39-40 30th STREET
QUEENS, NEW YORK
Block 399 Lot 34

SOIL VAPOR EXTRACTION DESIGN DOCUMENT

AUGUST 2016
Revised September 2016

Former Union Wire Dye Corp
BCP C241163

Prepared for:
Ganesh Management, LLC
39-40 30th Street
Long Island City, NY 11101

Prepared By:

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38-20 32ND Street
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CERTIFICATIONS

I, Ariel Czemerinski, certify that I am currently a NYS registered professional engineer and that this Soil Vapor Extraction Design Document was prepared in accordance accepted engineering practices.

076508	9/21/2016	
NYS Professional Engineer #	Date	Signature

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SOIL VAPOR EXTRACTION DESIGN DOCUMENT
39-40 30th Street, Queens

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1.0 SITE BACKGROUND

This SVE Design Document has been prepared by AMC Engineering (AMC) for a commercial property located at 39-40 30th Street in the Long Island City section of Queens (**Figure 1**). The Site has been formally presented for entry into to the New York State Department of Environmental Conservation (NYSDEC) Brownfields Cleanup Program (BCP) through an application submitted on June 11, 2014. The applicant has applied to this program as a Volunteer.

The remedial investigation was performed during several mobilizations; the initial mobilization from December 9, 2013 to December 20, 2013, in accordance with the Remedial Investigation Work Plan approved by the NYCOER as part of the E-designation review process, and the supplemental mobilization from December 15, 2014 through December 26, 2014 in accordance with the Remedial Investigation Work Plan approved by the NYSDEC. A third mobilization was conducted on August 5, 2015. A fourth mobilization was performed on October 29, 2015 and a fifth mobilization was conducted on November 24, 2015.

The Remedial Investigation (EBC) identified elevated levels of trichloroethene (TCE) in shallow soil (above the water table) for three boring locations; the concentrations were above unrestricted soil cleanup objectives (SCOs). Chlorinated VOC's, including tetrachloroethene (PCE) and TCE, were detected within all five groundwater samples above NYSDEC groundwater standards. TCE concentrations in soil gas ranged from 232 $\mu g/m^3$ to 9,400 $\mu g/m^3$. PCE concentrations ranged from 3,520 $\mu g/m^3$ to 9,760 $\mu g/m^3$. Cis-1,2-dichloroethene (DCE) was reported above groundwater standards in one sample. In addition, petroleum-related VOC's including 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, ethylbenzene, isopropylbenzene, and mixed xylenes were also reported above standards in one sample.

The elevated TCE levels reported in soil gas are associated with off-gassing from the TCE-impacted soil. It would not be expected to be related to off-gassing from the TCE impacted groundwater since the TCE concentrations in groundwater are relatively low. The elevated PCE levels in soil gas are either related to off-gassing from the PCE plume beneath the site or from the migration of vapors from PCE impacted soil on the adjacent Bridge Cleaners property.

Shallow soil samples collected reported elevated levels of some metals and SVOCs are consistent with that associated with historic fill throughout the area.

In addition the Remedial Investigation, several air-monitoring installations and inspections were completed in Fall 2015. An October 27, 2015 conference call with NYSDEC, NYSDOH, EBC, AMC Engineering, and Ganesh Management (owner) called for increased indoor air sampling throughout the building and the installation of an activated carbon system to filter out TCE.
The monitoring reported elevated indoor, ambient air concentrations of Trichloroethene that exceeded NYSDOH standards, calling for immediate action. The immediate actions included the addition of an air scrubbing system, the sealing of all slab cracks, and a carbon filtration system installation. On December 18, 2015, an Immediate Action Report was prepared by AMC detailing the results and actions taken during this time period. **Figure 2** illustrates the results of the air sampling event.

A soil vapor extraction (SVE) system has been proposed as part of the remedy outlined in the approved Remedial Action Work Plan (RAWP) to reduce the potential risk of vapor intrusion. The SVE system will be installed beneath the basement slab, and converted into an active sub-slab depressurization system (SSDS) upon reaching asymptotic recovery levels. A vapor barrier will be installed with all excavated areas and SVE/SSDS trenches.

2.0 SITE DESCRIPTION AND HISTORY

The Site address is 39-40 30th Street, Queens, New York 11101. It is located on the northwest corner of the intersection between 40th Avenue and 30th Street in Queens, New York. The site is designated as Block 399 Lot 34 on the Queens Tax Map. The Site consists of a single tax parcel with 133 feet of street frontage on 30th Street and 100 feet of street frontage on 40th Avenue for a for a total of 14,000 square feet (0.32 acres). The lot is currently developed with a two-story commercial warehouse which occupies approximately 70% of the lot.

The property has an elevation of approximately 28 feet above the National Geodetic Vertical Datum (NGVD) feet. The depth to groundwater beneath the site, as determined from field measurements, is approximately 20 feet below grade. Based on regional groundwater contour maps, groundwater flow is expected to be west towards the East River.

Historic records show the subject site as being developed with a gas station in 1936. The property was redeveloped by 1947 onto a two-story warehouse utilized by Optical Products Corporation for manufacturing, shipping, and as an office. The building has remained since, with several other occupants including Union Wire Die Corp (1960s), National Tea Packaging Co. Inc. (1962-1991), and a warehouse (1991-2006).

3.0 SOIL VAPOR EXTRACTION SYSTEM DESCRIPTION

Remediation of the CVOC vapors will be achieved through the installation of a Soil Vapor Extraction (SVE) system beneath the existing foundation. Based on soil type observed at the site and typical SVE system design parameters, the following preliminary design will be installed. The extraction well specifications at each location were determined based on the depth of soil contamination; the full data set on soil contamination is provided in the RAWP. The proposed system is as follows:

- Four extraction well system of the following depths:
    - VE1: 12.5’ below grade
    - VE2: 6.5’ below grade
    - VE3: 2.5’ below grade
    - VE4: 2.5’ below grade

- Extraction lines of the aforementioned depths consisting of 2-inch diameter PVC of the following lengths:
    - VE1: 11.5-foot slotted screen,
    - VE2: 5.5-foot slotted screen,
    - VE3: 1.5-foot slotted screen,
    - VE4: 1.5-foot slotted screen,

  Connected to 1-foot risers embedded in approximately 6 inches of bentonite grout;

- Extraction wells equipped with vacuum gauge, sampling port, and flow controllers;
- Wells tied to a system with 4-inch and 6-inch diameter PVC extraction lines;
- 7.5 HP regenerative blower (Ametek Rotron DR858AY72W) with particulate filter and vapor trap located outside the room;
- A 2-cannister, discharge treatment with vapor-phase granular activated carbon (General Carbon Corporation)

The four extraction wells are approximately located as indicated in **Figure 4.** The approximate locations are with respect to the building:

- VE1: 20’ south and 8’ east of the NW corner
- VE2: 8’ north and 10’ east of the SW corner
- VE3: 8’ north and 28’ west of the SE corner

- VE4: 13’ south and 20’ west of NE corner

The anticipated layout of the SVE system is shown in **Figure 4**.

A SVE pilot test was conducted to confirm that the preliminary SVE design was acceptable (See Section 4). The pilot test results provided the data to estimate the radius of influence and total flow in the system. After developing a layout based on the ROI and flow, the headloss was estimated. According to the pilot test results, the total flow in the system is approximately 208 cfm. The estimated headloss is 18 inches of water column. The blower was selected based on the estimated total flow and headloss to ensure that the vacuum in each well is sufficient.

The SVE system will not be discontinued without the written approval by the NYSDEC and NYSDOH. A proposal for conversion of the SVE system into an active SSDS through replacement of the regenerative blower with a radon type fan and removal of the vapor phase carbon treatment may be submitted by the property owner based on confirmatory data that justifies such a request. The system will remain in place and operation until permission to discontinue use is granted in writing by the NYSDEC and NYSDOH.

4.0 SVE PILOT TEST SUMMARY

4.1 Pilot Test Objectives

The objectives of the SVE pilot test were to:

- Collect vacuum and flow rate data to determine the full-scale design parameters for the SVE system;
- Determine the effective radius of influence (ROI) for the full-scale system design; and
- Estimate the VOC composition of effluent gas.

4.2 Pilot System Description

As depicted on **Figure 3**, the pilot system consisted of

- One extraction line constructed of 6.5 feet of 2-inch diameter 10 slot (0.010-inch) PVC well screen;
- One 2" Riser constructed of solid PVC Schedule 40 pipe, followed by
- One PVC piping system with a manual-control throttle
- One 1HP Regenerative Blower (Rotron EN505) capable of drawing 142 cfm @ 10" WC vacuum, followed by
- A 4" discharge hose to the outdoors
- 3 observation wells were monitored at 10', 15', and 25' from the extraction well (see **Figure 3**).

4.3 Pilot Test Results

The SVE pilot test was conducted on August 3, 2016, by Ariel Czemerinski (P.E, AMC). The test was witnessed by Ruth Curley (NYSDEC) and Aine Chalmers (AMC). The SVE test was conducted three times at different well head vacuums. The results of the pilot test can be found below:

		Vacuum (inches of water column)							
Test #	**Valve Setting**	**Blower**	**SV2**	**OW1 (25')**	**OW2 (10')**	**OW3 (15')**	**Exhaust Velocity (ft/min)**	**VOC (ppm)**	**Exhaust flow rate (cfm)**
1	Open	35	31	0.55	1.67	0.78	1929	1.25	168.34
2	Closed 45 degrees	47	21	0.35	1.21	0.55	1645	1.15	143.55
3	Closed 60 degrees	59	9	0.19	0.58	0.25	1161	0.85	101.32

For this site, the radius of influence is determined as the distance from the extraction well that indicates a minimum vacuum of 0.1 inches of water column. Based on our results, the radius of influence must be calculated through extrapolation. **Figure 5** includes the graphical data and estimation of the radius of influence.

5.0 SYSTEM DESIGN AND OPERATION

5.1 System Design

The SVE system is designed with four 2" wells as indicated in Figure 4. Data obtained from the pilot test was used to determine radius of influence, flows and needed vacuum at well heads to achieve 0.1"w.c. at the most remote area.

With these parameters in mind, after having analyzed the pressure drop across the piping, a 7.5 HP Rotron blower has been selected for this job.

5.2 System Summary

The SVE system is composed of four wells, each going to depths as specified in Figure 4. The risers are extended with 4" pipe into the underside of the ceiling from where they run until they meet a 6" PVC header. The header is reduced to 1.5" suction into the blower, which discharges the air through two vapor-phase activated carbon drums, arranged in series, and into the stack outdoors. Figure 4 and 5 contains details for installation.

5.3 Start-Up

The SVE system can begin operation once the equipment is obtained and the extraction system (PVC piping) is prepared. The extraction wells are already prepared. As indicated in the design, the extraction system will be lofted to the ceiling height, which is approximately 9 feet. The blower will be located in the garage (to reduce noise). The pipe will penetrate the wall separating the main space with the garage. The annular space will be sealed with silicone sealant.

The extraction wells (via sampling port) and monitoring wells (Figure 9) will be sampled after system start-up to confirm the SVE ROI. The start-up samples should be taken at all sampling wells on at least two different days to document the radius of influence. The start-up period will require weekly samples for approximately one month.

While it is unlikely, MW1 and MW2 are located at the furthest points from the vapor extraction wells and may not produce measurable vacuum readings. If the start-up testing indicates no vacuum at these points, additional vacuum monitoring points will be installed. The exact

placement of the additional vacuum monitoring points will be decided in consultation with the DEC, however, it is anticipated that the additional vacuum monitoring points would be located in a similar position, closer to the nearest extraction well.

PID readings should be collected at each SVE well during the start-up testing period. There are sampling ports on the SVE risers. First, a grab sample can be isolated using a tedlar bag and hand pump, then the PID can measure VOCs in the tedlar bag, unless a suitable reading can be obtained directly by inserting the PID probe into the sampling port.

All results must be recorded on the **SVE System Inspection** form (**Appendix B).**

5.4 Sampling Procedures

At the start, samples will be taken more frequently to ensure system functionality. Vacuum readings and samples will be taken weekly for one month, biweekly the following month, and then quarterly.

PID readings, vacuum readings and flow rates will be collected directly from the SVE wells. To allow for ease in sampling, pressure gauges and sampling ports will be installed directly onto the 2" PVC risers on each well. As per NYSDEC recommendation, sampling events will include the VOC concentration with PID (from tedlar bag method described in 5.3), flow rate, and vacuum pressure. These findings will be recorded on the **SVE System Inspection** form (**Appendix B).**

Once system operations have been established, quarterly inspections will be completed by a PE to ensure that the system is operating properly.

The activated carbon adsorption capacity and breakthrough will be tested by obtaining measures of the VOC content in the inlet and outlet of the carbon and comparing the two values. The sampling method described in Section 5.3 will be utilized. Based on historical observations, indoor air carbon needs to be sampled weekly to determine breakthrough. Breakthrough is defined as the instance when pre-carbon and mid-carbon values are approximately the same.

When breakthrough is achieved, the second stage carbon will be moved to first stage, and a new carbon vessel with fresh carbon will be installed as second stage. Canisters shall be labeled with their date of installation. All results must be included on the **Weekly Carbon Monitoring** form (**Appendix C).**

To ensure continuity in treatment, at least two spare canisters shall be kept onsite. These shall be labeled as "New" when delivered to avoid reuse. Used canister shall be labeled "Used".

If design conditions are not met, inspections will be more frequent to assess and correct the SVE system. Any system changes will be submitted to the NYSDEC for approval. Appropriate reporting procedures will be followed during this process.

5.5 Reporting

An inspection form will be completed during each inspection (following the timeline listed in 5.4). Any other actions will be recorded in a Daily Status Report (DSR). A Periodic Review Report will be completed each year to summarize the findings and assess the efficacy of the system.

When samples indicate sustained reduction, the system will be shut down and indoor air samples can be collected. The SVE system will not be discontinued without the written approval by the NYSDEC and NYSDOH. A proposal for conversion of the SVE system into an active SSDS through replacement of the regenerative blower with a radon type fan and removal of the vapor phase carbon treatment may be submitted by the property owner based on confirmatory data that justifies such a request. The system will remain in place and operation until permission to discontinue use is granted in writing by the NYSDEC and NYSDOH.

5.6 Performance

As mentioned, inspections will evaluate the system performance on a quarterly basis. It is expected that the four extraction wells have a radius of influence of approximately 50 feet or greater at the operating conditions.

The stack height is approximately 11 feet. The exit temperature is expected to be no more than 2 degrees above ambient temperature.

NYSDEC requires that VOC emissions do not exceed 0.5 lb/day. The designed SVE system meets this emission rate potential requirement. The emission rate potential was calculated based on the following assumptions:

1. No more than the highest measured total VOCs is expected to be drawn from the effluent.
2. The 2-cannister, vapor phase activated carbon system (General Carbon Corporation) has 90% removal efficiencies.
3. The highest concentration of VOCs measured during past investigations was on 08/2015 from SG11 at 27,700 ug/m^3.
4. From the pilot test data, we extrapolated the flow required to achieve 0.1" WC vacuum at a 50 radius of influence. This value is 79 cfm. Multiplying 79 times 4 (four wells are distributed in the site) results in the required volume of 316 cfm.
5. 27,700 ug/m^3 exhausted in 316 cfm of air will have 0.0328 lb/hr.
6. A 90% efficiency removal through the carbon will result in **0.00328 lb/hr of VOC emissions.**

The above value is a conservative estimate, considering the "worst case" for the critical parameters.

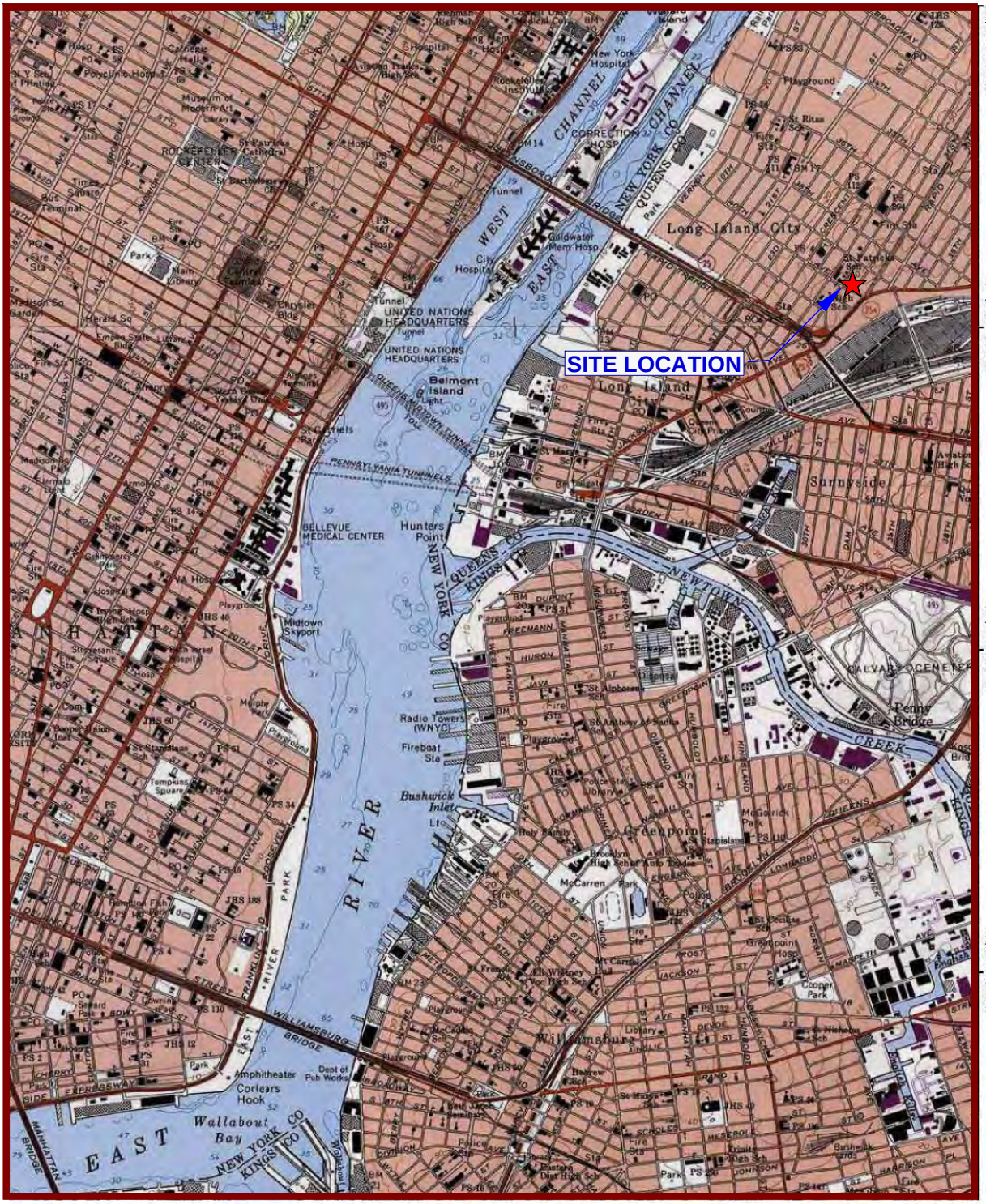
6.0 CONCLUSIONS AND SVE SYSTEM DESIGN CHANGES

The data collected from the pilot test was used to determine the final design parameters for the SVE system. By examining the placement of the wells and the distance to the corner of the room, it was noted that the minimum radius of influence needed in our design is approximately 50 feet. The desired lower limit for the vacuum is 0.1" of water column. Based on trendline analysis from the SVE tests, locations within 50 feet of the wells have an appropriate vacuum; this indicates that our design ensures adequate pressure at all locations.

The proposed design is acceptable, as all areas are within the radius of influence. The system is to be constructed as noted in Section 3. The system will remain in place and operation until permission to discontinue use is granted in writing by the NYSDEC and NYSDOH.

Future actions include obtaining a NYSDEP Industrial Work Permit through the online CATS system. The information included in this design document will also be a part of the DEP permit process.

FIGURES

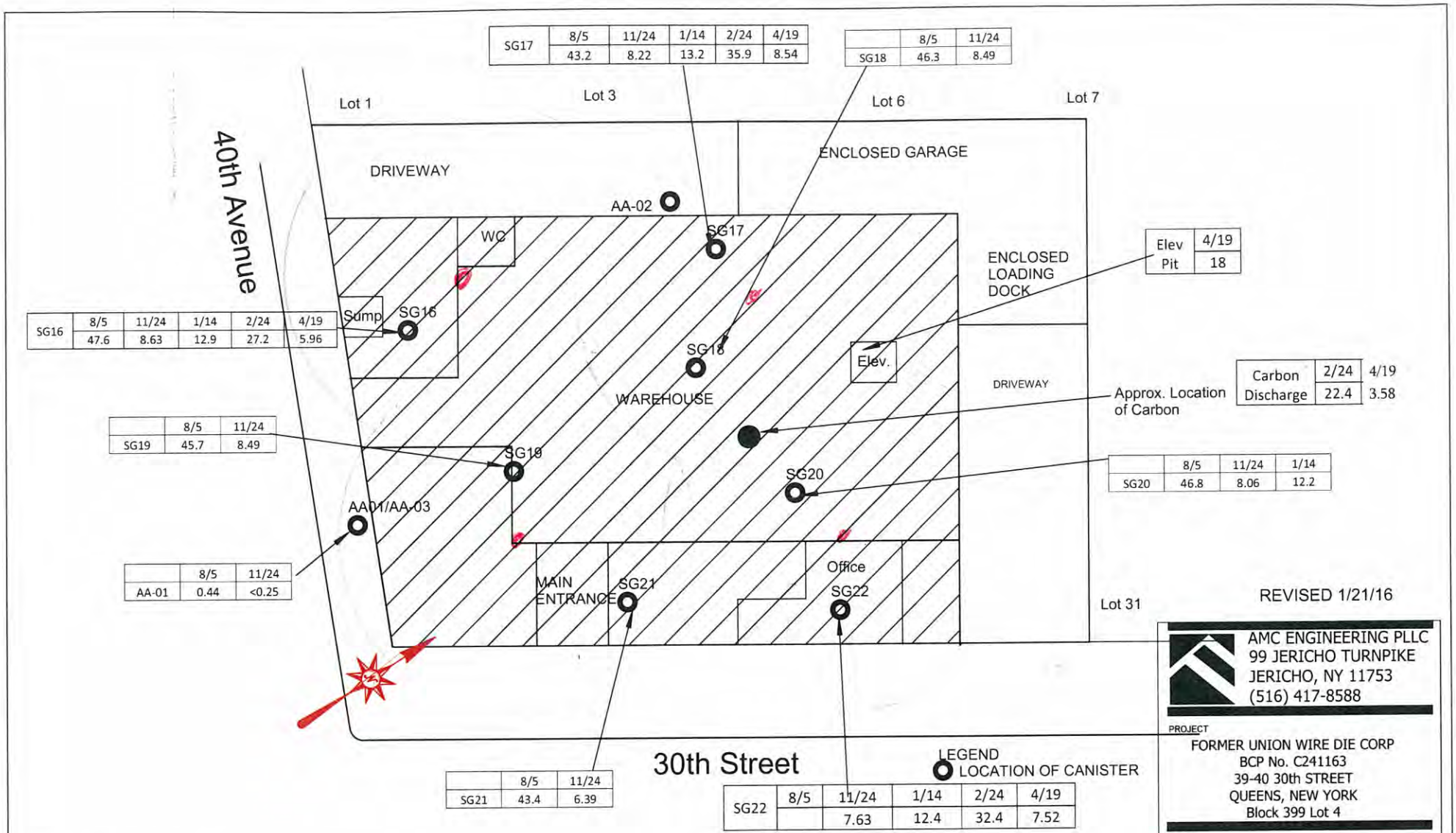


USGS Brooklyn Quadrangle 1995, Contour Interval = 10 feet

EBC
ENVIRONMENTAL BUSINESS CONSULTANTS
Phone 631.504.6000
Fax 631. 924 .2870

39-40 30TH AVENUE
LONG ISLAND CITY, NY 11101

FIGURE 1 SITE LOCATION MAP



Notes:
1. All values are for TCE expressed in ug/m3.
2. NYSDoH guideline for indoor air for TCE is 2 ug/m3.
3. As per NYSDoH Fact Sheet on TCE (dated August 2015), NYSDoH recommends taking immediate and effective action to reduce exposure when TCE in air cocentration is equal or above 20 ug/m3.
4. Activated carbon installed on 11/12/15 and reinstalled with two carbon drums on 3/8/2016.

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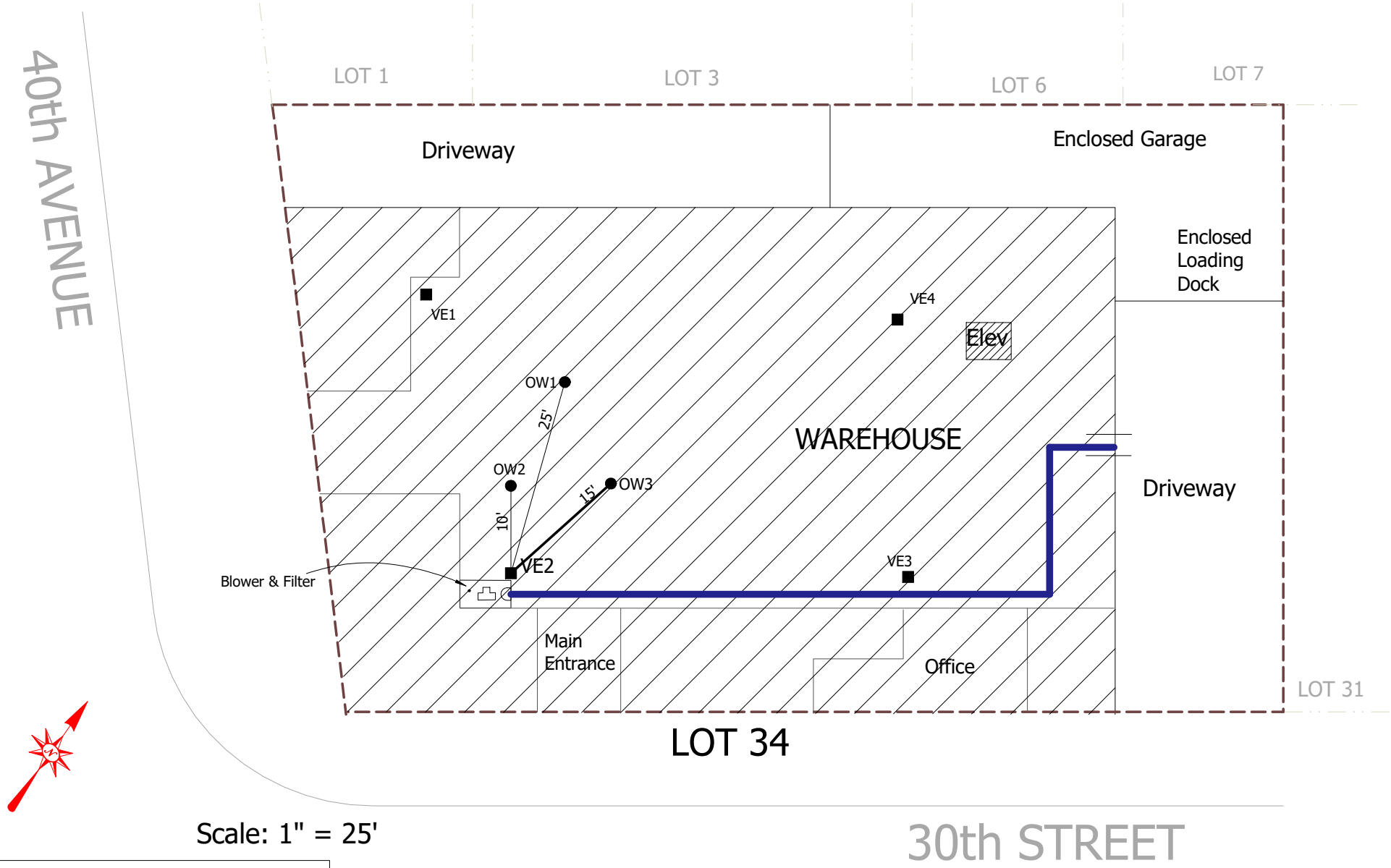
PROJECT
FORMER UNION WIRE DIE CORP
BCP No. C241163
39-40 30th STREET
QUEENS, NEW YORK
Block 399 Lot 4

TITLE:
FIGURE 2
First Floor Plan
Indoor Air Sampling Points
Sampling Data

SEAL & SIGNATURE:

DATE: DEC 6, 2015
PROJECT No:
DRAWING BY:
CHK BY:
DWG No:
CADD FILE No:



KEY

- Property Boundary
- Proposed Well Locations
- Test Well Locations
- 4" pipe
- Existing 2-Story Building

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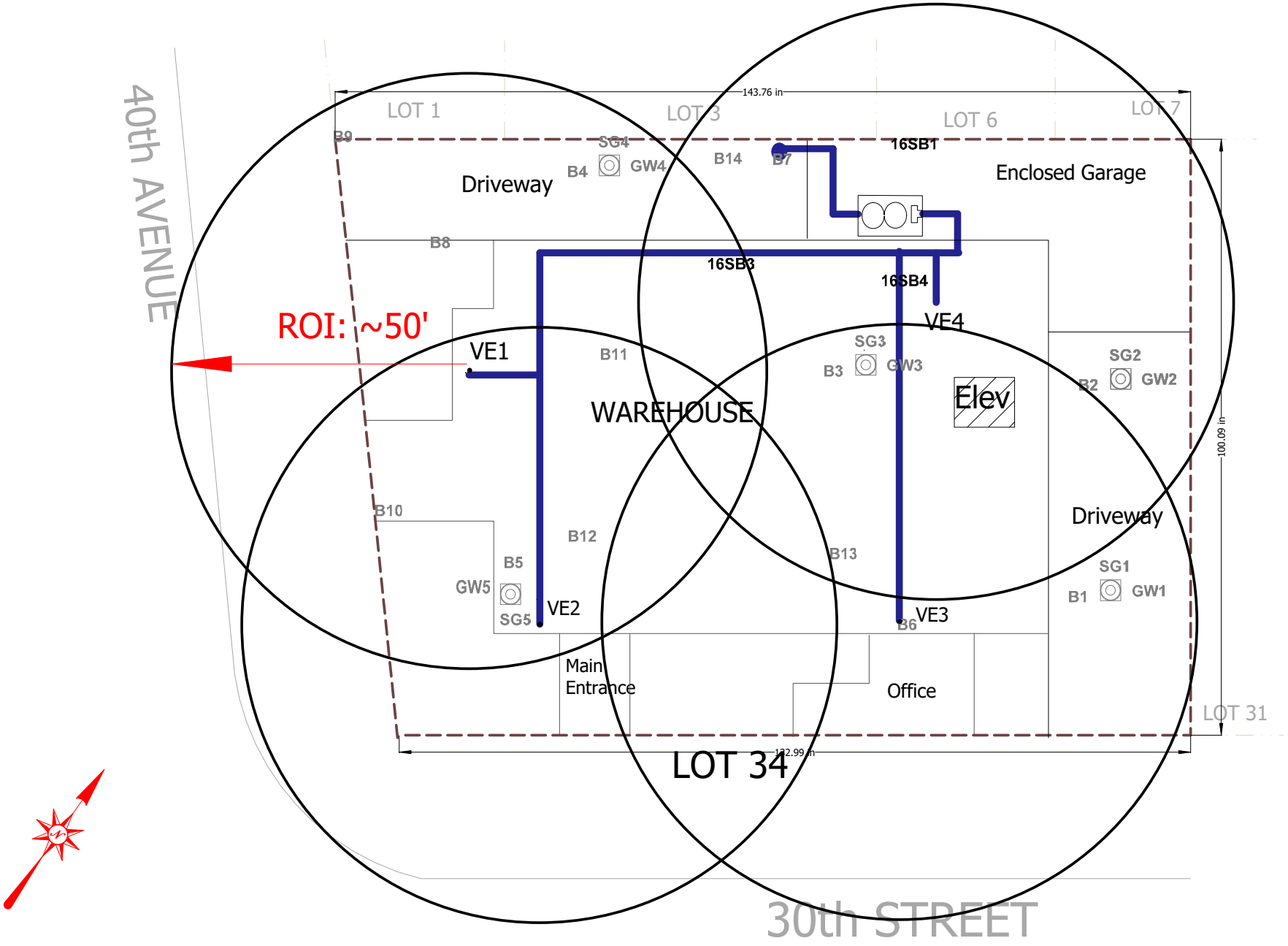
PROJECT
39-40 30th Street
Long Island City, NY 11101

DATE: AUG 16, 2016 | DRAWING BY AC

TITLE: Figure 3 - Pilot Test SVE Layout



KEY

- Property Boundary
- Existing 2-Story Building
- Vapor Extraction Well
- PVC Piping

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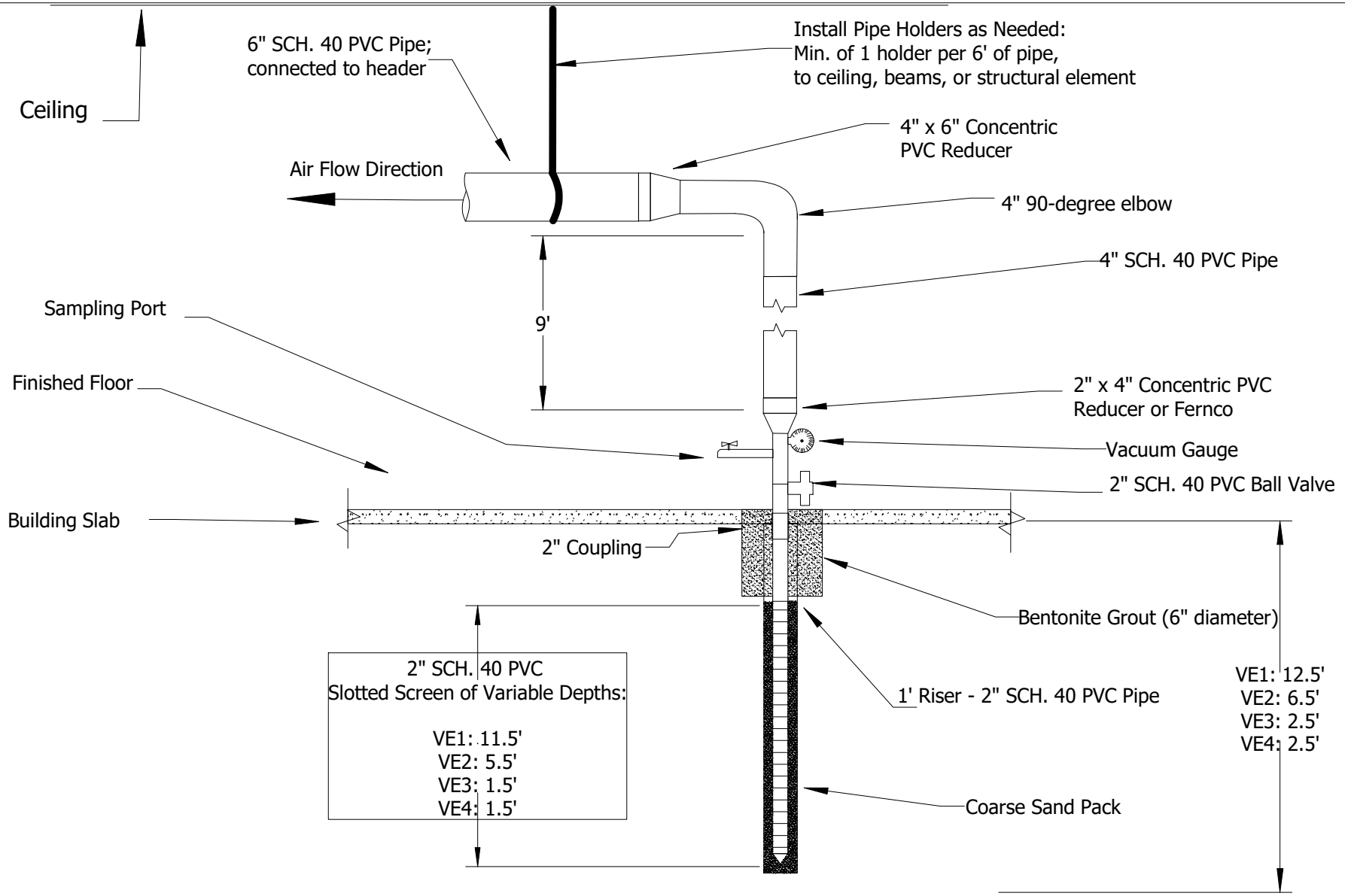
TITLE: Figure 4 - SVE System Layout



CONSTRUCTION DETAIL

N.T.S

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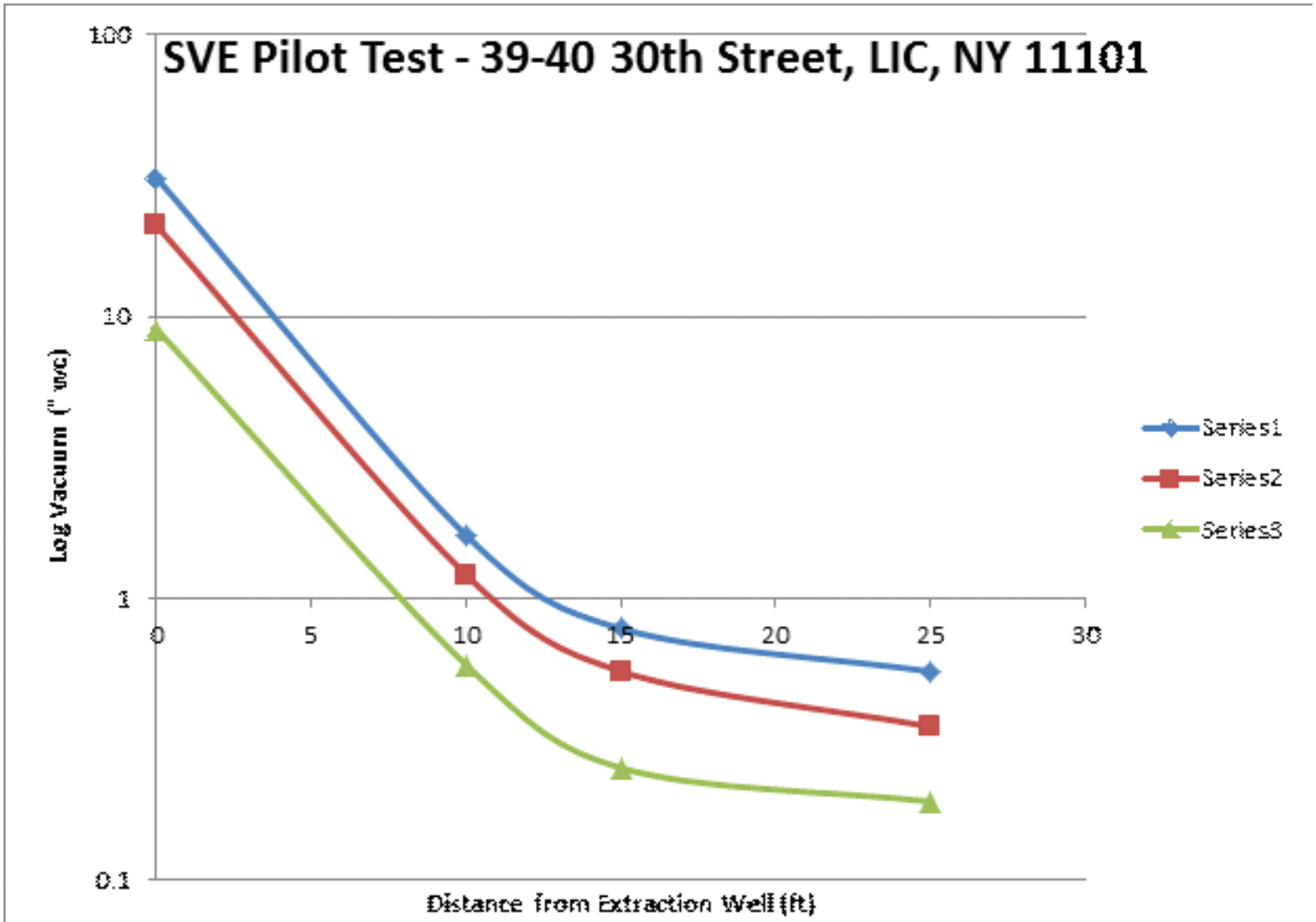
TITLE: Figure 5 - SVE Well Detail



Test #	Valve Setting	Vacuum (inches of water column)					Exhaust (ft/min)	VOC (ppm)
		Blower	SV2	OW1 (25')	OW2 (10')	OW3 (15')		
1	Open	-35	-31	-0.55	-0.78	-1.67	1929	1.25
2	Closed 45 degrees	-47	-21	-0.35	-0.55	-1.21	1645	1.15
3	Closed 60 degrees	-59	-9	-0.19	-0.25	-0.58	1161	0.85

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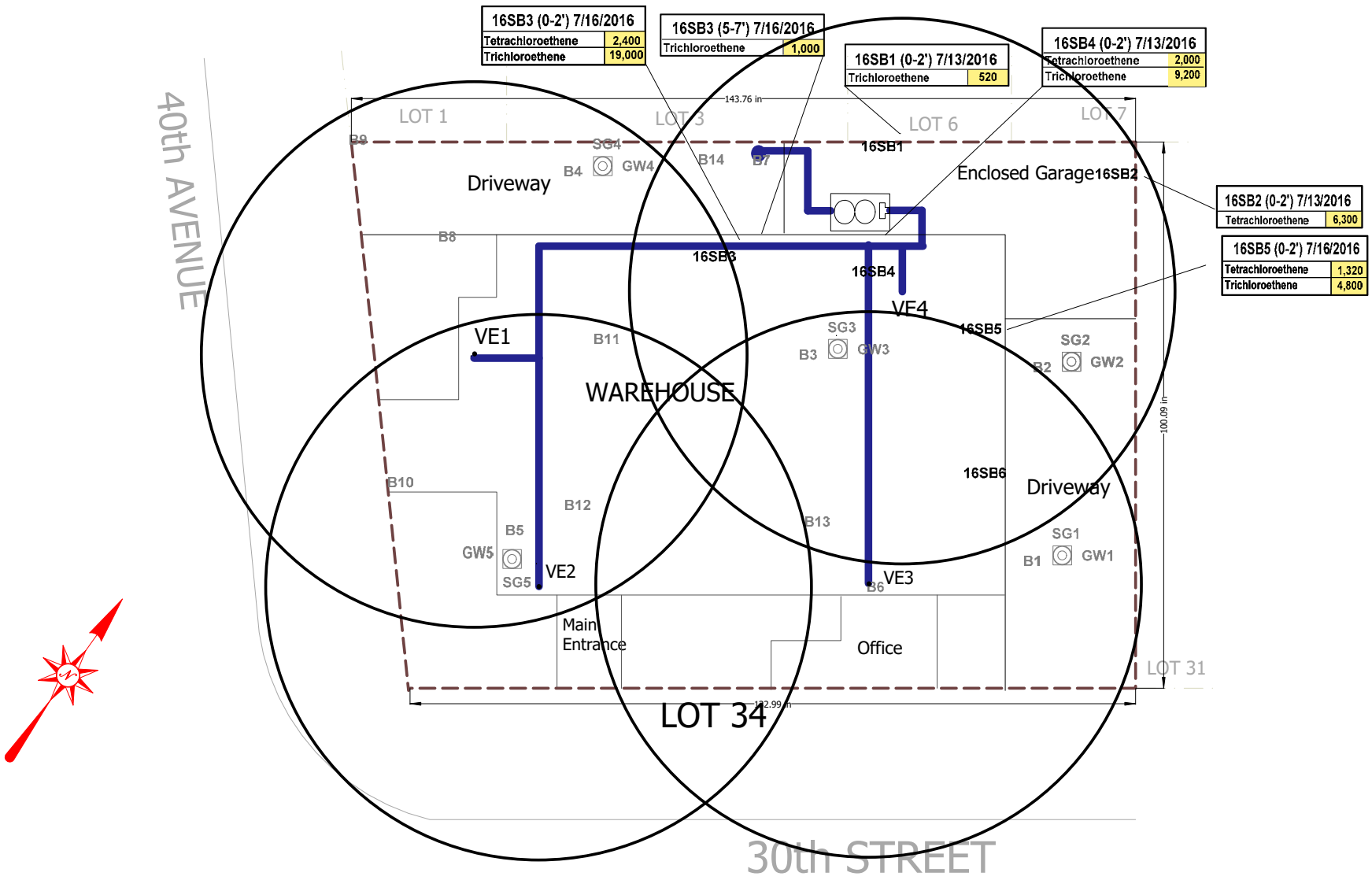
TITLE: Figure 6 - Radius of Influence calculation - Plotted results



KEY:

- Property Boundary
- Detections Above Unrestricted Use SCOs
- 50' Radius of Influence for Each Well
- Soil Gas Sampling Location

*Note - Existing building dimensions are approximated.

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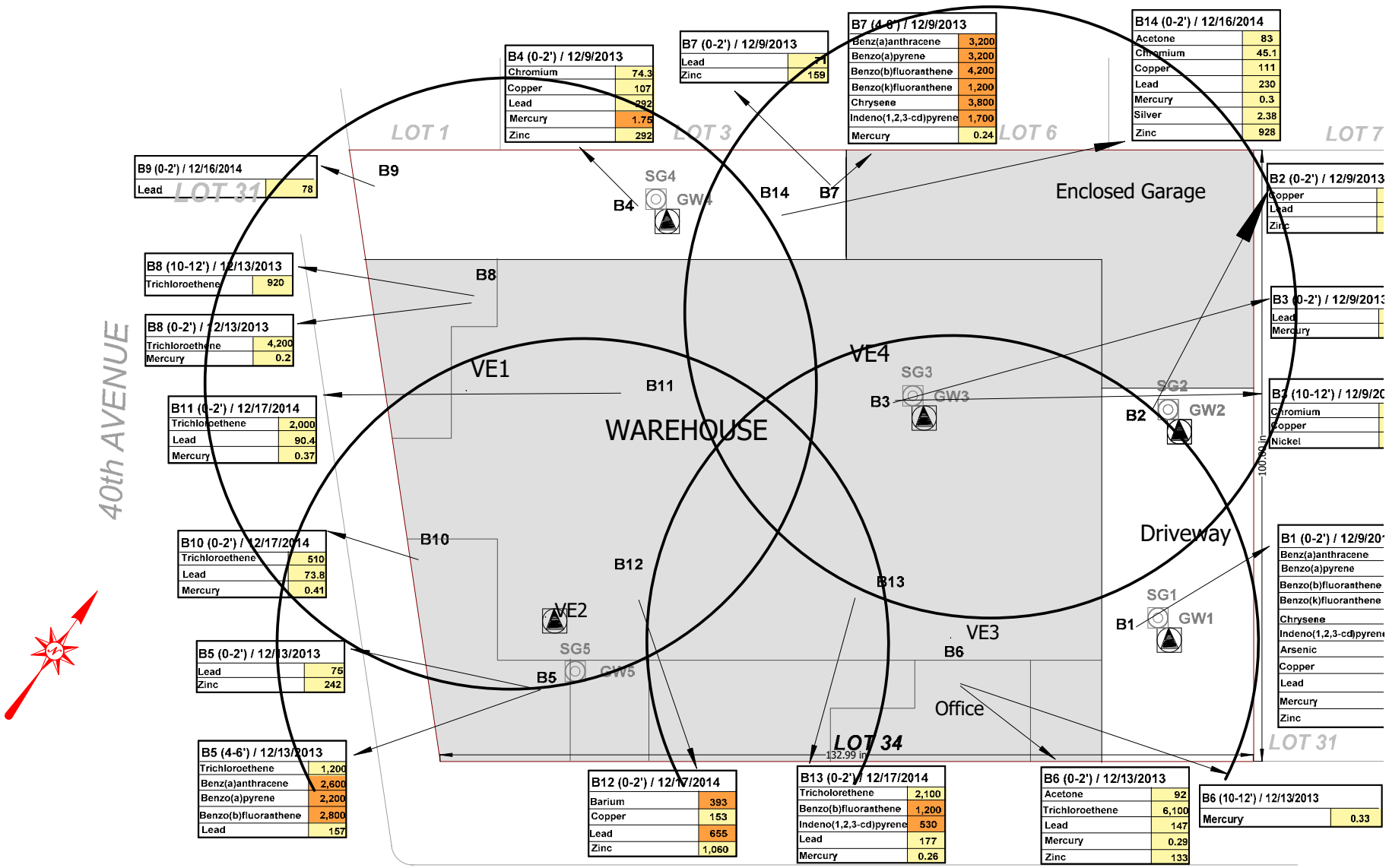
Fig 7: ROI – Soil Vapor Sampling Results



VOCs/SVOCs/Pesticides	ppb
Metals	ppm

Exceedence of Restricted Residential SCO

Exceedence of Unrestricted Use SCO

KEY:

- Property Boundary
- Groundwater Sampling Location
- Soil Boring Location
- Soil Gas Sampling Location
- Existing 2-Story Building*
- Radius of Influence

*Note - Existing building dimensions are approximated.

SCALE:

0 5 25

1 Inch = 25 feet

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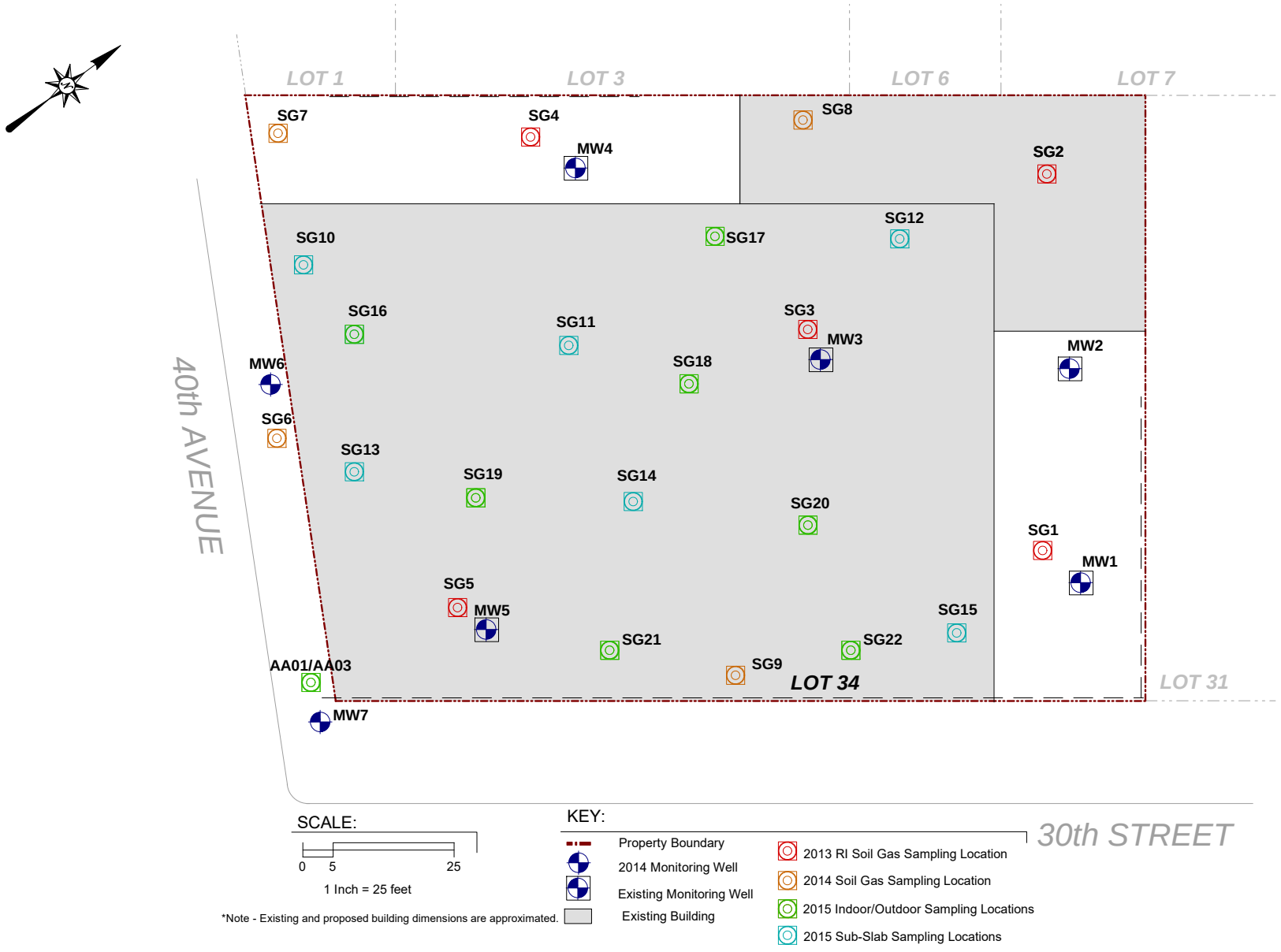
Fig 8: ROI – Soil Boring Sampling Results



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FORMER UNION WIRE DIE SITE
39-40 30th Street, Long Island City, NY

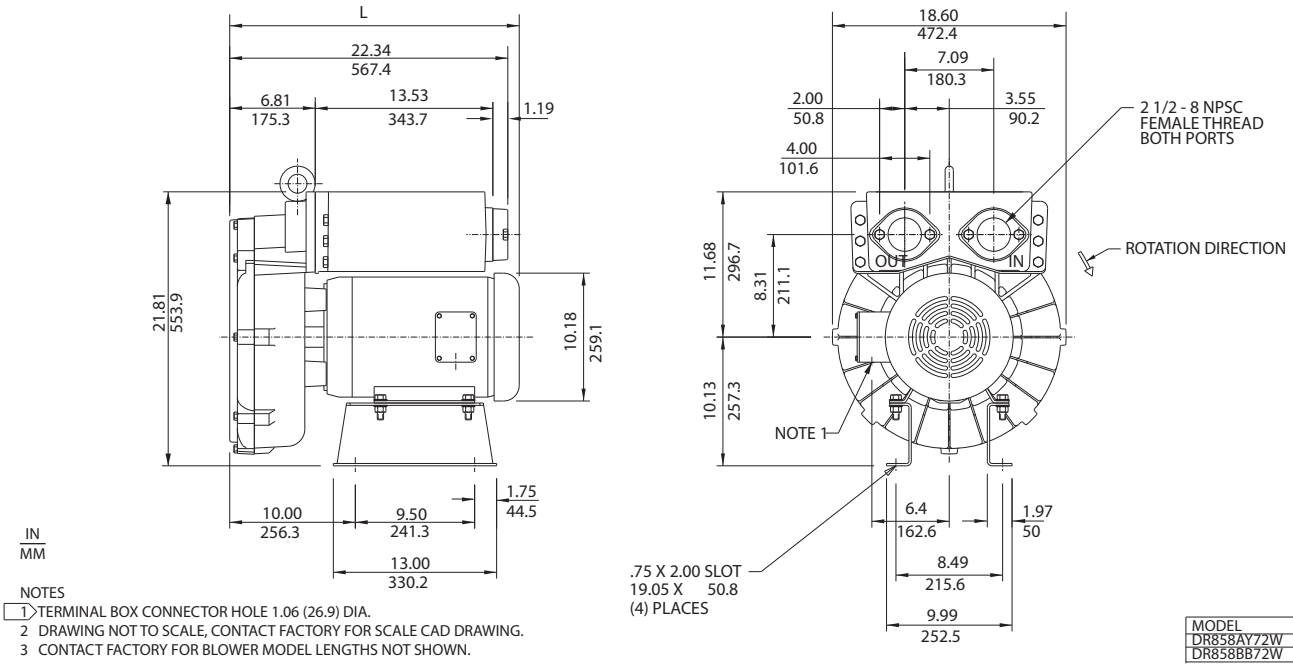
FIGURE 9
Monitoring Well and 1st Floor Soil Vapor/Air Sampling Locations

ATTACHMENT A
SVE Specifications

DR 858 & CP 858

ROTRON®

7.5 / 10.0 HP Regenerative Blower



NOTES
1. TERMINAL BOX CONNECTOR HOLE 1.06 (26.9) DIA.
2. DRAWING NOT TO SCALE, CONTACT FACTORY FOR SCALE CAD DRAWING.
3. CONTACT FACTORY FOR BLOWER MODEL LENGTHS NOT SHOWN.

MODEL	L (IN/MM)
DR858AY72W	23.06/585.7
DR858BB72W	23.19/589

		Part/ Model Number				
		DR858BB72W	DR858BB86W	DR858AY72W	CP858FH72WLR	HiE858BB72W
Specification	Units	038740	038742	038738	038749	038743
Motor Enclosure - Shaft Mtl.	-	TEFC-CS	TEFC-CS	TEFC-CS	Chem TEFC-SS	TEFC-CS
Horsepower	-	10	10	7.5	10	10
Voltage	AC	230/460	575	230/460	230/460	230/460
Phase - Frequency	-	Three-60 hz	Three-60 hz	Three-60 hz	Three-60 hz	Three-60 hz
Insulation Class	-	F	F	F	F	F
NEMA Rated Motor Amps	Amps (A)	26/13	10.5	17.8/8.9	26/13	26/13
Service Factor	-	1.15	1.15	1.15	1.15	1.15
Max. Blower Amps	Amps (A)	28/14	12	28/14	28/14	28/14
Locked Rotor Amps	Amps (A)	162/81	65	120/60	162/81	162/81
NEMA Starter Size	-	2/1	1	1/1	2/1	2/1
Shipping Weight	Lbs	280	280	264	280	280
	Kg	127	127	119.7	127	127
Model (Base Mount)	-	DR858BB72X	DR858BB86X	DR858AY72X		
Part Number (Base Mount)	-	038735	038737	038736		

Voltage - ROTRON motors are designed to handle a broad range of world voltages and power supply variations. Our dual voltage 3 phase motors are factory tested and certified to operate on both: **208-230/415-460 VAC-3 ph-60 Hz** and **190-208/380-415 VAC-3 ph-50 Hz**. Our dual voltage 1 phase motors are factory tested and certified to operate on both: **104-115/208-230 VAC-1 ph-60 Hz** and **100-110/200-220 VAC-1 ph-50 Hz**. All voltages above can handle a ±10% voltage fluctuation. Special wound motors can be ordered for voltages outside our certified range.

Operating Temperatures - Maximum operating temperature: Motor winding temperature (winding rise plus ambient) should not exceed 140°C for Class F rated motors or 120°C for Class B rated motors. Blower outlet air temperature should not exceed 140°C (air temperature rise plus inlet temperature). Performance curve maximum pressure and suction points are based on a 40°C inlet and ambient temperature. Consult factory for inlet or ambient temperatures above 40°C.

Maximum Blower Amps - Corresponds to the performance point at which the motor or blower temperature rise with a 40°C inlet and/or ambient temperature reaches the maximum operating temperature.

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AMETEK® TECHNICAL & INDUSTRIAL PRODUCTS

Industrial / Chemical Processing Blowers

DR 858 & CP 858

ROTRON®

7.5 / 10.0 HP Regenerative Blower

FEATURES

- Manufactured in the USA - ISO 9001 and NAFTA compliant
- CE compliant - Declaration of Conformity on file
- Maximum flow: 380 SCFM
- Maximum pressure: 125 IWG
- Maximum vacuum: 104.8 IWG
- Standard motor: 10 HP, TEFC
- Cast aluminum blower housing, impeller & cover; cast iron flanges (threaded)
- UL & CSA approved motor with permanently sealed ball bearings
- Inlet & outlet internal muffling
- Quiet operation within OSHA standards

MOTOR OPTIONS

- International voltage & frequency (Hz)
- Chemical duty, high efficiency, inverter duty or industry-specific designs
- Various horsepowers for application-specific needs

BLOWER OPTIONS

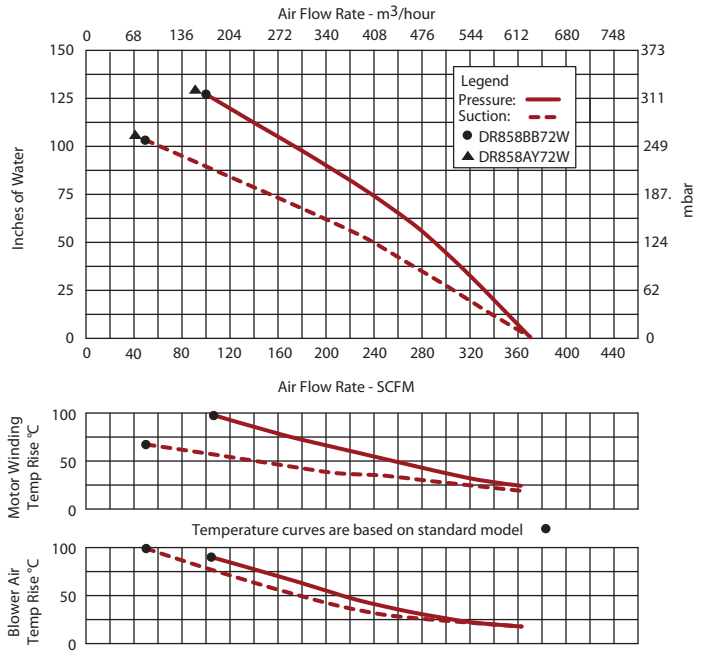
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

ACCESSORIES

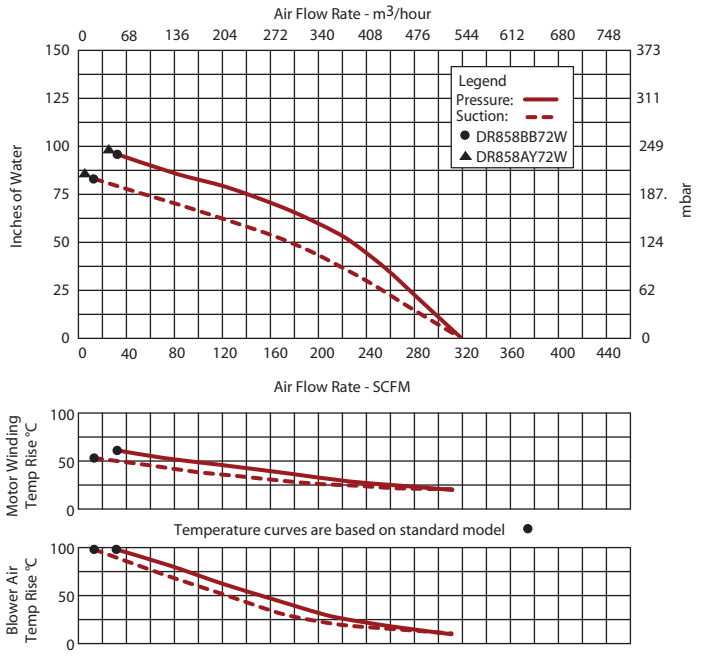
- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges, & relief valves
- Switches - air flow, pressure, vacuum, or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

Blower Performance at Standard Conditions

60 Hz



50 Hz



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AMETEK® TECHNICAL & INDUSTRIAL PRODUCTS

Econo V - Steel Drum Adsorbers

Modular Activated Carbon Vapor Phase Adsorbers

Solutions for Vapor Phase Remediation & Industrial Emission Control

The Econo - V steel drum activated carbon adsorption system excels at environmental remediation applications and industrial emissions control. This activated carbon adsorption drum is specifically designed fordependable performance and competitive pricing

The Econo - V GAC vapor phase adsorber is constructed of carbon steel and provides a double epoxy/phenolic lining durable enough for environmental remediation applications and industrial emission control

This GAC adsorption 55 gallon drum unit features specially constructed vapor distributors, designed

NOTES:

- Nominal flow can be used in environmental remediation activated carbon applications
- Desired contact time may allow higher or lower flow rates
- TIGG dry reactivated or virgin coal base activated carbon or coconut shell activated carbon provided as standard for environmental remediation applications
- Activated carbon fills are based on a bed density of 27 lb/ft
- Activated carbon fills can difer based on variable bed density and alternate adsorbents

ECONO

Modular Activated Carbon Vapor Adsorber

Model #	Nominal Flow (CFM)	Max Temp	Max Pressure (PSIG)	Inlet/ Outlet	Standard Fill (LBS)	Shipping Weight
EVP-1000	100	200	6	2"	175	225

Call a TIGG Representative Today at 800-925-0011

TIGG

http://www.tigg.com/Econo-sdrum.html

800-925-0011
www.TIGGtanks.com
www.TIGG.com

TIGG, LLC
1 Willow Avenue
Oakdale, PA 15071

Purifying Air & Water

APPENDIX B

SVE and DSR Forms

Soil Vapor Extraction
SYSTEM INSPECTION FORM

Date:_____

Time:_____

Inspector:_____

Extraction Point	Vacuum (iwc)	Flow (cfm)	PID reading (ppm)	Mass Flow (lbs/hr) **
VE-1				
VE-2				
VE-3				
VE-4				

**Mass Flow: (lbs/hr) = Flow * PID * 0.02

Flow (ft3/min) * PID (ppm) * $\frac{131.64 \text{ g/mole}}{24.45 \text{ l/mole}}$ TCE * 0.028 m3/ft * 60 min/hr * 1 lb/454 g * 1 liter/.001 m3 = lb/hr

Radius of Influence

Location	Observed Vacuum (iwc)	Comments

DAILY STATUS REPORT

Prepared By: _____

WEATHER	Snow		Rain		Overcast		Partly Cloudy		Bright Sun	
TEMP.	<32		32-50		50-70		70-85		>85	

Project Name:		Date:	

Consultant:	Safety Officer:
General Contractor:	Site Manager/ Supervisor:
Work Activities Performed Today by General Contractor:	

Measurements Collected Today:
Instrumentation:
Community Air Monitoring Results:
Problems Encountered:
Planned Activities for the Next Day/ Week:
Important Notes/Observations:

Data Sheet

- **include applicable charts, graph, and other data**

Schematic of Site (if applicable)

Photo Log (include as many as necessary)

Photo 1 –	
Photo 2 –	
Photo 3 –	

ATTACHMENT C
Carbon Inspection Form

WEEKLY CARBON MONITORING

Inspector:_____

Date/Time	Location	Flow cfm	PID reading	PID UNITS (ppm or ppb)
	Pre-Carbon			
	Mid-Carbon			
	Post-Carbon			

Comments/Actions Taken:_____

_____

_____

++

Inspector:_____

Date/Time	Location	Flow (cfm)	PID reading	PID UNITS ppm or ppb
	Pre-Carbon			
	Mid-Carbon			
	Post-Carbon			

Comments/Actions Taken:_____

_____

_____

ATTACHMENT D
SVE Test Photos

DAILY STATUS REPORT

Prepared By: **Aine Chalmers**

WEATHER	Snow		Rain		Overcast		Partly Cloudy	X	Bright Sun	
TEMP.	<32		32-50		50-70		70-85	X	>85	

Project Name:	**39-40 30th Street, Long Island City**	Date:	**August 3rd, 2016**

Consultant: **AMC Engineering, PLLC**	Safety Officer: **Aine Chalmers**
General Contractor:	Site Manager/ Supervisor:
Work Activities Performed Today by General Contractor: 1. **Soil Vapor Extraction Measurements**	

Measurements Collected Today:
- **Pressure at observation wells at varied blower pressures (inches of water).**
- **Air velocity (end of pipe) at varied blower pressures (ft/min).**
- **TCE readings for effluent stream (ppm).**

Instrumentation:
- **Ambient Weather Anemometer**
- **UltraRAE 3000 PID**
- **Dwyer Series 746A Manometer**
- **4" diameter piping**

Community Air Monitoring Results:

None.

Problems Encountered:

None.

Planned Activities for the Next Day/ Week:

None.

Important Notes/Observations:
- **Tests began after running vacuum for 20 minutes.**
- **TCE reading decreased as SV_2 pressure decreased.**
- **After completing each test, the final TCE reading jumped to 1.35ppm with fully open throttle.**

Data Sheet

Throttle	Blower	SV2	OW1 (25')	OW2 (10')	OW3 (15')	Velocity (ft/min)	TCE (ppm)
Test 1 (open)	-35	-31	-0.55	-0.78	-1.67	1929	1.25
Test 2 (45 degrees)	-47	-21	-0.35	-0.55	-1.21	1645	1.15
Test 3 (60 degrees)	-59	-9	-0.19	-0.25	-0.58	1161	0.85

Schematic of Well Placement

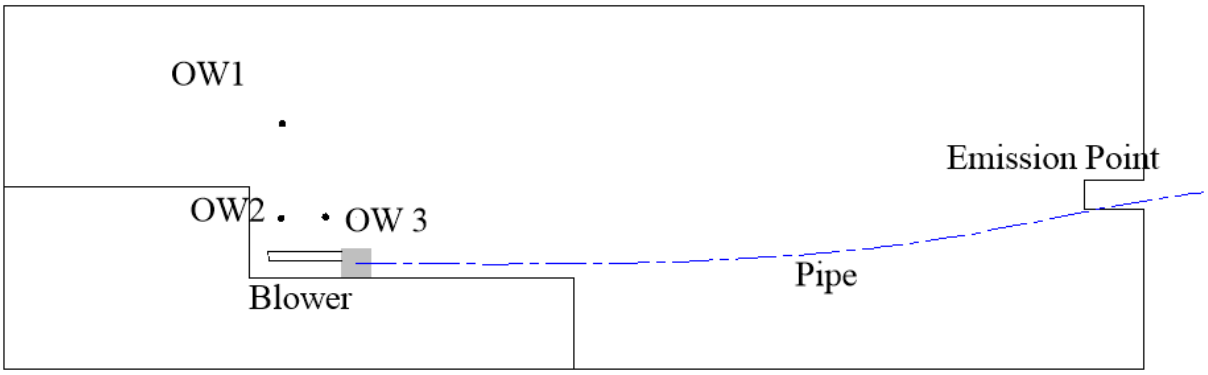

Photo Log

Photo 1 –

Test 1 – Throttle Open, Pressure readings

Photo 2 – **Test 1 – OW 1 Reading**	
Photo 3 – **Test 1 – OW 2 Reading**	

Photo 4 – **Test 1 – OW 3 Reading**	
Photo 5 – **Test 2 – Throttle at 45 degrees, Pressure Readings**	

Photo 6 – **Test 2 – OW 1 Readings**	
Photo 7 – **Test 2 – OW 2 Readings**	

Photo 8 – **Test 3 – Throttle at 60 degrees, Pressure Readings**	
Photo 9 – **Test 3 – OW 1**	

Photo 10 **Test 3 – OW 3**	
Photo 11 – **Test 3 – Final TCE Reading**