



Robert E. Lee & Associates, Inc.

Engineering, Surveying, Environmental Services

Green Bay Office
1250 Centennial Centre Boulevard
Hobart, WI 54155-8995
920-662-9641
FAX 920-662-9141

June 9, 2014

Mr. James Brunnuquell
TPAL, LLC
1708 12th Avenue
Grafton, WI 53024



RE: Indoor Air and Vapor Sampling Results for 1224 11th Avenue, Grafton, Wisconsin
WDNR BRRTS #02-46-560212

FID #24966470

Dear Mr. Brunnuquell:

This correspondence is to provide you with the results of the indoor air and sub-slab vapor sampling conducted on April 9, 2014 within the interior of your building located at 1124 11th Avenue, Grafton, Wisconsin. The sampling was conducted by Robert E. Lee & Associates, Inc., (REL) as required by the Wisconsin Department of Natural Resources (WDNR) for the on-going environmental investigation of a historic dry cleaning solvent release identified at former Quality Cleaners (the Site). Initial investigation results indicate that soil and groundwater at the Site are contaminated with dry cleaning solvents. Based on these findings, the responsible party will be taking actions to protect the public from potentially unhealthy exposures to these contaminants.

The purpose of the sampling was to determine whether dry cleaning related compound vapors from the subsurface contamination are migrating through soil and into the air (atmosphere) in the building. One 24-hour indoor air sample (IA-3) was collected from within the building and one sub-slab vapor sample (SSV-3) was collected from beneath the building floor via sampling devices installed in the floor. The samples were submitted to Pace Analytical Services, Inc., of Minneapolis, Minnesota for analysis of the following dry cleaning related compounds: cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), tetrachloroethene (PCE), trichloroethene (TCE), and vinyl chloride. A copy of the laboratory report is attached, and the results are summarized in Table 1.

Sub-Slab Vapor Results

Concentrations of PCE were detected in the sub-slab vapor sample collected from beneath the building's floor on this day; however, the concentrations are below the health-based Vapor Risk Screening Level established by the WDNR for halting exposures. The WDNR sub-slab Vapor Risk Screening Level (VRSL) for PCE is a health-based risk standard for long-term exposure and is a protective value that serves as a threshold of when sub-slab soil vapor concentrations may start to pose a risk for reaching and affecting indoor air quality.

Indoor Air Results

Concentrations of PCE were also detected in the indoor air of the building on this day; however, the concentrations are below the Vapor Action Level established by the WDNR. The WDNR Vapor Action Level (VAL) for PCE is a health-based risk standard for long-term exposure and is set at a concentration that is protective of human health and serves as a threshold above which exposure needs to be halted.

Conclusions

The WDNR, Wisconsin Department of Health Services (WDHS), and the Ozaukee County Health Department are working together with the responsible party to protect the public from exposures to the dry cleaning related contamination at the Site.

Although PCE concentrations were not detected above health-based risk standards in the levels of PCE in the sub-slab vapor and indoor air samples from your building, we have been informed that the WDNR is requiring at a minimum one additional indoor air and sub-slab vapor sample be collected from/beneath your building during the winter months (i.e., January or February). You will be contacted in the future to schedule the additional sampling.

In addition, the other buildings near the Site may be tested during the site investigation to determine if there are impacts to other off-site properties. Once the site investigation activities are complete, the WDNR will require remediation of the contaminated soil and groundwater at the Site to reduce the potential for PCE vapors in the future.

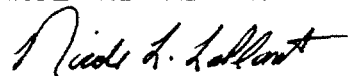
Enclosed are publications provided by the WDNR and WDHS that provide further information on vapor intrusion at properties.

Please feel free to contact Mr. John Feeny of the WDNR (920-893-8523) with any questions or concerns regarding the sampling results or required future actions for the Site. You may also contact Nicole LaPlant of Robert E. Lee & Associates, Inc., (920-662-9641) regarding results of the sampling.

Please contact Ms. Liz Evans of the Wisconsin Department of Health Services at 608-266-3393 or Mr. Dan Ziegler of the Ozaukee County Public Health Department at 262-284-8170 with any questions regarding any health questions related to the PCE concentrations detected in your building.

Sincerely,

ROBERT E. LEE & ASSOCIATES, INC.



Nicole L. LaPlant
Senior Project Geologist



Bruce D. Meissner, PG
Environmental Services Manager

NLL/BDM/LAR

ENC.

CC/ENC: Mr. Gerald Kuehl
Mr. John Feeny, WDNR
Ms. Liz Evans, WDHS
Mr. Dan Ziegler, Ozaukee County Health Department

TABLE 1
SUB-SLAB VAPOR AND AIR ANALYTICAL RESULTS SUMMARY
ADJACENT RESIDENTIAL/COMMERCIAL PROPERTY TO FORMER QUALITY CLEANERS, GRAFTON, WI

Sample ID	Sample Location	Sample Type	Date Collected	Relevant VOCs ($\mu\text{g}/\text{m}^3$)				
				PCE	TCE	Cis-1,2 DCE	Trans-1,2 DCE	Vinyl Chloride
Residential Sub-Slab Vapor Risk Screening Level (VRSL) -- $\mu\text{g}/\text{m}^3$				420	21	---	630	16
Residential Indoor Air Vapor Action Level (VAL) -- $\mu\text{g}/\text{m}^3$				42	2.1	---	63	1.6
SSV-3	1224 11th Avenue	Sub-slab	4/9/2014	375	ND	ND	ND	ND
IA-3		Indoor air		3.4	ND	ND	ND	ND
OA-2	Parking lot, east of building along east property boundary (upwind)	Outdoor air		1	ND	ND	ND	ND

Key:

- = No screening level established
- ND = Not detected above laboratory detection limits
- $\mu\text{g}/\text{m}^3$ = Micrograms per cubic meter
- PCE = Tetrachloroethene
- TCE = Trichloroethene
- Cis-1,2 DCE = Cis-1,2 Dichloroethene
- Trans-1,2 DCE = Trans-1,2 Dichloroethene
- 450 = Vapor Risk Screening Level (VRSL) exceeded

Notes:

- 1.) Sub-slab samples collected using Vapor Pin.
- 2.) The Vapor Risk Screening Level (VRSL) was calculated by multiplying the VAL by a dilution factor of 10 for residential buildings, in accordance with WDNR guidance.

May 27, 2014

Nicole LaPlant
Robert E. Lee & Associates
1250 Centennial Center Blvd.
Hobart, WI 54155

RE: Project: S446-001 Former Quality Cleane
Pace Project No.: 10263141

Dear Nicole LaPlant:

Enclosed are the analytical results for sample(s) received by the laboratory on April 11, 2014. The results relate only to the samples included in this report. Results reported herein conform to the most current TNI standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,



Carolynne Trout
carolynne.trout@pacelabs.com
Project Manager

Enclosures



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: S446-001 Former Quality Cleane
Pace Project No.: 10263141

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
A2LA Certification #: 2926.01
Alabama Certification #40770
Alabama Certification #40770
Alaska Certification #: UST-078
Alaska Certification #MN00064
Arizona Certification #: AZ-0014
Arkansas Certification #: 88-0680
California Certification #: 01155CA
Colorado Certification #Pace
Connecticut Certification #: PH-0256
EPA Region 8 Certification #: 8TMS-L
Florida/NELAP Certification #: E87605
Guam Certification #: Pace
Georgia Certification #: 959
Idaho Certification #: MN00064
Hawaii Certification #MN00064
Illinois Certification #: 200011
Indiana Certification#C-MN-01
Iowa Certification #: 368
Kansas Certification #: E-10167
Kentucky Dept of Envi. Protection - DW #90062
Kentucky Dept of Envi. Protection - WW #:90062
Louisiana DEQ Certification #: 3086
Louisiana DHH #: LA140001
Maine Certification #: 2013011
Maryland Certification #: 322
Michigan DEPH Certification #: 9909
Minnesota Certification #: 027-053-137

Mississippi Certification #: Pace
Montana Certification #: MT0092
Nebraska Certification #: Pace
New Jersey Certification #: MN-002
New Jersey Certification #: MN-002
New York Certification #: 11647
North Carolina Certification #: 530
North Carolina State Public Health #: 27700
North Dakota Certification #: R-036
Ohio EPA #: 4150
Ohio VAP Certification #: CL101
Oklahoma Certification #: 9507
Oregon Certification #: MN200001
Oregon Certification #: MN300001
Pennsylvania Certification #: 68-00563
Puerto Rico Certification
Saipan (CNMI) #:MP0003
South Carolina #:74003001
Texas Certification #: T104704192
Tennessee Certification #: 02818
Utah Certification #: MN000642013-4
Virginia DGS Certification #: 251
Virginia/VELAP Certification #: Pace
Washington Certification #: C486
Wisconsin Certification #: 999407970
West Virginia Certification #: 382
West Virginia TO-15 Approval
West Virginia DHHR #:9952C

REPORT OF LABORATORY ANALYSIS

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SAMPLE SUMMARY

Project: S446-001 Former Quality Cleane
Pace Project No.: 10263141

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10263141001	OA-2	Air	04/09/14 14:20	04/11/14 13:05
10263141002	IA-3	Air	04/09/14 15:10	04/11/14 13:05
10263141003	SSV-3	Air	04/09/14 16:15	04/11/14 13:05

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SAMPLE ANALYTE COUNT

Project: S446-001 Former Quality Cleane
Pace Project No.: 10263141

Lab ID	Sample ID	Method	Analysts	Analytes Reported
10263141001	OA-2	TO-15	DL1	5
10263141002	IA-3	TO-15	DL1	5
10263141003	SSV-3	TO-15	DL1	5

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ANALYTICAL RESULTS

Project: S446-001 Former Quality Cleane
Sample Project No.: 10263141

Sample: OA-2		Lab ID: 10263141001	Collected: 04/09/14 14:20	Received: 04/11/14 13:05	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR		Analytical Method: TO-15						
cis-1,2-Dichloroethene	ND	ug/m3	1.2	1.44		04/29/14 21:15	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.2	1.44		04/29/14 21:15	156-60-5	
Tetrachloroethene	1.0	ug/m3	0.99	1.44		04/29/14 21:15	127-18-4	
Trichloroethene	ND	ug/m3	0.79	1.44		04/29/14 21:15	79-01-6	
Vinyl chloride	ND	ug/m3	0.37	1.44		04/29/14 21:15	75-01-4	

Sample: IA-3		Lab ID: 10263141002	Collected: 04/09/14 15:10	Received: 04/11/14 13:05	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR		Analytical Method: TO-15						
cis-1,2-Dichloroethene	ND	ug/m3	1.2	1.49		04/29/14 21:38	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.2	1.49		04/29/14 21:38	156-60-5	
Tetrachloroethene	3.4	ug/m3	1.0	1.49		04/29/14 21:38	127-18-4	
Trichloroethene	ND	ug/m3	0.82	1.49		04/29/14 21:38	79-01-6	
Vinyl chloride	ND	ug/m3	0.39	1.49		04/29/14 21:38	75-01-4	

Sample: SSV-3		Lab ID: 10263141003	Collected: 04/09/14 16:15	Received: 04/11/14 13:05	Matrix: Air			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR		Analytical Method: TO-15						
cis-1,2-Dichloroethene	ND	ug/m3	1.3	1.55		04/29/14 22:00	156-59-2	
trans-1,2-Dichloroethene	ND	ug/m3	1.3	1.55		04/29/14 22:00	156-60-5	
Tetrachloroethene	375	ug/m3	1.1	1.55		04/29/14 22:00	127-18-4	E
Trichloroethene	ND	ug/m3	0.85	1.55		04/29/14 22:00	79-01-6	
Vinyl chloride	ND	ug/m3	0.40	1.55		04/29/14 22:00	75-01-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: S446-001 Former Quality Cleane
Pace Project No.: 10263141

QC Batch: AIR/20100 Analysis Method: TO-15
QC Batch Method: TO-15 Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10263141001, 10263141002, 10263141003

METHOD BLANK: 1667488 Matrix: Air
Associated Lab Samples: 10263141001, 10263141002, 10263141003

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,2-Dichloroethene	ug/m3	ND	0.81	04/29/14 10:27	
Tetrachloroethene	ug/m3	ND	0.69	04/29/14 10:27	
trans-1,2-Dichloroethene	ug/m3	ND	0.81	04/29/14 10:27	
Trichloroethene	ug/m3	ND	0.55	04/29/14 10:27	
Vinyl chloride	ug/m3	ND	0.26	04/29/14 10:27	

LABORATORY CONTROL SAMPLE: 1667489

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
cis-1,2-Dichloroethene	ug/m3	40.3	35.1	87	71-135	
Tetrachloroethene	ug/m3	69	57.2	83	69-136	
trans-1,2-Dichloroethene	ug/m3	40.3	34.8	86	70-131	
Trichloroethene	ug/m3	54.6	45.9	84	70-135	
Vinyl chloride	ug/m3	26	25.4	98	69-132	

SAMPLE DUPLICATE: 1667988

Parameter	Units	10263437003 Result	Dup Result	RPD	Max RPD	Qualifiers
cis-1,2-Dichloroethene	ug/m3		ND			
trans-1,2-Dichloroethene	ug/m3		ND			
Trichloroethene	ug/m3	4.3	4.3	.04	25	
Vinyl chloride	ug/m3	ND	ND		25	

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: S446-001 Former Quality Clean
Pace Project No.: 10263141

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to changes in sample preparation, dilution of the sample aliquot, or moisture content.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PRL - Pace Reporting Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine (8270 listed analyte) decomposes to Azobenzene.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

DUP - Sample Duplicate

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

ANALYTE QUALIFIERS

E Analyte concentration exceeded the calibration range. The reported result is estimated.

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: S446-001 Former Quality Cleane
Pace Project No.: 10263141

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10263141001	OA-2	TO-15	AIR/20100		
10263141002	IA-3	TO-15	AIR/20100		
10263141003	SSV-3	TO-15	AIR/20100		

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AIR: CHAIN-OF-CUSTODY / Analytical Request Document

The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

10L62171

Section A Required Client Information:	Section B Required Project Information:	Section C Invoice Information:	12958	Page: <u> </u> of <u> </u>
Company: <u>Robert E. Lee & Associates, Inc.</u>	Report To: <u>Nicole LaPlant</u>	Attention: <u>Nicole LaPlant</u>	Program	
Address: <u>1250 Centennial Centre Blvd Hobart, WI 54156</u>	Copy To:	Company Name: <u>Robert E. Lee & Associates, Inc.</u>		
Email To: <u>nlaplant@relee.com</u>	Purchase Order No.:	Address: <u>1250 Centennial Centre Blvd</u>	<input type="checkbox"/> UST <input type="checkbox"/> Superfund <input type="checkbox"/> Emissions <input type="checkbox"/> Clean Air Act <input type="checkbox"/> Voluntary Clean Up <input type="checkbox"/> Dry Clean <input type="checkbox"/> RCRA <input type="checkbox"/> Other	
Phone: <u>920-462-9641</u> Fax:	Project Name: <u>Super Quality Cleaners</u>	Pace Quote Reference:	Location of Sampling by State: <u> </u>	
Requested Due Date/TAT:	Project Number: <u>5446-001</u>	Pace Project Manager/Sales Rep: <u>Carolynn Trust</u>	Reporting Units ug/m ³ <u> </u> mg/m ³ <u> </u> PPBV <u> </u> PPMV <u> </u> Other <u> </u>	
		Pace Profile #:	Report Level II <u> </u> III <u> </u> IV <u> </u> Other <u> </u>	

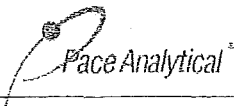
ITEM #	Section D Required Client Information AIR SAMPLE ID Sample IDs MUST BE UNIQUE	Valid Media Codes MEDIA CODE	PID Reading (Client only)	COLLECTED				Canister Pressure (Initial Field - psig)	Canister Pressure (Final Field - psig)	Summa Can Number	Flow Control Number	Method:							Pace Lab ID		
				COMPOSITE START ENDIGRAB		COMPOSITE						PM10	3C-Fixed Gas (%)	TO-3	TO-5M (Methane)	TO-4 (PCBs)	TO-13 (PAH)	TO-14		TO-15	TO-15 Short List*
				DATE	TIME	DATE	TIME														
	CA-2	GC		4-8-14	1426	4-9-14	1420	-27.5	-1.0	2391	X0320							X	001		
	IA-3	GC		4-8-14	1612	4-9-14	1510	-28	-3.5	2106	X0266							X	002		
	SSV-3	GC		4-9-14	1533	4-9-14	1615	-30	-4	1575	X0951							X	003		

Comments: TO15 Shortlist Only
-PCE, TCE, cis-DCE
trans-DCE, VC

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS				
<u>Janine (RED)</u>	<u>4/10/14</u>	<u>1426</u>	<u>Janine Pace</u>	<u>4/11/14</u>	<u>1305</u>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
					<u>1305</u>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
						<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

ORIGINAL

SAMPLER NAME AND SIGNATURE		Temp in °C	Received on Ice	Custody Sealed Cooler	Samples intact
PRINT Name of SAMPLER:	<u>Janine Pace</u>				
SIGNATURE OF SAMPLER:	<u>Janine Pace</u>				
DATE Signed (MM/DD/YY)					
		<u>4-9-14</u>			



Document Name:
Air Sample Condition Upon Receipt
Document No.:
F-MN-A-106-rev.09

Document Revised: 2006/2013
Page 1 of 1
Issuing Authority:
Pace Minnesota Quality Office

All Sample Condition Upon Receipt

Client Name: Robert E Lee & Associates

Project #:

WO#: **10263141**



Courier: Fed Ex UPS USPS Client
 Commercial Pace Other: _____

Tracking Number: 7949 3859 9055

Custody Seal on Cooler/Box Present? Yes No
Seals Intact? Yes No

Optional: Proj. Due Date: _____ Proj. Name: _____

Packing Material: Bubble Wrap Bubble Bags Foam None Other: _____ Temp Blank rec: Yes No

Temp. (TO17 and TO13 samples only) (°C): _____ Corrected Temp (°C): _____
Thermom. Used: B88A912167504 72337080
 B88A9132521491 80512447
Date & Initials of Person Examining Contents: 4/11/14

Type of ice Received Blue Wet None

Comments:

Chain of Custody Present?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	1.
Chain of Custody Filled Out?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	2.
Chain of Custody Relinquished?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	3.
Sampler Name and/or Signature on COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	4.
Samples Arrived within Hold Time?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	5.
Short Hold Time Analysis (<72 hr)?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	6.
Rush Turn Around Time Requested?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	7.
Sufficient Volume?	<input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	8.
Correct Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	9.
-Pace Containers Used?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	
Containers Intact?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	10.
Media: <u>air can</u>		11.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A	12. <u>coc says OA-2 can tag reads OA-3</u>

Canisters		Flow Controllers		Stand Alone G	
Sample Number	Can ID	Sample Number	Can ID	Sample Number	Can ID
<u>OA-2</u>	<u>2391</u>		<u>0320</u>		
<u>IA-3</u>	<u>2106</u>		<u>0266</u>		
<u>SSU-3</u>	<u>1575</u>		<u>0951</u>		

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: [Signature]

Date: 4/11/14

Note: Whenever there is a discrepancy affecting North Carolina compliance samples, a copy of this form will be sent to the North Carolina DEHNR Certification Office (i.e. out of hold, incorrect preservative, out of temp, incorrect containers)



CHEMICAL FACT SHEET

TETRACHLOROETHYLENE (PCE)

WHAT IS TETRACHLOROETHYLENE?

Tetrachloroethylene (PCE) is a nonflammable, liquid solvent widely used in dry cleaning, wood processing, fabric manufacturing, and metal degreasing. In homes, it may be found in suede protectors, paint removers, furniture stripper, water repellents, silicone lubricants, spot removers, glues, and wood cleaners. PCE evaporates slowly at room temperature and has a sweet, ether-like odor.

When PCE is improperly disposed of or spilled, most of it will evaporate into the air. The rest will seep into the soil. It may mix with ground water and contaminate water supplies.

HOW ARE PEOPLE EXPOSED TO TETRACHLOROETHYLENE?

People are most often exposed to PCE when they use it in their work, when cleaning or doing hobbies.

Breathing: PCE evaporates into the air. People are commonly exposed to PCE by breathing air containing its vapors. PCE can contaminate home air when people use cleaning solvents or other products. Exposure can also occur when using contaminated water to shower, do laundry, or perform other household chores.

Drinking/Eating: People can be exposed when using contaminated water for drinking and preparing food.

Touching: Small amounts of PCE can pass through the skin when people handle the chemical, contaminated soil, or bathe in contaminated water.

DO STANDARDS EXIST FOR REGULATING TETRACHLOROETHYLENE?

Water: The state and federal drinking water standards for PCE are both set at 5 parts per billion (ppb). We suggest you stop drinking water containing more than 5 ppb. If levels of PCE are above 70 ppb, you may need to avoid washing, bathing, or using the water for other purposes. Contact your local public health agency for more information specific to your situation.

Air: No standards exist for regulating the amount of PCE allowed in the air of homes. However, the Wisconsin Department of Natural Resources (DNR) has set a residential indoor air action level for PCE at 6 parts per billion by volume (ppbv). The action level is considered to be protective of public health. Breathing PCE for a lifetime at 6 ppbv is very unlikely to be harmful to people. If PCE concentrations in air are above the action level, we recommend taking an action to halt exposure.

Most people can smell PCE when the level reaches 1,000 ppbv. If you can smell the chemical, the level is too high to be safe.

The Wisconsin Department of Natural Resources regulates the amount of PCE that can be released into outdoor ambient air by industries.

WILL EXPOSURE TO TETRACHLOROETHYLENE RESULT IN HARMFUL HEALTH EFFECTS?

Some workplace jobs and certain home projects can produce levels of PCE high enough to cause health effects. The following symptoms may occur immediately or shortly after exposure to high levels:

- Breathing air containing more than 100 ppm (or 100,000 ppbv) of PCE may cause dizziness, headache, sleepiness, confusion, nausea and difficulty speaking and walking.
- Direct contact with PCE can irritate skin or eyes.
- Swallowing PCE can cause mental confusion and possible loss of consciousness.

The following health effects can occur after several years of exposure to low levels of PCE:

Cancer: PCE is shown to cause liver cancer, kidney cancer, and leukemia in laboratory animals.

Reproductive Effects: When a mother becomes sick from exposure to PCE, the development of her fetus may also be affected. *Pregnant women should avoid contact with PCE.*

Organ Systems: Liver and kidney damage has been noticed among exposed workers.

In general, chemicals affect the same organ systems in all people who are exposed. A person's reaction depends on several things, including individual health, heredity, previous exposure to chemicals including medicines, and personal habits such as smoking or drinking. It's also important to consider the length of exposure to the chemical; the amount of chemical exposure; and whether the chemical was inhaled, touched, or eaten.

Health problems such as cardiovascular disease, nervous system disorders, liver disease, or alcohol abuse may increase sensitivity to the effects of PCE.

CAN A MEDICAL TEST DETERMINE EXPOSURE TO TETRACHLOROETHYLENE?

PCE can be detected in the breath, blood, and urine of people who have recently been exposed to high levels. These tests require special equipment that most doctors' offices do not have, and the test results may not predict what health effects will develop. Liver and kidney function tests may be helpful in determining damage from PCE exposure.

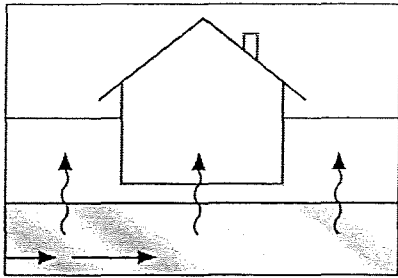
Seek medical advice if you have any symptoms that you think may be related to chemical exposure.

This fact sheet summarizes information about this chemical and is not a complete listing of all possible effects. It does not refer to work exposure or emergency situations.

For more information, contact:

- Your local health department: <http://www.dhs.wisconsin.gov/localhealth/>
- Division of Public Health, Bureau of Environmental and Occupational Health, (608) 266-1120: <http://www.dhs.wisconsin.gov/eh/>

Prepared by the Wisconsin Department of Health Services, Division of Public Health, with funds from the Agency for Toxic Substances and Disease Registry, Public Health Service, U.S. Department of Health and Human Services.



Vapor Intrusion

What to Expect if Vapors from Soil and Groundwater Contamination Exist on My Property

PUB-RR-892

September 2012

Chemicals used in commercial activities – such as dry cleaning chemicals, chemical degreasers, and petroleum products such as gasoline – are sometimes spilled or leaked into soil and groundwater. These chemicals, known as volatile organic compounds (VOCs), often become gases or vapors, which can travel from contaminated groundwater and soil and enter buildings. This can happen in both commercial buildings and homes.

The process where vapors from contamination enter a building or other structure is called vapor intrusion.

How do vapors enter a building?

If you live near a commercial or industrial facility, or a landfill where VOCs have entered the soil and/or groundwater, there may be potential for VOCs to travel as vapors through the soil and enter your home or business through openings in the foundation – such as cracks or utility lines.

Why is vapor intrusion a concern?

Exposure to VOCs can cause an increased risk of adverse health effects. Whether or not a person experiences any health effects depends on several factors, including the amount and length of exposure, the toxicity of the chemical and the individual's sensitivity to the chemical.

When vapor intrusion is the result of environmental contamination, the Wisconsin Department of Natural Resources (DNR) requires steps be taken to reduce or eliminate exposures which could be harmful to human health.

What should I expect if vapor intrusion is a concern near my home or business?

For sites with VOC contamination, the DNR requires that the potential for vapor intrusion be investigated. If you live near a site being cleaned up, you may be contacted by the site owner or others working on the cleanup. Your cooperation and consent will be requested before any testing/sampling is conducted on your property. Ask the person contacting you any questions you have about the work being done, or contact the DNR for more information (see DNR contact information on page 3).

What testing may be done on my property?

After the owner of the property where contamination originated – called the “responsible party” – has conducted tests of soil gas or groundwater on his/her own property and determined that vapors may be moving away from their property, he or she will contact other property owners that may be affected by vapor intrusion.

The responsible party or their representative – usually an environmental consultant – may ask for permission to install soil gas probes or groundwater wells on your property. Soil gas probes and groundwater wells are installed outside buildings, in yards or rights-of-way, using special drilling equipment. They may also ask to install sub-slab vapor probes through the foundation of your home or business.

These probes and wells can help determine if vapors are moving through the soils and onto your property.

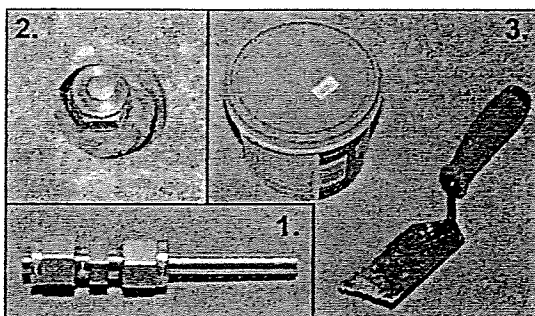


What are sub-slab samples and why are they needed?

Sub-slab samples are the most reliable method for determining whether vapors may be entering a structure due to vapor intrusion. Sub-slab samples are collected by drilling one or more small holes through the basement floor or foundation of a building.

A hand-held hammer drill is used to drill the hole and a small stainless steel or brass probe is placed in the hole, flush with the floor, and sealed with cement (see photo below).

When the cement is set, a vapor sample is collected using special equipment. The sub-slab probes may be sampled more than once. When the investigation of the vapor intrusion is complete, the sub-slab probes can be removed and the holes patched with cement.



A probe (1) is inserted into a 1-inch hole in the foundation (2) and held in place with cement (3) (photos courtesy DNR).

Why not take indoor air samples as an alternative to taking sub-slab samples?

Indoor air quality often changes from day to day. Therefore, sampling results one day may not reveal any contamination, while the next day's result will – this can create misleading assumptions about long-term indoor air quality.

In addition, indoor air quality may be affected by household and commercial products, including paints, glues, fuels, cleaners, cigarette smoke, aerosol sprays or new carpeting or furniture. These products can be a source of VOCs found in indoor air samples.

Furthermore, any outdoor air that enters indoors may also contain compounds which can alter test results. Therefore, indoor air testing will not necessarily confirm that the VOCs in the indoor air are entering a building from underground sources.

Sub-slab samples are more reliable indicators of potential vapor intrusion than indoor air samples, and are not affected by indoor chemical sources. If soil vapors are not detected in the sub-slab samples, additional sampling may not be necessary. If sub-slab vapors are detected at levels that may indicate vapors can seep into the indoor air, additional indoor air sampling should be performed to determine the levels at which those vapors are present inside the building.

When will I receive the sample results?

The laboratory results are usually available in two to four weeks. A responsible party is obligated to give you any sample results and explain whether additional steps need to be taken and what those steps will be.

What happens if a problem is found?

If vapor intrusion is detected in a home or business, the most common solution is to install systems often used to reduce naturally occurring radon.

These systems, called sub-slab depressurization systems (see Fig.1) or radon mitigation systems, remove soil vapors from below building foundations before they enter homes. Vapors are vented outside of the building where they disperse and are rendered harmless. These systems use minimal electricity and do not noticeably affect heating and cooling efficiency.

Sub-slab depressurization systems also prevent radon from entering homes – an added health benefit in radon-prone areas like southern Wisconsin.

The cost of installing a system is usually paid by the responsible party.

How will I know if the vapors have been eliminated?

After a vapor mitigation system is installed, follow-up testing of indoor air usually takes place three to six months later. The systems are usually considered permanent fixtures of the building.

In cases where the sources of the vapors are completely eliminated, the systems should no longer be needed.

Where can I find more information?

More information about health and vapor-related issues can be found in the Vapor Intrusion fact sheet from the Department of Health Services (DHS) at: www.dhs.wisconsin.gov/eh/air/fs/VI.htm.

For other health related questions, please contact your local health department: www.dhs.wisconsin.gov/localhealth/.

For more DNR information, please visit the DNR's Remediation and Redevelopment (RR) Program Vapor Intrusion page at: dnr.wi.gov/topic/Brownfields/Vapor.html.

Additional information can be obtained through the DNR field office in your region. To find the correct office, visit the RR Program Staff Contacts page at: dnr.wi.gov/topic/Brownfields/Contact.html. Or call the RR Program at (608) 266-2111.

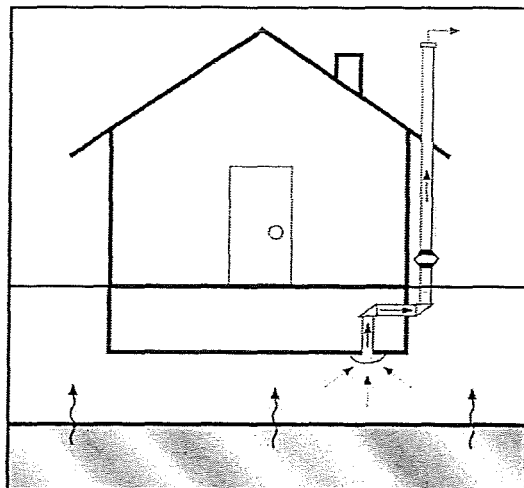


Fig.1 – Depicting a sub-slab depressurization system

This document contains information about certain state statutes and administrative rules but does not necessarily include all of the details found in the statutes and rules. Readers should consult the actual language of the statutes and rules to answer specific questions.

The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, services, and functions under an Affirmative Action Plan. If you have any questions, please write to Equal Opportunity Office, Department of Interior, Washington, D.C. 20240.

This publication is available in alternative format upon request. Please call 608-267-3543 for more information.

Quality email

6/2/14

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TABLE 1
SUB-SLAB VAPOR AND AIR ANALYTICAL RESULTS SUMMARY
ADJACENT RESIDENTIAL/COMMERCIAL PROPERTY TO FORMER QUALITY CLEANERS, GRAFTON, WI

Sample ID	Sample Location	Sample Type	Date Collected	Relevant VOCs ($\mu\text{g}/\text{m}^3$)				
				PCE	TCE	Cis-1,2 DCE	Trans-1,2 DCE	Vinyl Chloride
Residential Sub-Slab Vapor Risk Screening Level (VRSL) -- $\mu\text{g}/\text{m}^3$				420	21	---	630	16
Residential Indoor Air Vapor Action Level (VAL) -- $\mu\text{g}/\text{m}^3$				42	2.1	---	63	1.6
SSV-3	1224 11th Avenue	Sub-slab	4/9/2014	375	ND	ND	ND	ND
IA-3		Indoor air		3.4	ND	ND	ND	ND
OA-2	Parking lot, east of building along east property boundary (upwind)	Outdoor air		1	ND	ND	ND	ND

Key:

- = No screening level established
- ND = Not detected above laboratory detection limits
- $\mu\text{g}/\text{m}^3$ = Micrograms per cubic meter
- PCE = Tetrachloroethene
- TCE = Trichloroethene
- Cis-1,2 DCE = Cis-1,2 Dichloroethene
- Trans-1,2 DCE = Trans-1,2 Dichloroethene
- 138 = Vapor Risk Screening Level (VRSL) exceeded

Notes:

- 1.) Sub-slab samples collected using Vapor Pin.
- 2.) The Vapor Risk Screening Level (VRSL) was calculated by multiplying the VAL by a dilution factor of 10 for residential buildings, in accordance with WDNR guidance.

res/apartment/~~air~~ subslab
?

Nancy?

- Need 1 or 2 confirmation samples?
- Wait for those results or range out to other adjacent properties?

**TABLE 1
SUB-SLAB VAPOR AND AIR ANALYTICAL RESULTS SUMMARY
FORMER QUALITY CLEANERS, 1228 11th AVENUE, GRAFTON, WI**

Sample ID	Sample Location	Sample Type	Date Collected	Relevant VOCs ($\mu\text{g}/\text{m}^3$)				
				PCE	TCE	Cis-1,2 DCE	Trans-1,2 DCE	Vinyl Chloride
Non-Residential Sub-Slab Vapor Risk Screening Level (VRSL) -- $\mu\text{g}/\text{m}^3$				1,800	88	---	2,600	280
Non-Residential Indoor Air Vapor Action Level (VAL) -- $\mu\text{g}/\text{m}^3$				180	8.8	---	260	28
SSV-1	Hallway entrance to two tenant spaces, occupied by Hair Vision and private hair stylist.	Sub-slab	1/16/2014	246,000	3.3	ND	ND	ND
IA-1		Indoor air	1/16/2014	882	ND	ND	ND	ND
SSV-2	Near the location of the former dry cleaning machine (vicinity of Boring B1)	Sub-slab	1/16/2014	7,000,000	ND	ND	ND	ND
IA-2		Indoor air	1/16/2014	865	ND	ND	ND	ND
OA-1	Southwest of Site building, across 11th Street (upwind)	Outdoor air	1/16/2014	1.5	ND	ND	ND	ND

Key:

--- = No screening level established
 ND = Not detected above laboratory detection limits
 $\mu\text{g}/\text{m}^3$ = Micrograms per cubic meter
 PCE = Tetrachloroethene
 TCE = Trichloroethene
 Cis-1,2 DCE = Cis-1,2 Dichloroethene
 Trans-1,2 DCE = Trans-1,2 Dichloroethene
138 = Vapor Risk Screening Level (VRSL) exceeded
14.5 = Vapor Action Level (VAL) exceeded

Notes:

- 1.) Sub-slab samples collected using Vapor Pin.
- 2.) The Vapor Risk Screening Level (VRSL) was calculated by multiplying the VAL by a dilution factor of 10 for small commercial buildings, in accordance with WDNR guidance.

Figure 1: Vapor Intrusion Sample Locations, Former Quality Cleaners, Grafton, WI

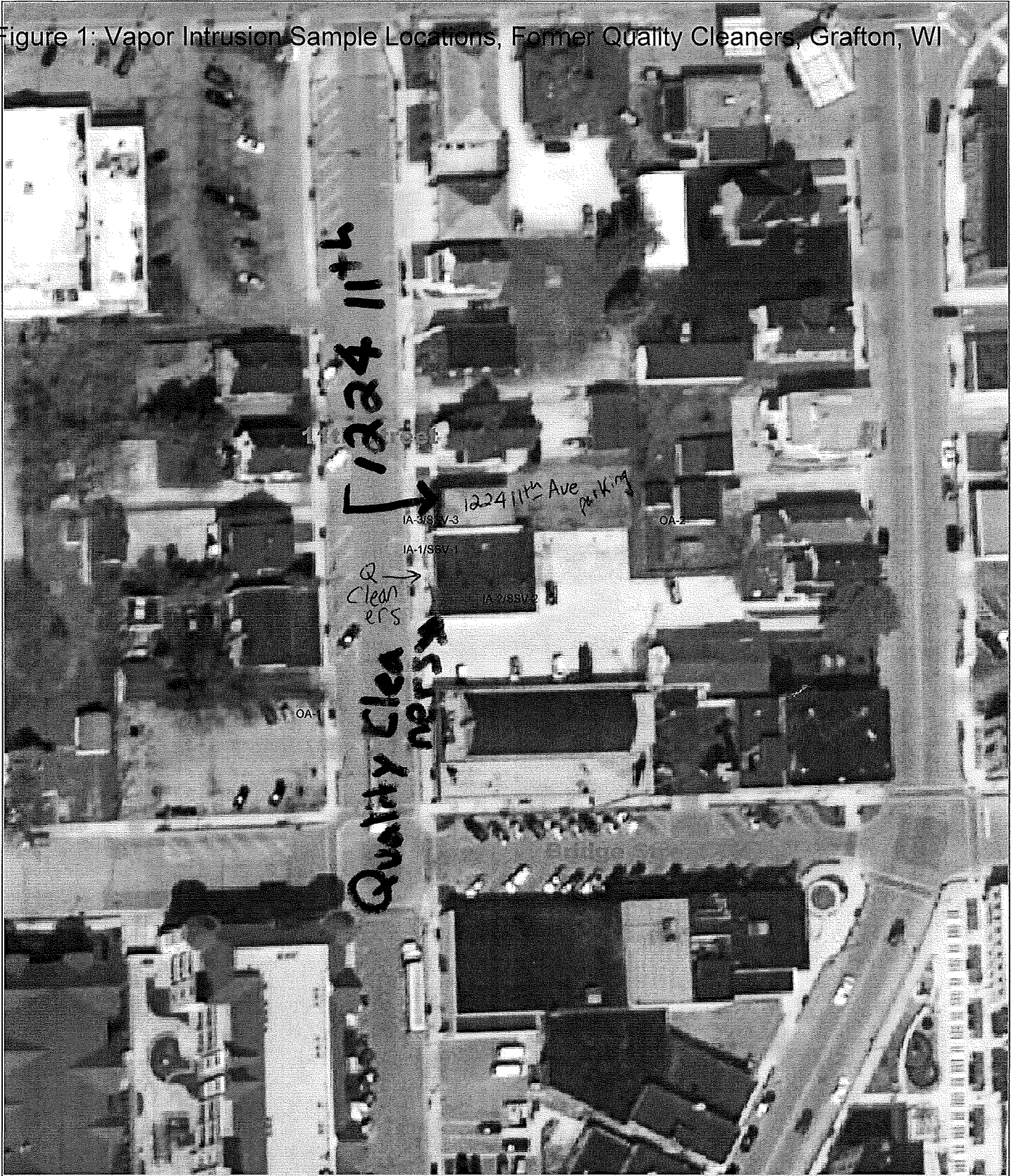


Figure 1: Vapor Intrusion Sample Locations

SSV-1 = Sub-Slab Sample

IA-1 = Indoor Air Sample

DISCLAIMER: Ozaukee County does not guarantee the accuracy of the material contained herein. It is possible that there may be an approximate property boundary misrepresentation of this information or its derivatives.



Ozaukee County

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SCALE: 1" = 81'

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