection & Analysis

The SVI mitigation blowers are to be started following manufacturer recommendations (see ***Appendix C*** for Blower Documentation). Initial operation is assumed to be completed with all individual well valves wide open (i.e., unbalanced operation). Based upon the data collected during start-up and review of the sample data to be collected, the individual SVI mitigation well valves may be adjusted to focus system energy on the areas needed and / or re-balance the system (i.e., if one area indicates very high concentrations or unacceptable IAQ levels, that well may be adjusted to increase flow / vacuum locally. Alternatively, wells in areas where there are no objectionable levels of vapors may be either partially or completely closed off to reduce operating costs.

3.2.1 Velocity and Volumetric Flow Rates

During start-up, the flow rate will be measured at each leg of the SSDS by inserting a velocity probe into the main line sample ports (or an equivalent, small diameter hole that can be plugged when not being used for velocity reading). Velocity readings (and confirmation of pipe diameters to allow conversion of velocity to volumetric flow rate) will be collected at the following locations:

- At the blower influents (B-1 through B-5);
- At the blower effluents; and,
- At the extraction well at the point where the wells first exit the ground.

Velocity readings will be converted volumetric flow rates using pipe diameter data as well as temperature and pressure data during data collection. Volumetric flow rates will be compared to design criteria discussed previously in ***Section 2***.

3.2.2 Vacuum and Differential Pressure Readings

Operating vacuum (or pressures) will be measured and recorded using magnehelic gauges in each leg of the system as well as within the facility and along the upwind and downwind exterior portions of the building. Vacuum / pressure readings will be collected at the following locations during start-up:

- At the blower influents and effluents (B-1 through B-5);
- At the extraction well at the point where the wells first exit the ground;
- At the sub-slab vapor monitoring points;
- In the ambient air immediately above vapor monitoring points; and,
- Outside the building both upwind and downwind of the building.

Although the determination of system effectiveness is based upon many factors including vacuum fields and analytical VOC data, a measurement of 0.01 inches water column differential between the sub-slab vapor monitoring points and the indoor air within the building will be considered indicative of an acceptable vacuum condition in the subsurface.

3.3 SOIL VAPOR/AIR SAMPLING & ANALYSIS

During initial start-up, both sub-slab and indoor air quality samples will be collected and analyzed for VOCs of concern. When VOC analytical data is used in conjunction with the mechanical data to be collected as discussed previously, a comprehensive system effectiveness evaluation can be completed. The following sections of this OM&M Plan discuss the analytical sampling phase of start-up testing.

3.3.1 Sub-Slab Sampling

The four (4) vapor probes installed (***see Section 2.3*** for a description and location) will be allowed to equilibrate for a minimum of 24 hours prior to sampling. Since installation was completed months before this manual, this 24 hour criteria has already been achieved. Prior to sampling, each vapor monitoring point will be purged of a minimum of three tube volumes of soil vapor. Confirmation of adequate purging will be determined by utilizing a photoionization detector (PID) to confirm the absence of volatile organic compounds above the PID detection limits. A six-liter, laboratory-supplied vacuum Summa canister will be connected to the Teflon tubing subsequent to the purging and the samples will be collected over a two-hour period at a flow rate of 0.05 liters per minute

(LPM), which is less than the maximum flow rate of 0.2 LPM as established in the NYSDOH Guidance Document.

3.3.2 Indoor Air Quality Sampling

In addition to the four (4) sub-slab vapor samples, four (4) indoor air quality samples, and one (1) outdoor air/ambient sample will be collected utilizing six-liter, laboratory-supplied Summa canisters set atop three-foot-tall stands, table tops or desks over a two-hour period, concurrent with the indoor sub-slab sampling. The samples will be collected to establish indoor air concentrations and background conditions at the site. The sample elevation will be selected in order to represent the air quality within the typical breathing zone (between three-and-five-feet above grade, as required in the NYSDOH Guidance Document).

3.3.3 QA/QC and Helium Monitoring

As a quality assurance/quality control (QA/QC) measure, helium will be introduced into a closed/sealed space surrounding the sampling tube as a tracer gas to confirm the integrity of the probe seals and to ensure that no outdoor air intrusion impact the soil vapor sample (e.g., no "short circuiting" occurs). The closed/sealed space around the sampling tube will be formed utilizing an inverted container placed atop of the ground at the point where sampling tubing exits the subsurface. Teflon sampling tubing will be run through an air-tight fitting installed on the top of the container and polyethylene tubing will be run from the helium supply through another air-tight fitting on the side of the container.

3.3.4 Analysis of Sub-Slab and IAQ Samples

All soil vapor and air samples will be analyzed by a NYSDOH Environmental Laboratory Accreditation Program (ELAP) - certified laboratory (with appropriate chain-of-custody) for NYSDOH-specified VOCs by EPA Method TO-15. The soil vapor samples will also be analyzed for helium to assist in data quality review.

3.4 Start-Up Testing Data Evaluation & Reporting

Upon completion of sampling and analyses, data will be evaluated in conjunction with NYSDOH evaluation criteria / decision matrices as outlined in "*Final Guidance for Evaluating Soil Vapor Intrusion in the State of New York*," dated October 2006, as amended, and results will be presented in a SVI Mitigation System Start-up Report.

For parameters that do not have specific guidance values or evaluation criteria / decision matrices, TechSolutions will evaluate results on a case by case basis utilizing appropriate guidance documents, regulatory criteria, models, comparison to background levels, or other methods acceptable to NYSDEC and NYSDOH.

If necessary, corrective measures will be implemented to ensure that the SVI mitigation system is performing consistent with the design intent. Corrective measures may include re-balancing of the system, upgrade of blowers, use of vapor control equipment and /or implementation of additional institutional or engineering controls.

4.0 ROUTINE OPERATION, MAINTENANCE AND MONITORING

Following completion of start-up testing and implementation of any necessary corrective measures (if any), the SVI mitigation system will enter routine OM&M. Since SVI system performance is typically measured during both heating and cooling seasons, an additional sampling event similar to the initial start-up event is planned for the 2013 heating season. Specifically the following additional, routine OM&M schedule is proposed:

4.1 Routine Monthly OM&M (Year 1)

Routine monthly OM&M is to be completed by the existing occupants after training by experienced SVI mitigation personnel. Monthly OM&M will be limited to the following activities primarily to ensure the system remains operational from a mechanical perspective:

- Visually inspect all system components daily to ensure they are operating properly and not damaged;
- Collect velocity readings using a velocity probe from the same locations identified in ***Section 3.3.1***; and,
- Collect vacuum readings using magnehelic gauges from the same locations identified ***in Section 3.3.2.***

Compare data to start-up data and make any system adjustments to ensure design objectives as outlined in the start-up report to be developed are being met.

4.2 Routine Quarterly OM&M (Year 1)

During every third month of OM&M in the first year (i.e., quarterly), the tasks identified above in ***Section 4.1*** are to be completed. In addition, VOC screening of the indoor and exterior (upwind) air is to be completed with a PID, along with collection of PID screening samples from the vapor monitoring probe and blower effluents. It should be noted that a hand pump and decontaminated / new Tedlar bags may be needed to collect proper samples for areas under vacuum.

4.3 Winter Heating System Testing (Year 1)

During the quarterly event that occurs within the winter heating season of 2013, the same procedures and sampling regiment that was identified in ***Section 3.0*** (all sub-sections) is to be repeated to document heating system conditions. Data collected will be compared to the summer cooling season data to establish a seasonal baseline for comparison to future OM&M data and to confirm system effectiveness under different environmental conditions.

4.4 OM&M Year 2

In the second year of operation (i.e., starting in the summer of 2013), routine OM&M will be completed quarterly following the same procedures as outlined in ***Section 4.2*** (i.e., mechanical system data collection such and vacuum and flow measurements as well as PID screening). During the winter quarterly event (i.e., winter 2014), an additional full round of sampling for VOCs is also to be completed (i.e., repeat scope of ***Section 4.3***).

Work completed will be documented in an annual SVI Mitigation Summary Report.

4.5 OM&M After Year 2

After year two~~, formal~~, formal OM&M will only be completed once per year during the winter heating section provided that informal checks are completed daily simply to confirm that the SSDS system is operating. During the annual OM&M event, the scope outlined previously in ***Section 3*** (all sub-sections) is to be followed and the results documented in an annual SVI Mitigation Summary Report.

OM&M is to continue until NYSDEC and NYSDOH allows shutdown of the SSDS system. The Volunteer may request shutdown at any time; however, the request for shutdown may not be accepted by NYSDEC and / or NYSDOH.

5.0 TROUBLESHOOTING AND OM&M PLAN UPDATES

5.1 System Alarms and Troubleshooting

The SSDS will be inspected daily to ensure it is operational. In the event the daily inspection indicates the system is not operating, a more detailed system inspection shall be performed to determine the cause of the shutdown. The blower maintenance manual in ***Appendix C*** may be helpful in this regard. If the cause of the shutdown can be identified and remedied, the blower systems can be reset and the system re-started. Following a re-start, the system should be checked more frequently to ensure it is again working properly.

If a system shutdown re-occurs or the system cannot be re-started properly, the SSDS should be checked by a firm that specializes in such systems and the system fixed as necessary. It is suggested that a maintenance log be maintained to aid in troubleshooting if a problem arises.

In the event of an unintended shutdown, the following are some initial things to look for prior to attempting a re-start:

- Check the power receptacles to ensure blowers are plugged in and that any breakers or Ground Fault Current Interrupters (GFCIs) are not tripped or do not need to be reset;
- Check the temperature of the blowers. Excessively hot blowers may be indicative of a motor malfunction and may necessitate blower replacement or repair;
- Ensure all valves are properly opened so that the blower are not "dead-headed" and unable to move vapors on either the suction or discharge sides;
- Ensure there is not excessive condensate build-up in the piping systems by draining piping at the low point vents;
- If accessible, inspect piping at well heads to ensure there are no ~~blockages~~ ~~.~~blockages. This may necessitate removing and reinstalling sample ports at the well heads and may require basic piping skills;

If the shutdown cannot be corrected by correcting any deficiencies outlined above, professional troubleshooting assistance may be required.

5.2 OM&M Plan Updates

This plan should be updated any time there is a significant change in building configuration and / or operations or knowledge of differing soil, groundwater, or soil vapor conditions. As a minimum, the OM&M plan should be reviewed annually as part of the winter heating season OM&M event.

FIGURES

SITE PLAN W/ FORMER INFRASTRUCTURE

0 40 80

SCALE FEET

LOCATION MAP
BRONX, NY (NTS)

FORMER MGP INFRASTRUCTURE LOCATION (APPROX.)

MONITORING WELL

3.0 GW ELEV. CONTOUR (APPROX. FT AMSL, 5/4/2011 URS)

INFERRED GW FLOW DIRECTION

TechSolutions Engineering, P.C.
52 Oceanview Boulevard
Manorville, New York 11949
Ph: 914-319-9375
Email: techsolnpc@gmail.com

SITE PLAN

LOCATION:		DESIGN:
STREET ADDRESS CITY, STATE		DJS
PROJECT NO / FILE SUSDEV1201.01 SHEET 1 - SITE PLAN	DRAWING DATE: 02/19/12	REV. NO.:	FIGURE: **1**

Appendix A

RI Report Data Summary Tables and Figures (URS April 2011)

Appendix B

Sub-Slab Depressurization System (SSDS) Design Drawings

Appendix C

Blower System Documentation and Operating Manual

SBMF-23 (3.5'-4.5')	4/11
VOCs:	
1,2-Dichloroethene (cis)	70
1,2-Dichloroethene (trans)	0.91
Acetone	0.091
Tetrachloroethene	19
Trichloroethene	8.6
Vinyl chloride	0.071
Xylene (total)	1.0

SBMF-23 (14.2'-15')	4/11
VOCs:	
1,2-Dichloroethene (cis)	24
1,2-Dichloroethene (trans)	0.41
Benzene	6.7
Ethylbenzene	20
Tetrachloroethene	5.3
Toluene	15
Trichloroethene	0.65
Vinyl chloride	1.2
Xylene (total)	66

SBMF-19 (45'-46')	4/11
VOCs:	
1,2-Dichloroethene (cis)	1.4
Benzene	63
Ethylbenzene	16
Tetrachloroethene	3.5
Toluene	86
Trichloroethene	0.63
Xylene (total)	120

SBMF-20 (4'-4.5')	4/11
VOCs:	
1,2-Dichloroethene (cis)	36
Tetrachloroethene	7.9
Trichloroethene	0.94

SBMF-20 (10'-10.5')	4/11
VOCs:	
Xylene (total)	0.27

SBMF-09 (9.5'-10')	4/11
VOCs:	
Benzene	0.083
Ethylbenzene	1.9
Xylene (total)	3.1

SBMF-09 (40.5'-41.5')	4/11
VOCs:	
1,2-Dichloroethane	0.51
1,2-Dichloroethene (cis)	3.3
Benzene	25
Ethylbenzene	39
Toluene	76
Vinyl chloride	0.12
Xylene (total)	110

MWMF-01 (19'-20')	3/11
VOCs:	
Benzene	0.38

SBMF-13 (5'-6')	4/11
VOCs:	
1,2-Dichloroethene (cis)	9.8
Benzene	62
Toluene	890
Xylene (total)	1900

SBMF-09 (41.5'-42.2')	4/11
VOCs:	
Benzene	0.57
Ethylbenzene	6.3
Toluene	8
Xylene (total)	24

SBMF-09 (44.5'-45')	4/11
VOCs:	
Benzene	1.5
Toluene	2.9
Xylene (total)	5.2

SBMF-13 (10.5'-11.2')	4/11
VOCs:	
Benzene	0.066
Ethylbenzene	1.5
Vinyl chloride	0.10
Xylene (total)	5.6

SBMF-18 (4.5'-5')	3/11
VOCs:	
Acetone	0.086

SBMF-18 (11.2'-11.8')	4/11
VOCs:	
Benzene	0.26
Ethylbenzene	1.5
Vinyl chloride	0.070
Xylene (total)	0.32

SBMF-18 (29'-30')	4/11
VOCs:	
Benzene	0.26

SBMF-13 (32'-33')	4/11
VOCs:	
Benzene	1.1

SBMF-18 (44.5'-45')	4/11
VOCs:	
1,2-Dichloroethene (cis)	5.1
Benzene	29
Ethylbenzene	7.8
Tetrachloroethene	7.1
Toluene	26
Trichloroethene	0.62
Vinyl chloride	0.18
Xylene (total)	37

SBMF-18 (45'-46')	4/11
VOCs:	
1,2-Dichloroethene (cis)	0.58
Benzene	0.90
Xylene (total)	0.64

SBMF-12 (4.5'-5')	3/11
VOCs:	
Acetone	0.19

SBMF-12 (8.3'-9.1')	4/11
VOCs:	
1,2-Dichloroethene (cis)	18
1,2-Dichloroethene (trans)	0.80
Benzene	0.35
Tetrachloroethene	1.9
Xylene (total)	0.88

MWMF-07S (4.5'-5.5')	3/11
VOCs:	
Ethylbenzene	1.9
Xylene (total)	0.88

SBMF-12 (10.5'-11.5')	4/11
VOCs:	
Vinyl chloride	0.059

SBMF-12 (29.5'-30')	4/11
VOCs:	
Benzene	3.5

SBMF-14 (4.5'-5')	3/11
VOCs:	
Acetone	0.078

SBMF-14 (13.2'-14')	4/11
VOCs:	
Benzene	2.5
Ethylbenzene	93
Xylene (total)	21

MWMF-05 (5'-5.5')	3/11
VOCs:	
Vinyl chloride	0.045

MWMF-05 (11'-12')	3/11
VOCs:	
Benzene	1.2
Ethylbenzene	1.6
Xylene (total)	1.6

MWMF-05 (19.5'-20')	3/11
VOCs:	
Benzene	0.20

SBMF-15 (9'-9.5')	4/11
VOCs:	
Benzene	0.22
Xylene (total)	0.78

SBMF-15 (14.2'-14.8')	4/11
VOCs:	
Benzene	1.2
Ethylbenzene	6.0
Xylene (total)	32

SBMF-10 (10'-11')	4/11
VOCs:	
1,2-Dichloroethene (cis)	1.6
Benzene	0.096
Vinyl chloride	0.20
Xylene (total)	0.49

SBMF-10 (17.6'-18')	4/11
VOCs:	
Xylene (total)	1.8

SBMF-16 (4.5'-5')	3/11
VOCs:	
1,2-Dichloroethene (cis)	2.1

SBMF-16 (10.5'-11.5')	4/11
VOCs:	
Benzene	3.1
Xylene (total)	2.5

SBMF-16 (34.8'-35.3')	4/11
VOCs:	
Benzene	0.25
Ethylbenzene	2.4
Xylene (total)	3.6

SBMF-16 (36.5'-37')	4/11
VOCs:	
Benzene	0.12
Ethylbenzene	1.5
Xylene (total)	2.7

SBMF-21 (36.4'-37')	4/11
VOCs:	
1,2-Dichloroethene (cis)	0.69
Benzene	4.2
Ethylbenzene	7.9
Toluene	22
Xylene (total)	62

SBMF-08 (19'-20')	3/11
VOCs:	
Benzene	0.26

MWMF-02 (3'-3.5')	3/11
VOCs:	
Acetone	0.074

SBMF-07 (12.5'-13')	3/11
VOCs:	
Benzene	0.083

SBMF-01 (9'-10')	4/11
VOCs:	
1,2-Dichloroethane	0.40
1,2-Dichloroethene (cis)	3.1
Acetone	1.7
Benzene	15
Ethylbenzene	260
Toluene	15
Xylene (total)	1200

MWMF-04 (10'-11')	3/11
VOCs:	
1,2-Dichloroethene (cis)	3.3
Vinyl chloride	0.45

MWMF-04 (28.2'-29')	3/11
VOCs:	
1,2-Dichloroethene (cis)	0.30
Benzene	1.1
Ethylbenzene	19
Toluene	1.9
Xylene (total)	24

SBMF-04 (3.2'-3.8')	3/11
VOCs:	
1,2-Dichloroethene (cis)	2.1

SBMF-04 (15'-16')	4/11
VOCs:	
1,2-Dichloroethene (cis)	1.8
Benzene	0.41
Vinyl chloride	0.69
Xylene (total)	0.77

SBMF-04 (45.5'-46')	4/11
VOCs:	
1,2-Dichloroethene (cis)	1.7
Benzene	630
Ethylbenzene	140
Tetrachloroethene	77
Toluene	1200
Trichloroethene	0.90
Xylene (total)	1200

MWMF-08 (3'-3.5')	3/11
VOCs:	
Xylene (total)	0.45

MWMF-08 (5.5'-6')	3/11
VOCs:	
Ethylbenzene	2.0
Xylene (total)	4.6

MWMF-08 (9'-10')	3/11
VOCs:	
Ethylbenzene	76
Toluene	2.1
Xylene (total)	150

MWMF-03 (4.5'-5')	3/11
VOCs:	
Benzene	2.3
Ethylbenzene	17
Toluene	0.89
Xylene (total)	12

SBMF-06 (18.2'-19')	3/11
VOCs:	
Benzene	0.068
Xylene (total)	0.47

Rose Feiss Blvd

E 140th St

E 139th St

Locust Ave

SBMF-03

MWMF-07D

FORMER FUELING STATION

SBMF-11

SBMF-22

SBMF-02

SBMF-17

MWMF-06

SBMF-05

Legend

- Not Sampled
- No Compounds Exceed Criteria
- One Or More Compounds Exceed Criteria

Location ID | Depth Interval | Sample Date

MWMF-07S (4.5'-5.5')	3/11
VOCs:	
Ethylbenzene	1.9
Xylene (total)	0.88

Compound | Concentration (mg/kg)

NOTE:
6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use.

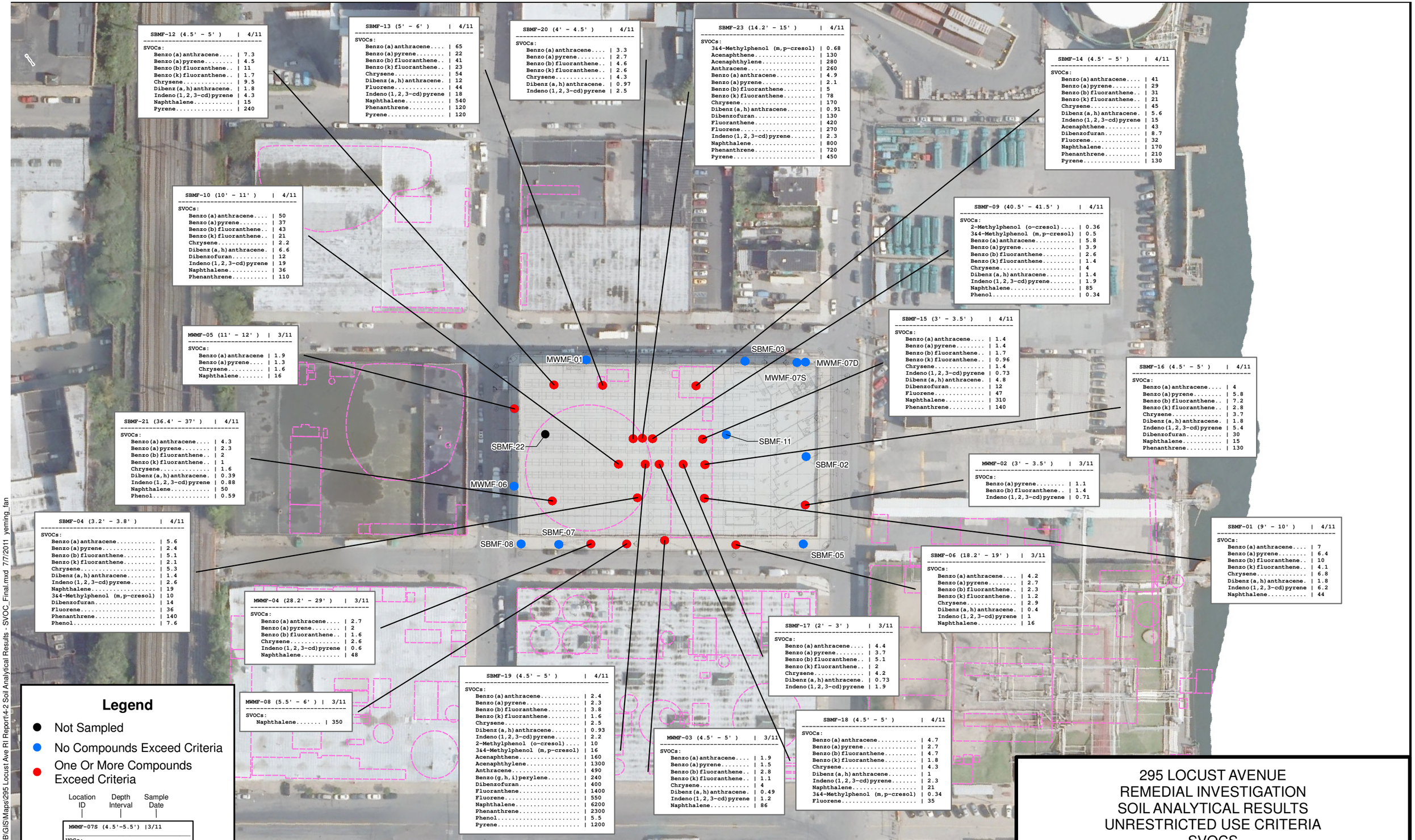
100 0 100 Feet

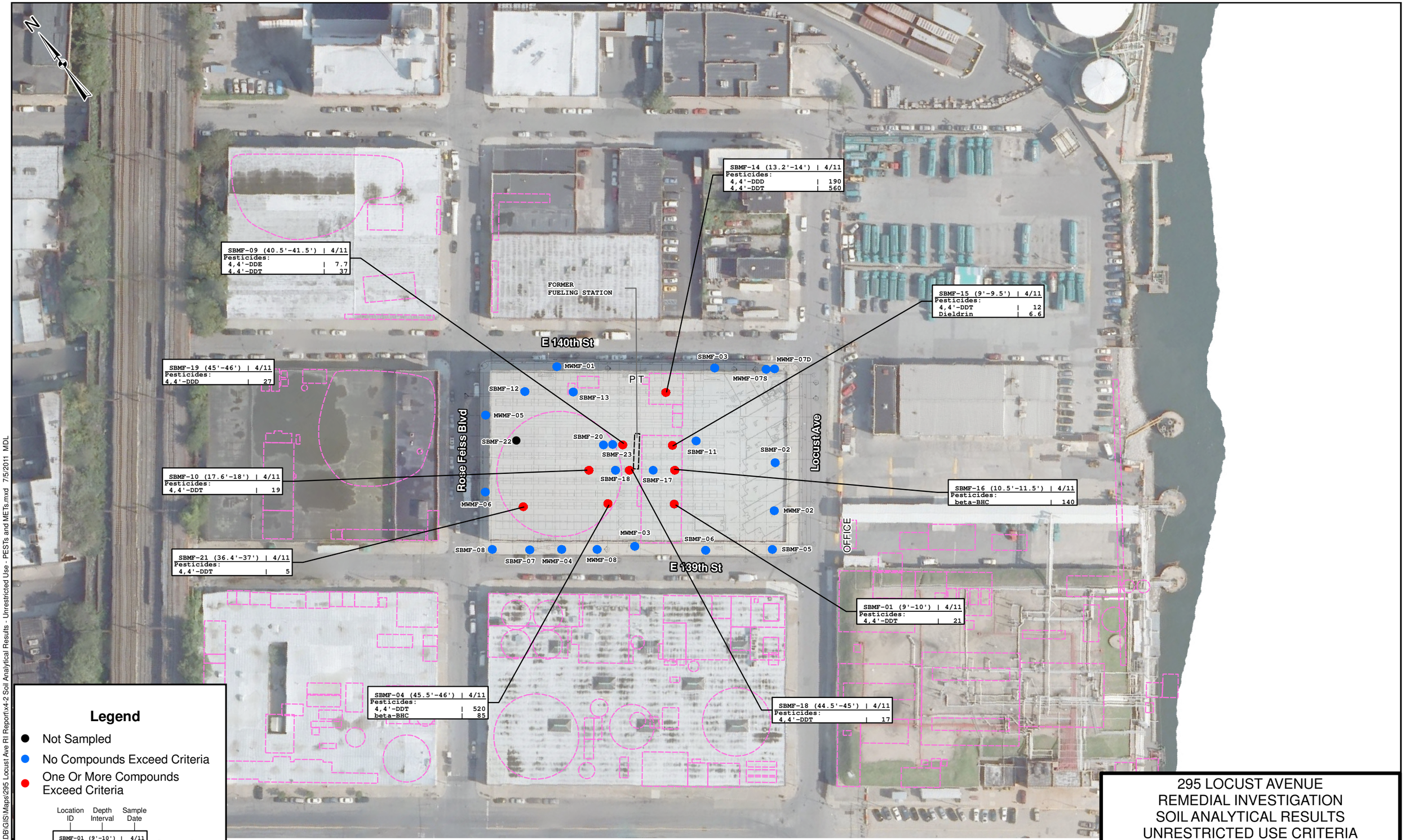
295 LOCUST AVENUE REMEDIAL INVESTIGATION SOIL ANALYTICAL RESULTS UNRESTRICTED USE CRITERIA VOCS

conEdison URS

FIGURE 4-1

J:\11175538.00000\DB\GIS\Maps\295 Locust Ave RI Report\4-1 Soil Analytical Results - Unrestricted Use - VOCs.mxd 7/5/2011 MDL


SBMF-12 (4.5' - 5') | 4/11
SVOCs:
Benzo(a)anthracene.... | 7.3
Benzo(a)pyrene..... | 4.5
Benzo(b)fluoranthene.. | 11
Benzo(k)fluoranthene.. | 1.7
Chrysene..... | 9.5
Dibenz(a,h)anthracene. | 1.8
Indeno(1,2,3-cd)pyrene | 4.3
Naphthalene..... | 15
Pyrene..... | 240
SBMF-13 (5' - 6') | 4/11
SVOCs:
Benzo(a)anthracene.... | 65
Benzo(a)pyrene..... | 22
Benzo(b)fluoranthene.. | 41
Benzo(k)fluoranthene.. | 23
Chrysene..... | 54
Dibenz(a,h)anthracene. | 12
Fluorene..... | 44
Indeno(1,2,3-cd)pyrene | 18
Naphthalene..... | 540
Phenanthrene..... | 120
Pyrene..... | 120
SBMF-20 (4' - 4.5') | 4/11
SVOCs:
Benzo(a)anthracene.... | 3.3
Benzo(a)pyrene..... | 2.7
Benzo(b)fluoranthene.. | 4.6
Benzo(k)fluoranthene.. | 2.6
Chrysene..... | 4.3
Dibenz(a,h)anthracene. | 0.97
Indeno(1,2,3-cd)pyrene | 2.5
SBMF-23 (14.2' - 15') | 4/11
SVOCs:
3&4-Methylphenol (m,p-cresol) | 0.68
Acenaphthene..... | 130
Acenaphthylene..... | 280
Anthracene..... | 260
Benzo(a)anthracene..... | 4.9
Benzo(a)pyrene..... | 2.1
Benzo(b)fluoranthene..... | 5
Benzo(k)fluoranthene..... | 78
Chrysene..... | 170
Dibenz(a,h)anthracene..... | 0.91
Dibenzofuran..... | 130
Fluoranthene..... | 420
Fluorene..... | 270
Indeno(1,2,3-cd)pyrene..... | 2.3
Naphthalene..... | 800
Phenanthrene..... | 720
Pyrene..... | 450
SBMF-14 (4.5' - 5') | 4/11
SVOCs:
Benzo(a)anthracene.... | 41
Benzo(a)pyrene..... | 29
Benzo(b)fluoranthene.. | 31
Benzo(k)fluoranthene.. | 21
Chrysene..... | 45
Dibenz(a,h)anthracene. | 5.6
Indeno(1,2,3-cd)pyrene | 15
Acenaphthene..... | 43
Dibenzofuran..... | 8.7
Fluorene..... | 32
Naphthalene..... | 170
Phenanthrene..... | 210
Pyrene..... | 130
SBMF-10 (10' - 11') | 4/11
SVOCs:
Benzo(a)anthracene.... | 50
Benzo(a)pyrene..... | 37
Benzo(b)fluoranthene.. | 43
Benzo(k)fluoranthene.. | 21
Chrysene..... | 2.2
Dibenz(a,h)anthracene. | 6.6
Dibenzofuran..... | 12
Indeno(1,2,3-cd)pyrene | 19
Naphthalene..... | 36
Phenanthrene..... | 110
SBMF-09 (40.5' - 41.5') | 4/11
SVOCs:
2-Methylphenol (o-cresol).... | 0.36
3&4-Methylphenol (m,p-cresol) | 0.5
Benzo(a)anthracene..... | 5.8
Benzo(a)pyrene..... | 3.9
Benzo(b)fluoranthene..... | 2.6
Benzo(k)fluoranthene..... | 1.4
Chrysene..... | 4
Dibenz(a,h)anthracene..... | 1.4
Indeno(1,2,3-cd)pyrene..... | 1.9
Naphthalene..... | 85
Phenol..... | 0.34
MWMF-05 (11' - 12') | 3/11
SVOCs:
Benzo(a)anthracene | 1.9
Benzo(a)pyrene.... | 1.3
Chrysene..... | 1.6
Naphthalene..... | 16
SBMF-15 (3' - 3.5') | 4/11
SVOCs:
Benzo(a)anthracene.... | 1.4
Benzo(a)pyrene..... | 1.4
Benzo(b)fluoranthene.. | 1.7
Benzo(k)fluoranthene.. | 0.96
Chrysene..... | 1.4
Indeno(1,2,3-cd)pyrene | 0.73
Dibenz(a,h)anthracene. | 4.8
Dibenzofuran..... | 12
Fluorene..... | 47
Naphthalene..... | 310
Phenanthrene..... | 140
SBMF-16 (4.5' - 5') | 4/11
SVOCs:
Benzo(a)anthracene.... | 4
Benzo(a)pyrene..... | 5.8
Benzo(b)fluoranthene.. | 7.2
Benzo(k)fluoranthene.. | 2.8
Chrysene..... | 3.7
Dibenz(a,h)anthracene. | 1.8
Indeno(1,2,3-cd)pyrene | 5.4
Dibenzofuran..... | 30
Naphthalene..... | 15
Phenanthrene..... | 130
SBMF-21 (36.4' - 37') | 4/11
SVOCs:
Benzo(a)anthracene.... | 4.3
Benzo(a)pyrene..... | 2.3
Benzo(b)fluoranthene.. | 2
Benzo(k)fluoranthene.. | 1
Chrysene..... | 1.6
Dibenz(a,h)anthracene. | 0.39
Indeno(1,2,3-cd)pyrene | 0.88
Naphthalene..... | 50
Phenol..... | 0.59
MWMF-02 (3' - 3.5') | 3/11
SVOCs:
Benzo(a)pyrene..... | 1.1
Benzo(b)fluoranthene.. | 1.4
Indeno(1,2,3-cd)pyrene | 0.71
SBMF-04 (3.2' - 3.8') | 4/11
SVOCs:
Benzo(a)anthracene..... | 5.6
Benzo(a)pyrene..... | 2.4
Benzo(b)fluoranthene..... | 5.1
Benzo(k)fluoranthene..... | 2.1
Chrysene..... | 5.3
Dibenz(a,h)anthracene..... | 1.4
Indeno(1,2,3-cd)pyrene..... | 2.6
Naphthalene..... | 19
3&4-Methylphenol (m,p-cresol) | 10
Dibenzofuran..... | 14
Fluorene..... | 36
Phenanthrene..... | 140
Phenol..... | 7.6
SBMF-01 (9' - 10') | 4/11
SVOCs:
Benzo(a)anthracene.... | 7
Benzo(a)pyrene..... | 6.4
Benzo(b)fluoranthene.. | 10
Benzo(k)fluoranthene.. | 4.1
Chrysene..... | 6.8
Dibenz(a,h)anthracene. | 1.8
Indeno(1,2,3-cd)pyrene | 6.2
Naphthalene..... | 44
SBMF-06 (18.2' - 19') | 3/11
SVOCs:
Benzo(a)anthracene.... | 4.2
Benzo(a)pyrene..... | 2.7
Benzo(b)fluoranthene.. | 2.3
Benzo(k)fluoranthene.. | 1.2
Chrysene..... | 2.9
Dibenz(a,h)anthracene. | 0.4
Indeno(1,2,3-cd)pyrene | 1
Naphthalene..... | 16
MWMF-04 (28.2' - 29') | 3/11
SVOCs:
Benzo(a)anthracene.... | 2.7
Benzo(a)pyrene..... | 2
Benzo(b)fluoranthene.. | 1.6
Chrysene..... | 2.6
Indeno(1,2,3-cd)pyrene | 0.6
Naphthalene..... | 48
SBMF-17 (2' - 3') | 3/11
SVOCs:
Benzo(a)anthracene.... | 4.4
Benzo(a)pyrene..... | 3.7
Benzo(b)fluoranthene.. | 5.1
Benzo(k)fluoranthene.. | 2
Chrysene..... | 4.2
Dibenz(a,h)anthracene. | 0.73
Indeno(1,2,3-cd)pyrene | 1.9
SBMF-19 (4.5' - 5') | 4/11
SVOCs:
Benzo(a)anthracene..... | 2.4
Benzo(a)pyrene..... | 2.3
Benzo(b)fluoranthene..... | 3.8
Benzo(k)fluoranthene..... | 1.6
Chrysene..... | 2.5
Dibenz(a,h)anthracene..... | 0.93
Indeno(1,2,3-cd)pyrene..... | 2.2
2-Methylphenol (o-cresol).... | 10
3&4-Methylphenol (m,p-cresol) | 16
Acenaphthene..... | 160
Acenaphthylene..... | 1300
Anthracene..... | 490
Benzo(g,h,i)perylene..... | 240
Dibenzofuran..... | 400
Fluoranthene..... | 1400
Fluorene..... | 550
Naphthalene..... | 6200
Phenanthrene..... | 2300
Phenol..... | 5.5
Pyrene..... | 1200
MWMF-08 (5.5' - 6') | 3/11
SVOCs:
Naphthalene..... | 350
MWMF-03 (4.5' - 5') | 3/11
SVOCs:
Benzo(a)anthracene.... | 1.9
Benzo(a)pyrene..... | 1.5
Benzo(b)fluoranthene.. | 2.8
Benzo(k)fluoranthene.. | 1.1
Chrysene..... | 4
Dibenz(a,h)anthracene. | 0.49
Indeno(1,2,3-cd)pyrene | 1.2
Naphthalene..... | 86
SBMF-18 (4.5' - 5') | 4/11
SVOCs:
Benzo(a)anthracene..... | 4.7
Benzo(a)pyrene..... | 2.7
Benzo(b)fluoranthene..... | 4.7
Benzo(k)fluoranthene..... | 1.8
Chrysene..... | 4.3
Dibenz(a,h)anthracene..... | 1
Indeno(1,2,3-cd)pyrene..... | 2.3
Naphthalene..... | 21
3&4-Methylphenol (m,p-cresol) | 0.34
Fluorene..... | 35
MWMF-01
SBMF-03
MWMF-07D
MWMF-07S
SBMF-22
SBMF-11
SBMF-02
MWMF-06
SBMF-07
SBMF-08
SBMF-05
Legend
Not Sampled
No Compounds Exceed Criteria
One Or More Compounds Exceed Criteria
Location ID
Depth Interval
Sample Date
MWMF-07S (4.5'-5.5') |3/11
VOCs:
Ethylbenzene | 1.9
Xylene (total) | 0.88
Compound
Concentration (mg/kg)
NOTE:
6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use.
100
0
100 Feet
295 LOCUST AVENUE
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
UNRESTRICTED USE CRITERIA
SVOCS
conEdison
URS
FIGURE 4-2
J:\11175538.00000\DB\GIS\Maps\295 Locust Ave RI Report\4-2 Soil Analytical Results - SVOC_Final.mxd 7/7/2011 yeming_fan



Legend

- Not Sampled
- No Compounds Exceed Criteria
- One Or More Compounds Exceed Criteria

Location ID | Depth Interval | Sample Date

SBMF-01 (9'-10') | 4/11
Pesticides:
4,4'-DDT | 21 — Concentration (µg/kg)

Compound

NOTE:
6 NYCRR Part 375.6, Remedial Program Soil Cleanup Objectives, Effective 12/14/06. Unrestricted Use.

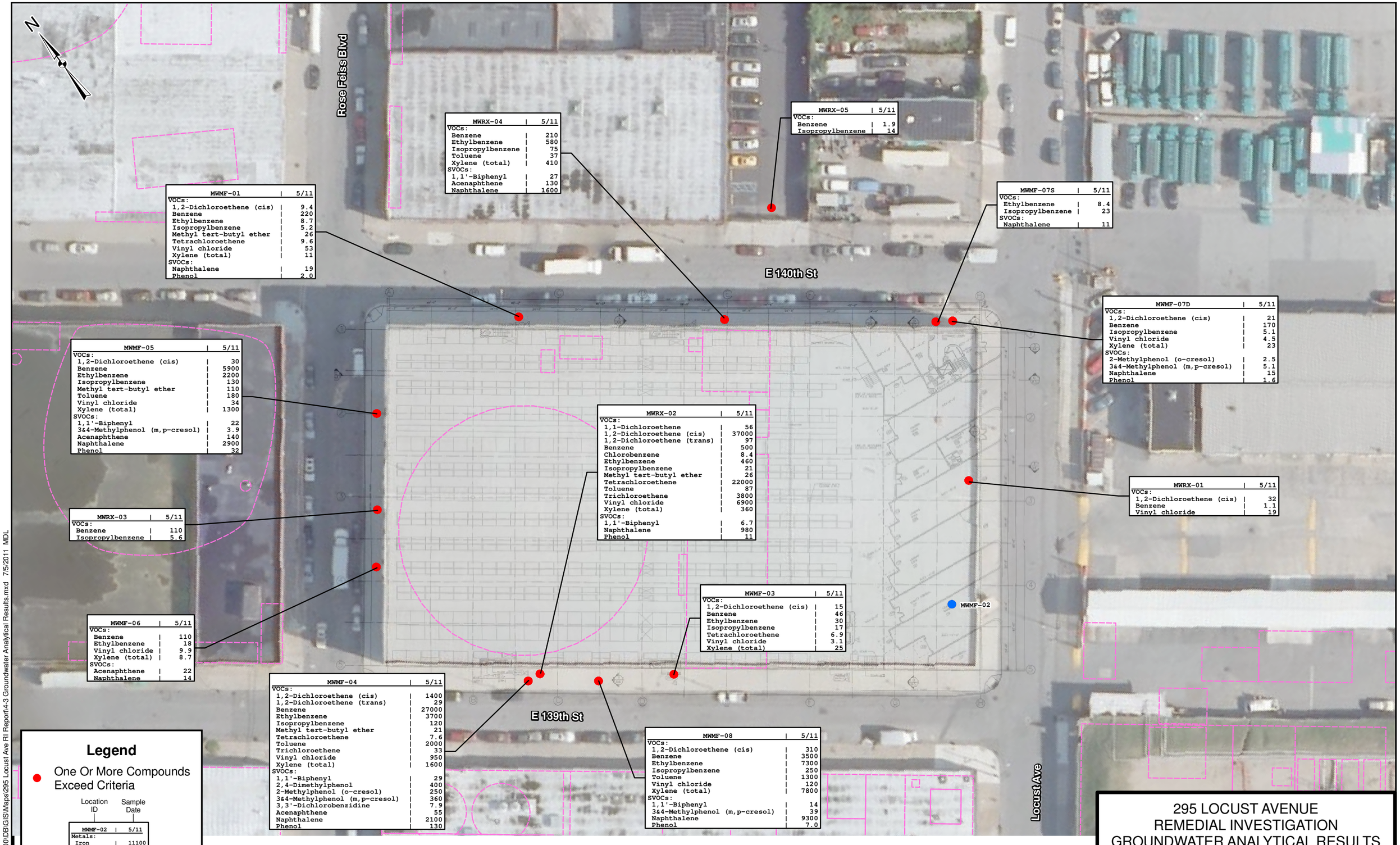
100 0 100 Feet

295 LOCUST AVENUE
REMEDIAL INVESTIGATION
SOIL ANALYTICAL RESULTS
UNRESTRICTED USE CRITERIA
PESTICIDES

conEdison URS

FIGURE 4-3

J:\11175538.00000\DB\GIS\Maps\295 Locust Ave RI Report\x4-2 Soil Analytical Results - Unrestricted Use - PESTs and METs.mxd 7/5/2011 MDL



MWMF-01	5/11
VOCs:	
1,2-Dichloroethene (cis)	9.4
Benzene	220
Ethylbenzene	8.7
Isopropylbenzene	5.2
Methyl tert-butyl ether	26
Tetrachloroethene	9.6
Vinyl chloride	53
Xylene (total)	11
SVOCs:	
Naphthalene	19
Phenol	2.0

MWRX-04	5/11
VOCs:	
Benzene	210
Ethylbenzene	580
Isopropylbenzene	75
Toluene	37
Xylene (total)	410
SVOCs:	
1,1'-Biphenyl	27
Acenaphthene	130
Naphthalene	1600

MWRX-05	5/11
VOCs:	
Benzene	1.9
Isopropylbenzene	14

MWMF-07S	5/11
VOCs:	
Ethylbenzene	8.4
Isopropylbenzene	23
SVOCs:	
Naphthalene	11

MWMF-07D	5/11
VOCs:	
1,2-Dichloroethene (cis)	21
Benzene	170
Isopropylbenzene	5.1
Vinyl chloride	4.5
Xylene (total)	23
SVOCs:	
2-Methylphenol (o-cresol)	2.5
3&4-Methylphenol (m,p-cresol)	5.1
Naphthalene	15
Phenol	1.6

MWMF-05	5/11
VOCs:	
1,2-Dichloroethene (cis)	30
Benzene	5900
Ethylbenzene	2200
Isopropylbenzene	130
Methyl tert-butyl ether	110
Toluene	180
Vinyl chloride	34
Xylene (total)	1300
SVOCs:	
1,1'-Biphenyl	22
3&4-Methylphenol (m,p-cresol)	3.9
Acenaphthene	140
Naphthalene	2900
Phenol	32

MWRX-02	5/11
VOCs:	
1,1-Dichloroethene	56
1,2-Dichloroethene (cis)	37000
1,2-Dichloroethene (trans)	97
Benzene	500
Chlorobenzene	8.4
Ethylbenzene	460
Isopropylbenzene	21
Methyl tert-butyl ether	26
Tetrachloroethene	22000
Toluene	87
Trichloroethene	3800
Vinyl chloride	6900
Xylene (total)	360
SVOCs:	
1,1'-Biphenyl	6.7
Naphthalene	980
Phenol	11

MWRX-01	5/11
VOCs:	
1,2-Dichloroethene (cis)	32
Benzene	1.1
Vinyl chloride	19

MWRX-03	5/11
VOCs:	
Benzene	110
Isopropylbenzene	5.6

MWMF-06	5/11
VOCs:	
Benzene	110
Ethylbenzene	18
Vinyl chloride	9.9
Xylene (total)	8.7
SVOCs:	
Acenaphthene	22
Naphthalene	14

MWMF-03	5/11
VOCs:	
1,2-Dichloroethene (cis)	15
Benzene	46
Ethylbenzene	30
Isopropylbenzene	17
Tetrachloroethene	6.9
Vinyl chloride	3.1
Xylene (total)	25

MWMF-04	5/11
VOCs:	
1,2-Dichloroethene (cis)	1400
1,2-Dichloroethene (trans)	29
Benzene	27000
Ethylbenzene	3700
Isopropylbenzene	120
Methyl tert-butyl ether	21
Tetrachloroethene	7.6
Toluene	2000
Trichloroethene	33
Vinyl chloride	950
Xylene (total)	1600
SVOCs:	
1,1'-Biphenyl	29
2,4-Dimethylphenol	400
2-Methylphenol (o-cresol)	250
3&4-Methylphenol (m,p-cresol)	360
3,3'-Dichlorobenzidine	7.9
Acenaphthene	55
Naphthalene	2100
Phenol	130

MWMF-08	5/11
VOCs:	
1,2-Dichloroethene (cis)	310
Benzene	3500
Ethylbenzene	7300
Isopropylbenzene	250
Toluene	1300
Vinyl chloride	120
Xylene (total)	7800
SVOCs:	
1,1'-Biphenyl	14
3&4-Methylphenol (m,p-cresol)	39
Naphthalene	9300
Phenol	7.0

Legend

One Or More Compounds Exceed Criteria

Location ID | Sample Date

MWMF-02	5/11
Metals:	
Iron	11100
Manganese	918

Compound | Concentration (µg/L)

NOTE:
NYSDEC TOGS (1.1.1), Ambient Water Quality Standards and Guidance Values and Groundwater Effluent Limitations. June 1998 (including April 2000 and June 2004 addenda). Class GA.

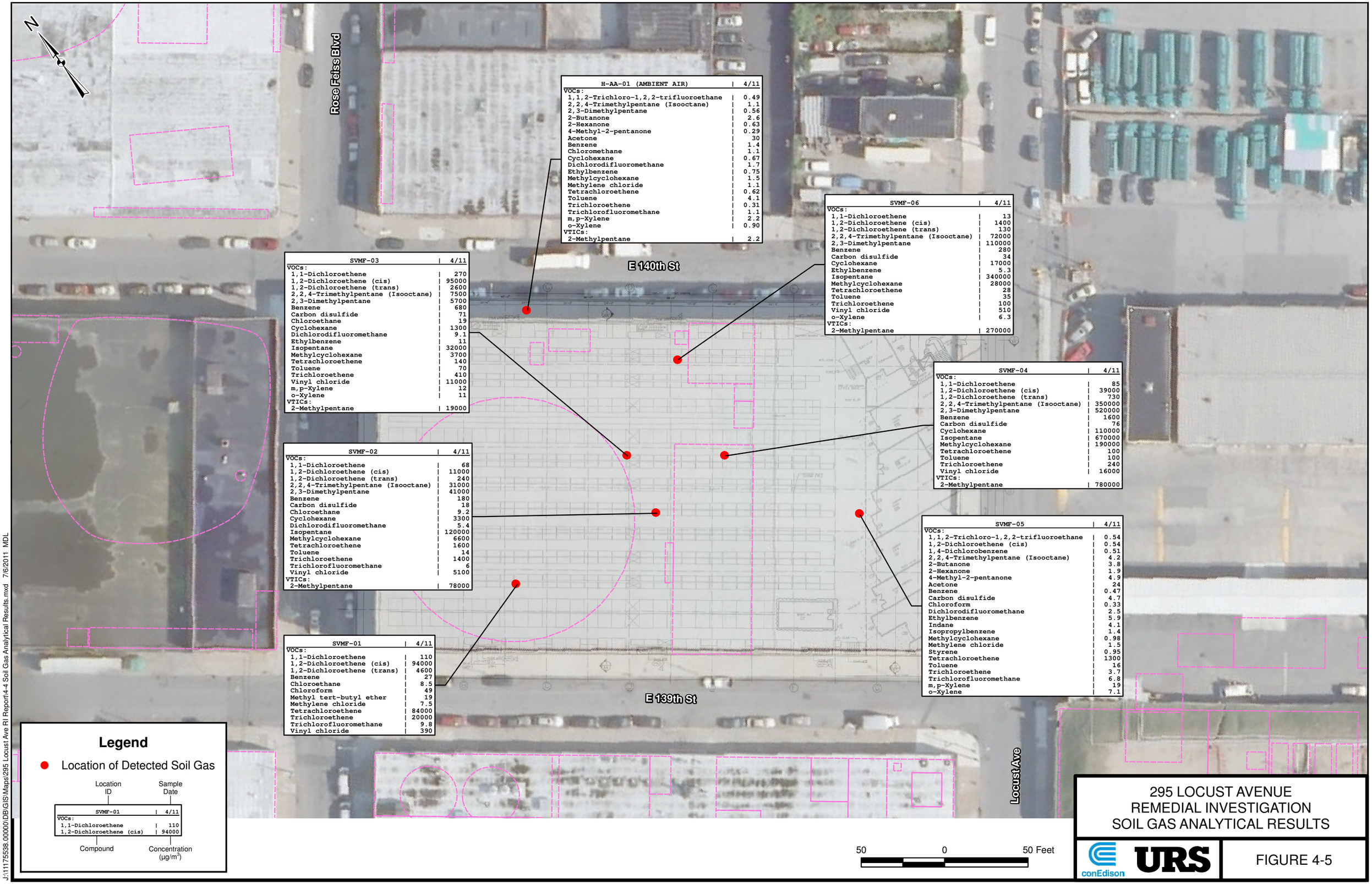
50 0 50 Feet

295 LOCUST AVENUE
REMEDIAL INVESTIGATION
GROUNDWATER ANALYTICAL RESULTS

conEdison URS

FIGURE 4-4

J:\11175538.00000\DB\GIS\Maps\295 Locust Ave RI Report\4-3 Groundwater Analytical Results.mxd 7/5/2011 MDL



H-AA-01 (AMBIENT AIR)	4/11
VOCs:	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.49
2,2,4-Trimethylpentane (Isooctane)	1.1
2,3-Dimethylpentane	0.56
2-Butanone	2.6
2-Hexanone	0.63
4-Methyl-2-pentanone	0.29
Acetone	30
Benzene	1.4
Chloromethane	1.1
Cyclohexane	0.67
Dichlorodifluoromethane	1.7
Ethylbenzene	0.75
Methylcyclohexane	1.5
Methylene chloride	1.1
Tetrachloroethene	0.62
Toluene	4.1
Trichloroethene	0.31
Trichlorofluoromethane	1.1
m,p-Xylene	2.2
o-Xylene	0.90
VTICs:	
2-Methylpentane	2.2

SVMF-03	4/11
VOCs:	
1,1-Dichloroethene	270
1,2-Dichloroethene (cis)	95000
1,2-Dichloroethene (trans)	2600
2,2,4-Trimethylpentane (Isooctane)	7500
2,3-Dimethylpentane	5700
Benzene	680
Carbon disulfide	71
Chloroethane	19
Cyclohexane	1300
Dichlorodifluoromethane	9.1
Ethylbenzene	11
Isopentane	32000
Methylcyclohexane	3700
Tetrachloroethene	140
Toluene	70
Trichloroethene	410
Vinyl chloride	11000
m,p-Xylene	12
o-Xylene	11
VTICs:	
2-Methylpentane	19000

SVMF-06	4/11
VOCs:	
1,1-Dichloroethene	13
1,2-Dichloroethene (cis)	1400
1,2-Dichloroethene (trans)	130
2,2,4-Trimethylpentane (Isooctane)	72000
2,3-Dimethylpentane	110000
Benzene	280
Carbon disulfide	34
Cyclohexane	17000
Ethylbenzene	5.3
Isopentane	340000
Methylcyclohexane	28000
Tetrachloroethene	28
Toluene	35
Trichloroethene	100
Vinyl chloride	510
o-Xylene	6.3
VTICs:	
2-Methylpentane	270000

SVMF-02	4/11
VOCs:	
1,1-Dichloroethene	68
1,2-Dichloroethene (cis)	11000
1,2-Dichloroethene (trans)	240
2,2,4-Trimethylpentane (Isooctane)	31000
2,3-Dimethylpentane	41000
Benzene	180
Carbon disulfide	18
Chloroethane	9.2
Cyclohexane	3300
Dichlorodifluoromethane	5.4
Isopentane	120000
Methylcyclohexane	6600
Tetrachloroethene	1600
Toluene	14
Trichloroethene	1400
Trichlorofluoromethane	6
Vinyl chloride	5100
VTICs:	
2-Methylpentane	78000

SVMF-04	4/11
VOCs:	
1,1-Dichloroethene	85
1,2-Dichloroethene (cis)	39000
1,2-Dichloroethene (trans)	730
2,2,4-Trimethylpentane (Isooctane)	350000
2,3-Dimethylpentane	520000
Benzene	1600
Carbon disulfide	76
Cyclohexane	110000
Isopentane	670000
Methylcyclohexane	190000
Tetrachloroethene	100
Toluene	100
Trichloroethene	240
Vinyl chloride	16000
VTICs:	
2-Methylpentane	780000

SVMF-01	4/11
VOCs:	
1,1-Dichloroethene	110
1,2-Dichloroethene (cis)	94000
1,2-Dichloroethene (trans)	4600
Benzene	27
Chloroethane	8.5
Chloroform	49
Methyl tert-butyl ether	19
Methylene chloride	7.5
Tetrachloroethene	84000
Trichloroethene	20000
Trichlorofluoromethane	9.8
Vinyl chloride	390

SVMF-05	4/11
VOCs:	
1,1,2-Trichloro-1,2,2-trifluoroethane	0.54
1,2-Dichloroethene (cis)	0.54
1,4-Dichlorobenzene	0.51
2,2,4-Trimethylpentane (Isooctane)	4.2
2-Butanone	3.8
2-Hexanone	1.9
4-Methyl-2-pentanone	4.9
Acetone	24
Benzene	0.47
Carbon disulfide	4.7
Chloroform	0.33
Dichlorodifluoromethane	2.5
Ethylbenzene	5.9
Indane	4.1
Isopropylbenzene	1.4
Methylcyclohexane	0.98
Methylene chloride	1.5
Styrene	0.95
Tetrachloroethene	1300
Toluene	16
Trichloroethene	3.7
Trichlorofluoromethane	6.8
m,p-Xylene	19
o-Xylene	7.1

Legend

- Location of Detected Soil Gas

Location ID: SVMF-01 | Sample Date: 4/11

SVMF-01	4/11
VOCs:	
1,1-Dichloroethene	110
1,2-Dichloroethene (cis)	94000

Compound | Concentration ($\mu g/m^3$)

50 0 50 Feet

295 LOCUST AVENUE REMEDIAL INVESTIGATION SOIL GAS ANALYTICAL RESULTS

conEdison URS

FIGURE 4-5

J:\11175538.00000\DB\GIS\Maps\295 Locust Ave RI Report\4-4 Soil Gas Analytical Results.mxd 7/6/2011 MDL

RadonAway™
The World's Leading Radon Fan Manufacturer

RP Series

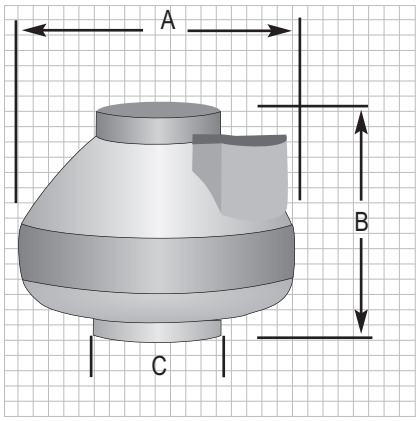
Radon Mitigation Fans

All RadonAway fans are specifically designed for radon mitigation. RP Series Fans provide superb performance, run ultra-quiet and are attractive. They are ideal for most sub-slab radon mitigation systems.

Features:

- Five-year hassle-free warranty
- Quiet and attractive
- Thermally protected
- Motorized impeller
- ETL Listed - for indoor or outdoor use
- Meets all electrical code requirements
- Rated for commercial and residential use

Model	Watts	Max. Pressure "WC	Typical CFM vs. Static Pressure WC					A"	B"	C"
			0"	.5"	1.0"	1.5"	2.0"			
RP140	14-20	0.8	134	68	-	-	-	9.7	7.9	4
RP145	37-71	2.1	173	132	94	55	11	9.7	7.9	4
RP260	52-72	1.8	275	180	105	20	-	11.8	9.9	6
RP265	86-140	2.5	327	260	207	139	57	11.8	9.9	6
RP380	103-156	2.3	510	393	268	165	35	13.41	10.53	8



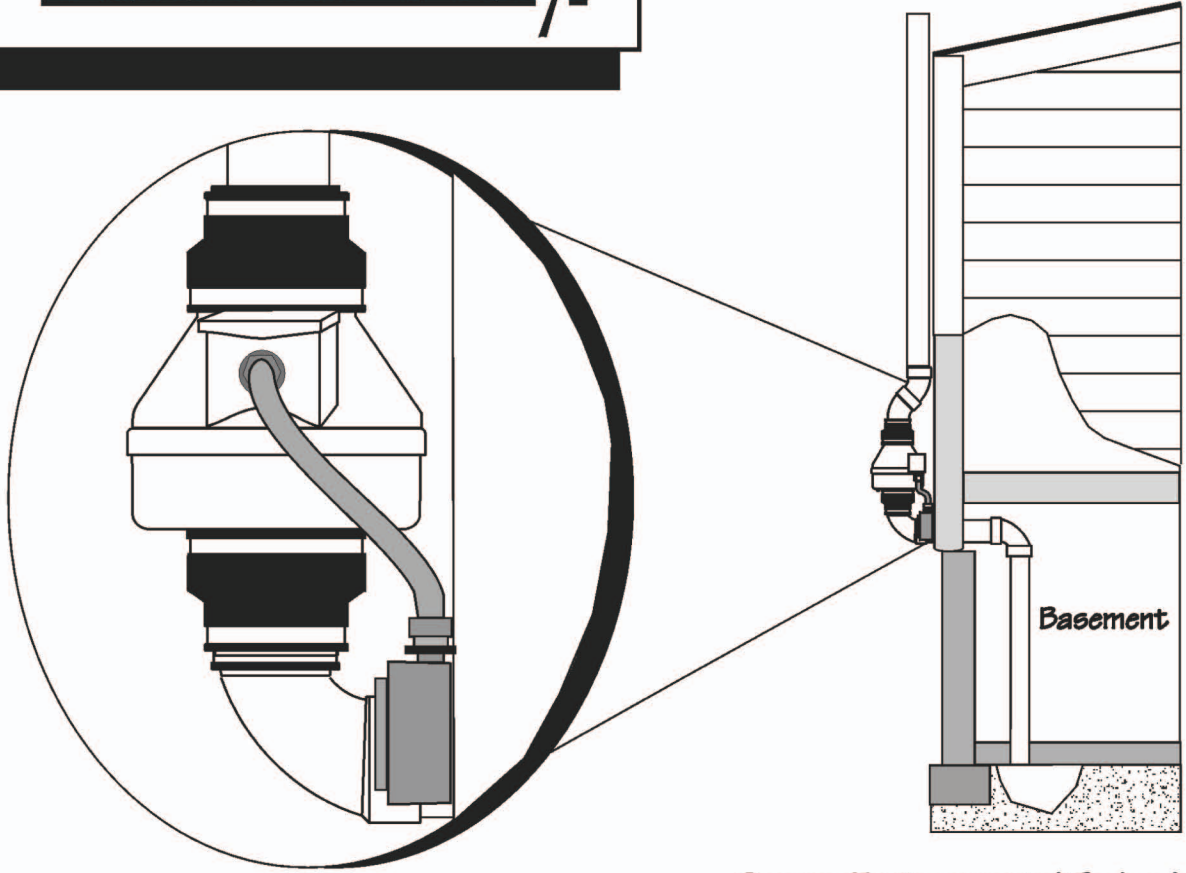
Choice of model is dependent on building characteristics including sub-slab materials and should be made by a radon professional.

For Further Information Contact:

4/09
P/N 02008

RP Series Installation Instructions

By RadonAway™



Spruce Environmental Technologies, Inc.
Ward Hill, MA P/N IN020 Rev J

RadonAway™

Series Fan Installation Instructions

Please Read and Save These Instructions.

DO NOT CONNECT POWER SUPPLY UNTIL FAN IS COMPLETELY INSTALLED.
MAKE SURE ELECTRICAL SERVICE TO FAN IS LOCKED IN "OFF" POSITION.
DISCONNECT POWER BEFORE SERVICING FAN.

1. **WARNING!** Do not use fan in hazardous environments where fan electrical system could provide ignition to combustible or flammable materials.

2. **WARNING!** Do not use fan to pump explosive or corrosive gases.

3. **WARNING!** Check voltage at the fan to insure it corresponds with nameplate.

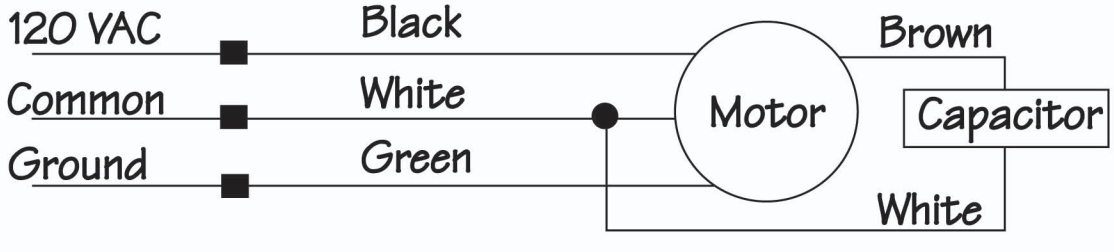
4. **WARNING!** Normal operation of this device may affect the combustion airflow needed for safe operation of fuel burning equipment. Check for possible backdraft conditions on all combustion devices after installation.

5. **NOTICE!** There are no user serviceable parts located inside the fan unit.
Do NOT attempt to open. Return unit to the factory for service.

6. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician

7. **WARNING!** Do not leave fan unit installed on system piping without electrical power for more than 48 hours. Fan failure could result from this non-operational storage.

DynaVac RP Series Fan Wiring Diagram



INSTALLATION INSTRUCTIONS IN020 Rev I

DynaVac - RP Series
RP140 p/n 23029-1
RP145 p/n 23030-1
RP260 p/n 23032-1
RP265 p/n 23033-1
RP380 p/n 28208

1.0 SYSTEM DESIGN CONSIDERATIONS

1.1 INTRODUCTION

The DynaVac RP Series Radon Fans are intended for use by trained, professional Radon mitigators. The purpose of this instruction is to provide additional guidance for the most effective use of a DynaVac Fan. This instruction should be considered as a supplement to EPA standard practices, state and local building codes and state regulations. In the event of a conflict, those codes, practices and regulations take precedence over this instruction.

1.2 ENVIRONMENTALS

The RP Series Fans are designed to perform year-round in all but the harshest climates without additional concern for temperature or weather. For installations in an area of severe cold weather, please contact RadonAway for assistance. When not in operation, the fan should be stored in an area where the temperature is never less than 32 degrees F. or more than 100 degrees F.

1.3 ACOUSTICS

The RP Series Fan, when installed properly, operates with little or no noticeable noise to the building occupants. The velocity of the outgoing air should be considered in the overall system design. In some cases the "rushing" sound of the outlet air may be disturbing. In these instances, the use of a RadonAway Exhaust Muffler is recommended.

1.4 GROUND WATER

In the event that a temporary high water table results in water at or above slab level, water may be drawn into the riser pipes thus blocking air flow to the RP Series Fan. The lack of cooling air may result in the fan cycling on and off as the internal temperature rises above the thermal cutoff and falls upon shutoff. Should this condition arise, it is recommended that the fan be turned off until the water recedes allowing for return to normal operation.

1.5 SLAB COVERAGE

The RP Series Fan can provide coverage up to 2000+ sq. ft. per slab penetration. This will primarily depend on the sub-slab material in any particular installation. In general, the tighter the material, the smaller the area covered per penetration. Appropriate selection of the RP Series Fan best suited for the sub-slab material can improve the slab coverage. The RP140/145/155 are best suited for general purpose use. The RP260 can be used where additional airflow is required and the RP265/380 is best suited for large slab, high airflow applications. Additional suction points can be added as required. It is recommended that a small pit (5 to 10 gallons in size) be created below the slab at each suction hole.

1.6 CONDENSATION & DRAINAGE

Condensation is formed in the piping of a mitigation system when the air in the piping is chilled below its dew point. This can occur at points where the system piping goes through unheated space such as an attic, garage or outside. The system design must provide a means for water to drain back to a slab hole to remove the condensation. The RP Series Fan **MUST** be mounted vertically plumb and level, with the outlet pointing up for proper drainage through the fan. Avoid mounting the fan in any orientation that will allow water to accumulate inside the fan housing. The RP Series Fans are **NOT** suitable for underground burial.

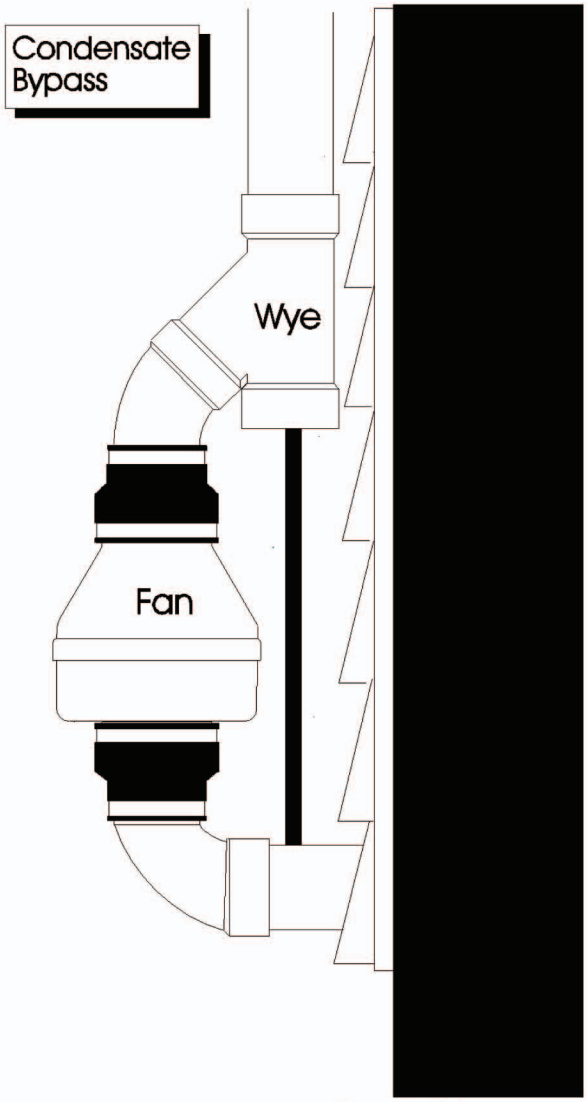
For RP Series Fan piping, the following table provides the minimum recommended pipe diameter and pitch under several system conditions.

Pipe Dia.	Minimum Rise per Ft of Run*				
	@25 CFM	@50 CFM	@100 CFM	@200 CFM	@300 CFM
6"	-	3/16	1/4	3/8	3/4
4"	1/8	1/4	3/8	2 3/8	-
3"	1/4	3/8	1 1/2	-	-

*Typical RP1xx/2xx Series Fan operational flow rate is 25 - 90 CFM 0n 3" and 4" pipe. (For more precision, determine flow rate by measuring Static Pressure, in WC, and correlate pressure to flow in the performance chart in the addendum.)

Under some circumstances in an outdoor installation a condensate bypass should be installed in the outlet ducting as shown. This may be particularly true in cold climate installations which require long lengths of outlet ducting or where the outlet ducting is likely to produce large amounts of condensation because of high soil moisture or outlet duct material. Schedule 20 piping and other thin-walled plastic ducting and Aluminum downspout will normally produce much more condensation than Schedule 40 piping.

The bypass is constructed with a 45 degree Wye fitting at the bottom of the outlet stack. The bottom of the Wye is capped and fitted with a tube that connects to the inlet piping or other drain. The condensation produced in the outlet stack is collected in the Wye fitting and drained through the bypass tube. The bypass tubing may be insulated to prevent freezing.



1.7 "SYSTEM ON" INDICATOR

A properly designed system should incorporate a "System On" Indicator for affirmation of system operation. A manometer, such as a U-Tube, or a vacuum alarm is recommended for this purpose.

1.8 ELECTRICAL WIRING

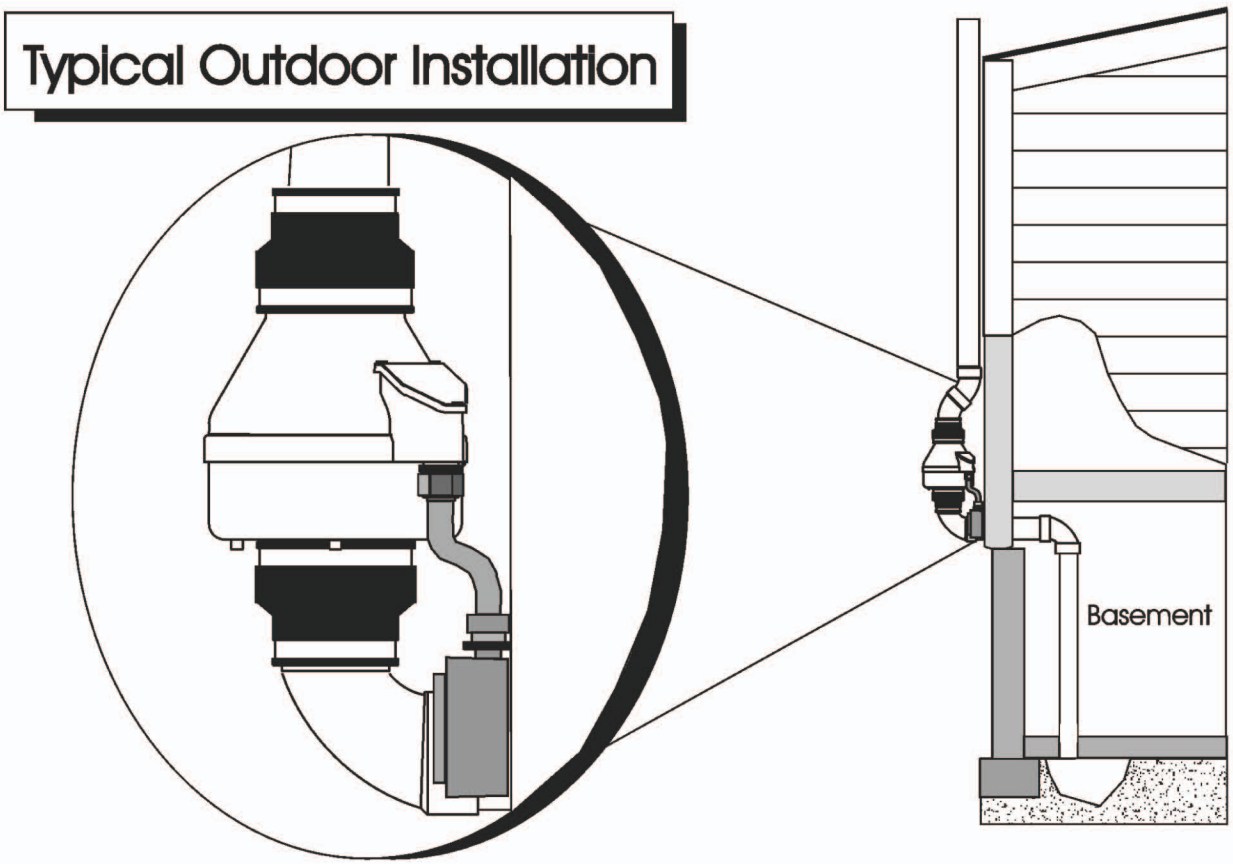
The RP Series Fans operate on standard 120V 60 Hz. AC. All wiring must be performed in accordance with the National Fire Protection Association's (NFPA)"National Electrical Code, Standard #70"-current edition for all commercial and industrial work, and state and local building codes. All wiring must be performed by a qualified and licensed electrician. Outdoor installations require the use of a U.L. listed watertight conduit. Ensure that all exterior electrical boxes are outdoor rated and properly sealed to prevent water penetration into the box. A means, such as a weep hole, is recommended to drain the box.

1.9 SPEED CONTROLS

The RP Series Fans are rated for use with electronic speed controls ,however , they are generally not recommended.

2.0 INSTALLATION

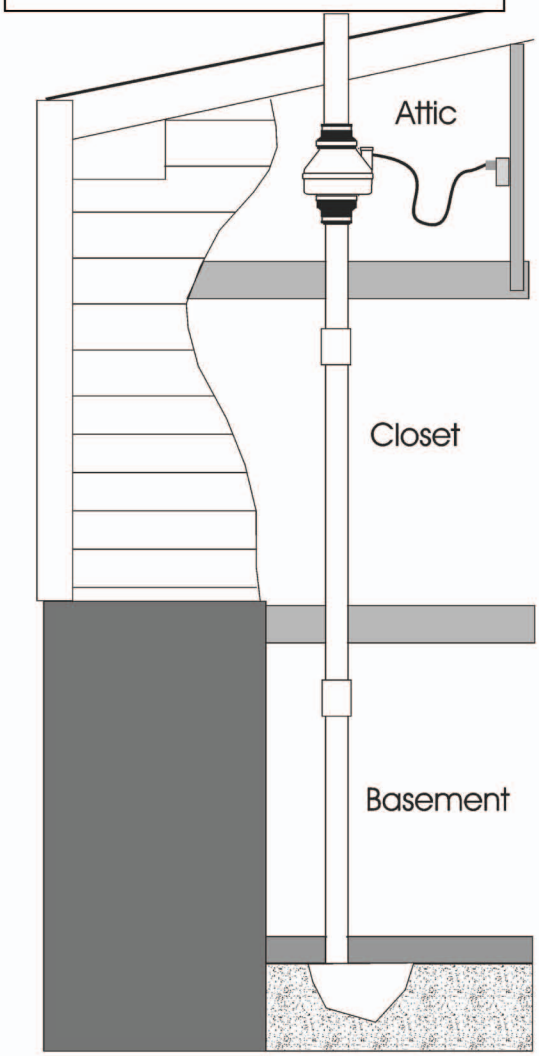
The RP Series Fan can be mounted indoors or outdoors. (It is suggested that EPA recommendations be followed in choosing the fan location.) The RP Series Fan may be mounted directly on the system piping or fastened to a supporting structure by means of optional mounting bracket.



2.1 MOUNTING

Mount the RP Series Fan vertically with outlet up. Insure the unit is plumb and level. When mounting directly on the system piping assure that the fan does not contact any building surface to avoid vibration noise.

Typical Indoor Installation



2.2 MOUNTING BRACKET (optional)

The RP Series fan may be optionally secured with the RadonAway P/N 25007-2 (25033 for RP385) mounting bracket. Foam or rubber grommets may also be used between the bracket and mounting surface for vibration isolation.

2.3 SYSTEM PIPING

Complete piping run, using flexible couplings as means of disconnect for servicing the unit and vibration isolation.

2.4 ELECTRICAL CONNECTION

Connect wiring with wire nuts provided, observing proper connections(See Section 1.8):

Fan Wire	Connection
Green	Ground
Black	AC Hot
White	AC Common

2.5 VENT MUFFLER (optional)

Install the muffler assembly in the selected location in the outlet ducting. Solvent weld all connections. The muffler is normally installed at the end of the vent pipe.

2.6 OPERATION CHECKS

_____ **Verify** all connections are tight and **leak-free**.

_____ **Insure** the RP Series Fan and all ducting is secure and vibration-free.

_____ **Verify** system vacuum pressure with manometer. **Insure** vacuum pressure is **less than** maximum recommended operating pressure

(Based on sea-level operation, at higher altitudes reduce by about 4% per 1000 Feet.)

(Further reduce Maximum Operating Pressure by 10% for High Temperature environments)

See Product Specifications. If this is exceeded, increase the number of suction points.

_____ **Verify Radon levels by testing to EPA protocol.**

RP SERIES PRODUCT SPECIFICATIONS

The following chart shows fan performance for the RP Series Fan:

Typical CFM Vs Static Pressure "WC									
	0"	.25"	.5"	.75"	1.0"	1.25"	1.5"	1.75"	2.0"
RP140	135	103	70	14	-	-	-	-	-
RP145	166	146	126	104	82	61	41	21	3
RP260	272	220	176	138	103	57	13	-	-
RP265	334	291	247	210	176	142	116	87	52
RP380*	497	401	353	281	220	176	130	80	38

* Tested with 6″ inlet and discharge pipe.

Power Consumption 120 VAC, 60Hz 1.5 Amp Maximum			Maximum Recommended Operating Pressure* (Sea Level Operation)**	
RP140	17 - 21	watts	RP140	0.8" W.C.
RP145	41 - 72	watts	RP145	1.7" W.C.
RP260	52 - 72	watts	RP260	1.5" W.C.
RP265	91 - 129	watts	RP265	2.2" W.C.
RP380	95 - 152	watts	RP380	2.0" W.C.

**Reduce by 10% for High Temperature Operation*
***Reduce by 4% per 1000 feet of altitude*

	Size	Weight	Inlet/Outlet
RP140	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)
RP145	8.5H" x 9.7" Dia.	5.5 lbs.	4.5" OD (4.0" PVC Sched 40 size compatible)
RP155	8.5H" x 9.7" Dia.	5.5 lbs.	5.0" OD
RP260	8.6H" x 11.75" Dia.	5.5 lbs.	6.0″ OD
RP265	8.6H" x 11.75" Dia.	6.5 lbs.	6.0″ OD
RP380	10.53H" x 13.41" Dia.	11.5 lbs.	8.0″ OD

Recommended ducting: 3" or 4" RP1xx/2xx, 6″ RP380, Schedule 20/40 PVC Pipe

Mounting: Mount on the duct pipe or with optional mounting bracket.

Storage temperature range: 32 - 100 degrees F.

Normal operating temperature range: -20 - 120 degrees F.

Maximum inlet air temperature: 80 degrees F.

Continuous Duty

Class B Insulation

Thermally protected

3000 RPM

Rated for Indoor or Outdoor Use

LISTED Electric Fan ETL® 77728 Tested to UL Std. 507 ® 2100 HVI CERTIFIED

IMPORTANT INSTRUCTIONS TO INSTALLER

Inspect the GP/XP/XR/RP Series Fan for shipping damage within 15 days of receipt. Notify **RadonAway of any damages immediately**. Radonaway is not responsible for damages incurred during shipping. However, for your benefit, Radonaway does insure shipments.

There are no user serviceable parts inside the fan. **Do not attempt to open.** Return unit to factory for service.

Install the GP/XP/XR/RP Series Fan in accordance with all EPA standard practices, and state and local building codes and state regulations.

WARRANTY

Subject to any applicable consumer protection legislation, RadonAway warrants that the GPX01/XP/XR/RP Series Fan (the "Fan") will be free from defects in materials and workmanship for a period of 90 days from the date of purchase (the "Warranty Term").

RadonAway will replace any Fan which fails due to defects in materials or workmanship. The Fan must be returned (at Owner's cost) to the RadonAway factory. Any Fan returned to the factory will be discarded unless the Owner provides specific instructions along with the Fan when it is returned regardless of whether or not the Fan is actually replaced under this warranty. Proof of purchase must be supplied upon request for service under this Warranty.

This Warranty is contingent on installation of the Fan in accordance with the instructions provided. This Warranty does not apply where any repairs or alterations have been made or attempted by others, or if the unit has been abused or misused. Warranty does not cover damage in shipment unless the damage is due to the negligence of RadonAway.

5 YEAR EXTENDED WARRANTY WITH PROFESSIONAL INSTALLATION.

RadonAway will extend the Warranty Term of the fan to 5 years from date of manufacture if the Fan is installed in a professionally designed and professionally installed radon system or installed as a replacement fan in a professionally designed and professionally installed radon system. Proof of purchase and/or proof of professional installation may be required for service under this warranty. Outside the Continental United States and Canada the extended Warranty Term is limited to one (1) year from the date of manufacture.

RadonAway is not responsible for installation, removal or delivery costs associated with this Warranty.

EXCEPT AS STATED ABOVE, THE GPx01/XP/XR/RP SERIES FANS ARE PROVIDED WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

IN NO EVENT SHALL RADONAWAY BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES ARISING OUT OF, OR RELATING TO, THE FAN OR THE PERFORMANCE THEREOF. RADONAWAY'S AGGREGATE LIABILITY HEREUNDER SHALL NOT IN ANY EVENT EXCEED THE AMOUNT OF THE PURCHASE PRICE OF SAID PRODUCT. THE SOLE AND EXCLUSIVE REMEDY UNDER THIS WARRANTY SHALL BE THE REPAIR OR REPLACEMENT OF THE PRODUCT, TO THE EXTENT THE SAME DOES NOT MEET WITH RADONAWAY'S WARRANTY AS PROVIDED ABOVE.

For service under this Warranty, contact RadonAway for a Return Material Authorization (RMA) number and shipping information. No returns can be accepted without an RMA. If factory return is required, the customer assumes all shipping cost to and from factory.

RadonAway
3 Saber Way
Ward Hill, MA 01835
TEL. (978) 521-3703
FAX (978) 521-3964

Record the following information for your records:

Serial No._____
Purchase Date_____

SITE PLAN W/ FORMER INFRASTRUCTURE

0 40 80

SCALE FEET

LOCATION MAP
BRONX, NY (NTS)

FORMER MGP INFRASTRUCTURE LOCATION (APPROX.)

MONITORING WELL

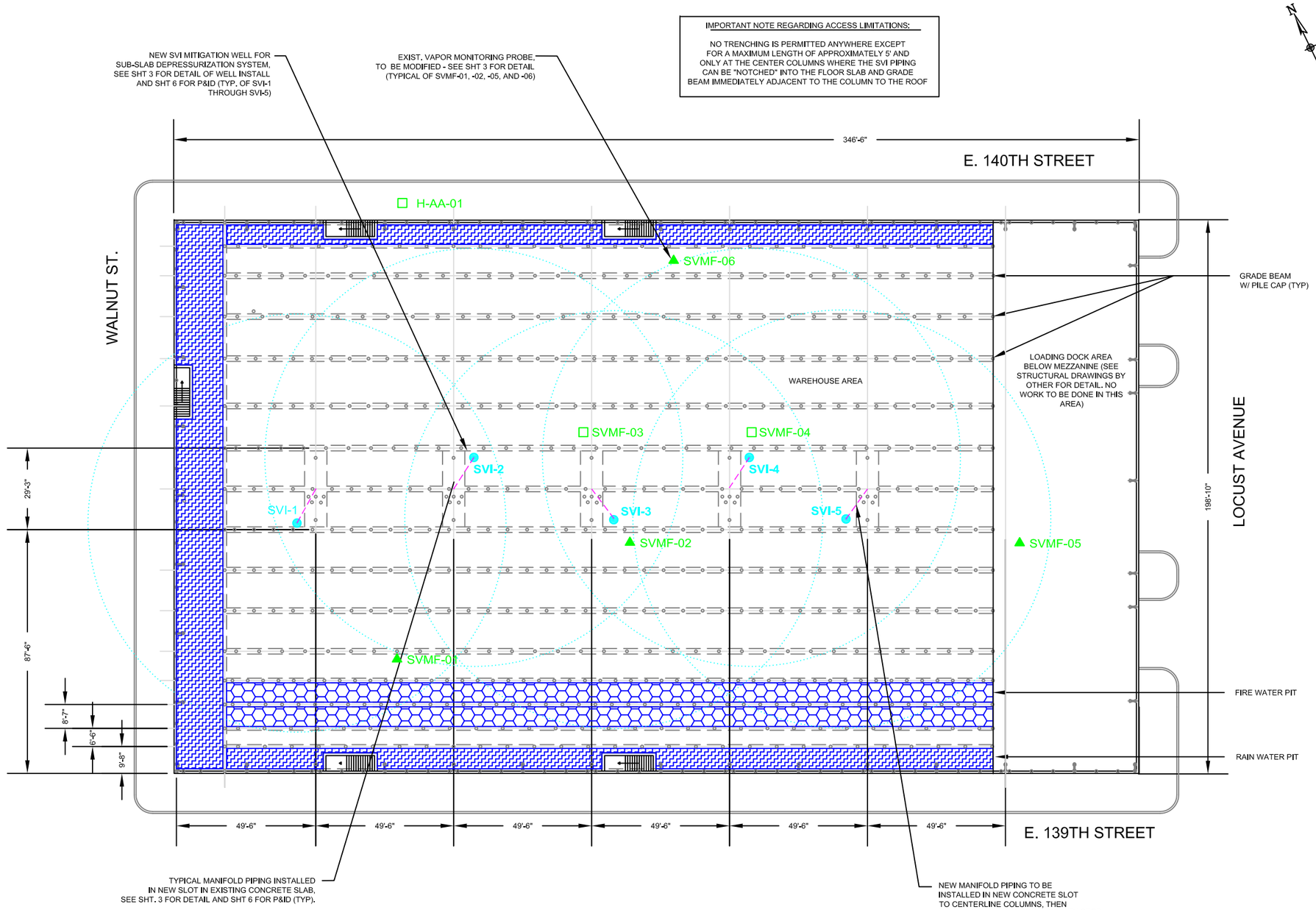
3.0 GW ELEV. CONTOUR (APPROX. FT AMSL, 5/4/2011 URS)

INFERRED GW FLOW DIRECTION

TechSolutions Engineering, P.C.
52 Oceanview Boulevard
Manorville, New York 11949
Ph: 914-319-9375
Email: techsolnpc@gmail.com

SITE PLAN

LOCATION:		DESIGN:
STREET ADDRESS CITY, STATE		DJS
PROJECT NO / FILE SUSDEV1201.01 SHEET 1 - SITE PLAN	DRAWING DATE: 02/19/12	REV. NO.:	FIGURE: **1**



SVI MITIGATION INSTALLATION PLAN

0 40 80

SCALE FEET

IMPORTANT NOTE REGARDING ACCESS LIMITATIONS:

NO DISRUPTION OF CONCRETE, TRENCHING, PUNCTURES OR ANY OTHER ACTIVITIES ARE PERMITTED IN THE SLAB OVERLYING THE RAIN WATER AND / OR FIRE WATER BASINS. IN ADDITION, NO TRENCHING IS ALLOWED MORE THAN APPROXIMATELY 5' FROM CENTERLINE COLUMNS. THEREFORE IT IS NOT POSSIBLE TO INSTALL SUB-SLAB DEPRESSURIZATION WELLS ALONG THE 139TH STREET, 140TH STREET OR ROSE FEISS BOULEVARD AREAS.

REVISION 1:
1. MODIFIED VAPOR MONITORING POINT LOCATIONS TO INCORPORATE EXISTING PROBES INTO DESIGN.
2. MODIFIED TRENCH LAYOUT TO INDICATE STRAIGHT RUN FROM SVI WELL TO COLUMN BEFORE RISER TO ROOF.

LEGEND

- SVI-7 — NEW SVI EXTRACTION WELL AND PIPING W/ APPROXIMATE RADIUS OF INFLUENCE
- SVFM-01 ▲ — EXIST VAPOR MONITORING POINT TO BE MODIFIED TO ECTEND BELOW GRADE BEAM
- SVFM-01 □ — EXIST VAPOR MONITORING POINT
- APPROX. GRADE BEAM LOCATION W/ PILE CAP (SEE STRUCTURAL DWGS BY OTHERS FOR EXACT LOCATIONS)
- RAIN WATER STORAGE PIT BELOW FINISHED FLOOR SLAB
- FIRE WATER STORAGE PIT BELOW FINISHED FLOOR SLAB

GENERAL NOTES

1. CONTRACTOR TO VERIFY LOCATIONS OF SUBSURFACE UTILITIES AND STRUCTURES PRIOR TO WORK. NEW SVI WELLS AND ASSOCIATED TRENCHING MAY NEED TO BE RELOCATED AS NEC. TO AVOID SUBSURFACE UTILITIES / STRUCTURES. DO NOT RELOCATE WITHOUT PRIOR APPROVAL OF ENGINEER. LOCATIONS OF STRUCTURAL COMPONENTS SHOWN ARE APPROXIMATE ONLY - REFER TO STRUCTURAL DRAWINGS S-1A AND S-1B, AND RELATED SECTIONS ON S-2 AND S-101 FOR DETAILED DIMENSIONS AND NECESSARY CLEARANCES FOR SVI SYSTEM INSTALLATION.

2. ALL WORK TO BE COORDINATED WITH TENANT / OWNER BEFORE START OF WORK. AREAS TO REMAIN ACCESSIBLE AT ALL TIMES INCLUDE SVI WELL LOCATIONS AND SOIL VAPOR MONITORING PROBE LOCATIONS.

3. CONTRACTOR IS RESPONSIBLE FOR PROCURING ALL PERMITS REQUIRED FOR COMPLETION OF THE WORK, INCLUDING BUT NOT LIMITED TO NYC CONSTRUCTION PERMITS, WELL PERMITS, ROAD OPENING PERMITS, ELECTRICAL PERMITS, FIRE PERMITS, ETC.

4. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND REGULATIONS.

5. ALL WASTES GENERATED TO BE PROPERLY MANAGED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

6. ALL WORK TO BE FINISHED AT GRADE IS TO BE FLUSH MOUNTED UNLESS SPECIFIED OTHERWISE. CONTRACTOR IS RESPONSIBLE FOR ENSURING LIQUID TIGHT SEALS AND ABSENCE OF UNEVEN SURFACES THAT COULD POSE A TRIP OR FALL HAZARD.

7. ALL WORK TO BE COORDINATED WITH NYSDEC AND NYSDOH, AS WELL AS NYC ENVIRONMENTAL AGENCIES, TO ENSURE REGULATORY APPROVALS. WHETHER EXPRESSLY INDICATED ON DESIGN DRAWINGS OR NOT, CONTRACTOR IS RESPONSIBLE FOR COMPLETION OF WORK IN CONFORMANCE WITH NYSDOH "GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK," OCTOBER 2006, AS AMENDED.

8. STRUCTURAL DETAILS INDICATED IN THIS DESIGN PACKAGE WERE REPRODUCED FROM DRAWINGS PREPARED BY OTHERS AND WERE INCLUDED HEREIN SOLELY AS A POINT OF REFERENCE FOR NEW SUB-SLAB DEPRESSURIZATION / SVI MITIGATION SYSTEM COMPONENTS. TECHSOLUTIONS ENGINEERING, P.C. HAS NOT PERFORMED ANY STRUCTURAL ANALYSES, NOR IS RESPONSIBLE FOR ANY STRUCTURAL OR GEOTECHNICAL ASPECTS OF THE DESIGN. CONTRACTOR IS FULLY RESPONSIBLE FOR VERIFICATION OF ACTUALSTRUCTURAL COMPONENTS AND SUBSURFACE UTILITY LOCATIONS AND AVOIDANCE OF SAME.

9. THE SVI MITIGATION SYSTEM DESIGN PRESENTED HEREIN WAS BASED UPON ENVIRONMENTAL DATA INCLUDING BUT NOT LIMITED TO SOIL, GROUNDWATER, SOIL VAPOR, AND INDOOR AIR QUALITY DATA, COLLECTED BY OTHERS AS WELL AS LIMITATIONS FOR ACCESS IMPOSED BY THE CLIENT. TECHSOLUTIONS ENGINEERING, P.C. IS NOT RESPONSIBLE IN ANY WAY FOR ERRORS OR OMISSIONS RELATED TO DATA COLLECTED BY AND / OR PROVIDED BY OTHERS. IF DATA COLLECTED BY AND / OR PROVIDED BY OTHERS IS IN ERROR, MODIFICATIONS TO THE DESIGN HEREIN MAY BE NECESSARY TO MEET THE DESIGN INTENT.

10. THIS DESIGN HAS BEEN DEVELOPED FOR THE SOLE USE OF TECHSOLUTIONS ENGINEERING, P.C.'S CLIENT AND MAY NOT BE RELIED UPON BY OTHERS WITHOUT THE EXPRESS WRITTEN CONSENT OF TECHSOLUTIONS ENGINEERING, P.C. AND ITS CLIENT.

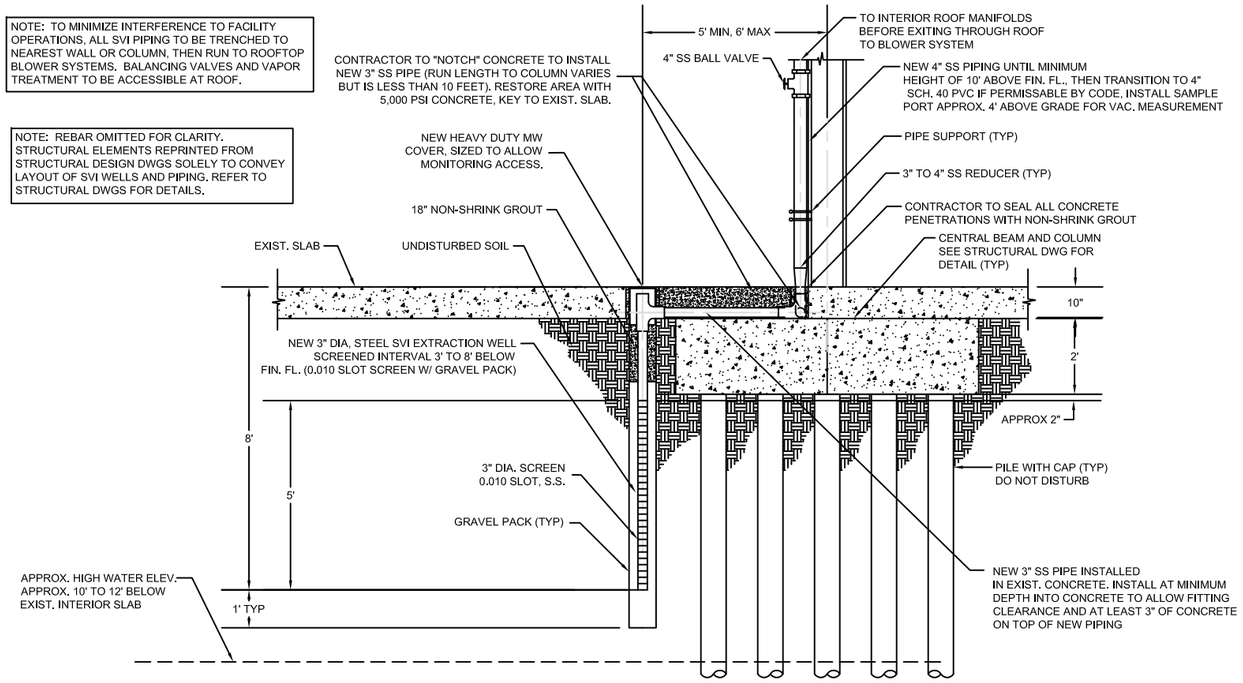
TechSolutions Engineering, P.C.
52 Oceanview Boulevard
Manorville, New York 11949
Ph: 914-319-9375
Email: techsolnpc@gmail.com

SVI MITIGATION INSTALLATION PLAN

LOCATION:		DESIGN:
295 LOCUST AVENUE BRONX, NEW YORK		DJS
PROJECT NO / FILE: SUSDEV1201.01 Sht 2 - SVI Mitigation Plan	DRAWING DATE: 03/03/12	REV. NO.: 1
		FIGURE: 2

NOTE: TO MINIMIZE INTERFERENCE TO FACILITY OPERATIONS, ALL SVI PIPING TO BE TRENCHED TO NEAREST WALL OR COLUMN, THEN RUN TO ROOFTOP BLOWER SYSTEMS. BALANCING VALVES AND VAPOR TREATMENT TO BE ACCESSIBLE AT ROOF.

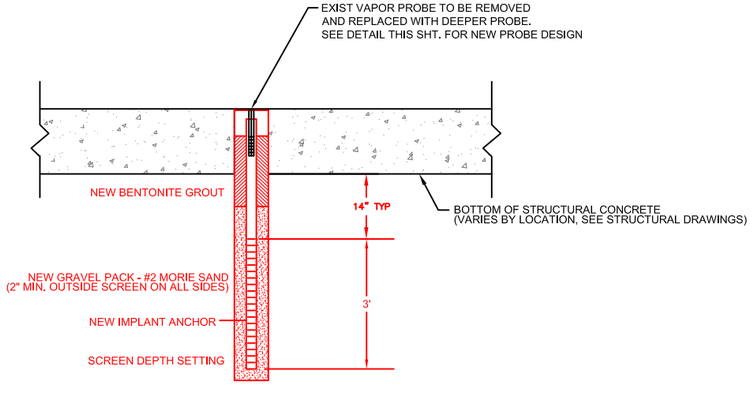
NOTE: REBAR OMITTED FOR CLARITY. STRUCTURAL ELEMENTS REPRINTED FROM STRUCTURAL DESIGN DWGS SOLELY TO CONVEY LAYOUT OF SVI WELLS AND PIPING. REFER TO STRUCTURAL DWGS FOR DETAILS.



SVI EXTRACTION WELL AND PIPING DETAIL (TYPICAL FOR ALL SVI WELLS)

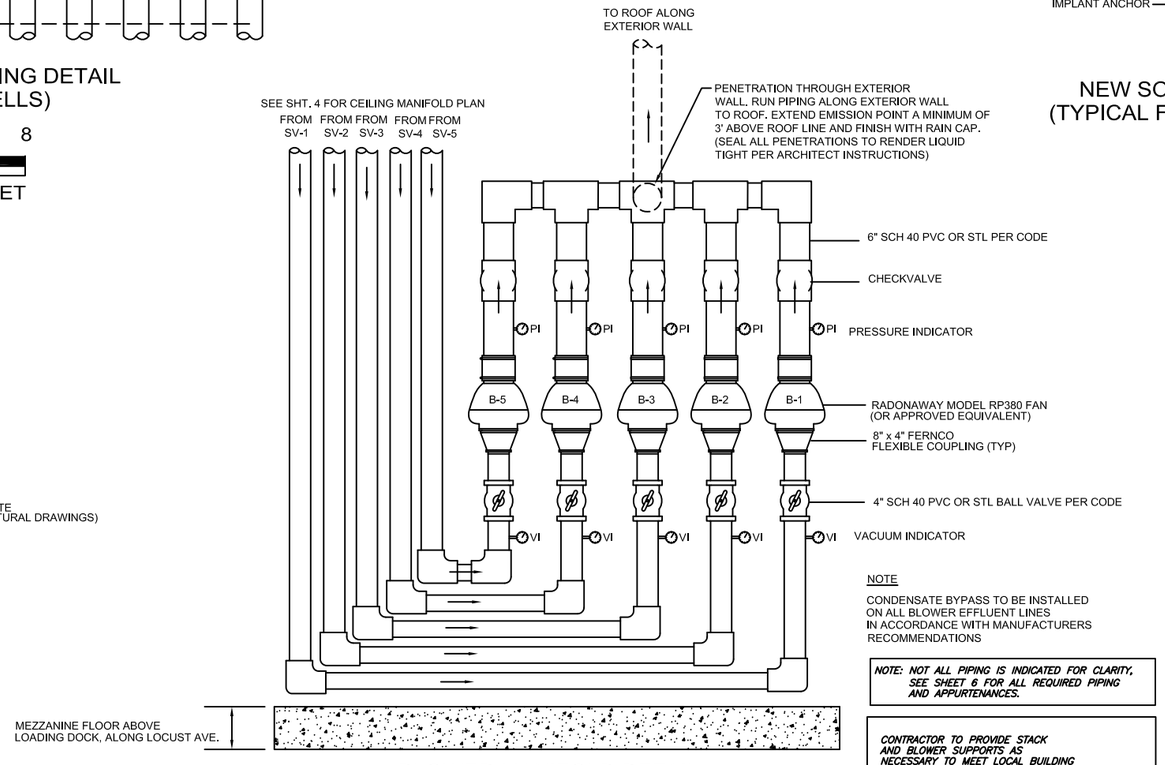
0 4 8

SCALE FEET



VAPOR MONITORING POINT MODIFICATION DETAIL (TYPICAL FOR SVMF-01, -02, -05, AND -06)

NOT TO SCALE



NOTE

CONDENSATE BYPASS TO BE INSTALLED ON ALL BLOWER EFFLUENT LINES IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS

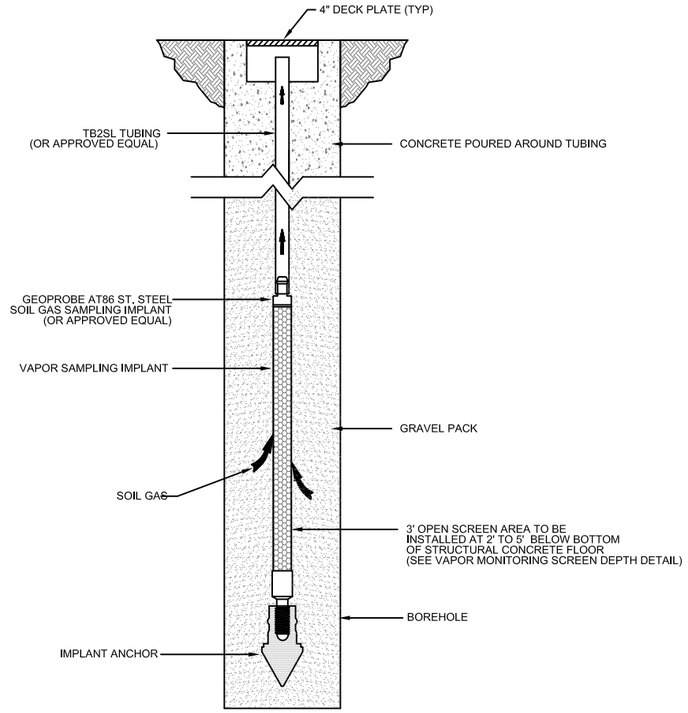
NOTE: NOT ALL PIPING IS INDICATED FOR CLARITY, SEE SHEET 6 FOR ALL REQUIRED PIPING AND APPURTENANCES.

CONTRACTOR TO PROVIDE STACK AND BLOWER SUPPORTS AS NECESSARY TO MEET LOCAL BUILDING CODES AND TO SUSTAIN 100 MPH WIND WITHOUT DAMAGE OR FUNCTION FAILURE.

BLOWER MANIFOLD DETAIL

MANIDOLD TO BE INSTALLED AS CLOSE TO LOCUST AVE. WALL AS POSSIBLE

NOT TO SCALE



NEW SOIL VAPOR MONITORING POINT DETAIL (TYPICAL FOR MODIFIED SVFM-01, -02, -05, AND -06)

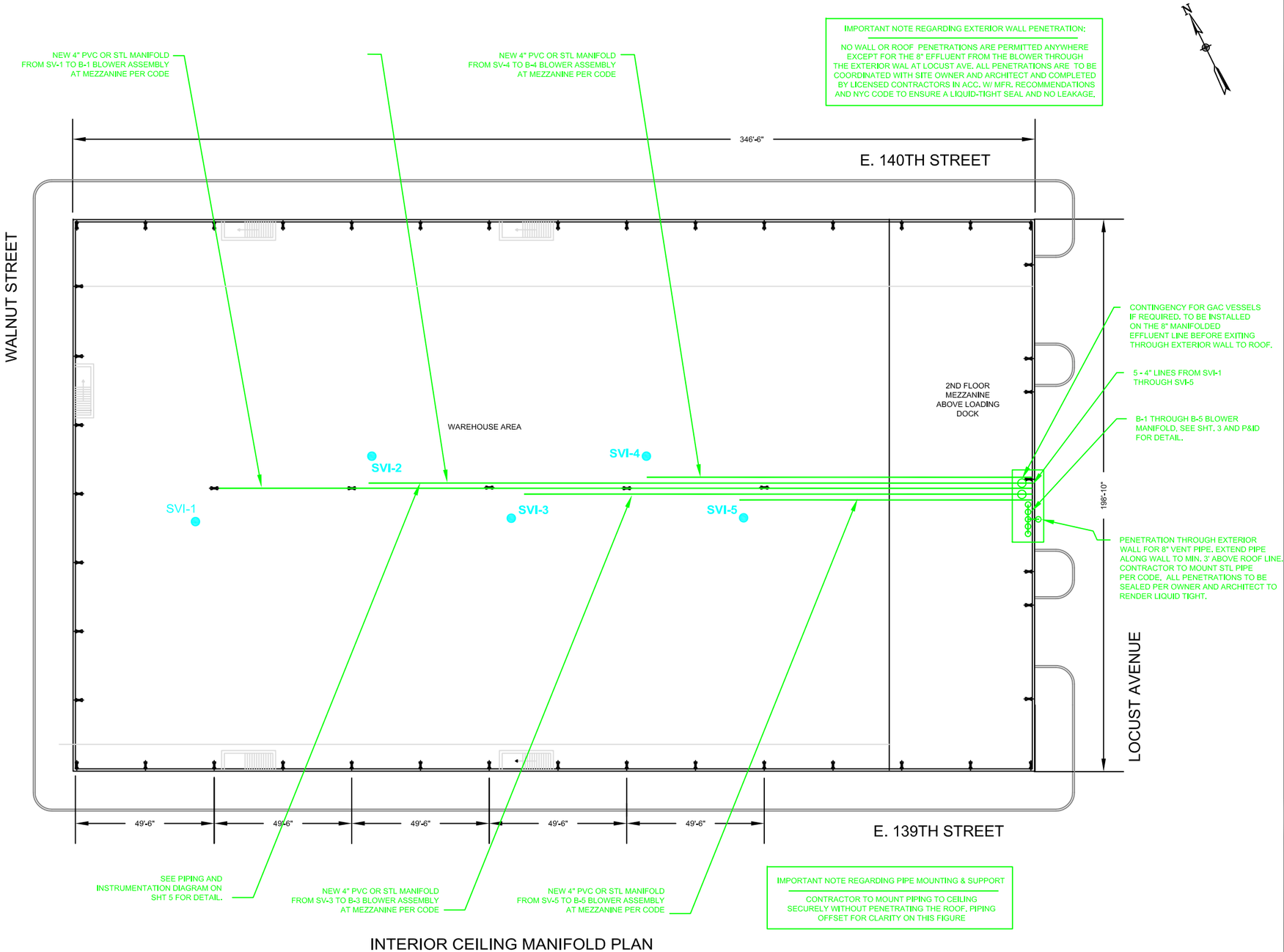
NOT TO SCALE

REVISION 1:
1. ADDED BLOWER FOR EACH SVI WELL (TOT. 5)
2. REVISED BLOWER DETAIL TO SHOW NEW MANIFOLD FOR 5 BLOWERS ON MEZZANINE
3. MODIFIED VAPOR PROBE DETAIL TO SHOW RETROFIT OF EXISTING VAPOR PROBES.

TechSolutions Engineering, P.C.
52 Oceanview Boulevard
Manorville, New York 11949
Ph: 914-319-9375
Email: techsolnpc@gmail.com

SVI MITIGATION WELL AND PIPING DETAILS / SECTIONS

LOCATION:		DESIGN:
295 LOCUST AVE. BRONX, NEW YORK		DJS
PROJECT NO / FILE: SUSDEV1201.01 Sht 3 - SVI Detail	DRAWING DATE: 03/04/12	REV. NO.: 1	FIGURE: 3



INTERIOR CEILING MANIFOLD PLAN

0 40 80

SCALE FEET

REVISION 1:
1. REVISED MANIFOLD SO THAT EACH BLOWER HAS DEDICATED 4" PIPING TO DEDICATED BLOWER.
2. RELOCATED BLOWER PACKAGES TO 2ND FLOOR MEZZANINE
3. ELIMINATED ROOF PENETRATION. NEW EFFLUENT PIPE FROM BLOWER TO ROOF TO EXIT THROUGH LOCUST EXTERIOR WALL.
4. MODIFIED PIPING TO STL. AS REQD TO MEET NYC CODE.

LEGEND

SVI-3 — NEW SVI EXTRACTION WELL & PIPING IN FIN. FL. (at grade level - shown for perspective only)

NEW SVI PIPING MANIFOLD ON CEILING (INSTALL INSIDE PRIOR TO ROOF PENETRATION WHERE SHOWN. SEE o&id FOR DETAIL)

GENERAL NOTES

1. CONTRACTOR TO VERIFY LOCATIONS OF ROOF SUPPORTS BEFORE WORK. NEW CEILING MANIFOLDS MAY NEED TO BE RELOCATED AS NEC. TO AVOID ELECTRICAL FIXTURES, LIGHTING AND STRUCTURES. DO NOT RELOCATE WITHOUT PRIOR APPROVAL OF ENGINEER. LOCATIONS OF STRUCTURAL COMPONENTS (I.E., COLUMN CENTERLINES AND LOCATIONS) SHOWN ARE APPROXIMATE ONLY - REFER TO STRUCTURAL AND ARCHITECTURAL DRAWINGS BY OTHERS FOR DETAILED DIMENSIONS AND NECESSARY CLEARANCES FOR SVI SYSTEM INSTALLATION.

2. ALL WORK TO BE COORDINATED WITH TENANT / OWNER BEFORE START OF WORK. AREAS TO REMAIN ACCESSIBLE AT ALL TIMES INCLUDE SVI WELL LOCATIONS, BLOWER SYSTEMS ON ROOF, AND SOIL VAPOR MONITORING PROBE LOCATIONS.

3. CONTRACTOR IS RESPONSIBLE FOR PROCURING ALL PERMITS REQUIRED FOR COMPLETION OF THE WORK, INCLUDING BUT NOT LIMITED TO NYC CONSTRUCTION PERMITS, WELL PERMITS, ROAD OPENING PERMITS, ELECTRICAL PERMITS, FIRE PERMITS, ROOF REPAIR PERMITS, ETC.

4. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND REGULATIONS.

5. ALL WASTES GENERATED TO BE PROPERLY MANAGED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

6. ALL WORK TO BE FINISHED AT ROOF AND CEILING IS TO BE COMPLETED IN STRICT ACCORDANCE WITH ROOF MANUFACTURER AND ARCHITECT RECOMMENDATIONS TO ENSURE THAT ROOF INTEGRITY IS NOT IMPACTED. ONLY THE ROOF PENETRATIONS SHOWN ON THESE DRAWINGS ARE PERMITTED AND THOSE PENETRATIONS MUST BE MADE PER ARCHITECT AND ROOF MANUFACTURER RECOMMENDATIONS TO ENSURE A LIQUID TIGHT SEAL.

7. ALL WORK TO BE COORDINATED WITH NYSDEC AND NYSDOH, AS WELL AS NYC ENVIRONMENTAL AGENCIES, TO ENSURE REGULATORY APPROVALS. WHETHER EXPRESSLY INDICATED ON DESIGN DRAWINGS OR NOT, CONTRACTOR IS RESPONSIBLE FOR COMPLETION OF WORK IN CONFORMANCE WITH NYSDOH "GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK," OCTOBER 2006, AS AMENDED.

8. STRUCTURAL AND ARCHITECTURAL DETAILS INDICATED IN THIS DESIGN PACKAGE WERE REPRODUCED FROM DRAWINGS PREPARED BY OTHERS AND WERE INCLUDED HEREIN SOLELY AS A POINT OF REFERENCE FOR NEW SUB-SLAB DEPRESSURIZATION / SVI MITIGATION SYSTEM COMPONENTS. TECHSOLUTIONS ENGINEERING, P.C. HAS NOT PERFORMED ANY STRUCTURAL ANALYSES, NOR IS RESPONSIBLE FOR ANY STRUCTURAL OR GEOTECHNICAL ASPECTS OF THE DESIGN. CONTRACTOR IS FULLY RESPONSIBLE FOR VERIFICATION OF ACTUAL STRUCTURAL COMPONENTS AND SUBSURFACE UTILITY LOCATIONS AND AVOIDANCE OF SAME.

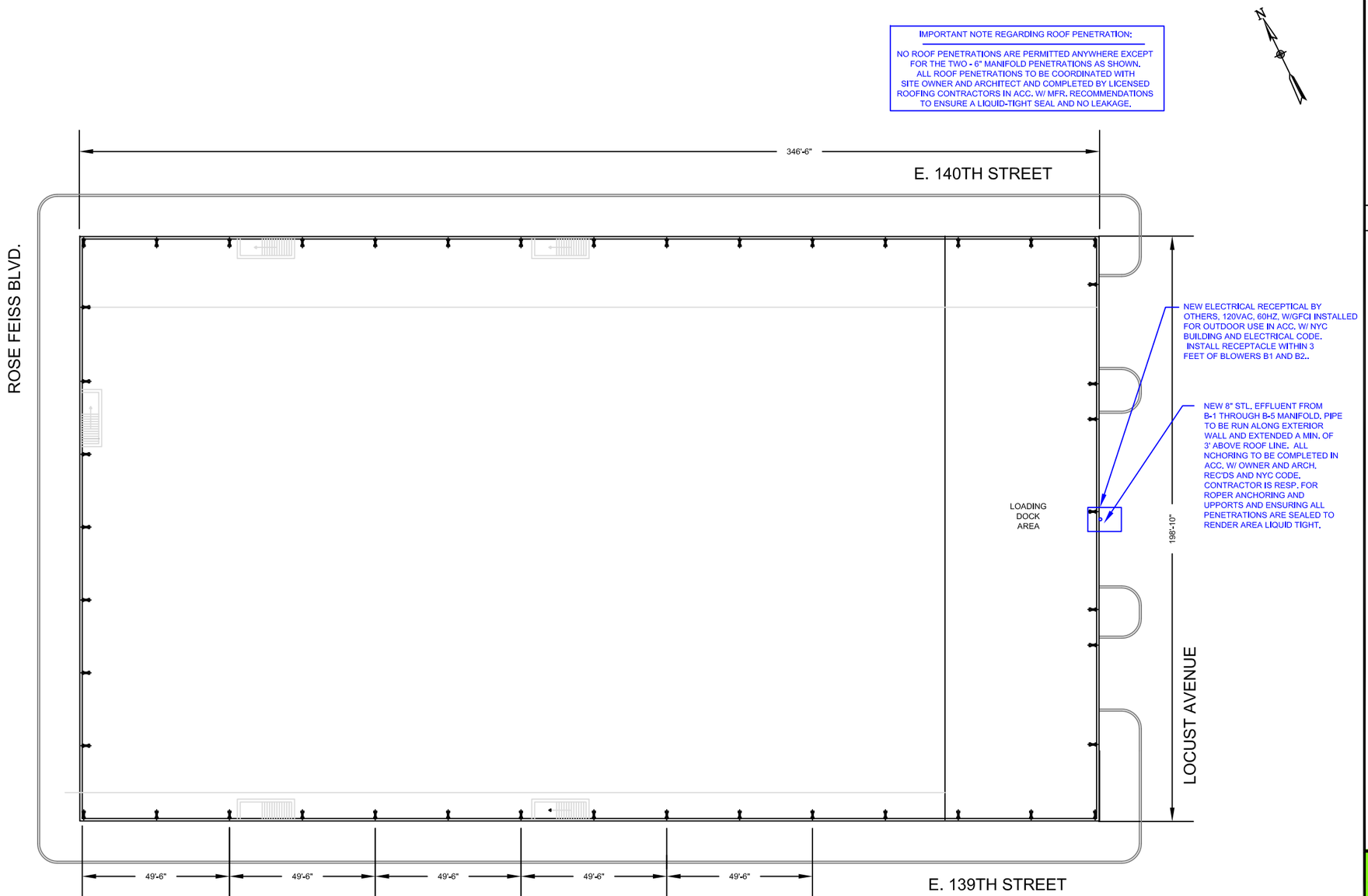
9. THE SVI MITIGATION SYSTEM DESIGN PRESENTED HEREIN WAS BASED UPON ENVIRONMENTAL DATA INCLUDING BUT NOT LIMITED TO SOIL, GROUNDWATER, SOIL VAPOR, AND INDOOR AIR QUALITY DATA, COLLECTED BY OTHERS AS WELL AS LIMITATIONS FOR ACCESS IMPOSED BY THE CLIENT. TECHSOLUTIONS ENGINEERING, P.C. IS NOT RESPONSIBLE IN ANY WAY FOR ERRORS OR OMISSIONS RELATED TO DATA COLLECTED BY AND / OR PROVIDED BY OTHERS. IF DATA COLLECTED BY AND / OR PROVIDED BY OTHERS IS IN ERROR, MODIFICATIONS TO THE DESIGN HEREIN MAY BE NECESSARY TO MEET THE DESIGN INTENT.

10. THIS DESIGN HAS BEEN DEVELOPED FOR THE SOLE USE OF TECHSOLUTIONS ENGINEERING, P.C.'S CLIENT AND MAY NOT BE RELIED UPON BY OTHERS WITHOUT THE EXPRESS WRITTEN CONSENT OF TECHSOLUTIONS ENGINEERING, P.C. AND ITS CLIENT.

TechSolutions Engineering, P.C.
52 Oceanview Boulevard
Manorville, New York 11949
Ph: 914-319-9375
Email: techsolnpc@gmail.com

CEILING MANIFOLD PLAN

LOCATION:			DESIGN:
295 LOCUST AVENUE BRONX, NEW YORK			DJS
PROJECT NO / FILE	DRAWING DATE:	REV. NO.:	FIGURE:
SUSDEV1201.01 Sht 4 - Ceiling Manifold Plan	03/04/12	1	4



ROOFING PLAN - NEW SVI COMPONENTS

0 40 80

SCALE FEET

REVISION 1:
1. RELOCATED BLOWERS B-1 THROUGH B-5 TO 2ND FLOOR MEZZANINE.
2. ELIMINATED ALL ROOF PENETRATIONS AND REMOVED ALL EQUIPMENT FROM ROOF.
3. ADDED EXTERIOR WALL PENETRATION AND PIPING ALONG LOCUST AVE.
4. REFERENCED NYC BUILDING CODE REQT.

LEGEND

NEWMANIFOLD FROM B-1 THROUGH B-5 TO ROOF, ADJUST AS NECESSARY BASED UPON STRUCTURAL SUPPORTS FOR ROOF (BY OTHERS).

GENERAL NOTES

1. CONTRACTOR TO VERIFY LOCATIONS OF ROOF SUPPORTS BEFORE WORK, NEW CEILING MANIFOLDS MAY NEED TO BE RELOCATED AS NEC. TO AVOID ELECTRICAL FIXTURES, LIGHTING AND STRUCTURES. DO NOT RELOCATE WITHOUT PRIOR APPROVAL OF ENGINEER. LOCATIONS OF STRUCTURAL COMPONENTS (I.E., COLUMN CENTERLINES AND LOCATIONS) SHOWN ARE APPROXIMATE ONLY - REFER TO STRUCTURAL AND ARCHITECTURAL DRAWINGS BY OTHERS FOR DETAILED DIMENSIONS AND NECESSARY CLEARANCES FOR SVI SYSTEM INSTALLATION.

2. ALL WORK TO BE COORDINATED WITH TENANT / OWNER BEFORE START OF WORK. AREAS TO REMAIN ACCESSIBLE AT ALL TIMES INCLUDE SVI WELL LOCATIONS, BLOWER SYSTEMS ON ROOF, AND SOIL VAPOR MONITORING PROBE LOCATIONS.

3. CONTRACTOR IS RESPONSIBLE FOR PROCURING ALL PERMITS REQUIRED FOR COMPLETION OF THE WORK, INCLUDING BUT NOT LIMITED TO NYC CONSTRUCTION PERMITS, WELL PERMITS, ROAD OPENING PERMITS, ELECTRICAL PERMITS, FIRE PERMITS, ROOF REPAIR PERMITS, ETC.

4. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH APPLICABLE BUILDING CODES AND REGULATIONS. ELECTRICAL RECEPTACLE INSTALLATION ON ROOF AND BLOWER ELECTRICAL CONNECTIONS BY OTHERS.

5. ALL WASTES GENERATED TO BE PROPERLY MANAGED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL REGULATIONS.

6. ALL WORK TO BE FINISHED AT ROOF AND CEILING IS TO BE COMPLETED IN STRICT ACCORDANCE WITH ROOF MANUFACTURER AND ARCHITECT RECOMMENDATIONS TO ENSURE THAT ROOF INTEGRITY IS NOT IMPACTED. ONLY THE ROOF PENETRATIONS SHOWN ON THESE DRAWINGS ARE PERMITTED AND THOSE PENETRATIONS MUST BE MADE PER ARCHITECT AND ROOF MANUFACTURER RECOMMENDATIONS TO ENSURE A LIQUID TIGHT SEAL.

7. ALL WORK TO BE COORDINATED WITH NYSDEC AND NYSDOH, AS WELL AS NYC ENVIRONMENTAL AGENCIES, TO ENSURE REGULATORY APPROVALS. WHETHER EXPRESSLY INDICATED ON DESIGN DRAWINGS OR NOT, CONTRACTOR IS RESPONSIBLE FOR COMPLETION OF WORK IN CONFORMANCE WITH NYSDOH "GUIDANCE FOR EVALUATING SOIL VAPOR INTRUSION IN THE STATE OF NEW YORK," OCTOBER 2006, AS AMENDED.

8. STRUCTURAL AND ARCHITECTURAL DETAILS INDICATED IN THIS DESIGN PACKAGE WERE REPRODUCED FROM DRAWINGS PREPARED BY OTHERS AND WERE INCLUDED HEREIN SOLELY AS A POINT OF REFERENCE FOR NEW SUB-SLAB DEPRESSURIZATION / SVI MITIGATION SYSTEM COMPONENTS. TECHSOLUTIONS ENGINEERING, P.C. HAS NOT PERFORMED ANY STRUCTURAL ANALYSES, NOR IS RESPONSIBLE FOR ANY STRUCTURAL OR GEOTECHNICAL ASPECTS OF THE DESIGN. CONTRACTOR IS FULLY RESPONSIBLE FOR VERIFICATION OF ACTUAL STRUCTURAL COMPONENTS AND SUBSURFACE UTILITY LOCATIONS AND AVOIDANCE OF SAME.

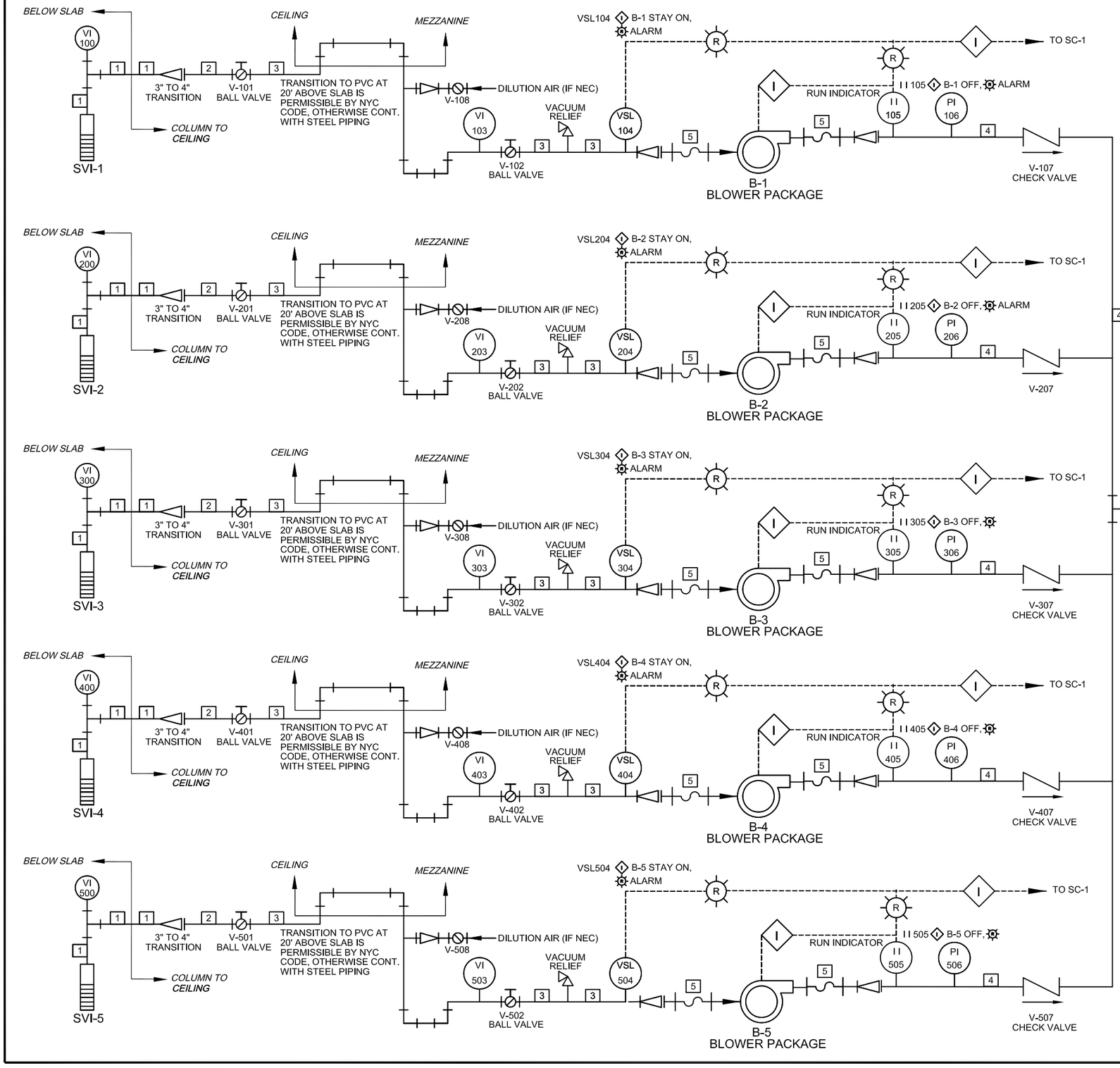
9. THE SVI MITIGATION SYSTEM DESIGN PRESENTED HEREIN WAS BASED UPON ENVIRONMENTAL DATA INCLUDING BUT NOT LIMITED TO SOIL, GROUNDWATER, SOIL VAPOR, AND INDOOR AIR QUALITY DATA, COLLECTED BY OTHERS AS WELL AS LIMITATIONS FOR ACCESS IMPOSED BY THE CLIENT. TECHSOLUTIONS ENGINEERING, P.C. IS NOT RESPONSIBLE IN ANY WAY FOR ERRORS OR OMISSIONS RELATED TO DATA COLLECTED BY AND / OR PROVIDED BY OTHERS. IF DATA COLLECTED BY AND / OR PROVIDED BY OTHERS IS IN ERROR, MODIFICATIONS TO THE DESIGN HEREIN MAY BE NECESSARY TO MEET THE DESIGN INTENT.

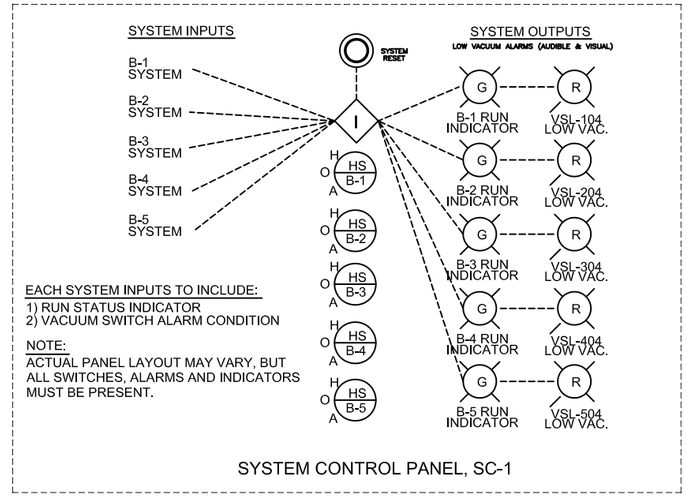
10. THIS DESIGN HAS BEEN DEVELOPED FOR THE SOLE USE OF TECHSOLUTIONS ENGINEERING, P.C.'S CLIENT AND MAY NOT BE RELIED UPON BY OTHERS WITHOUT THE EXPRESS WRITTEN CONSENT OF TECHSOLUTIONS ENGINEERING, P.C. AND ITS CLIENT.

TechSolutions Engineering, P.C.
52 Oceanview Boulevard
Manorville, New York 11949
Ph: 914-319-9375
Email: techsolnpc@gmail.com

ROOFING PLAN NEW SVI COMPONENTS

LOCATION:		DESIGN:
295 LOCUST AVENUE BRONX, NEW YORK		DJS
PROJECT NO / FILE: SUSDEV1201.01 Sht 4 - Ceiling Manifold Plan	DRAWING DATE: 03/04/12	REV. NO.: 1
		FIGURE: 5





SYSTEM CONTROL PANEL, SC-1

PIPING SCHEDULE

TAG #	DESCRIPTION	DIA	MATL
1	VENT SCREEN	3"	S.S. WELL
2	SINGLE WELL VENT PIPE / MANIFOLDS	4"	SS
3	SINGLE WELL VENT PIPE / MANIFOLDS	4"	SS / PVC
4	MULTI-WELL VENT PIPE / MANIFOLDS	6"	SS / PVC
5	FLEX HOSE	VARIES	VARIES

EQUIPMENT SCHEDULE

TAG #	DESCRIPTION	MFR.	MODEL	COMMENTS / NOTES
B1 - B5	SVI BLOWER (5 TOT.)	RADONAWAY	RP380	268 CFM @ 1.0"WC, 165 CFM@ 1.5" WC 35 CFM @ 2.0 IN H2O, 115VAC, SINGLE PH
VI	VACUUM INDICATOR	DWYER OR EQ.	2003	0 TO 3.0 IN. W.C., 0.1 INCREMENTS
PI	PRESSURE INDICAT.	DWYER OR EQ.	SGD-D0222N-PY	0 TO 15 PSI, GLYCERIN FILLED
GAC1,2	VAP. PHASE CARBON	CARBTROL	VAPOR DRUM	APPROX 55 GAL DRUM, OR EQUAL

IMPORTANT ELECTRICAL NOTE:

ALL ELECTRICAL CONNECTIONS TO BE DESIGNED AND INSTALLED BY OTHERS IN ACCORDANCE WITH NYC ELECTRICAL AND BUILDING CODES. IT SHOULD BE ASSUMED THAT VAPORS FROM THE SUBSURFACE MAY BE EXPLOSIVE AND AS SUCH EXPLOSION PROOF MATERIALS AND ELECTRICAL CONNECTIONS ARE RECOMMENDED

TechSolutions Engineering, P.C.
52 Oceanview Boulevard
Manorville, New York 11949
Ph: 914-319-9375
Email: techsolnpc@gmail.com

PIPING & INSTRUMENTATION DIAGRAM & CONTROLS

LOCATION:	DESIGN:
295 LOCUST AVE. BRONX, NEW YORK	DJS

PROJECT NO / FILE	DRAWING DATE:	REV. NO.:	FIGURE:
SUSDEV1201.01 SHT 6 - P&ID	03/11/12	1	6

VALVE AND PIPING SYMBOLS

- GLOBE VALVE
- GATE VALVE
- BUTTERFLY VALVE
- CHECK VALVE
- PLUG VALVE
- 3-WAY VALVE
- ANGLE VALVE
- **RELIEF OR SAFETY VALVE**
- DIAPHRAGM VALVE
- BALL VALVE
- GLOBE VALVE
- SELF-CONTAINED PRESSURE REGULATING VALVE W/RELIEF
- KNIFE GATE VALVE
- BP BACKFLOW PREVENTER
- NO NORMALLY OPEN
- NC NORMALLY CLOSED
- SP SAMPLE PORT
- FLEXIBLE HOSE
- BASKET TYPE STRAINER
- Y-TYPE STRAINER
- DUPLEX STRAINER
- SLEEVE COUPLING (SC)
- FLOOR DRAIN
- EQUIPMENT DRAIN
- CLEANOUT (CO)
- REMOVABLE PLUG
- REMOVABLE CAP
- BF BLIND FLANGE
- EXHAUST TO ATMOSPHERE (INSIDE)
- EXHAUST TO ATMOSPHERE (OUTSIDE)
- REDUCER
- UNION
- C QUICK DISCONNECT COUPLING
- GAUGE SEAL
- DAMPER

VALVE OPERATOR SYMBOLS

- S SOLENOID
- M MOTOR, ELECTRIC
- DIAPHRAGM
- DIAPHRAGM WITH POSITIONER
- HANDWHEEL OR LEVER
- CHAINWHEEL

PRIMARY ELEMENT SYMBOLS - FLOW

- ORIFICE PLATE
- PITOT TUBE
- AVERAGING PITOT TUBE
- VENTURI OR FLOW TUBE
- TOTALIZING FLOWMETER
- FLUME
- WEIR
- TURBINE OR PROPELLOR TYPE METER
- MAGNETIC FLOW METER
- ROTAMETER

EQUIPMENT SYMBOLS

- SUBMERSIBLE PUMP
- PUMP
- PNEUMATIC DIAPHRAGM PUMP
- BLOWER
- AIR COMPRESSOR

GENERAL INSTRUMENT SYMBOLS

ONE VARIABLE	TWO VARIABLES	
○	○○	LOCALLY MOUNTED
⊖	⊖⊖	PANEL MOUNTED
⊖	⊖⊖	REAR-OF-PANEL MOUNTED
◇ I		INTERLOCK
◇ P		PURGE

LINE SYMBOLS

- PROCESS PIPES OR CHANNELS
- CONNECTION TO PROCESS, MECHANICAL LINK OR INSTRUMENT SUPPLY
- PNEUMATIC SIGNAL
- ELECTRIC SIGNAL
- CAPILLARY TUBING (FILLED SYSTEM)
- HYDRAULIC SIGNAL
- ELECTROMAGNETIC OR SONIC SIGNAL NO WIRING OR TUBING

PROCESS LINE ABBREVIATIONS

AIR	AIR, ATMOSPHERIC PRESSURE
BW	BACKWASH
CA	COMPRESSED AIR
CGW	CONTAMINATED GROUNDWATER
D	DRAIN
EFF	EFFLUENT
EXH	EXHAUST
GW	GROUNDWATER
NPW	NON-POTABLE WATER
P	PRODUCT
PW	POTABLE WATER
S	SANITARY
SL	SLUDGE
SP	SAMPLE PORT
SS	STORM SEWER
TF	TOTAL FLUIDS
V	VENT
VAP	VAPOR

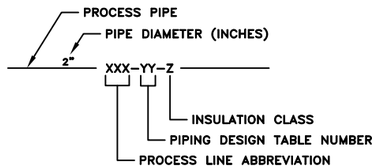
PIPING MATERIAL IDENTIFICATION

CPVC	CHLORINATED POLYVINYL CHLORIDE
CSP	CARBON STEEL PIPE
COP	COPPER
CMP	CORRUGATED METAL PIPE
CIP	CAST IRON PIPE
DIP	DUCTILE IRON PIPE
GAL	GALVANIZED STEEL PIPE
PE	POLYETHYLENE PIPE
PP	POLYPROPYLENE PIPE
PVC	POLYVINYL CHLORIDE PIPE
RCP	REINFORCED CONCRETE PIPE
RUB	RUBBER HOSE
SS	STAINLESS STEEL PIPE
VCP	VITRIFIED CLAY PIPE

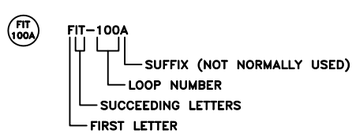
INSTRUMENT IDENTIFICATION TABLE

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER FLAME				
C	CONDUCTIVITY			CONTROL	
D	DENSITY (SP. GR.)	DIFFERENTIAL			
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE	RATIO			
G	GAUGING (DIMENSIONAL)		GLASS		
H	HAND (MANUAL)				HIGH
I	CURRENT		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE			CONTROL STATION	
L	LEVEL		LIGHT (PILOT)		LOW
M	MOISTURE OR HUMIDITY				MIDDLE
N					
O			ORIFICE		
P	PRESSURE OR VACUUM		POINT (TEST)		
Q	QUANT. OR EVENT	INTEGRATE			
R	RADIOACTIVITY		RECORD OR PRINT		
S	SPEED OR FREQ.	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION		
V	VACUUM			VALVE OR DAMPER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED		
Y				RELAY OR COMPUTE	
Z	POSITION			DRIVE, ACTUATE	

PROCESS PIPING IDENTIFICATION



INSTRUMENT IDENTIFICATION



FUNCTION ABBREVIATIONS

DO	DISSOLVED OXYGEN	OC	OPEN-CLOSE
FC	FAIL CLOSED	OO	ON-OFF (MAINTAINED)
FI	FAIL INDETERMINATE	ORP	OXIDATION REDUCTION POTENTIAL
FL	FAIL LOCKED	OSC	OPEN-STOP-CLOSE (MOMENTARY)
FO	FAIL OPEN	SS	START-STOP (MOMENTARY)
HOA	HAND-OFF-AUTOMATIC	>	HIGH SELECT
I/I	CURRENT-TO-CURRENT	<	LOW SELECT
I/P	CURRENT-TO-PNEUMATIC	√‾	SQUARE ROOT
LEL	LOWER EXPLOSIVE LIMIT	Σ	ADD OR TOTALIZE
LR	LOCAL-REMOTE		

C:\Users\Daniel Smith\TechSolutions\TechSolutions Logo.bmp

TechSolutions Engineering, P.C.
52 Oceanview Boulevard
Manorville, New York 11949
Ph: 914-319-9375
Email: techsolnpc@gmail.com

PIPING & INSTRUMENTATION DIAGRAM LEGEND

LOCATION: STREET ADDRESS CITY, STATE			DESIGN: DJS
PROJECT NO / FILE: SUSDEV1201.01 SHT 6 - P&ID LEGEND	DRAWING DATE: 02/20/12	REV. NO.:	FIGURE: 7