ENGINEER'S REPORT

MODIFICATION TO FEBRUARY 7, 2012
REMEDIAL ACTION WORK PLAN
RE: PILOT TEST, DESIGN, AND VES INSTALLATION

for

AMERICAN CLEANERS, INC.
360 Route 211 East
Middletown, NY 10940

NYSDEC Site Number V-00461-3

September, 2012

Prepared by:

Jansen Engineering, PLLC
72 Colburn Drive
Poughkeepsie, NY 12603

and

Mid-Hudson Geosciences
1003 Route 44/55
P.O. Box 332
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I, Jolanda G. Jansen certify that I am currently a NYS registered professional engineer and that this Modification to February 7, 2012 Remedial Action Work Plan RE: Pilot Test, Design, and VES Installation was prepared in accordance with all applicable statutes and regulations and in substantial conformance with the DER Technical Guidance for Site Investigation and Remediation (DER-10).

Jolanda G. Jansen, P.E.
NYS Lic. No. 068972-1

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1.0 Introduction and Purpose

This work plan reports on pilot testing and the design of a sub-slab vapor extraction system, and lays out plans for installation of the system. The plan is written to document the proposed remedial action to cleanup tetrachloroethylene (PCE) and other volatile organic compounds (VOCs) encountered as vapors beneath the concrete slab. A schedule for installation is included.

Historical and recent soil gas sampling results are shown on Figure 1. Historical concentrations of PCE vapors were detected under the building slab and beneath blacktop in parking areas shown in black with sample identification. Laboratory results for three recent (August 2012) Summa Canister testing locations are shown with new sample concentrations in bold pink numbers beside hexagonal outlines around the location (Figure 1). The historical and recent soil gas sampling results are summarized in this table:

Significant Soil Gas Sampling at American Cleaners, Middletown

Location	Sample ID	PCE ug/m^3	Sampling Date	PCE ppbV
Sub-slab	SSV-1	20,000	11/18/2005	
	XP2	27,200	08/14/2012	4010
Parking Lot	SG11	460	06/03	
near front door	SG11	46.3	08/14/12	6.83
Parking Lot	SG25	120,000	11/17/05	
downhill edge	SG25	35.3	08/14/12	5.2
NYSDOH Guidance Value for PCE = 15 ppbV				

In August 2012, PCE vapors beneath the blacktop at locations SG25 and SG11 were significantly lower than reported in November 2005 and June 2003, respectively. PCE concentrations were below the NYSDOH guidance value of 15 ppbV.

However, in August 2012, the PCE concentration measured in vapors from the sub-slab extraction point XP2 was the same order of magnitude as the SSV-1 sample of November 2005, comparing 27,200 to 20,000 ug/m^3.

The resulting pilot test and design reported in this plan were conducted to remediate the PCE and associated VOCs vapors detected beneath the building slab. This work plan describes the hardware, materials, and specifications for the installation of a vapor extraction system to remove sub-slab contaminant vapors.

In the parking lot, several rounds of soil sampling beneath blacktop have been conducted historically and recently in 1012. One area germane to this work plan is just outside the backdoor of the American Cleaners building (Figure 2), where a recent test

indicated PCE-contamination above NYSDEC soil cleanup standards. The following table summarizes relevant test results from that specific area.

Significant Soil Samples

American Cleaners Middletown, near back door

Sample ID	Sample Depth	PCE ug/kg (ppb)	Sampling Date
BEI-3	2 ft	18	06/18/03
BEI-3	10 ft*	1900	06/18/03
ASCM-11	3 ft	23	05/16/12
ASCM-12S	6 inches	3900	07/25/12
ASCM-12D	3 ft	210	07/25/12

* sample below water table, not a soil sample
NYSDEC Soil Cleanup Standard = 1300 ug/kg

As reported in the laboratory analysis, the shallow sample from location 12, collected just below the permeable gravel layer, the PCE concentration of 3900 ug/kg exceeds the NYSDEC soil cleanup standard of 1300 ug/kg, specifically for PCE. As a result, the soil by the backdoor will be excavated with perimeter sampling to remediate the area with compliant disposal of the contaminated soil material. Procedures to conduct the remedial measure consisting of soil excavation and disposal are described in this work plan in Section 6.0. If excavation does not result in a successful cleanup, a second circuit will be added to the VES using a horizontal slotted PVC collection pipe placed in gravel fill in the excavation and new blacktop will be placed above the fill excavation.

The design for this potential installation of a second VES circuit is outlined in this work plan, in case it is needed.

2.0 Work Plan Objective and Rationale

The objectives of this work plan are:

- Report relevant sampling results: soil and soil gas
- Define PCE contaminants requiring cleanup with an VES
- Report pilot test results
- Plan VES using data presented in this list above
- Describe the VES with diagrams, photos, layouts, specifications
- Define Startup of the VES and Initial Vapor Testing
- Describe remedial measure of contaminated soil outside back door
- Describe potential remedial measure of installation of secondary VES circuit for soil outside back door

The VES presented here is designed to meet NYSDEC requirements for site cleanup of PCE vapors in the Voluntary Cleanup Program.

3.0 Sub-Slab Vapor Extraction System Pilot Testing

On August 14, 2012, pilot testing for an indoor sub-slab vapor extraction system was conducted and design began. The concrete slab was found to be approximately 4 to 5 inches thick with about 6 inches of gravel beneath the slab. Three vapor extraction points were installed, one where the highest concentrations of PCE were detected in soil and soil gas samples. Two other points were installed about 15 feet away in the same quadrant of the building (Figure 3).

The vapor extraction points were installed by drilling a two-inch diameter hole through the slab with an electric Bosch high-powered drill. Attempts were made to extract gravel from the space below the slab, but as fast as it was removed, more would tumble into the space just cleared. For that reason, it was not possible to drill deeper and obtain sub-slab soil samples.

The extraction points (Photo 1) were constructed of one-inch inner diameter Schedule 40 PVC. The original plan was to use one-inch PVC screening, but on-site it was decided that the conventional slot size (0.010 inch) was too small and would restrict air flow. To prevent such constriction, 6- to 8-inch lengths of PVC “screen” were fabricated by drilling 4 rows of 8 holes (9/32 inch diameter) parallel to the long axis of the one-inch pipe (Photo 2). This array of openings was designed to not restrict air flow and keep gravel from entering the pipe, allowing maximum flow to be created by the selected system blower. The manufactured “screen” was placed 6 to 8 inches below the base of the concrete slab with a pointed cap on the base and about one foot of stickup of PVC above the floor. This arrangement allows air flow to occur throughout the highly porous and permeable gravel layer beneath the slab and pull vapors to the extraction point.

Prior to the vapor extraction system pilot test, a photoionization detector (PID) was used to measure volatile organic compounds (VOCs) in each of the three extraction points. The center point XP2 had a maximum reading of 68.3 ppm after opening the sealed cap and placing the PID extension into the top of the 1-inch PVC pipe. At 15 feet away from XP2 in opposite directions, the other points (XP1 and XP3) had no indication of VOCs with 0.0 ppm readings. The test involved creating a vacuum with a shop vac (6.5 horsepower, 120 volt, Photo3) with suction rated at 31- to 32-inches of water. The vacuum was applied to the center extraction point XP2, which seemed to be close to the source of contamination as indicated by the PID readings and historical soil and soil gas sampling.

Prior to hooking the vacuum to XP2, the vacuum was turned on with 40 feet of 2.5-inch diameter hose (Photo 4) running from the shop vac by the back door to XP2. With no connection, the air flow was measured at 120 cubic feet per minute (cfm, Photo 5) and vacuum was measured at -18.7 inches of water (Photo 6). Upon hookup (Photo 7), the air flow dropped to and remained at 55 cfm (Photo 8) for one hour with a vacuum of approximately -28 inches of water. Vacuum measurements at XP1 and XP3 were -0.32 and -0.36 inches of water (Photos 9 and 10), respectively for the duration of the test with very slight variation. Another vacuum monitoring point (Photo 11) was drilled

through the floor in the far corner of the building and a vacuum of 0.005 inches of water was detected there during the pilot test. That reading indicates that the vacuum applied to XP2 is capable of drawing air from the entire sub-slab gravel layer under the 82 by 60 feet building. Under such conditions, it is reasonable to expect that using a Summa Canister a one-hour soil gas sample collected from XP2 is adequate to characterize VOC vapor concentrations under the slab.

4.0 Summa Canister Testing of Subsurface Vapors

Summa canisters supplied by Alpha Analytical of Mansfield, Massachusetts were used to sample vapors from two locations below the blacktop (SG25 and SG11) and from beneath the slab in the building (from the extraction point used for pilot testing XP2). Results were received from Alpha Analytical on August 29. Significant results are shown back on page 1 and discussed below. Some photos are included to show the field configuration of the Summa Canister, the 5-gallon bucket with helium for leak detection, the lines running from Helium canister and Summa canister, and the vacuum gauge on the Summa canister (Photos 12, 13, 14). The canisters are set up by the lab to start at a high vacuum (about 28 inches). The beginning vacuum and the ending vacuum are reported on the chain of custody, so that the lab knows the Summa canister was holding the vacuum while in transit to and from the site. After the lab-assigned time, in this case, one hour; the vacuum reading is record on the chain of custody and the valve closed ending the vapor sample collection.

Under the blacktop, concentrations of PCE measured at locations SG25 and SG11 are considered not detrimental to humans because they are less than half of the NYSDOH guidance value of 15 ppbv. At extraction point XP2, a concentration of 4010 ppbv was measured in the sub-slab vapor sample. Two breakdown products of PCE were measured in the XP2 sample. Cis12DCE was detected at 208 ppbv and TCE was detected at 118 ppbv. Other VOC's in the XP2 sample include Chloroform at 27.9, Toluene at 18.8, xylenes at 38.7 and 124Trimethylbenzene at 8.63 ppbv. The pilot testing was conducted to measure parameters required to properly design the sub-slab Vapor Extraction System.

Helium was detected in SG25 at 13.1% indicating a leak probably through the blacktop. Helium concentration in the other two samples was very low 0.9% at SG11 and 1.54% at XP2 and therefore, do not alter the concentrations significantly. In retrospect, probably way too much helium was injected into the bucket creating over-pressurization and resulting in greater leakage of helium than would occur at normal atmospheric pressure.

5.0 Description of Vapor Extraction System

Based on the air flow rate of 55 cubic feet per minute (cfm) measured during the pilot test, a Rotron DR404 regenerative blower was selected with a maximum flow rate of approximately 100 cfm. Based on the 60 cycle performance curve (Appendix 1 Rotron Spec Sheet), at 55 cfm, a vacuum of about 35 inches of water would be generated in

the system. In actuality, the blower will induce the vacuum which will be measured and the flow rate estimated from the performance curve.

The proposed components of the VES are shown on a schematic diagram (Figure 4) and listed on a parts list (Table 1).

The original 1-inch PVC extraction point (XP2) will be replaced with a 2-inch PVC point to avoid constriction of the air flow (Figure 2). A calculation of cross sectional area was made for a one-foot length of Schedule 40 PVC screen with 0.020-inch slots with 4 slots per inch of length sold by Atlantic Screen & Manufacturing Company (Calculation 1). The Cross sectional area of 2-inch diameter pipe or screen is 3.14 square inches and the cross sectional area of a one-foot length of slotting is 3.0 inches. A few additional holes will be drilled in the PVC screen to assure maximum air flow and reduce constriction.

From the extraction point XP2 to the blower (Figure 5), air will be conducted vertically upward form the extractor to a height above nearby production structures, then horizontally to the wall, and along the wall to the blower through 2-inch PVC piping. The blower will be bolted to an existing shelf.

A vacuum gauge will be installed to measure vacuum in the line. Using the vacuum reading, the performance curve of the Rotron DR404 can be used to estimate the air flow rate in the system.

The discharge of the blower will be very hot, perhaps 50 degrees centigrade (132^0F) according to the performance curves on the specification sheet (Appendix 1). A 2-inch copper pipe in the shape of a trombone will be used as a cooling zone between the blower and the carbon treatment drum. Temporary recording thermometers will be placed at both ends of the trombone to monitor temperature of vapor flow in the VES. The drum will be on the floor below the shelf with the blower.

The carbon treatment will be activated carbon in a steel drum manufactured with a plenum on the bottom to assure even distribution of air upward through the carbon. The discharge from the top of the drum will be directed to the 4-inch PVC stack (Figures 5 and 7).

New electrical wiring will be run from the panel on the back wall to the left rear corner of the building and forward along the left wall to the blower on the shelf (Figure 6). A licensed electrician will install the wiring from the circuit breaker box (panel) to an existing locking disconnect box (not currently used) to a new starter on/off switch box with overload protection and relays. The blower will be supplied by 230 volts single phase power by wire installed in 1-inch metal conduit. A junction box will be installed on the wall for the connection between the blower and power supply.

6.0 Remedial Measure for PCE Contamination of Soil by Back Door

The presence of PCE contamination in soils beneath the blacktop is quantified in section 1.0. Cleanup by excavation and disposal of contaminated soil is the most cost effective remedial measure. That measure is described here and proposed as the first method of cleanup. In the event that complete cleanup can not be achieved by excavation, a second circuit will be installed in the vapor extraction system with a horizontal extraction pipe buried in the excavation backfilled with gravel. That secondary measure is described below to be used as an alternative measure, if the excavation work is too costly and extensive. That result is unlikely, but must be presented to document potential sampling results and potential remedial measures.

6.1 Soil Excavation by Back Door

As described in section 1.0, a concentration of 3900 ug/kg detected in soil sample 12S (6-inches below surface) is above the NYSDEC soil cleanup standard (SCS) of 1300 ug/kg for PCE. In the same boring, sample 12D (3-feet below surface) PCE was detected at 210 ug/kg indication that soil at that depth is below the NYDSEC SCS for PCE. The original sample at BEI-3 (at 2-feet below surface) was reported as18 ug/kg. The sample at 10 feet in the BEI-3 boring was below the water table, so it is not really a soil sample and is not considered relevant to this remedial measure. A PCE-concentration of 23 ug/kg was detected in Sample 11 (3 feet below surface) and about 6.5 feet away from sample 12. Sample 11 is located 9 feet from the shed wall and the back wall of the back door corner of the American Cleaners Building, forming a maximum 9-foot square as the maximum excavation area for the remedial measure (Figure 8). Sample 12D and Sample 11 predict the maximum depth of the excavation at 3 feet below ground surface.

Remedial Steps are as follows:

- The blacktop will be removed and piled on plastic sheeting in the third parking place along the curb to the southeast of the back door.

- Digging will begin at the location of samples BEI-3 and 12 and proceed radially outward in vertical intervals of 1-foot. After testing for with the Photoionization Detector (PID), the soil will be placed on plastic on the first parking place to the southeast of the back door. The second parking place will be empty.

- A RAE systems ppbRAE 3000 will be rented to scan soil samples because that model can measure down to 1 ppb, whereas other miniRAE models have a limit of 1 ppm. Since the SCS is 1300 ug/kg (1300 ppb or 1.3 ppm), the ppbRAE 3000 will help be effective in determining where “clean” soil is detected on the perimeter of the excavation of soil samples. A clean small shovel / trowel / spoon will be used to place soil samples into 2-ounce clear jars with screw lid provided by the laboratory. Aluminum foil will be placed over the top of the jar when it is filled with soil reducing headspace to a minimum.

● Each soil sample will be kept in the jar for 15 to 30 minutes. If weather is warm, the jar will be placed in the sun. If weather is cold, a hair dryer will be used to warm the jar and encourage VOCs to be released from the soil and vaporize in the headspace. Once the jar and contents are warm, the nozzle of the ppbRAE 3000 will be poked through the foil to get a reading of total VOCs measured in ppb. If the PID measurement is not "clean," additional soil will be removed along the perimeter surface the sample came from.

● Each sidewall will have two samples with vertical separation(samples will be at 6-inchs and some greater distance below the ground surface depending on excavation depth) with a total of 8 sidewall samples to be sent to the laboratory for analysis. Two samples will be taken from the bottom of the excavation. When 10 samples have been deemed "clean" with the PID, excavation will cease and the sample jars will be sealed with plastic lids placed on ice and sent to the laboratory. A NYS-certified laboratory Analysis will analyze the soil samples with EPA method SW-846-8260B. Category B deliverables will be ordered from the laboratory and sent to a data validation expert to prepare a data usability report. For each day of sampling, a field blank (distilled water run over sampling equipment) and a trip blank (distilled water sent from the lab in clear glass 40 milliliter vials) will be submitted to the laboratory.

● The hole in the ground will be covered with a plywood platform, so that employees can enter the back door.

● The soil and blacktop piles will be covered with good plastic sheeting or tarp during rain while working and after completion of each day of excavation. As soon as the volume of soil for disposal is known, a roll-off or dump truck will be ordered to hold the soil and remove it from the site. Initial calculations indicate that the total volume of the excavated soil will be a maximum of 6 cubic yards.

● When sample results are returned from the laboratory, if all samples are deemed "clean" with respect to PCE-contamination, then the excavation will be backfilled with gravel or washed- stone. The specifications will be transmitted to DEC in written communication as soon as such information if obtained, definitely prior to mobilization. If all samples are not considered "clean," then excavation and sampling will be continued until they are or it is decided that it will be more cost effective to install of a second circuit in the Vapor Extraction System.

● New blacktop will be applied to the area of excavation over the backfilled gravel.

Trained hazardous waste workers will perform all of the tasks described in this section of the work plan. Results of sampling and documentation of the soil excavation will be included in the final report indicating the fate of PCE-contaminants on the American Cleaners Middletown Site. Soil disposal will be documented with manifest and any other appropriate records.

6.2 Second VES Circuit for Potential Treatment of Driveway Contaminants beneath Blacktop at Back Door

The schematic diagram (Figure 4) shows a separate circuit on the left side for a second circuit for treatment of VOCs beneath the blacktop outside the back door (Figures 8 and 9). A 4-inch PVC manifold is planned to merge the air flow from the sub-slab extraction point (XP2) in the building with that from a horizontal slotted screen placed below the blacktop by the backdoor. This second circuit will only be installed if the excavation of soils from the backdoor area is not able to attain perimeter soil samples below the soil cleanup standard of 1300 ug/kg for PCE. Blacktop will applied to the area of excavation and installation of the horizontal PVC extraction pipe with backfilled gravel.

7.0 Concomitant Procedural Plans

Concomitant procedural plans include the contributory plans associated with the remedial action work plan such as the QA/QC Plan, the Health and Safety Plan, and the Community Air Monitoring Plan as described or referenced below.

7.1 QA/QC Plan

For VES vapor flow testing, the analytical parameters and other Quality Assurance Project Plans (QUAPP) information is provided on Table 3. York Analytical Laboratories, or another NYSDOH certified laboratory will be preparing the Summa Canisters and analyzing the samples for Volatile Organic Compounds using EPA method TO-15.
Category B (NY ASP B) laboratory deliverables will be requested from the lab and submitted and a Data Usability Summary Report (DUSR) will be prepared by a data validation expert. During the first week of operation, sampling of the vapor flow in the VES will be conducted on the first, second and eighth day as specified in Table 3 and mentioned section 8.0 Schedule. Additional testing will be based on a schedule established after those three initial tests.

The laboratory testing of air samples will be done for EPA Method TO-15 for samples collected with Summa Canisters.. The Summa canister will be connected with flexible tubing to the sampling port(s) constructed in the PVC line(s). Other sampling techniques may be used with DEC approval such as programmable pocket pump with sorbent tubes or possibly pocket pump with Tedlar bags. These methods may be used to reduce costs, if found to provide equivalent results to the Summa Canister testing.

For soil sampling outside the back door for confirmation of excavation to clean perimeters, analytical parameters and other QAPP information is provided in Table 4. York Analytical Laboratories, or another NYSDOH certified laboratory will be analyzing the samples for Volatile Organic Compounds using EPA method Sw-846-8260B.
Category B (NY ASP B) laboratory deliverables will be requested from the lab and submitted and a Data Usability Summary Report (DUSR) will be prepared by a data validation expert. Trip and equipment blanks will be sent to the lab for each day of soil sampling.

7.2. Health and Safety Plan

The Health and Safety Plan for field work at the American Cleaners Middletown location has been used and updated for the Site Re-Evaluation Work Plan (June 2012) and is included here as Appendix 3.

7.3. Community Air Monitoring Plan

The Community Air Monitoring Air Plan for field work at the American Cleaners Middletown location has been used and updated for the Site Re-evaluation Work Plan (June 2012) and is included here as Appendix 4.

8.0 Schedule

Installation of the components described above is scheduled for September 24. If additional time is needed, work will resume on September 27. Todd Syska will be supervising the installation.

The electrical inspection will be done by the licensed electrician and the remainder of the installation will be certified by Jolanda G. Jansen, P.E.

Once DEC approves use of the use of the system, it will be turned on. Vapor samples will be collected and sent to the lab for analysis of VOCs. The method of air sample collection will be either Summa Canister or Programmable Pocket Pump with sorbent tubes using EPA method TO-15 or TO-17. Three samples will be collected during the first week of operation. To monitor the VOC concentrations, PID measurements will also be made through the sampling port before and after each sample collection. The PID measurements and laboratory results will be correlated to allow us of PID measurements to monitor changes in concentrations of VOCs withdrawn from the sub-slab area.

Concentrations of vapors moving though the system are significant because the need for the carbon treatment system seems superfluous since the estimated concentrations of total VOCs based on Summa Canister analysis of XP2 sample is 1/500 of the permissible untreated emissions of VOCs at ½ pound per hour.

The first VES will be installed to treat the sub-slab vapors from XP2 and will be turned on as soon as approval is granted by DEC. If needed the second circuit will be installed to treat vapors from beneath the black top near the back door within two weeks of receiving confirmatory soil samples indicating the presence of PCE above soil cleanup standards.

Additional operating procedures will be described in the Site Management Plan (SMP) to be prepared shortly after commencement of VES operation.

Calculation Sheet 1

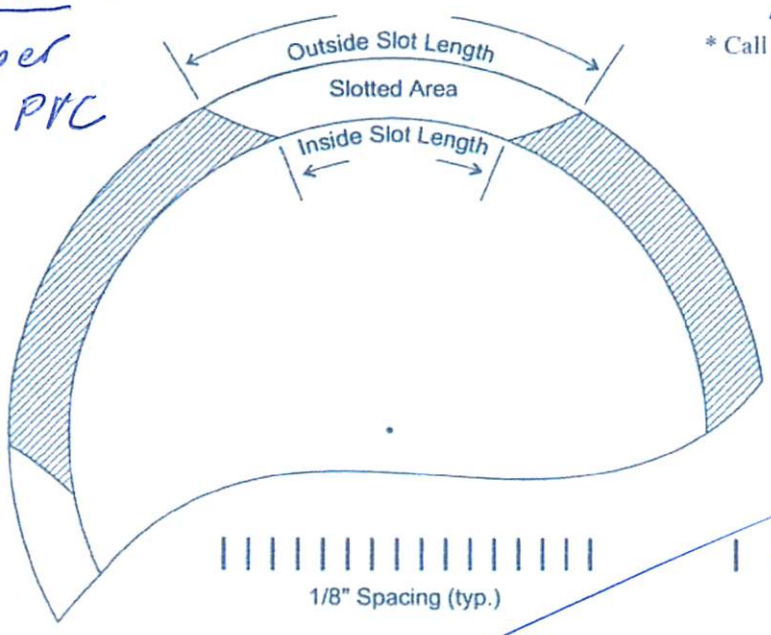
ATLANTIC SCREEN & MANUFACTURING, INC.

Calculation of Cross Sectional Area
K J Beinkafner 9/10/12

SLOTTED PIPE

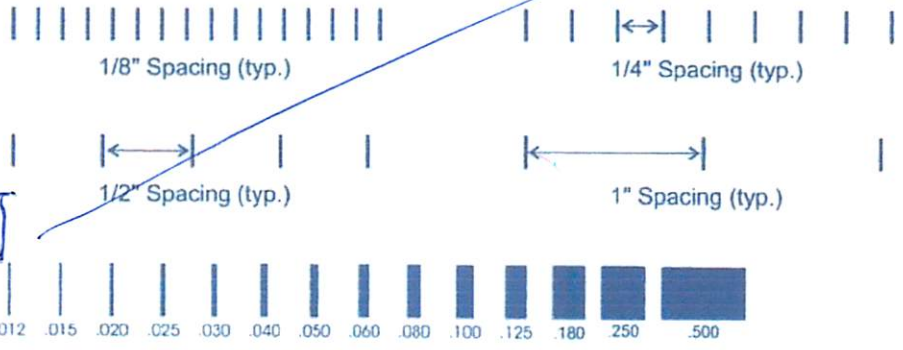
* Call for more information

Assumption:
4 slots per 1" length PVC



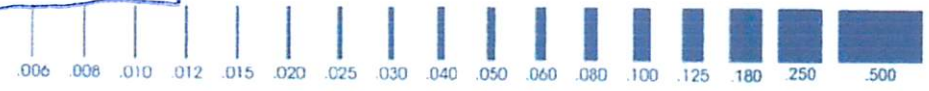
4 slots/inch
48 slots/foot

Conclusion
for 1-foot 2" Diam PVC, cross sectional area of slots is 3 sq inches



.020 × 48 = .96 × 3.14 = 3 sq INCHES

slots in one foot

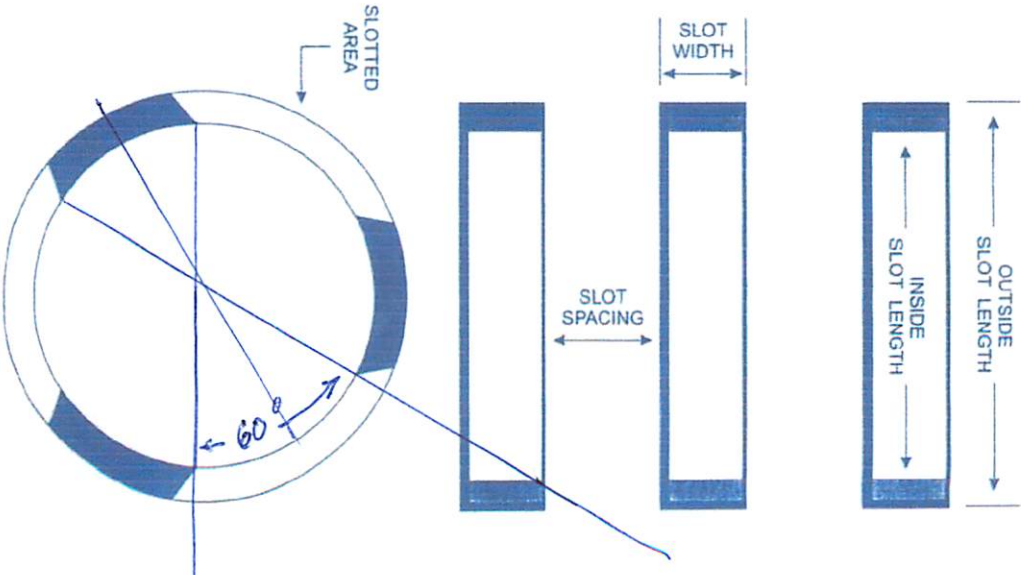


Typical Slot Widths

C = πd = π · 2"

180°/360° =

1/2 circumference = 3.14 inches



ATLANTIC SCREEN, INC.
142 BROADKILL ROAD
MILTON, DE 19968
2008

PHONE: 302-684-3197
FAX: 302-684-0643
www.atlantic-screen.com

Calculation Sheet 2

Project: American Cleaners Middletown
Sub-Slab Vapor Extraction System Design

Calculations of VOCs in pounds per hour to Estimate Contaminant Emissions to atmosphere using total contaminants from Summa Canister Test and system air flow from pilot test

Thurs Aug 30, 2012

Paul Patel said emission limit without treatment is 0.5 pounds of contaminant / hour

Sum of VOCs from SummaTest from XP2 on 8/14/12 reported by Alpha Analytical 8/27/12

PCE	4010
cis 12 DCE	208
chloroform	28
TCE	116
Toluene	19
p/m xylene	27
o-xylene	12
124 trimethbenz	21
12 dichlorobenz	9
VOC Contaminant =	4350 ug/m³

Pilot Test Air Flow = 55 cfm
round up to 60 cfm

4350 ug = ? Kg
= .004350 g · 10^{-3} Kg
= $4.35 \cdot 10^{-6}$ Kg

1 Kg = 2.2 pounds

$4.35 \cdot 10^{-6}$ Kg × 2.2 = $9.57 \cdot 10^{-6}$ pounds / cu meter

1 cu meter = 35.3 cuft

$\frac{9.57 \cdot 10^{-7}}{35.3} = 2.71 \cdot 10^{-7}$ pounds / cu ft

$2.71 \cdot 10^{-7} \frac{\text{pounds}}{\text{cuft}} \times 60 \text{ cuft} \times 60 \frac{\text{min}}{\text{hour}}$

$2.71 \cdot 10^{-7} \times 3600 = 9.7 \cdot 10^{3} \cdot 10^{-7}$

Estimated Emission →
$= 9.7 \cdot 10^{-4}$ pounds / hour
$\approx 1 \cdot 10^{-3}$ pounds / hours
≈ 0.001 pounds / hours

$\frac{.5}{.001}$ = ~~500 times the~~ emissions limit is 500 ~~or 500~~ times estimated emission

Table 1			
Dimensions of Extraction Points			
Construction Details from July 25, 2012			
American Cleaners, Middletown			
see Figure 3 for locations			
Dimension	XP1	XP2	XP3
Height above floor (inches)	11	22	13
Slab thickness (inches)	4	5	4
Screen Length (inches)	6	8	6
Total Length (feet)	1.6	3.1	1.9
PID (ppm)	5	20	4.5
PID = Photoionization measurements of total VOCs			
measured from top of XP after cap removal			

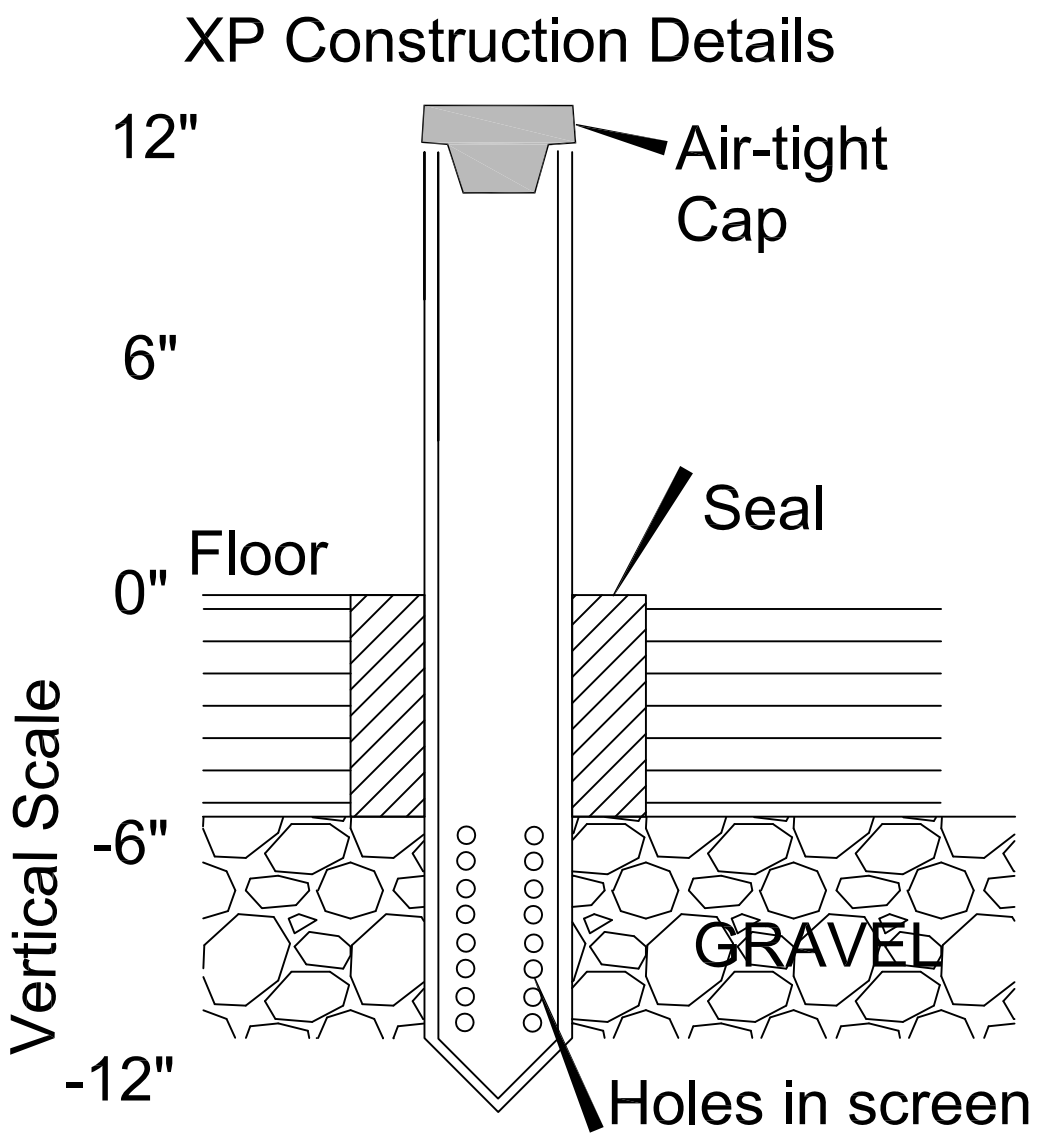


Table 2

List of VAPOR EXTRACTION PARTS from Schematic for Sub-Slab Installation

Status	*Item*
Reinstall	New 2" extraction point at XP2
Todd	Pressure Indicator = Vacuum Gauge
Todd	Sampling Port #1 Before Blower
Ordered	Vapor Extraction Blower, Rotron DR404 regenerative 1hp 1ph
Todd/Erez	2-inch Copper Trombone Cooling Zone
DEC required	Vapor Treatment, Carbon canister, Todd has one
Todd	Post Treatment Vacuum Gauge
Todd	Sampling Port #2 Post Treatment

Electrical Parts for Blower

Electrician	Starter Box with Overload Protection, Relays, and On/Off Switch
On the wall	Existing Locking Disconnect Box
Electrician	Wiring, Junction Boxes, Conduit

Piping

Erez	Extraction to blower 2-inch PVC
Todd/Erez	Blower to Treatment to Stack: 2-inchCcopper
Erez	Stack 4-inch Schedule 40 PVC
Todd	Carbon Drum to Stack connector

List of VAPOR EXTRACTION PARTS for Second System from Driveway by Back Door (If Needed)

Pending	4-inch PVC Manifold to combine XP2 & Backdoor Loads
Pending	Ambient Air Intake/Relief Valve
Pending	2 Flow Control Valves
Pending	2 Pressure Indicators Vacuum Gauge

Table 3
SVE Air/Gas Effluent Sampling for VOCs using USEPA Method TO-15 and Summa Canisters
Quality Assurance Program Plan in Vapor Extraction System Work Plan
February 6, 2012, Revised September 12, 2012
American Cleaners, Inc., 360 Route 211 East, Middletown, NY
NYSDEC DER VCP Site V-00601-3
Compiled by Jansen Engineering, PLLC & Mid-Hudson Geosciences

SAMPLE TIMING, RATIONALE, NUMBERS, AND LABORATORY METHOD for Summa Canister at VES Sampling Port

Sample Identification	Time of Sample Collection & Rationale	Number of Samples	VOCs EPA Method TO-15
Sample 1	2 hours after system start up, time to stabilize blower, yet get initial concentrations	1	√
Sample 2	1 day after system start up, to observe any early decline or increase in contaminant removal	1	√
Sample 3	1 week after system start up, to observe system stabilization to estimate cleanup duration	1	√

Notes:
VOCs are Volatile Organic Compounds.
EPA TO-15 is the US EPA Analytical Method for VOCs in air or soil gas mixture.

SAMPLE QUANTIFICATION

Parameter	AIR	
Maximum number of samples	4	
Number of field blanks	Not Applicable	
Number of trip blanks	Not Applicable	
Number of duplicate samples	Not Applicable	
Number of matrix spike samples	Not Applicable	
Number of matrix spike duplicate samples	Not Applicable	
Sample preservation	sealed in stainless steel canister	
Sample container volume	6 Liter	
Sample container type	stainless steel Summa	
Sample holding time	30 days	
Sample storage in field	inside canister	
Transport to laboratory	inside canister	

Table 4

Soil Sampling Locations, Rationale, Analytical Method, and QA Quantification

Modification to Remedial Action Work Plan of February 7, 2012

Soil Excavation and Disposal outside Back Door

Confirmation of Perimeter Samples as "Clean" compared with Soil Cleanup Standard for PCE of 1300 ug/kg

American Cleaners, Middletown, NY

NYS DEC DER Voluntary Cleanup Program Site No. V-99461-3

Prepared by Mid-Hudson Geosciences and Jansen Engineering, September 18, 2012

Soil Sample Identification	Sample Dep[th (inches)	Soil Sample Location	Rationale for Location	Number of Samples	VOCs EPA 8260B
NSW1	6	sidewall	Determine concentration RE SCS	1	√
NSW2	below 6	sidewall	Determine concentration RE SCS	1	√
ESW1	6	sidewall	Determine concentration RE SCS	1	√
ESW2	below 6	sidewall	Determine concentration RE SCS	1	√
SSW1	6	sidewall	Determine concentration RE SCS	1	√
SSW2	below 6	sidewall	Determine concentration RE SCS	1	√
WSW1	6	sidewall	Determine concentration RE SCS	1	√
WSW2	below 6	sidewall	Determine concentration RE SCS	1	√
EB	bottom	excavation	Determine concentration RE SCS	1	√
WB	bottom	excavation	Determine concentration RE SCS	1	√

Notes: 1. Abbreviations for sidewall sample ID, first letter is for North, East, South, or West
second two letters are SD for "sidewall" and last number 1 is for 6-inch deep sample
or "below 6" for deeper sample below 6-inches
2. Abbreviations for bottom of excavation sample ID, EB stands for East Bottom
and WB stands for West Bottom

SAMPLE QUALITY ASSURANCE QUANTIFICATION	
Parameter	Soil Samples
Maximum number of Samples	8
Number of Equipment Blanks	1/day
Number of trip Blanks	1/day
Number of Duplicate Samples	0
Number of Matrix Spike Samples	0
Number of Matrix Spike Duplicates	0
Sample Preservation	minimal head space
	cool at 4 ^{o}F
Sample Container Volume	2 oz
Sample Container Type	clear glass jar, screw lid
Sample Holding Time	14 days
Sample Storage in Field	cooler with ice paks
Transport to Laboratory	Cooler with fresh ice paks

Photo 1. Vapor Extraction Point installed in Concrete Slab with sealing orange J-cap.

Photo 2. Vapor extraction "screen" prepared by drilling holes in 1-inch PVC to maximize air flow from sub-slab gravel.

Photo 3. Shop vac used to create vacuum for VES pilot test rated at 31-32 inch water.

Photo 4. Hose for connection from shop vac to extraction point XP2.

Photo 5. Air flow meter, blower on, no connection to XP2, 120 cfm.

Photo 6. Vacuum gauge, blower on, no connection to XP2, -18.7 inches water.

Photo 7. Connection of vacuum line from blower to extraction point XP2.

Photo 8. Air flow meter at 55 cfm for one hour pilot test monitoring flow from XP2 to shop vac.

Photo 9. Vacuum gauge measuring -0.31 inches water at XP1 during pilot test.

Photo 10. Vacuum gauge measuring -0.38 inches water at XP3 during pilot test.

Photo 11. Vacuum gauge measuring -.005 at temporary XP4 in far corner of building.

Photo 12. Setting up Summa sampling at SG25 with bentonite seal with canister & helium supply lines running under seal.

Photo 13. Summa canister with vacuum gauge at location SG11.

Photo 14. Summa canister setup at XP2 for sub-slab vapor sample.

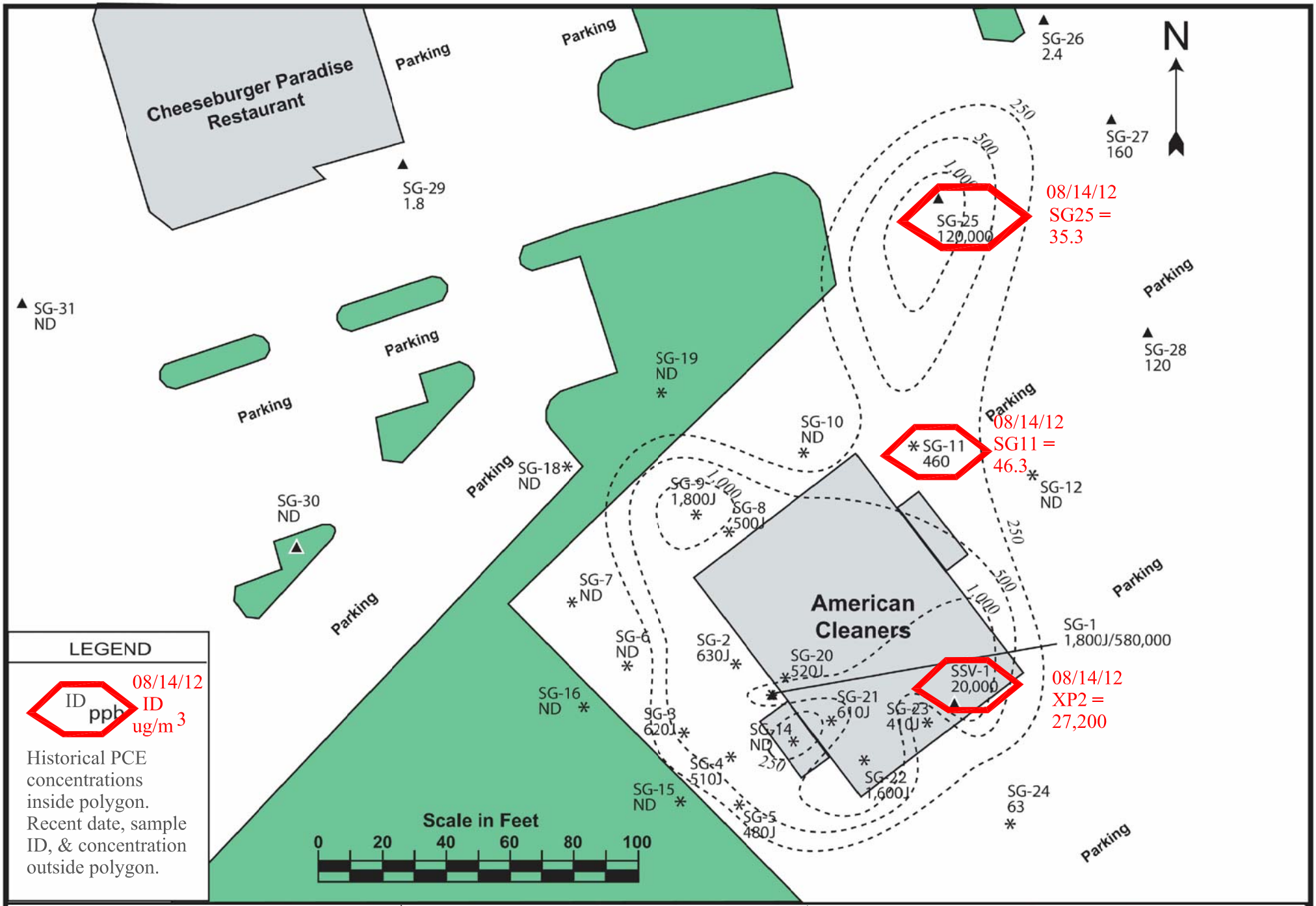


Figure 1. PCE Concentrations (ug/m3) Historical and recent Soil Gas Sampling with Summa Canisters.

American Cleaners at Caldor Lloyds Plaza
360 Route 211 East, Middletown, NY 10940
NYSDEC DER VCP V-00461, Sept 2012

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PO Box 332, Clintondale, NY 12515

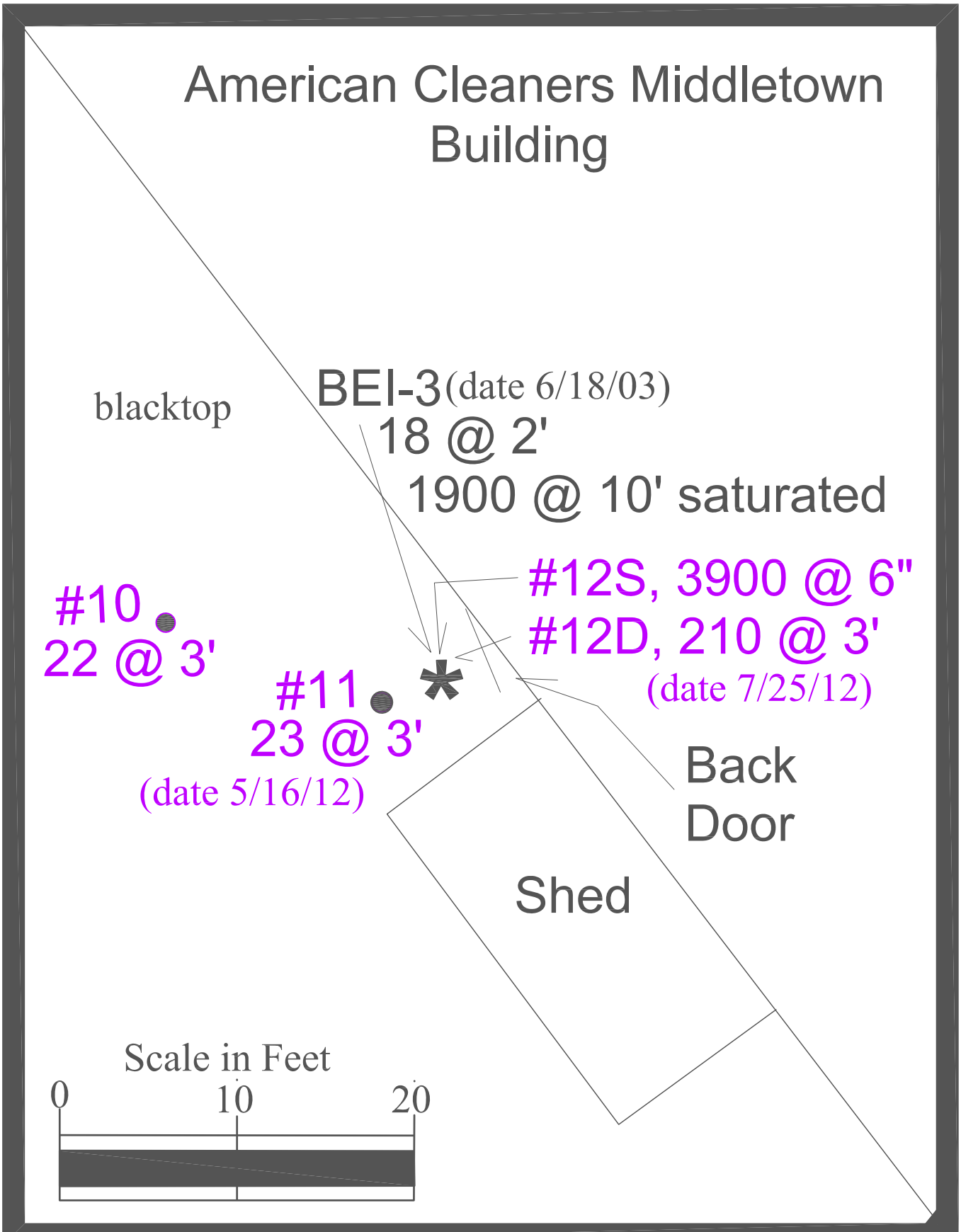

Figure 2. Concentrations of PCE in significant samples near back door under blacktop, historical and recent. Sample 12D at 3900 ug/kg exceeds NYSDEC soil cleanup Standard of 1300 ug/kg. American Cleaners 360 Route 211 East, Middletown, NY 10940 NYSDEC DER VCP V-00461, September 2012

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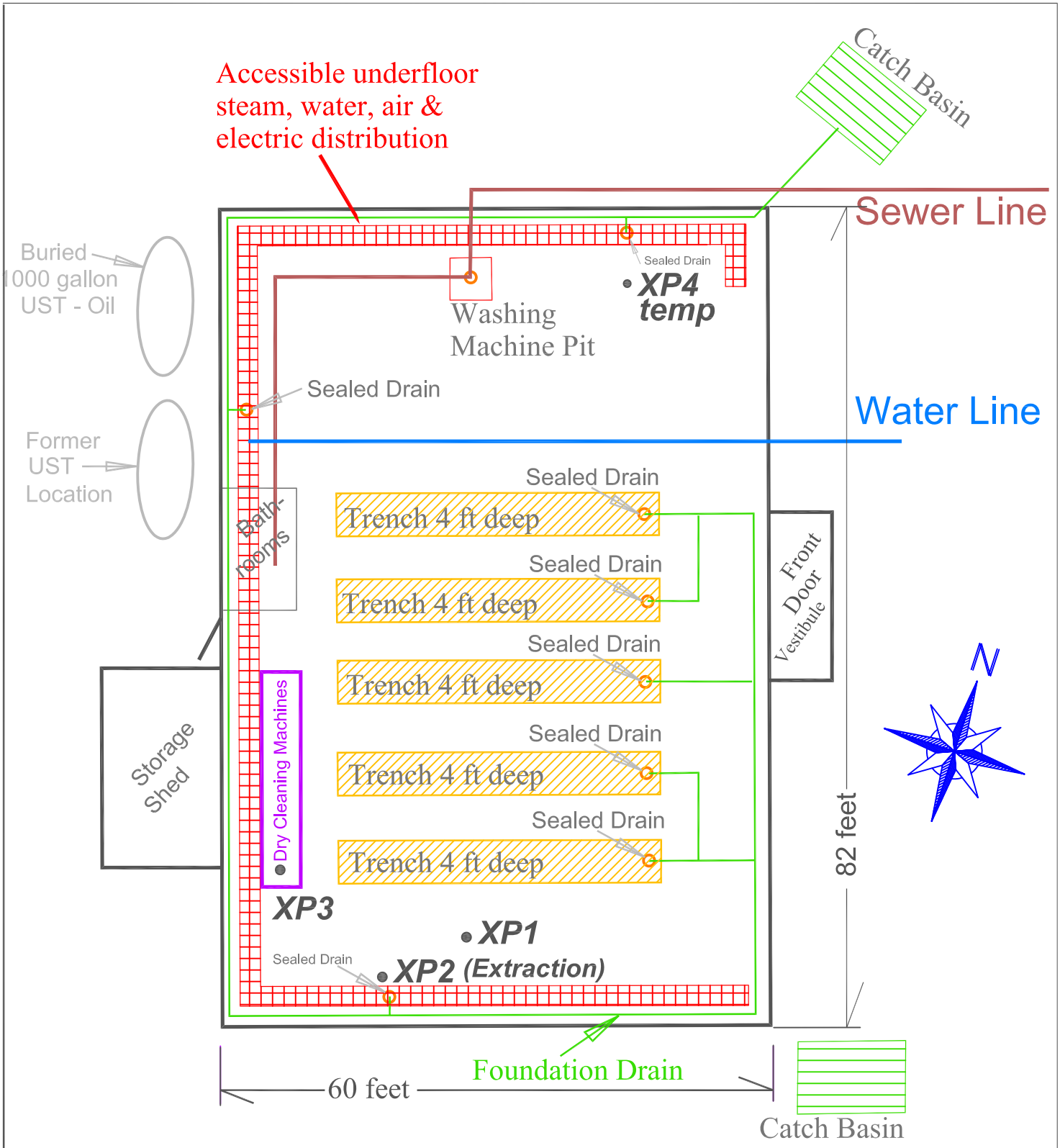

Figure 3. Floor plan showing location of vacuum extraction and monitoring points ***(XP1, XP2, XP3, XP4)*** American Cleaners
360 Route 211 East, Middletown, NY 10940
NYSDEC DER VCP V-00461, Sept 2012

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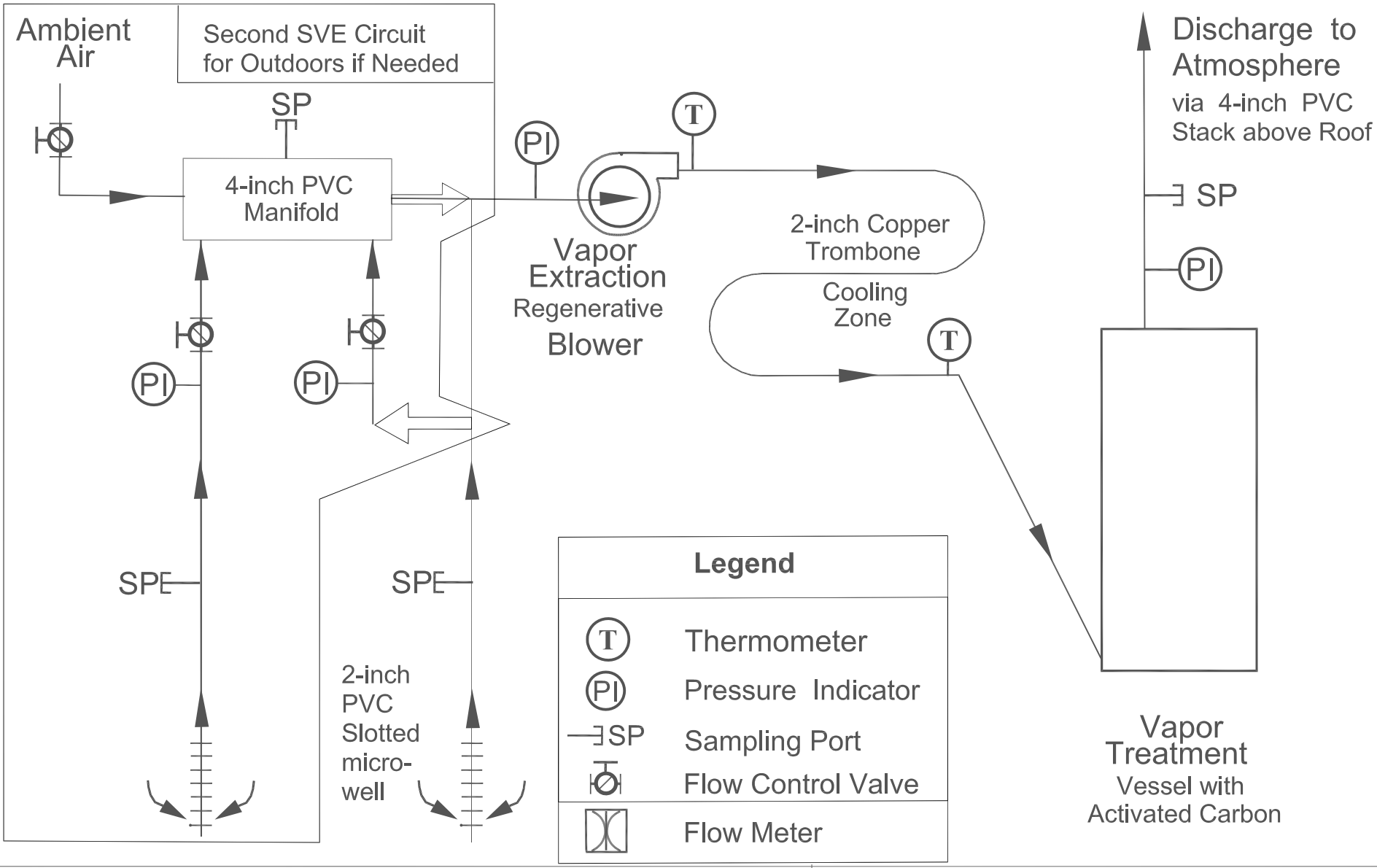

Figure 4. Schematic Diagram of Proposed Vapor Extraction System for American Cleaners
360 Route 211 East, Middletown, NY 10940
NYSDEC DER VCP V-00461-3, September 2012

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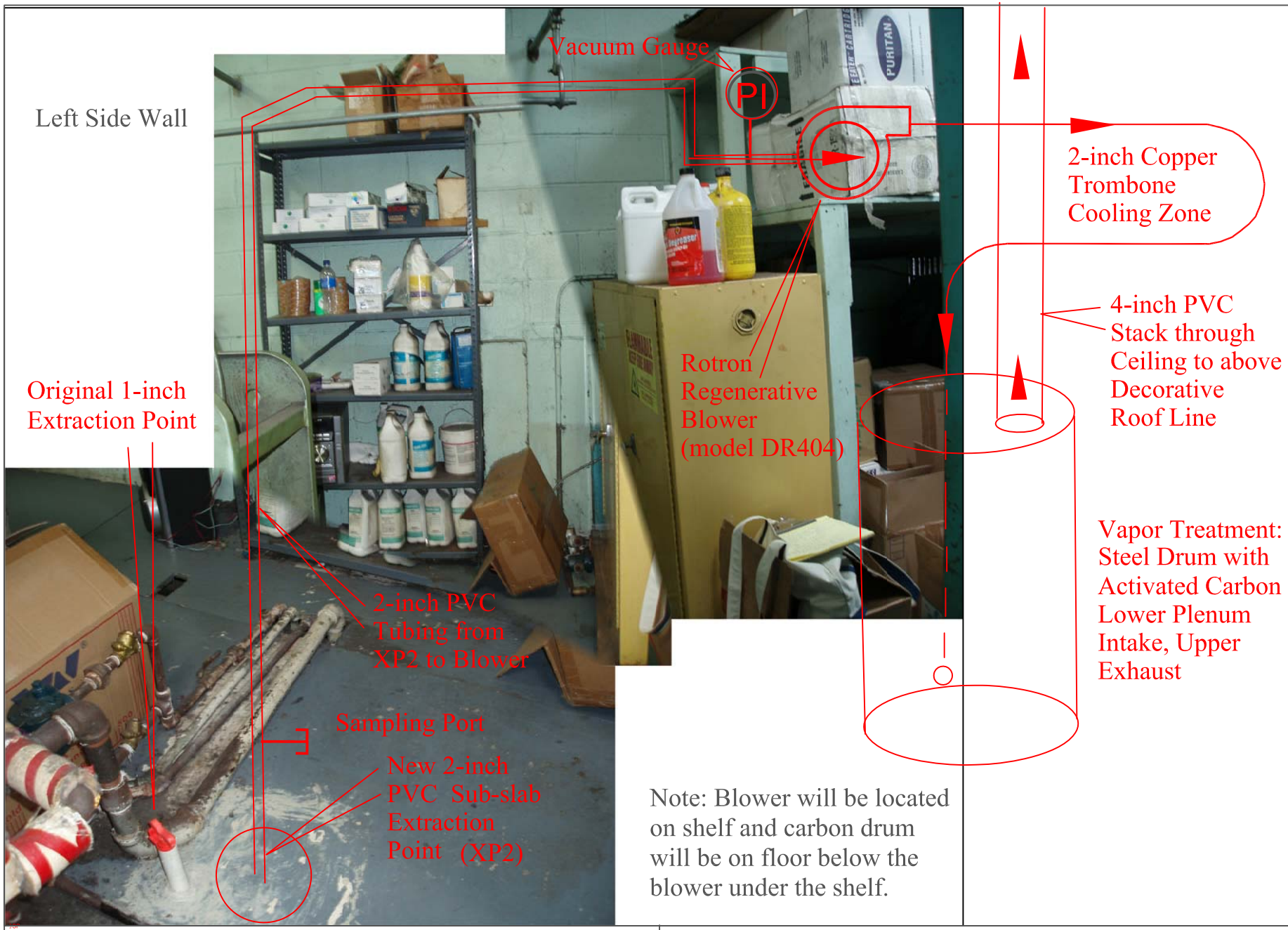

Figure 5. PVC lines from Extraction Point XP2 to Blower to Carbon Treatment to Exhaust Stack. Vapor Extraction System at American Cleaners, 360 Route 211 East, Middletown, NY 10940 NYSDEC DER VCP V-00461-3, Sept 2012

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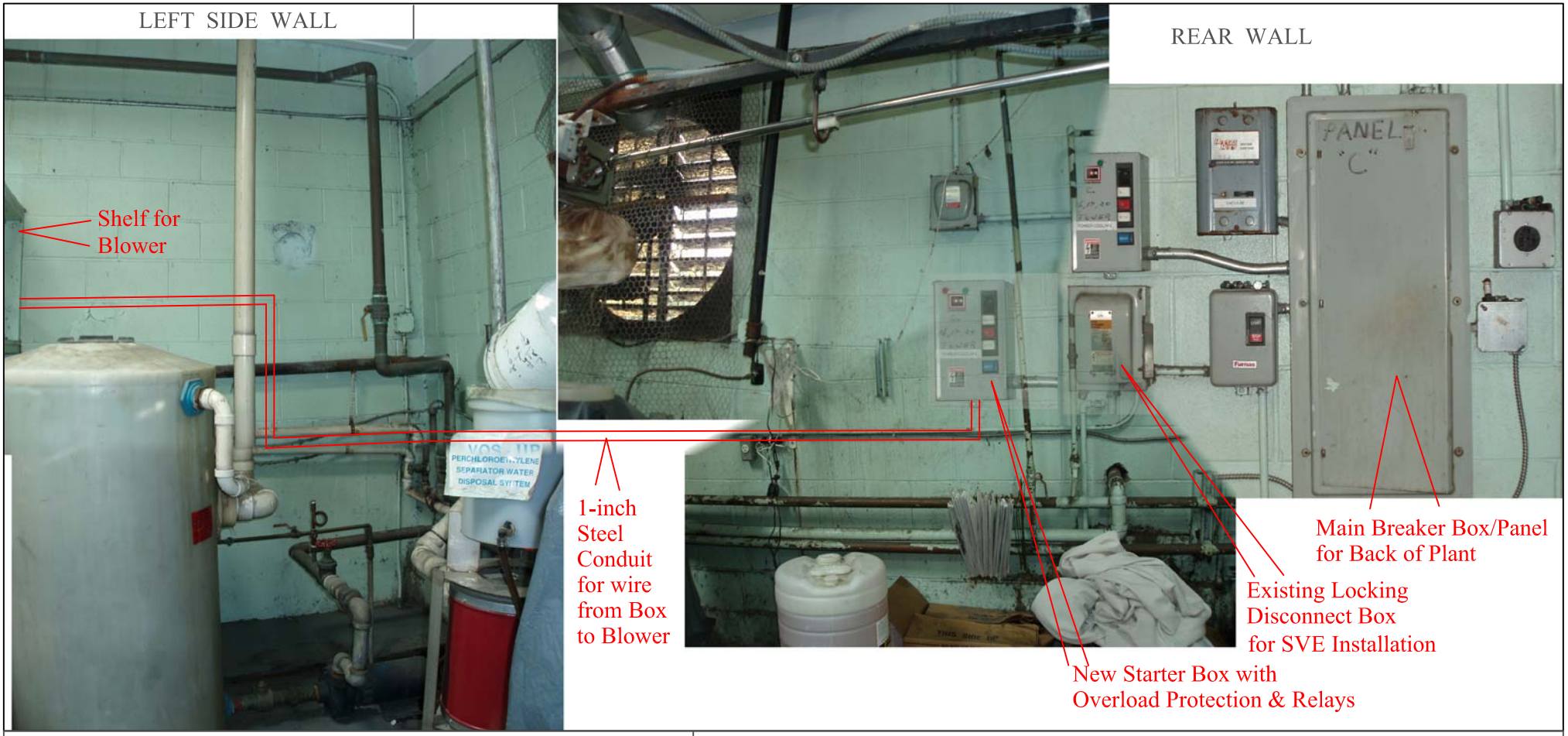

Figure 6. Wiring layout for installation of Rotron regenerative blower (model DR404) for the sub-slab vapor extraction system at American Cleaners, 360 Route 211 East, Middletown, NY 10940 NYSDEC DER VCP V-00461-3, September 2012

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Figure 7. Outside left rear corner of building from backyard showing location of 4-inch PVC stack for Vapor Extraction System at American Cleaners at 360 Route 211 East, Middletown, NY 10940
NYSDEC DER VCP V-00461-3, September 2012

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Figure 8. Area of excavation by back door to remove PCE-contamination at Sample #12S
Vapor Extraction System at American Cleaners at
360 Route 211 East, Middletown, NY 10940
NYSDEC DER VCP V-00461-3, September 2012

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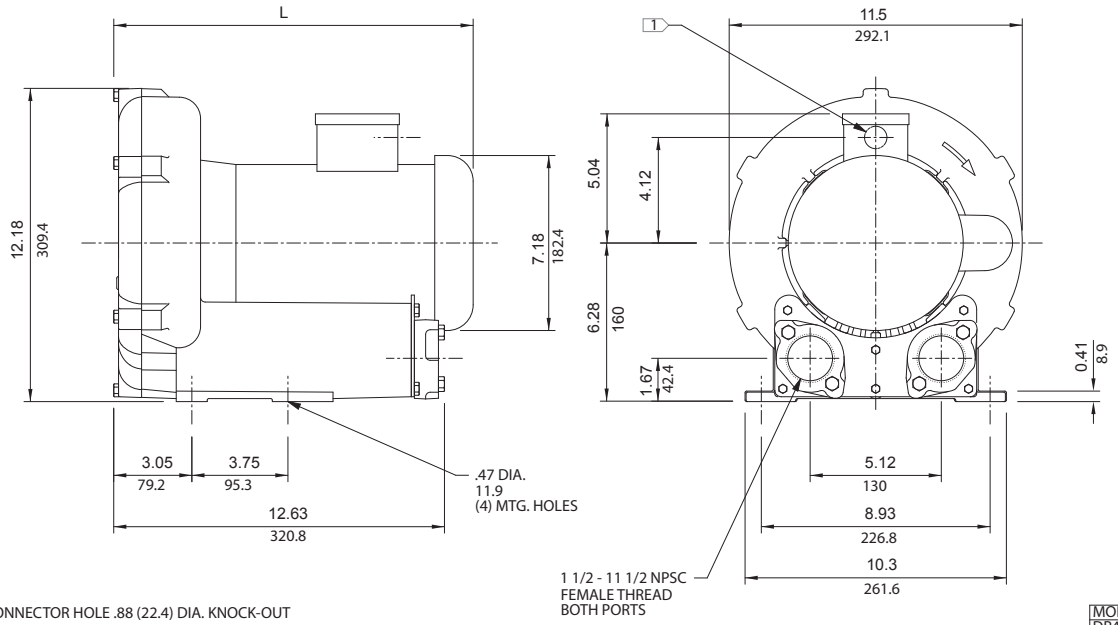
DR 404 & CP 404

ROTRON®

1.0 HP Regenerative Blower



IN
MM

NOTES
1. TERMINAL BOX CONNECTOR HOLE .88 (22.4) DIA. KNOCK-OUT
2. DRAWING NOT TO SCALE, CONTACT FACTORY FOR SCALE CAD DRAWING.
3. CONTACT FACTORY FOR BLOWER MODEL LENGTHS NOT SHOWN.

MODEL	L (IN/MM)
DR404AL58M	14.41/366.0
DR404AL72M	14.18/360.2
DR404AL86M	13.38/339.9

		Part/ Model Number			
		DR404AL58M	DR404AL72M	DR404AL86M	CP404CU72MLR
Specification	Units	037407	037406	037408	038233
Motor Enclosure - Shaft Mtl.	-	TEFC - CS	TEFC - CS	TEFC - CS	Chem TEFC - SS
Horsepower	-	1.0	1.0	1.0	1.0
Voltage	AC	115/230	230/460	575	230/460
Phase - Frequency	-	Single - 60 Hz	Three - 60 Hz	Three - 60 Hz	Three - 60 Hz
Insulation Class	-	F	F	F	F
NEMA Rated Motor Amps	Amps (A)	11.4/5.7	3.0/1.5	1.2	3.0/1.5
Service Factor	-	1.15	1.15	1.15	1.15
Max. Blower Amps	Amps (A)	14.5/7.25	4.0/2.0	1.4	4.0/2.0
Locked Rotor Amps	Amps (A)	70/35	21.0/10.5	7.6	21.0/10.5
NEMA Starter Size	-	00/00	00/00	00	00/00
Shipping Weight	Lbs	69	64	64	64
	Kg	31.3	29	29	29

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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DR 404 & CP 404

ROTRON®

1.0 HP Regenerative Blower

FEATURES

- Manufactured in the USA - ISO 9001 and NAFTA compliant
- CE compliant - Declaration of Conformity on file
- Maximum flow: 105 SCFM
- Maximum pressure: 58 IWG
- Maximum vacuum: 50 IWG
- Standard motor: 1.0 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

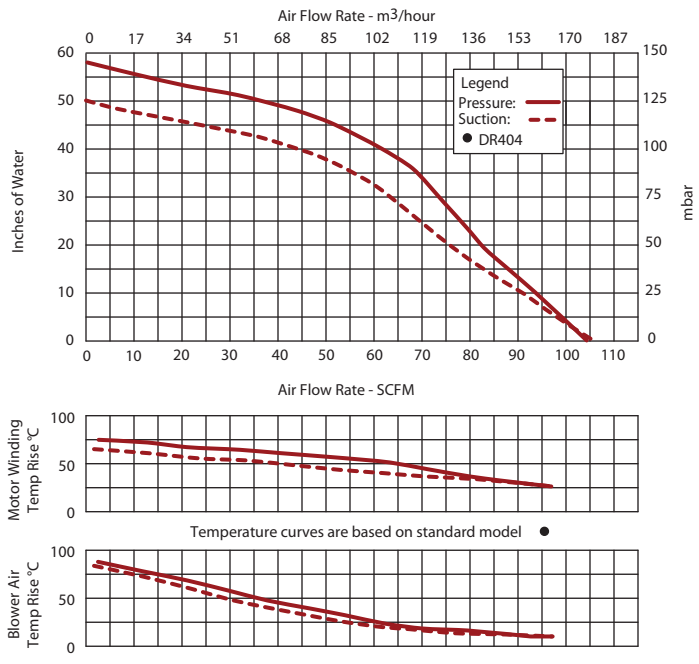
- Corrosion resistant surface treatments & sealing options
- Remote drive (motorless) models
- Slip-on or face flanges for application-specific needs

ACCESSORIES

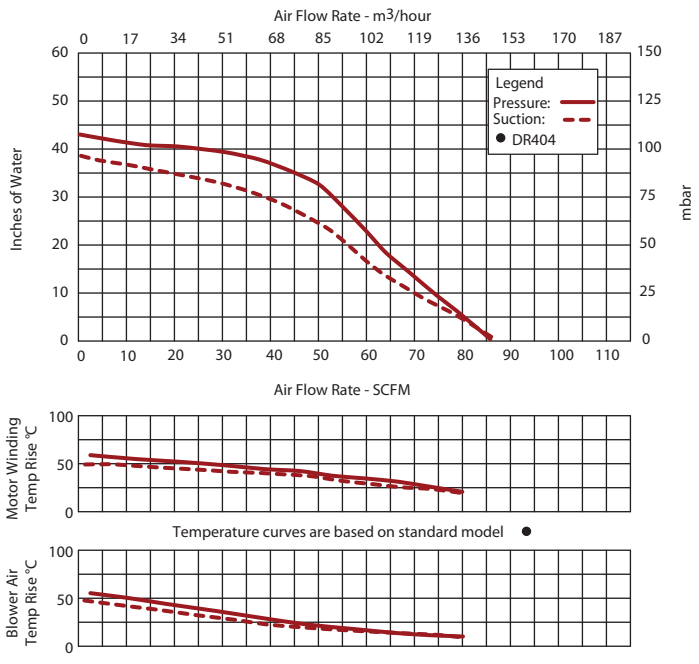
- Flowmeters reading in SCFM
- Filters & moisture separators
- Pressure gauges, vacuum gauges, & relief valves
- Switches - air flow, pressure, vacuum, or temperature
- External mufflers for additional silencing
- Air knives (used on blow-off applications)
- Variable frequency drive package

Blower Performance at Standard Conditions

60 Hz



50 Hz



This document is for informational purposes only and should not be considered as a binding description of the products or their performance in all applications. The performance data on this page depicts typical performance under controlled laboratory conditions. AMETEK is not responsible for blowers driven beyond factory specified speed, temperature, pressure, flow or without proper alignment. Actual performance will vary depending on the operating environment and application. AMETEK products are not designed for and should not be used in medical life support applications. AMETEK reserves the right to revise its products without notification. The above characteristics represent standard products. For product designed to meet specific applications, contact AMETEK Technical & Industrial Products Sales department.

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Vapor Phase Carbon Vessels

Request for Quote

Carbonair's GPC Series vapor phase carbon vessels are designed to provide an efficient and economical means to reduce VOC concentrations, corrosive gases, toxic vapors, and to control odor. Carbonair's GPC Series Vapor Phase Carbon Vessels can be filled with several types of granular activated carbons and other specialty media for a variety of applications. For more information on Vapor Phase Carbon and Specialty Media available from Carbonair please click here.

Carbonair's GPC Series vapor phase carbon vessels are constructed of high quality steel and treated with corrosion resistant paint inside and out. The GPC Series is designed to provide the most efficient use of the granular activated carbon in the bed and to provide the lowest pressure drop possible in order to minimize back pressure on blowers and other equipment. Some vessels use slotted plastic pipe to distribute the air flow across the carbon bed. This tends to create excessive back pressure and can cause channeling of the carbon bed, causing the waste of some of the carbon in the bed and premature breakthrough. Carbonair GPC vessels employ a carbon bed supported on a screened grate above a plenum. The air stream enters the vessel through the plenum where it is evenly distributed across the entire cross section of the carbon bed, providing the lowest pressure drop and most efficient use of the carbon.

Click here for specifications for our GPC Drum Series, GPC Round Series, and GPC Series of vapor phase carbon filters.

Vapor Phase Carbon Vessel Specifications; <1000 cfm

Model	GPC 3	GPC 3H	GPC 5R	GPC 7R	GPC 13R
Dimensions	24.5" OD x 36.5" H	24.5" OD x 36.5" H	30" OD x 5'7" H	3'2" OD x 7' H	4' OD x 7' H
Bed Area (Square Feet)	2.7	2.7	4.91	7.07	12.57
Nominal Flow Rate (cfm)	100	300	400	500	800
Carbon Capacity (pounds)	200	200	500	1,000	1,500

Fittings	2" NPT	4" NPT	4-1/2" nozzle	6-5/8" nozzle	8-5/8" nozzle
Empty Weight (pounds)	65	65	550	790	1,090
Operating Weight (pounds)	265	265	1,050	1,790	2,590

Vapor Phase Carbon Vessel Specifications; >1000 cfm

Model	GPC 20R	GPC 28R	GPC 50R	GPC 70	GPC 120
Dimensions	5' OD x 7' H	6' OD x 7'3" H	8' OD x 7' H	16' L x 5' W x 8'6" H	16'6" L x 8' W x 8'6" H
Bed Area (Square Feet)	19.63	28.30	50.27	69.80	120.00
Nominal Flow Rate (cfm)	2,000	2,500	4,000	7,000	12,000
Carbon Capacity (pounds)	2,000	3,000	5,000	10,000	13,500
Fittings	8-5/8" nozzle	8-5/8" nozzle	12-3/4" nozzle	12-3/4" nozzle	12-3/4" nozzle
Empty Weight (pounds)	1,425	1,795	3,970	5,850	9,250
Operating Weight (pounds)	3,425	4,795	8,970	15,850	22,750

Applications

We offer full service application support, from equipment sizing, carbon usage modeling, activated carbon analysis, on-site carbon change-out, filter exchange and spent carbon recycling. Typical applications include:

- VOC control from SVE systems and air strippers
- NESHAPS emissions control
- Wastewater, product storage tank and similar vents
- Odor and H2S control

Standard Features

- Galvanized steel drum (GPC 3, 3H)
- Two 4" PVC connections (GPC 3, 3H)
- Baked enamel exterior (GPC 3, 3H)
- PVC internals (GPC 3, 3H)
- Welded steel construction.
- Forkliftable tubes
- Epoxy coated interior & exterior
- One condensation drain
- FRP grate with screen
- Nozzle connections

Optional Components

- Blowers Humidity control
- Influent/effluent ducting
- Discharge stack
- Additional sampling ports and valves
- Vapor monitors

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Carbonair provides a complete selection of vapor phase carbon vessels. Contact us for more information!

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www.carbonair.com

Reactivated Granular Carbon (Vapor Phase)

Carbonair's reactivated granular carbon is manufactured from spent bituminous coal and coconut based carbon which has been thermally reactivated to regain its adsorptive capacity. This adsorbent media offers an economical option for treating low level organic hydrocarbons.

Typical Applications

Soil vapor extraction, air stripper off-gas, VOC control, and tank venting.

Typical Contaminants

Petroleum hydrocarbons such as MTBE, BTEX (benzene, toluene, ethylbenzene, xylenes), butylbenzene, isopropylbenzene, isopropylether, propylbenzene, styrene, trimethylbenzene, tetraethyl lead (TEL), low molecular weight PAHs (polyaromatic hydrocarbons such as naphthalene, methylnaphthalene) and high molecular weight PAHs (fluoranthene, phenanthrene, and pyrene).

Chlorinated and brominated hydrocarbons such as bromoform, bromodichloromethane, carbontetrachloride, chlorodibromomethane, chloroform, dibromochloropropane, dichloroethene (DCE), dichloroethane (DCA), ethylenedibromide, trichloroethane (TCA), trichloroethene (TCE), tetrachloroethane, and tetrachloroethene (PCE), and polychlorinated biphenyls (PCBs).

Typical Physical Properties*

Carbon Tetrachloride Number	55% (minimum)
Apparent density (dense packing)	30-31 lbs/ft^3
Hardness Number	95 (minimum)
Moisture Content (as packed)	2% (maximum)
Mesh Size	4x10

* Please consult with Carbonair for your specific application.

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10419 General Ave
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Virgin Granular Coal Based Carbon (Vapor Phase)

Carbonair's virgin granular coal based carbon is manufactured from selected grades of bituminous coal which provides high adsorption surface area with a broad pore size distribution (micropore, mesopore, and macropore). This adsorbent media is recommended for treating a variety of organic hydrocarbons.

Typical Applications

Soil vapor extraction, air stripper off-gas, VOC treatment, tank venting, and solvent recovery.

Typical Contaminants

Petroleum hydrocarbons such as MTBE, BTEX (benzene, toluene, ethylbenzene, xylenes), butylbenzene, isopropylbenzene, isopropylether, propylbenzene, styrene, trimethylbenzene, tetraethyl lead (TEL), low molecular weight PAHs (polyaromatic hydrocarbons such as naphthalene, methylnaphthalene) and high molecular weight PAHs (fluoranthene, phenanthrene, and pyrene).

Chlorinated and brominated hydrocarbons such as bromoform, bromodichloromethane, carbontetrachloride, chlorodibromomethane, chloroform, dibromochloropropane, dichloroethene (DCE), dichloroethane (DCA), ethylenedibromide, trichloroethane (TCA), trichloroethene (TCE), tetrachloroethane, and tetrachloroethene (PCE), and polychlorinated biphenyls (PCBs).

Typical Physical Properties*

Carbon Tetrachloride Number	60% (minimum)
Apparent density (dense packing)	27-31 lbs/ft^3
Hardness Number	95 (minimum)
Moisture Content (as packed)	2% (maximum)
Mesh Size	4x6, 4x10

* Please consult with Carbonair for your specific application.

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Virgin Granular Coconut Based Carbon (Vapor Phase)

Carbonair's virgin granular coconut based carbon is manufactured from selected grades of coconut shell which provides high adsorption surface area with a large quantity of micropores. This adsorbent media is best suited for contaminated air streams that contain low molecular weight organic hydrocarbons (MW < 150, approximately).

Typical Applications

Soil vapor extraction, air stripper off-gas, VOC control, tank venting, and solvent recovery.

Typical Contaminants

Petroleum hydrocarbons such as MTBE, BTEX (benzene, toluene, ethylbenzene, xylenes), butylbenzene, isopropylbenzene, isopropylether, propylbenzene, styrene, trimethylbenzene, and low molecular weight PAHs (polyaromatic hydrocarbons such as naphthalene, methylnaphthalene).

Chlorinated and brominated hydrocarbons such as bromoform, bromodichloromethane, carbontetrachloride, chlorodibromomethane, chloroform, dichloroethene (DCE), dichloroethane (DCA), ethylenedibromide, trichloroethane (TCA), trichloroethene (TCE), tetrachloroethane, and tetrachloroethene (PCE).

Typical Physical Properties*

Carbon Tetrachloride Number	60% (minimum)
Apparent density (dense packing)	28-30 lbs/ft^3
Hardness Number	95 (minimum)
Moisture Content (as packed)	2% (maximum)
Mesh Size	4x10

* Please consult with Carbonair for your specific application.

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For Remedial Investigation Work Plan Re-Evaluation: Soil Sampling, Groundwater Sampling, Slug Testing, Soil Gas Testing, and Vapor Extraction System Installation at New York State Department of Environmental Conservation,
Hazardous Waste Voluntary Cleanup Site No. V-00461-3
American Cleaners Store, 360 Route 211 East, Middletown, NY10940 Orange County, NY

A. SITE DESCRIPTION

Site: American Cleaners Store, Dry Cleaning and Customer Service
Date of Plan: November 08, 2009
Location: East Side of Route 211, in separate building at the southern end of Caldor Plaza or Shopping Center, East of MHV Federal Credit Union, accessed from the Plaza Entry and across a parking area
Hazards: Tetrachloroethene (PCE or Perc) was used in the dry cleaning process, A spill occurred in the parking area behind (south) of the building and waste PCE was placed in the dumpsters behind the building prior to hazardous waste control. PCE has migrated downward into the unconsolidated overburden sediments beneath the parking lot and under the building. PCE vapors have been detected beneath the building and beneath the pavement in downgradient locations. Dissolved PCE has been detected in groundwater sampled from Monitoring Wells around the building and downgradient toward Route 211. Ambient air gas sampling with Summa Canisters has shown no indoor air, outdoor air or subslab vapors contaminated with PCE above NYS DOH standards in the AC Building, the MHV Federal Credit Union, Cheeseburger Paradise Restaurant, nor the Vacant Video Store. Oil and gasoline spills were reported at the former Lloyds supermarket and gas station and auto service store to the south. The Lloyd buildings were demolished and spill remediation activities have not been investigated, nor impacts on AC evaluated.
Topography: The building lies at an elevation of approximately 560 feet above sea level on a slight slope to the north downward toward Route 211. Route 211 lies at an elevation approximately 520 feet. The MHV Federal Credit Union is northeast of AC at an elevation of approximately 550 feet and Cheeseburger Paradise is at a similar elevation to the northwest. The main building of the Caldor Plaza or Caldor Shopping Center lies on top of a ridge at an elevation of approximately 580 feet and elongated
Weather Conditions: Due to the hillside location and open fetch from the north and west, weather tends to be more windy than on lower ground. Prevailing winds are generally from the west or northwest.
Additional Information: American Cleaners continues to function as a dry cleaning operation with standard use of regulated solvents and standard operating procedures, which reduce human exposure and spillage of materials.

B. **CLEANUP OBJECTIVES** – The objective of this investigation is to define the extent and nature of tetrachloroethene contamination in soils and groundwater in the subsurface overburden materials surrounding the building.

C. **ONSITE ORGANIZATION AND COORDINATION** – The following personnel are designated to carry out the stated job functions on site. (Note: One person may carry out more than one job function.)

Health and Safety Officer ……. Katherine J Beinkafner, PhD, CPG
Project Engineer …… Jolanda G. Jansen, P.E.
Driller …….. Todd Syska
American Cleaners Owner and Site Manager …… Erez Halevah
NYSDEC Oversite and Project Manager ……..…Paul Patel, P.E.

All site visitors will also be given an introduction to the Health and Safety plan and relevant site procedures.
All personnel arriving or departing the site should log in and out with the Katherine Beinkafner or Erez Halevah. All activities on site must be cleared through the Katherine or Erez.

D. ONSITE CONTROL

The Health & Safety Officer has been designated to coordinate access control and security on site. Because hazardous or toxic waste is beneath the ground surface, the work zone will be defined by traffic cones, which define a safe perimeter. No one should enter the work zone without the acknowledgement of the driller or project manager. A hot zone will be defined if a need arises. The decontamination zone will be a special area where drill equipment is cleaned or safety gear is changed. If indeed, hazardous or toxic waste is detected through monitoring, the safety zones will immediately be established by the Health & Safety Officer.

A safe perimeter will be established with orange traffic cones and yellow or orange caution tape and will move with the drill rig from drill location to drill location. No unauthorized person should be within this area.
The onsite Command Post will be at the American Cleaner's front door if an emergency arises or at the back of the former Credit Union if the front door is unsafe. The staging area for drilling or other site operations will be on the north side of the building near the front so that people inside can see the equipment and workers outside.
The prevailing wind conditions are from the north and northwest, so the command post is upwind from the Work Zone, except in the case of drilling one upgradient well and work near the dumpsters.

E. HAZARD EVALUATION

The following substance(s) are known or suspected to be on site. The primary hazards of each are identified.

Substances Involved	Concentrations (If Known)	Primary Hazards
Tetrachloroethene	ND to 7800 ug/L in groundwater ND to 580,000 ug/m^3 in Soil Gas	

The following additional hazards are expected on site: uneven parking lot and paved areas, often wet areas or ice in winter, pot holes, weeds and overgrowth off the pavement.

Hazardous Substance Fact Sheet for tetrachloroethene is attached.

F. PERSONAL PROTECTIVE EQUIPMENT

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work areas or tasks:

Location	Job Function	Level of Protection
Work Zone	Drilling, Sampling	D until higher levels needed.
Contamination	N/A	A B C D Other
Reduction Zone	N/A	A B C D Other

Specific protective equipment for each level of protection is as follows:

Level A	Fully encapsulating suit, SCBA (disposable coveralls)
Level B	Splash gear (type), SCBA
Level C	Splash gear (type), Full-face canister respirator
Level D	**Hard Hats, Gloves, Safety Steel-toe Boots, Safety Glasses, Long sleeve shirts, long work pants.**

The following protective clothing materials are required for the involved substance(s):

Substance (Chemical Name)	Material (material name, e.g. Viton)
none at this time	none at this time

If air-purifying respirators are authorized, (filtering medium) is the appropriate canister for use with the involved substances and concentrations. A competent individual has determined that all criteria for using this type of respiratory protection have been met. Appropriate canister type will be filled in if dust, hazardous gas or vapors are detected on site.

No changes to the specified levels of protection shall be made without the approval of the site safety officer and the project team leader.

G. ONSITE WORK PLANS

The work party and any substitutes will be listed on the Signature Page of this Health and Safety Plan.

H. COMMUNICATION PROCEDURES

All other onsite communications will use voice commands.
Personnel in the Work Zone should remain in constant contact with or within sight of the Project Team Leader. Any failure of communication or accident or emergency requires an evaluation of whether personnel should leave the Work Zone.

Continuing Intermittent Horn BEEPING is the emergency signal to indicate that all personnel should leave the Work Zone and meet at the Command Post.

The following standard hand signals will be used in case of failure voice communications:

Hand gripping throat ---------- Out of air, can't breathe
Grip partner's wrist or ---------- Leave area immediately
both hands around waist
Hands on top of head ---------- Need assistance
Thumbs up ---------- OK, I am all right, I understand
Thumbs down ---------- No, negative

I. DECONTAMINATION PROCEDURES

Personnel and equipment in contact with contaminated soil or groundwater upon leaving the Work Zone shall be thoroughly decontaminated. The standard level "C" decontamination protocol shall be used with the following decontamination stations (if needed):

Emergency decontamination will include the following stations (if needed):

Equipment Drop
Outer Garment, Boots, and Gloves Wash and Rinse
Outer Boot and Glove Removal
Canister or Mask Change
Boot, Gloves and Outer Garment Removal
Face Plate Removal
Field Wash

The following decontamination equipment is required:

Buckets with Brushes
Gallons of Distilled or Bottled Water
Detergent
Benches
Plastic on Ground & Plastic Bags for Disposable items
Spare Canisters for Respirators

Detergent and water will be used as the decontamination solution.

J. SITE-SPECIFIC SAFETY AND HEALTH PLAN

1. The Site Safety Officer and is directly responsible to the Project Team Leader for safety recommendations on site.
2. Emergency Medical Care

Emergency Medical Service: Immediate Medical Care
111 Maltese Drive
Middletown, NY
(845) 342-4774

Hospital with Emergency Room: Orange Regional Medical Center
County Route 67, 707 East Main Street (See map to Hospital)
Middletown, NY 10940
(845) 333-1000

Ambulance Service: Regional EMS (845) 343-2345
Or Mobile Life Support (845) 343-1212

The following First-aid equipment is on site:
First-aid kit
Emergency eyewash
Emergency shower spray

List of emergency phone numbers:

Agency/Facility	Phone #	Contact
Police	845 343-3151	City of Middletown Police
Fire	845 343-7131	Silver Lake Volunteer Fire Co. 26 Maltese Dr, Middletown
Hospital	845 333-1000	Orange Regional Medical Ctr
Ambulance	845 343-2345	Regional EMS
	845 343-1212	Mobile Life Support

3. Environmental Monitoring (see attached Contingency Plan)

The following environmental monitoring instruments shall be used on site (cross out if not applicable) at the specified intervals.

Meter		Monitoring Frequency
Combustible Gas Indicator	-	excavation and fresh exposures
HNU/Microtip (VOCs)	-	excavation and fresh exposures

The following will be monitored if a relevant contingency plan is invoked:

Oxygen Monitor	-	continuous / hourly / daily / other
Colorimetric Tubes	-	continuous / hourly / daily / other
Air Temperature/Thermometer	-	continuous / hourly / daily / other
Radioactivity Meter	-	continuous / hourly / daily / other

4. Emergency Procedures (should be modified as required for incident)
The following standard emergency procedures will be used by onsite personnel. The Site Safety Officer shall be notified of any onsite emergencies and be responsible for ensuring that the appropriate procedures are followed.

Personnel Injury in the Work Zone: Upon notification of an injury in the Exclusion Zone, the designated emergency signal, continuing horn beeping shall be sounded. All site personnel shall assemble at the Command Post. The rescue team will enter the Work Zone (if required) to remove the injured person to safety. The Site Safety Officer and Project Team Leader should evaluate the nature of the injury, and the affected person should be decontaminated to the extent possible prior to movement. The onsite EMT shall initiate the appropriate first aid, and contact should be made for an ambulance and with the designated medical facility (if required). No persons shall reenter the Work Zone until the cause of the injury is determined.

Personnel Injury in the Support Zone: Upon notification of any injury in the Support Zone, the Project Team Leader and Site Safety Officer will assess the nature of the injury. If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue, with the onsite EMT initiating the appropriate first aid and necessary follow-up as stated above. If the injury increases the risk to others, the designated emergency signal, continuing intermittent horn beeping shall be sounded and all site personnel shall move to the decontamination line for further instructions. Activities on site will stop until the added risk is removed or minimized.

Fire/Explosion: Upon notification of a fire or explosion on site, the designated emergency signal continuing intermittent horn beeping shall be sounded and all site personnel assembled at the Command Post. The fire department shall be alerted and all personnel moved to a safe distance from the involved area.

Personal Protective Equipment Failure: If any site worker experiences a failure or alteration or protective equipment that affects the protection factor, that person and his/her buddy shall immediately leave the Work Zone. Reentry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure: If any other equipment on site fails to operate properly, the Project Team Leader and Site Safety Officer shall be notified and then determine the effect of this failure on continuing operation on site. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel shall leave the Work Zone until the situation is evaluated and appropriate actions taken.

5. PERSONAL MONITORING

The following personal monitoring will be in effect on site.
Personal exposure sampling: Total VOCs will be measured with an hnu DL-101 or photovac microtip HL-2000 or HL-3000 or MiniRAE- 2000 at the well bore or monitoring wells or soil sampling locations to assess the safety of the breathing zone.

Medical monitoring: The expected air temperature will be (50°F). If it is determined that heat stress monitoring is required (mandatory if over 70°F) the following procedures shall be followed: monitoring body temperature, respiration rate, pulse rate. If a level of personal Protection higher than C is required, continuous outdoor temperature monitoring will be a standard operating procedure and will be described in the revision of this Plan.

Health and Safety Plan Acknowledgement and Agreement Page

I acknowledge I have reviewed a copy of this Health and Safety Plan for American Cleaners Middletown Site, understand it, and agree to comply with its provisions.

►Health and Safety Officer _____
Name Company
_____/_____/_____
Date Signature EMT? CPR? FirstAid?FirstResponder?

► _____
Position Name Company
_____/_____/_____
Date Signature EMT? CPR? FirstAid?FirstResponder?

► _____
Position Name Company
_____/_____/_____
Date Signature EMT? CPR? irstAid?FirstResponder?

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	845 343-1212	Mobile Life Support

ATSDR
AGENCY FOR TOXIC SUBSTANCES AND DISEASE REGISTRY

TETRACHLOROETHYLENE
CAS # 127-18-4

Agency for Toxic Substances and Disease Registry ToxFAQs **September 1997**

This fact sheet answers the most frequently asked health questions (FAQs) about tetrachloroethylene. For more information, call the ATSDR Information Center at 1-888-422-8737. This fact sheet is one in a series of summaries about hazardous substances and their health effects. It's important you understand this information because this substance may harm you. The effects of exposure to any hazardous substance depend on the dose, the duration, how you are exposed, personal traits and habits, and whether other chemicals are present.

HIGHLIGHTS: Tetrachloroethylene is a manufactured chemical used for dry cleaning and metal degreasing. Exposure to very high concentrations of tetrachloroethylene can cause dizziness, headaches, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death. Tetrachloroethylene has been found in at least 771 of the 1,430 National Priorities List sites identified by the Environmental Protection Agency (EPA).

What is tetrachloroethylene?

(Pronounced tĕt′rə-klôr′ ō-ĕth′ə-lēn′)

Tetrachloroethylene is a manufactured chemical that is widely used for dry cleaning of fabrics and for metal-degreasing. It is also used to make other chemicals and is used in some consumer products.

Other names for tetrachloroethylene include perchloroethylene, PCE, and tetrachloroethene. It is a nonflammable liquid at room temperature. It evaporates easily into the air and has a sharp, sweet odor. Most people can smell tetrachloroethylene when it is present in the air at a level of 1 part tetrachloroethylene per million parts of air (1 ppm) or more, although some can smell it at even lower levels.

What happens to tetrachloroethylene when it enters the environment?

- Much of the tetrachloroethylene that gets into water or soil evaporates into the air.
- Microorganisms can break down some of the tetrachloroethylene in soil or underground water.
- In the air, it is broken down by sunlight into other chemicals or brought back to the soil and water by rain.
- It does not appear to collect in fish or other animals that live in water.

How might I be exposed to tetrachloroethylene?

- When you bring clothes from the dry cleaners, they will release small amounts of tetrachloroethylene into the air.
- When you drink water containing tetrachloroethylene, you are exposed to it.

How can tetrachloroethylene affect my health?

High concentrations of tetrachloroethylene (particularly in closed, poorly ventilated areas) can cause dizziness, headache, sleepiness, confusion, nausea, difficulty in speaking and walking, unconsciousness, and death.

Irritation may result from repeated or extended skin contact with it. These symptoms occur almost entirely in work (or hobby) environments when people have been accidentally exposed to high concentrations or have intentionally used tetrachloroethylene to get a "high."

In industry, most workers are exposed to levels lower than those causing obvious nervous system effects. The health effects of breathing in air or drinking water with low levels of tetrachloroethylene are not known.

Results from some studies suggest that women who work in dry cleaning industries where exposures to tetrachloroethyl-

ene can be quite high may have more menstrual problems and spontaneous abortions than women who are not exposed. However, it is not known if tetrachloroethylene was responsible for these problems because other possible causes were not considered.

Results of animal studies, conducted with amounts much higher than those that most people are exposed to, show that tetrachloroethylene can cause liver and kidney damage. Exposure to very high levels of tetrachloroethylene can be toxic to the unborn pups of pregnant rats and mice. Changes in behavior were observed in the offspring of rats that breathed high levels of the chemical while they were pregnant.

How likely is tetrachloroethylene to cause cancer?

The Department of Health and Human Services (DHHS) has determined that tetrachloroethylene may reasonably be anticipated to be a carcinogen. Tetrachloroethylene has been shown to cause liver tumors in mice and kidney tumors in male rats.

Is there a medical test to show whether I've been exposed to tetrachloroethylene?

One way of testing for tetrachloroethylene exposure is to measure the amount of the chemical in the breath, much the same way breath-alcohol measurements are used to determine the amount of alcohol in the blood.

Because it is stored in the body's fat and slowly released into the bloodstream, tetrachloroethylene can be detected in the breath for weeks following a heavy exposure.

Tetrachloroethylene and trichloroacetic acid (TCA), a breakdown product of tetrachloroethylene, can be detected in the blood. These tests are relatively simple to perform. These tests aren't available at most doctors' offices, but can be performed at special laboratories that have the right equipment.

Because exposure to other chemicals can produce the same breakdown products in the urine and blood, the tests for breakdown products cannot determine if you have been exposed to tetrachloroethylene or the other chemicals.

Has the federal government made recommendations to protect human health?

The EPA maximum contaminant level for the amount of tetrachloroethylene that can be in drinking water is 0.005 milligrams tetrachloroethylene per liter of water (0.005 mg/L).

The Occupational Safety and Health Administration (OSHA) has set a limit of 100 ppm for an 8-hour workday over a 40-hour workweek.

The National Institute for Occupational Safety and Health (NIOSH) recommends that tetrachloroethylene be handled as a potential carcinogen and recommends that levels in workplace air should be as low as possible.

Glossary

Carcinogen: A substance with the ability to cause cancer.

CAS: Chemical Abstracts Service.

Milligram (mg): One thousandth of a gram.

Nonflammable: Will not burn.

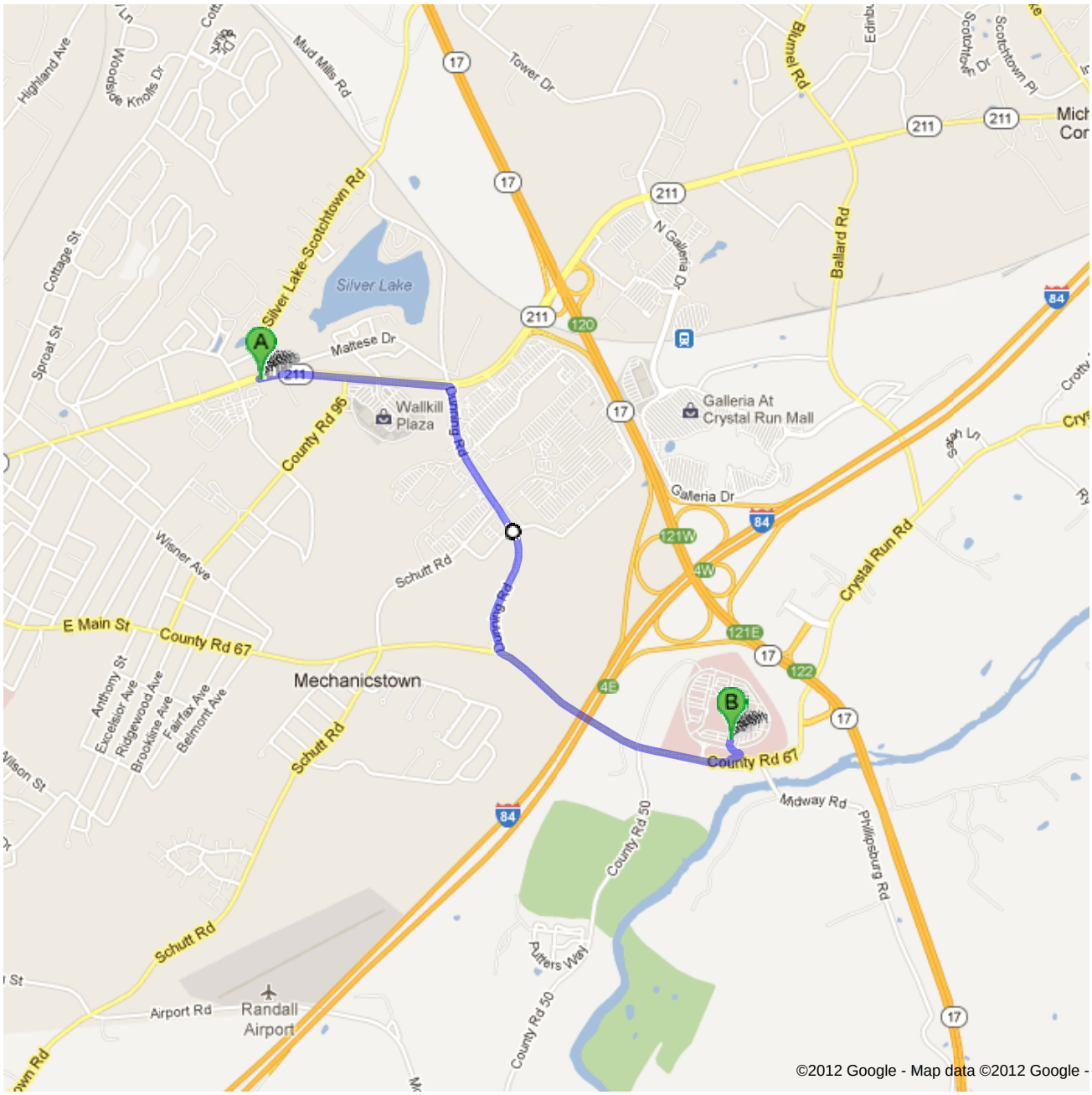
References

This ToxFAQs information is taken from the 1997 Toxicological Profile for Tetrachloroethylene (update) produced by the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services, Public Health Service in Atlanta, GA.

Where can I get more information? For more information, contact the Agency for Toxic Substances and Disease Registry, Division of Toxicology, 1600 Clifton Road NE, Mailstop F-32, Atlanta, GA 30333. Phone:1-888-422-8737, FAX: 770-488-4178. ToxFAQs Internet address via WWW is http://www.atsdr.cdc.gov/toxfaq.html ATSDR can tell you where to find occupational and environmental health clinics. Their specialists can recognize, evaluate, and treat illnesses resulting from exposure to hazardous substances. You can also contact your community or state health or environmental quality department if you have any more questions or concerns.

Google

Directions to Orange Regional Medical Center
707 E Main St, Middletown, New York 10940 - (
845) 333-1000
2.2 mi – about **7 mins**



360 New York 211, Middletown, NY 10940

1.	Head **east** on **NY-211 E** toward **Silver Lake Scotchtown Rd** About 1 min	go 0.5 mi total 0.5 mi
2.	Turn right onto **County Rd 92/Dunning Rd** About 3 mins	go 0.8 mi total 1.4 mi
3.	Turn left onto **County Rd 67/E Main St** About 2 mins	go 0.8 mi total 2.1 mi
4.	Turn left	go 0.1 mi total 2.2 mi

Orange Regional Medical Center
707 E Main St, Middletown, New York 10940 - (845) 333-1000

These directions are for planning purposes only. You may find that construction projects, traffic, weather, or other events may cause conditions to differ from the map results, and you should plan your route accordingly. You must obey all signs or notices regarding your route.

Directions weren't right? Please find your route on maps.google.com and click "Report a problem" at the bottom left.

Appendix 4:
Community Air Monitoring Plan, September 12, 2012, page 1 of 3
For Remedial Investigation Work Plan Re-Evaluation: Soil Sampling, Groundwater Sampling, Slug Testing, Soil Gas Testing, and Vapor Extraction System Installation at New York State Department of Environmental Conservation,
Hazardous Waste Voluntary Cleanup Site No. V-00461-3
American Cleaners Store, 360 Route 211 East, Middletown, NY10940 Orange County

Community air monitoring consists of two types of monitoring: continuous and periodic. Specific meters are required to monitor air. A photo-ionization detector (PID) is used to measure VOCs in air and a particulate meter is used to monitor dust. NYSDOH and NYSDEC provide specific guidelines to respond to monitoring measurements.

Continuous Monitoring will be conducted for the ground intrusive activities identified in the RIWP such as advancement of soil borings and installation of monitoring wells. Since these tasks will be performed outdoors in a public parking lot, continuous monitoring will be conducted 5 to 150 feet downwind of the boring / well locations avoiding any exhaust from machinery. A data recording Hnu (photo-ionization) meter will be used to monitor the VOCs in the air. Particulate dust will be monitored with a DataRAM™. The equipment will be calibrated at least once each day or in accordance with manufacturers' recommendations.

Periodic monitoring for VOCs will be conducted during the non-intrusive tasks of well development and collection of groundwater samples from monitoring wells. Readings will be taken with the Hnu meter when the cap of the monitoring well is first opened to determine if VOCs have accumulated above the water table inside the well casing. Readings will be obtained while the purge water is accumulating in the graduated cylinder to ascertain if VOCs are degassing from the pump discharge water.

The following two sections are from the generic CAMP in Appendix 1A in the back of the DER-10 manual (November 2009). They describe what actions to take based on monitoring results reaching specific measurement levels.

VOC Monitoring, Response Levels, and Actions

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

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

readings) below 5 ppm over background, work activities can resume with continued monitoring.

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

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

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

Particulate Monitoring, Response Levels, and Actions

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

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

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

particulate concentration to within 150 mcg/m^3 of the upwind level and in preventing visible dust migration.

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

ppbRAE 3000

Portable Handheld VOC Monitor

The ppbRAE 3000 is the most advanced handheld volatile organic compound (VOC) monitor on the market. Its photoionization detector's (PID) extended range of 1 ppb to 10,000 ppm makes it an ideal instrument for applications from HazMat/Homeland Security and industrial hygiene to Indoor Air Quality and military applications.

The **RF modem allows real-time data communication** with a base controller located up to 500 feet away from the ppbRAE 3000 detector (or two miles with optional RAELink3 portable modem). A personal computer can be used as the base station for a ppbRAE 3000 system. The standard ProRAE Remote software is capable of monitoring the input of up to 64 remotely located monitors, including ppbRAE 3000, AreaRAE, etc.

Wireless

AutoRAE Compatible

Key Features

- **Proven PID technology.** The patented sensor provides the following unique features:
  - 3-second response time
  - Extended range from 1 ppb to 10,000 ppm with improved linearity
  - Humidity compensation with integral humidity and temperature sensors
- **Real-time wireless** data transmission with built-in RF modem or Bluetooth
- **Designed for simple service** Easy access to lamp and sensor in seconds without tools
- **Big graphic display** for easy overview of gas type, Correction Factor and concentration
- **Field-interchangeable battery pack** replaced in seconds without tools
- **Integrated flashlight** for better view in dark conditions
- **User-friendly screens including dataplot chart view**
- **Integrated RAE Systems Correction Factors list for more than 200 compounds** to measure more chemicals than any other PID
- **Multi-language support** with 12 languages encoded
- **Rugged housing** withstands use in harsh environments
  - IP67 waterproof design for easy cleaning and decontamination in water
  - Strong, protective removable rubber boot

Additional Advantages

- View real-time sensor data and alarm status at headquarters or command center
- Automatic lamp type recognition
- Duty-cycling™ lamp and sensor auto-cleaning technology
- Tough, flexible inlet Flexi-Probe™
- 3 Large keys operable with 3 layers of gloves
- Strong, built-in sample pump draws up to 100 feet (30m) horizontally or vertically
- Loud 95 dB audible alarm
- Bright red flashing visual alarm
- Interchangeable drop-in Lithium-Ion and alkaline battery packs
- Charging cradle doubles as an external battery charger
- Compatible with AutoRAE™ calibration station
- ProRAE Remote software simultaneously controls and displays readings for up to 64 remote detectors
- License free, ISM band RF transmission with communication range up to 500 feet (2 miles with optional RAELink3 modem)
- Optional RAELink3 modem provides GPS capability to track and display readings from remote detectors and provides up to 2 miles long distance transmission
- Data logging with up to 6 months of data at one-minute intervals
- 3-year 10.6 eV lamp Warranty

ppbRAE 3000

Specifications*

Detector Specifications

Size	10" L x 3.0" W x 2.5" H (25.5 cm x 7.6 cm x 6.4 cm)
Weight	26 oz (738 g)
Sensors	Photoionization sensor with standard 10.6 eV or optional 9.8 eV or 11.7 eV lamps
Battery	• Rechargeable, external field-replaceable Lithium-Ion battery pack • Alkaline battery adapter
Operating Hours	16 hours of operation (12 hours with alkaline battery)
Display Graphic	4 lines, 28 x 43 mm, with LED backlight for enhanced display readability
Keypad	1 operation and 2 programming keys, 1 flashlight on/off
Direct Readout	Instantaneous reading • VOCs as ppm by volume • High values • STEL and TWA • Battery and shutdown voltage • Date, time, temperature
Alarms	95dB at 12" (30 cm) buzzer and flashing red LED to indicate exceeded preset limits • High: 3 beeps and flashes per second • Low: 2 beeps and flashes per second • STEL and TWA: 1 beep and flash per second • Alarms latching with manual override or automatic reset • Additional diagnostic alarm and display message for low battery and pump stall
EMI/RFI	Highly resistant to EMI/RFI. Compliant with EMC directive (2004/108/EC); R & TTE directive (1999/5/EC)
IP Rating	• IP67 unit off and without flexible probe • IP65 unit running
Datalogging	Standard 6 months at one-minute intervals
Calibration	Two-point or three-point calibration for zero and span. Calibration memory for 8 calibration gases, alarm limits, span values and calibration dates
Sampling Pump	• Internal, integrated flow rate at 500 cc/mn • Sample from 100' (30m) horizontally and vertically
Low Flow Alarm	• Auto pump shutoff at low-flow condition
Communication	• Download data and upload instrument set-up from PC through charging cradle or optional Bluetooth™ • Wireless data transmission through built-in RF modem
Frequency	902 to 928 MHz (license-free), 2.400 to 2.4835 GHz (license-free), 433 MHz, 869 MHz
RF Range	Up to 500' (152m; 900 MHz, 433 Mhz, 869 Mhz), extendable with RAELink3 Repeater to 2 miles (3.2km)
Hazard Area Approval	• **US and Canada:** c SP us, Classified as Intrinsically Safe for use in Class I, Division 1 Groups A, B, C, D • **Europe:** ATEX II 2G EEx ia IIC T4
Temperature	-4° to 122° F (-20° to 50° C)
Humidity	0% to 95% relative humidity (non-condensing)
Attachments	Durable black rubber boot
Warranty	3 years for 10.6 eV lamp, 1 year for pump, battery, sensor and instrument

*Specifications are subject to change

Sensor Specifications

Gas Monitor	Range	Resolution	Response Time T90
VOCs	0 to 9999 ppb 10 to 99 ppm 100 to 999.9 ppm 1000 to 9999 ppm	1 ppb 0.01 ppm 0.1 ppm 1 ppm	< 3 s < 3 s < 3 s < 3 s

Monitor only includes:

- ppbRAE 3000 Monitor, Model PGM-7340
- Wireless communication module built in, as specified
- Datalogging with ProRAE Studio Package for Windows™ 98, 2000, NT, ME & XP
- Charging/download adapter
- RAE UV lamp, as specified
- VOC Zeroing Tubes (1 box)
- Tube adapter
- Tedlar® bag for calibration
- Flex-I-Probe™
- External filter
- Rubber boot with straps
- Alkaline battery adapter
- Lamp-cleaning kit
- Tool Kit
- Operation CD-ROM
- Operation & Maintenance manual
- Soft leather case

Monitor with accessories kit adds:

- Hard transport case with pre-cut foam padding
- Charging/download cradle
- 5 Porous metal filters and O-rings
- Organic vapor zeroing kit
- Gas outlet port adapter and tubing

Optional calibration kit adds:

- 10 ppm isobutylene calibration gas, 34L
- Calibration regulator and flow controller

Optional Guaranteed Cost of Ownership Program:

- 4-year repair and replacement guarantee
- Annual maintenance service

DISTRIBUTED BY:

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