

#### Via E-Mail

September 1, 2015

Mr. Scott Stupak
North Carolina Department of Environment and
Natural Resources
Division of Waste Management, Superfund Section
Dry Cleaning Solvent Cleanup Program
1646 Mail Service Center
Raleigh, NC 27699-1646

Re: Soil Gas Sampling Report Cunningham Cleaners Charlotte, Mecklenburg County DSCA ID: DC600013 H&H Job No. DS0-76D

Dear Scott:

#### 1.0 Introduction

Hart & Hickman, PC (H&H) is submitting this letter report to document additional soil gas sampling activities conducted at the Cunningham Cleaners site located at 104 S. Sharon Amity Road in Charlotte, Mecklenburg County, North Carolina. In order to further evaluate the potential for vapor intrusion and allow long-term vapor monitoring, H&H installed two permanent subsurface soil gas monitoring points adjacent to the SunTrust Bank (SunTrust) building located at 207 S. Sharon Amity Road, downgradient of the Cunningham Cleaners source property. A brief discussion of previous vapor intrusion assessment activities on the SunTrust property is provided below and is followed by a description of the recent sampling activities and results.

H&H previously collected three subsurface soil gas samples (SGP-1 through SGP-3) on the SunTrust property to evaluate the potential for vapor intrusion. The analytical results indicated the dry-cleaning solvent tetrachloroethene (PCE) and its degradation product trichloroethene



(TCE) were present in each of the subsurface soil vapor samples collected at concentrations ranging from 1.5  $\mu$ g/m³ to 8,100  $\mu$ g/m³ for PCE and 0.49 J  $\mu$ g/m³ to 1,900  $\mu$ g/m³ for TCE. The sample locations and results are shown on Figure 2. The PCE and TCE concentrations detected in one of the samples, SGP-3, exceeded the Division of Waste Management (DWM) Residential and Non-Residential Soil Gas Screening Levels (SGSLs), and the calculated risks associated with the concentrations detected in SGP-3 exceeded acceptable levels (hazard index greater than 1 and/or carcinogenic risk greater than 1 x 10<sup>-4</sup>) for residential and non-residential exposures. Indoor air samples collected inside SunTrust did not identify any current unacceptable exposure risks. However, the DSCA Program requested installation of permanent soil gas points to allow long-term monitoring of soil gas concentrations on the SunTrust property.

#### 2.0 Sampling Activities

On July 27, 2015, H&H contracted Carolina Soil Investigations, LLC (CSI) to install two permanent subsurface soil vapor monitoring points (VMP-1 and VMP-2) at SunTrust. VMP-1 was installed along the northern side of the building, and VMP-2 was installed near the southwestern corner of the building. The VMPs were installed above the capillary fringe to evaluate potential vapor impacts from groundwater. The sample locations are depicted on Figure 2, and photographs are provided in Appendix A.

The VMP sampling points were installed approximately 2-3 ft above the capillary fringe at depths of approximately 5.5 ft below ground surface (bgs) utilizing hand auger methods. Each VMP was constructed with a 6-inch stainless steel screen set at the bottom of the borehole and ¼-inch Teflon® tubing extending from the screen to above the ground surface. Well filter sand was placed around the annulus of the screened interval of the sample point and extended to approximately 6 inches above the top of the screen interval. A granular bentonite seal was placed above the sand pack and hydrated. The remaining portion of the borehole annulus was filled with cement grout to grade. The monitoring points were completed with flush-mount housings and 6-inch steel man-hole covers secured within a one-ft by one-ft concrete pad. Upon completion, the end of the Teflon® tubing sampling assembly was secured inside the flush mount



Mr. Scott Stupak September 1, 2015 Page 3

housing.

On July 28, 2015, H&H mobilized to the site to collect soil gas samples from VMP-1 and VMP-2. Prior to sample collection, each sample point was purged and a leak check was performed. A minimum of three volumes of air was purged from each location using a syringe. The purge volumes were calculated to include the screen, tubing, and sand pack for each subsurface soil vapor monitoring point. A leak check was conducted at each location by constructing a shroud around the sampling point and flooding the air within the shroud with helium gas. H&H utilized a syringe to collect a sample of the gas in the shroud into a Tedlar<sup>®</sup> bag and analyzed the sample for helium using a helium gas detector. Vapor from the monitoring points was collected outside of the shroud into a separate Tedlar<sup>®</sup> bag and analyzed using the helium gas detector to confirm that helium concentrations were less than 10% of the helium concentrations detected in the shroud. Both of the sample points passed the leak check criteria.

Following purging and a successful leak check, vapor samples were collected from each location using a laboratory-supplied 6-liter Summa canister and airflow regulator calibrated to collect the samples at a rate of approximately 100 mL/min. The Summa canister and airflow regulator were connected to the tubing at each monitoring point using a brass nut and ferrule assembly to form an airtight seal. Subsequently, the canister's intake valve was opened to collect the subsurface soil gas sample. Vacuum readings on the Summa canister were recorded prior to and following the sampling period to confirm adequate sample volume was collected.

After sample collection, the canisters were shipped to Con-Test Analytical Laboratory for analysis of the primary constituents of concern for the site, including PCE, TCE, cis-1,2-dichloroethene (cis-1,2-DCE), trans-1,2-dichloroethene (trans-1,2-DCE), and vinyl chloride (VC) by EPA Method TO-15. The laboratory analytical report and chain-of-custody record are provided in Appendix C.



#### 3.0 Analytical Results

The dry-cleaning solvent PCE and its degradation products TCE and cis-1,2-DCE were detected in each of the soil vapor samples collected adjacent to the SunTrust building and degradation products trans-1,2-DCE and VC were detected in sample VMP-1. Slightly higher concentrations were detected in VMP-1 located on the north side of the building closer to the Cunningham Cleaners source property with concentrations of 72  $\mu$ g/m³ for PCE, 81  $\mu$ g/m³ for TCE, 28  $\mu$ g/m³ for cis-1,2-DCE, 11  $\mu$ g/m³ for trans-1,2-DCE, and 7.3  $\mu$ g/m³ for VC. Slightly lower concentrations of 48  $\mu$ g/m³ for PCE, 71  $\mu$ g/m³ for TCE, and 0.18  $\mu$ g/m³ for cis-1,2-DCE were detected in VMP-2 located near the southwestern corner of the building. The concentrations detected in VMP-1 and VMP-2 are notably lower than the previous concentrations detected in SGP-1 through SGP-3. The analytical results for the current and previous soil gas samples are summarized in Table 4 and presented on Figure 2.

To further evaluate the soil gas data, H&H completed the DSCA Program's soil gas risk calculator for both a non-residential worker and a resident using the concentrations detected in each of the soil gas samples. Copies of the risk calculators are provided in Appendix C, and the results are summarized below.

Sample ID	Non-Residenti	al Worker	Resident			
Sample 1D	Carcinogenic Risk	HI	Carcinogenic Risk	HI		
VMP-1	3.12x10 <sup>-7</sup>	0.10	6.59x10 <sup>-6</sup>	1.22		
VMP-2	2.48x10 <sup>-7</sup>	0.08	4.59x10 <sup>-6</sup>	1.06		

The risk calculations indicate acceptable risk levels (carcinogenic risk less than  $1 \times 10^{-5}$  and HI less than 1) for a non-residential worker based on the concentrations detected in both soil vapor monitoring points. However, the risk calculations for a resident indicate the calculated HI values slightly exceed the acceptable level of 1. Because the property is currently zoned for commercial use, there is no current vapor intrusion risk. However, in order to close the site, a land use



restriction would be needed to protect against a potential future residential exposure scenario.

#### 4.0 Summary

H&H installed and sampled two permanent soil gas monitoring points adjacent to the SunTrust Bank located downgradient of the Cunningham Cleaners source property to further evaluate the potential for vapor intrusion and allow for long-term monitoring of soil gas. The laboratory analytical results indicate the dry-cleaning solvent PCE and its degradation products (TCE, cis-1,2-DCE, trans-1,2-DCE, and VC) are present in soil gas on the SunTrust property. The detected concentrations in the newly installed monitoring points (VMP-1 and VMP-2) were notably lower than previous soil gas concentrations detected in temporary points SGP-1 through SGP-3 in 2014.

To evaluate the potential vapor intrusion risk associated with the detected soil gas concentrations, H&H calculated the carcinogenic and non-carcinogenic risks associated with concentrations detected in VMP-1 and VMP-2. The risks were within acceptable levels for non-residential exposures. However, the calculated non-carcinogenic risks for a resident associated with concentrations detected in VMP-1 (HI = 1.22) and VMP-2 (HI = 1.06) slightly exceed the acceptable level of 1. The property is currently zoned for commercial use; thus, there is no current vapor intrusion risk. However, in order to close the site, a land use restriction would be needed to protect against a potential future residential exposure scenario. Because of the slight exceedance for residential non-carcinogenic risks and the notable difference in soil gas concentrations for the previous SGP-1 through SGP-3 samples and recent VMP-1 and VMP-2 samples, H&H recommends periodic soil gas monitoring to further evaluate concentrations over time on the SunTrust property.



H&H appreciates the opportunity to work with you on this project. If you have any questions or require additional information, please do not hesitate to contact us at 704-586-0007.

Very truly yours,

Hart & Hickman, PC

Brett Lawrence

Assistant Project Geologist

Attachments

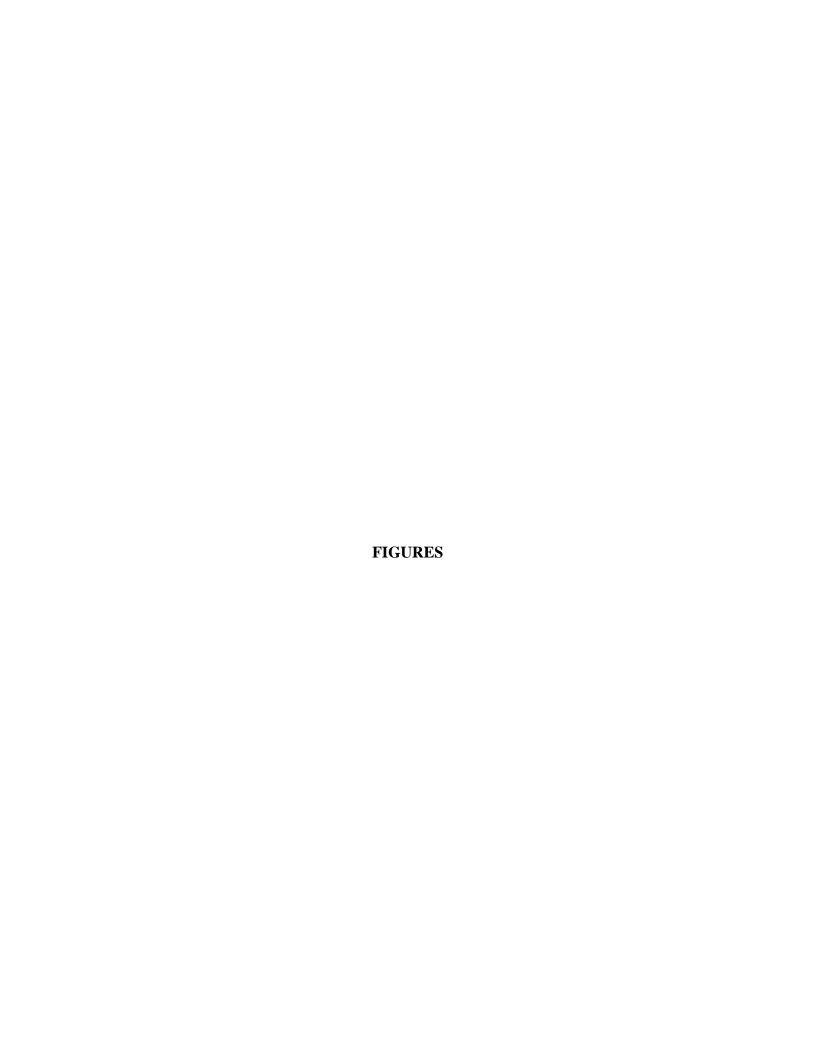
Christie Zawtocki, PERONOMERANTONIA Principal Engineer

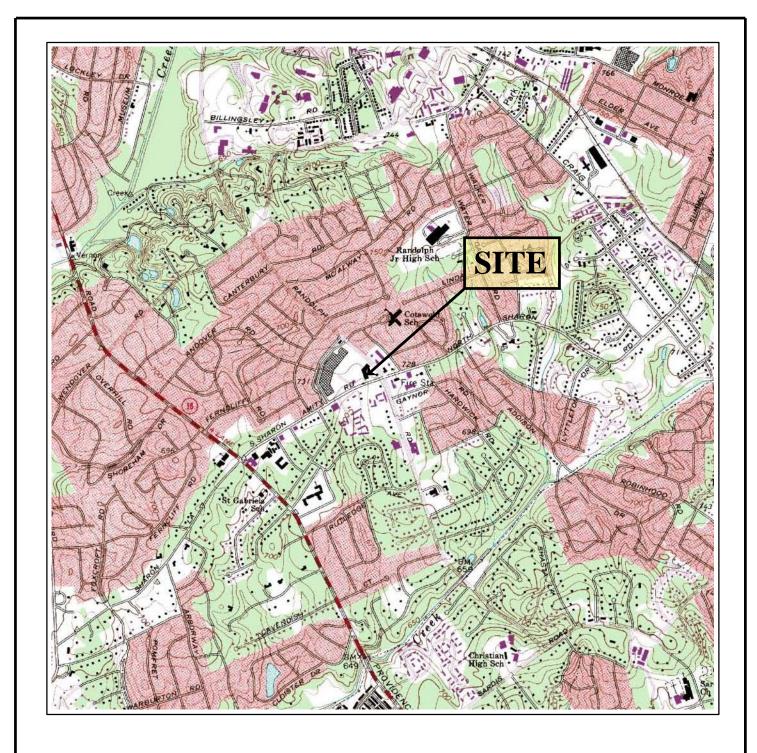


Table 4: Analytical Data for Soil Gas										A	ADT 4									
DSCA ID No.: DC600013																				
Sample ID  Depth [feet bgs]  Sample Duration  Sample Duration  Benzene  Cis-1,2-Dichloroethylene  Thylbenzene  Methyl tert-butyl ether (MTBE)  Naphthalene  Trichloroethylene  Trichloroethylene																				
San	De <sub>I</sub>	San	San									[µg	$/\text{m}^3$ ]							
SGP-1	5.5	1 hr	07/09/14	NA	< 0.40	NA	NA	NA	1.5	NA	< 0.40	0.49 J	0.62	NA						
SGP-2	5.5	1 hr	07/09/14	NA	0.17 J	NA	NA	NA	720	NA	< 0.40	9.9	0.43	NA						
SGP-3	5.5	1 hr	07/09/14	NA	20	NA	NA	NA	8,100	NA	< 0.40	1,900	< 0.26	NA						
VMP-1	5.5	1 hr 25 min	07/28/15	NA	28	NA	NA	NA	72	NA	11	81	7.3	NA						
VMP-2	5.5	54 min	07/28/15	NA	0.18 J	NA	NA	NA	48	NA	< 0.20	71	< 0.13	NA						
	DWM Resid	dential SGSL			NE 278 NE 13.9 55.9															
DA	WM Non-Re	sidential SGS	SL	-	NE			-	3,500	1	NE	175	2,790	-	·	·			·	

#### Notes:

- 1. NE = Not Established; DWM = Division of Waste Management; SGSL = soil gas screening levels
- 2. J flag denotes estimated concentration between the laboratory reporting limit and method detection limit
- 3. Helium gas was used to perform a leak check on each sample location. No helium was detected during the leak checks.
- 4. Samples were collected into 6-liter Summa cannisters and were analyzed using EPA Method TO-15.









U.S.G.S. QUADRANGLE MAP

**CHARLOTTE EAST, NORTH CAROLINA (1991)** 

QUADRANGLE 7.5 MINUTE SERIES (TOPOGRAPHIC)

TITLE

#### SITE LOCATION MAP

PROJECT

CUNNINGHAM CLEANERS
DSCA ID: DC600013
104 SOUTH SHARON AMITY ROAD
CHARLOTTE, MECKLENBURG COUNTY

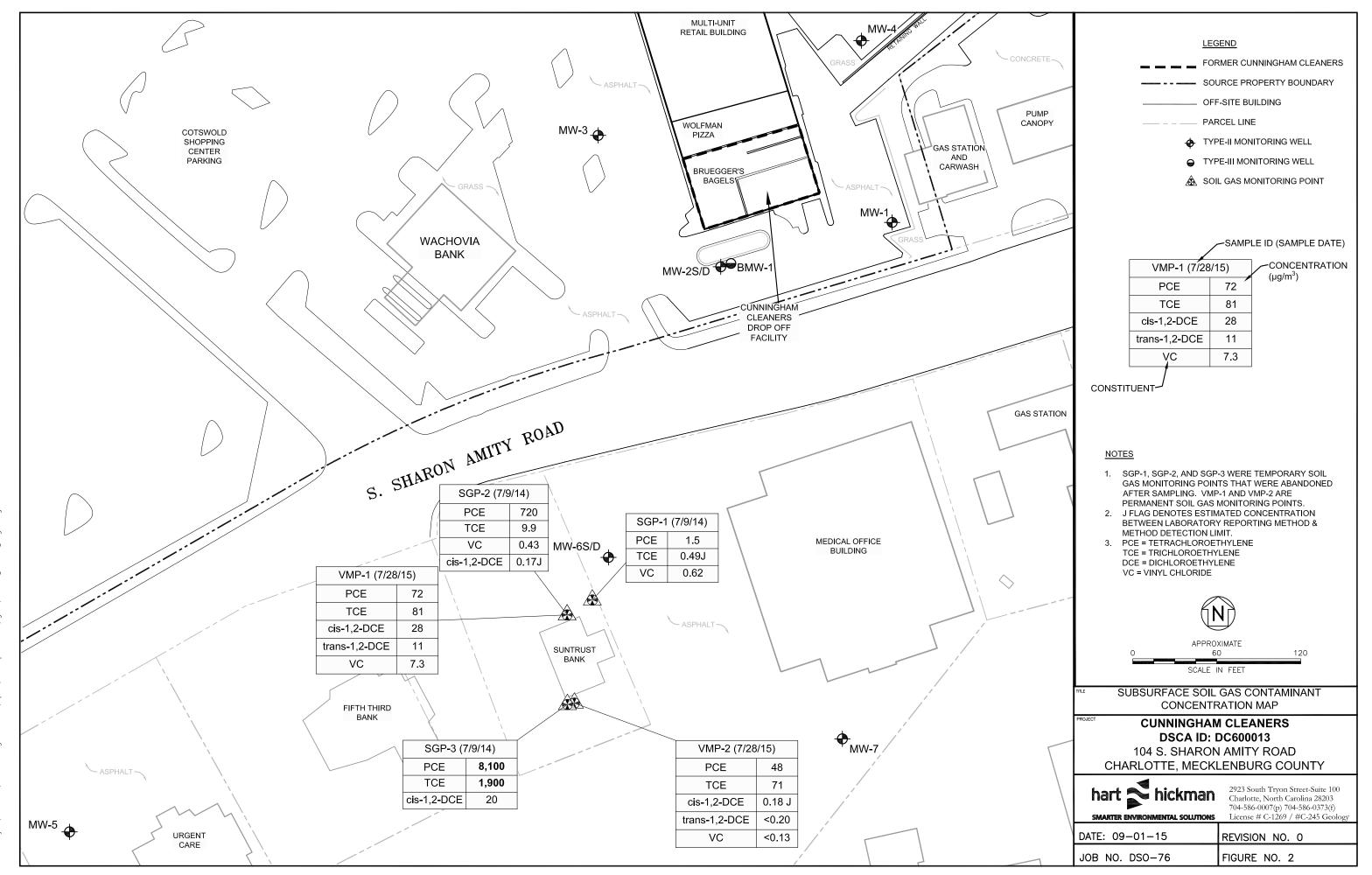
hart hickman

2923 South Tryon Street-Suite 100 Charlotte, North Carolina 28203 704-586-0007 (p) 704-586-0373 (f)

SMARTER ENVIRONMENTAL SOLUTIONS

DATE: 08-11-15 REVISION NO: 0

JOB NO: DS0-76 FIGURE: 1



S. AAA-Master Projects (DSCA - DSO) DS0-76 Cunningham Cleaners (Reports 07-15 Vapor Intrusion (Figures (DC600013 20150901 VI

## APPENDIX A PHOTOGRAPHIC LOG



Photograph 1: VMP-1, following installation.



Photograph 2: VMP-2, following installation.





Photograph 3: VMP-1, during sampling activities.



Photograph 4: VMP-2, during sampling activities.



## APPENDIX B LABORATORY ANALYTICAL REPORT

August 31, 2015

Brett Lawrence Hart & Hickman - Charlotte, NC 2923 South Tryon Street, Suite 100 Charlotte, NC 28203

Project Location: Charlotte, NC

Client Job Number: Project Number: DS0-76

Laboratory Work Order Number: 15H0014

Lua Watthington

Enclosed are results of analyses for samples received by the laboratory on July 30, 2015. If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Lisa A. Worthington Project Manager



Hart & Hickman - Charlotte, NC 2923 South Tryon Street, Suite 100 Charlotte, NC 28203

ATTN: Brett Lawrence

PURCHASE ORDER NUMBER:

PROJECT NUMBER: DS0-76

ANALYTICAL SUMMARY

15H0014 WORK ORDER NUMBER:

REPORT DATE: 8/31/2015

The results of analyses performed on the following samples submitted to the CON-TEST Analytical Laboratory are found in this report.

PROJECT LOCATION: Charlotte, NC

FIELD SAMPLE #	LAB ID:	MATRIX	SAMPLE DESCRIPTION	TEST	SUB LAB
VMP-1	15H0014-01	Air		EPA TO-15	
VMP-2	15H0014-02	Air		EPA TO-15	



#### CASE NARRATIVE SUMMARY

All reported results are within defined laboratory quality control objectives unless listed below or otherwise qualified in this report.

REVISED REPORT 08-31-15: The final air can pressure has been revised on the CoC in accordance with the client's field log.

The results of analyses reported only relate to samples submitted to the Con-Test Analytical Laboratory for testing.

I certify that the analyses listed above, unless specifically listed as subcontracted, if any, were performed under my direction according to the approved methodologies listed in this document, and that based upon my inquiry of those individuals immediately responsible for obtaining the information, the material contained in this report is, to the best of my knowledge and belief, accurate and complete.

Lisa A. Worthington Project Manager

Lua Watslengton



#### ANALYTICAL RESULTS

Project Location: Charlotte, NC Date Received: 7/30/2015 Field Sample #: VMP-1 Sample ID: 15H0014-01 Sample Matrix: Air Sampled: 7/28/2015 16:43 Sample Description/Location: Sub Description/Location: Canister ID: 1094 Canister Size: 6 liter Flow Controller ID: 4137 Sample Type: 1 hr Work Order: 15H0014 Initial Vacuum(in Hg): -25 Final Vacuum(in Hg): -5 Receipt Vacuum(in Hg): -10.5 Flow Controller Type: Fixed-Orifice Flow Controller Calibration

RPD Pre and Post-Sampling:

		E	PA TO-15						
		ppbv			ug/r	m3		Date/Time	
Analyte	Results	RL	MDL	Flag	Results	RL	Dilution	Analyzed	Analys
cis-1,2-Dichloroethylene	7.2	0.050	0.019		28	0.20	1	8/5/15 2:32	TPH
rans-1,2-Dichloroethylene	2.7	0.050	0.013		11	0.20	1	8/4/15 18:30	TPH
Tetrachloroethylene	11	0.050	0.014		72	0.34	1	8/5/15 2:32	TPH
richloroethylene	15	0.050	0.015		81	0.27	1	8/5/15 2:32	TPH
Vinyl Chloride	2.9	0.050	0.021		7.3	0.13	1	8/4/15 18:30	ТРН
Surrogates	% Recov	ery		% RE	CC Limits				
-Bromofluorobenzene (1)		93.8		70	0-130			8/5/15 2:32	
-Bromofluorobenzene (1)		93.6		70	0-130			8/4/15 18:30	



#### ANALYTICAL RESULTS

Project Location: Charlotte, NC Date Received: 7/30/2015 Field Sample #: VMP-2 Sample ID: 15H0014-02 Sample Matrix: Air Sampled: 7/28/2015 16:17 Sample Description/Location: Sub Description/Location: Canister ID: 1223 Canister Size: 6 liter Flow Controller ID: 4136 Sample Type: 1 hr Work Order: 15H0014 Initial Vacuum(in Hg): -30 Final Vacuum(in Hg): -9 Receipt Vacuum(in Hg): -5.8 Flow Controller Type: Fixed-Orifice Flow Controller Calibration

RPD Pre and Post-Sampling:

		F	PA TO-15							
		ppbv				ug/r	n3		Date/Time	
Analyte	Results	RL	MDL		Flag	Results	RL	Dilution	Analyzed	Analyst
cis-1,2-Dichloroethylene	0.046	0.050	0.019	J		0.18	0.20	1	8/4/15 19:10	TPH
trans-1,2-Dichloroethylene	ND	0.050	0.013			ND	0.20	1	8/4/15 19:10	TPH
Tetrachloroethylene	7.1	0.050	0.014			48	0.34	1	8/5/15 3:12	TPH
Trichloroethylene	13	0.050	0.015			71	0.27	1	8/4/15 19:10	TPH
Vinyl Chloride	ND	0.050	0.021			ND	0.13	1	8/4/15 19:10	ТРН
	0/ 7									
Surrogates	% Recov	ery			% RI	EC Limits				

Surrogates	% Recovery	% REC Limits	
4-Bromofluorobenzene (1)	93.0	70-130	8/5/15 3:12
4-Bromofluorobenzene (1)	97.9	70-130	8/4/15 19:10



#### **Sample Extraction Data**

Prep Method: TO-15 Prep-EPA TO-15		Pressure	Pre	Pre-Dil Initial	Pre-Dil Final	Default	Actual	
Lab Number [Field ID]	Batch	Dilution	Dilution	mL	mL	Injection mL	Injection mL	Date
15H0014-01 [VMP-1]	B128126	1	1	N/A	1000			08/04/15
15H0014-01RE1 [VMP-1]	B128126	1	1	N/A	1000			08/04/15
15H0014-02 [VMP-2]	B128126	1	1	N/A	1000			08/04/15
15H0014-02RE1 [VMP-2]	B128126	1	1	N/A	1000			08/04/15



#### QUALITY CONTROL

#### Air Toxics by EPA Compendium Methods - Quality Control

	ppl	bv	ug/n	n3	Spike Level	Source		%REC		RPD	
Analyte	Results	RL	Results	RL	ppbv	Result	%REC	Limits	RPD	Limit	Flag
Batch B128126 - TO-15 Prep											
Blank (B128126-BLK1)					Prepared & A	Analyzed: 08	/04/15				
cis-1,2-Dichloroethylene	ND	0.050									
trans-1,2-Dichloroethylene	ND	0.050									
Tetrachloroethylene	ND	0.050									
Trichloroethylene	ND	0.050									
Vinyl Chloride	ND	0.050									
Surrogate: 4-Bromofluorobenzene (1)	7.31				8.00		91.4	70-130			
LCS (B128126-BS1)					Prepared & A	Analyzed: 08	/04/15				
cis-1,2-Dichloroethylene	5.35				5.00		107	70-130			
trans-1,2-Dichloroethylene	5.19				5.00		104	70-130			
Tetrachloroethylene	4.81				5.00		96.1	70-130			
Trichloroethylene	6.05				5.00		121	70-130			
Vinyl Chloride	4.82				5.00		96.4	70-130			
Surrogate: 4-Bromofluorobenzene (1)	7.97				8.00		99.6	70-130			



#### FLAG/QUALIFIER SUMMARY

*	OC result is	s outside of	established	limits

- † Wide recovery limits established for difficult compound.
- ‡ Wide RPD limits established for difficult compound.
- # Data exceeded client recommended or regulatory level

Percent recoveries and relative percent differences (RPDs) are determined by the software using values in the

calculation which have not been rounded.

J Detected but below the Reporting Limit (lowest calibration standard); therefore, result is an estimated

concentration (CLP J-Flag).



#### CERTIFICATIONS

#### Certified Analyses included in this Report

**Analyte** Certifications

#### EPA TO-15 in Air

cis-1,2-DichloroethyleneAIHA,FL,NY,VAtrans-1,2-DichloroethyleneAIHA,NJ,NY,VATetrachloroethyleneAIHA,FL,NJ,NY,VATrichloroethyleneAIHA,FL,NJ,NY,VAVinyl ChlorideAIHA,FL,NJ,NY,VA

The CON-TEST Environmental Laboratory operates under the following certifications and accreditations:

Code	Description	Number	Expires
AIHA	AIHA-LAP, LLC	100033	02/1/2016
MA	Massachusetts DEP	M-MA100	06/30/2016
CT	Connecticut Department of Publilc Health	PH-0567	09/30/2015
NY	New York State Department of Health	10899 NELAP	04/1/2016
NH-S	New Hampshire Environmental Lab	2516 NELAP	02/5/2016
RI	Rhode Island Department of Health	LAO00112	12/30/2015
NC	North Carolina Div. of Water Quality	652	12/31/2015
NJ	New Jersey DEP	MA007 NELAP	09/30/2015
FL	Florida Department of Health	E871027 NELAP	06/30/2016
VT	Vermont Department of Health Lead Laboratory	LL015036	07/30/2016
WA	State of Washington Department of Ecology	C2065	02/23/2016
ME	State of Maine	2011028	06/9/2017
VA	Commonwealth of Virginia	460217	12/14/2015
NH-P	New Hampshire Environmental Lab	2557 NELAP	09/6/2015

COP Fex: 413-525-2332 ANALYTICAL LABORATORY

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39 Spruce Street

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East long meadow, MA 01028

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Page 10 of 13 15H0014 1 Contest

\*\* Preservation

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Final MDL

THENAROUND THE STARTS AT 9:00 A.M. THE DAY AFTER SAMPLE RECEIPT UNLESS THERE ARE QUESTIONS ON YOUR CHAIN. IF THIS FORM IS NOT FILLED OUT COMPLETELY OR IS INCORRECT, TURNAROUND TIME WILL NOT START UNTIL ALL QUESTIONS ARE ANSWERED BY OUR CLIENT.

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#### FedEx "Tracking

#### 3477584(4574200)

Ship date Thur 7/30/2015

Actual delivery : Fri 7/31/2015 10:13 am

MAUS

CHAUS

Delivered Signed for by: P.BLAKE

#### Travel History

∡ Date/Time	Activity	Location
× 7/31/2015	- Friday	
10:13 ani	Delivered	4,04
7:53 am	On FedEx vehicle for delivery	VBNOSQR (I)F.F1; QT
7:47 am	At local FedEx facility	Verbson:00ks ci
6:25 am	At destination sort facility	EAST GRAMM, CT
4:51 am	Departed FedEx location	BIDIARAPOLIS IN
12:55 am	Arrived at FedEx location	SECTION APPOLIST BY
<b>7/30/2015</b>	- Thursday	
9:07 pm	Left FedEx origin facility	CHARLOTTE NO
4:33 pm	Picked up	CHARLOUTE NO
Chinmont Fac	†n	

#### Shipment Facts

Tracking	
number	

807531352200

Deliver Weekday

Weight 14 lbs / 6.35 kgs Shipping/Receiving

Delivered To Total shipment

14 lbs / 6.35 kgs weight

Special handling

Service

FedEx Standard Overnight

Dimensions

22x14x9 in.

Total pieces

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Fred Byz.

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39 Sprace St.
East Longmeadow, MA.
01028
P: 413-525-2332

P: 413-525-2332 F: 413-525-6405

### AIR Only Receipt Checklist

CLIENT NAME: Hat a Hicknan	RECEIVE	DBY: PB	DATE: 47:31.15
		N. S.	^
1) Was the chain(s) of custody relinquished and signed	17		
2) Does the chain agree with the samples?  If not, explain:		Yes N	
3) Are all the samples in good condition? If not, explain:		(Yes) N	, whole the purpose of the control o
4) Are there any samples "On Hold"?		Yes (N	Stored where:
5) Are there any RUSH or SHORT HOLDING TIME samp	des?	Yes (N	o)
Who was notified Date			many parties
W no was flouried		§	contract samples? Yes No
6) Location where samples are stored:		F.	nly) if not already approved
7) Number of cans Individually Certified or Batch Certif	ied? <u>LV</u>	N. C.	
Containers rec	eived	at Con-Tes	
		# of Containers	Types (Size, Duration)
Summa Cans (TO-14/TO-15/APH)			
Tedar Bags			MANAGEM AND
TO-17 Tubes			
			1 V
Regulators		The second secon	The second secon
Restrictors			
Hg/Hopcalite Tube (NIOSH 6009)		manes produces and control of the co	The state of the s
(TO-4A/TO-10A/TO-13) PUFs		والمراج والمناور المراورة والمراورة والمراورة والمراورة والمراورة والمراورة والمراورة والمراورة والمراورة والم	
PCB Florisll Tubes (NIOSH 5503)		entre metarak pang pakatan katan katan katan katan bahan 1975 katan 1975 katan 1975 katan bahan katan bahan ba	
Air cassette		desir Mandal Birga ettimolde et eit 1919 i Managament diesele und destination propagation il 1824 bit dell'ett	Art School by 1700 gg marketing to the control of t
PM 2.5/PM 10		теру бражина ( допродна на настанија на јенерово и поришта Livelania ( да настано в 1944 годин о того и	Annual hadissing of the Part of the Control of the
TO-11A Carridges		amai mateen sii illa kalka kalka kalka ka k	Control of the Contro
Other		and the second second of the second second second second second is a second second second second second second	group gar made a december 1990 and the first of the control of the
Unused Summas/PUF Media:		sed Regulators:	het gemeen versteen kan van de verste gebeure van de verste gebeure van de versteer van de ver
1) Was all media (used & unused) checked into t	he WASP	?	
2) Were all returned summa cans, Restrictors & Air Lab Inbound/Outbound Excel Spreadsheet?	Regulator	s and PUF's doc	umented as returned in the
Laboratory Comments: 194 413	and the second s	gydgolaethid d Albaniaman Albaniau gang b Piplanda gyan maa amad ka Bahan paraman addi ambanya 1997. I	The state of the s
1333 413	9		

Doc # 278 Rev. 5 October 2014

### Page 2 of 2 Login Sample Receipt Checklist

# (Rejection Criteria Listing - Using Sample Acceptance Policy) Any False statement will be brought to the attention of Client Answer (True/False)

Any False statement will be b	rought to the atter	ation of Chem.  Comment
Section 1997	Answer Lilue/Fais	A Section of the sect
Question	TIFINA	
	White was been recovered to the control of the cont	
to describe present is intent	L ACA	
The coolers'/boxes' custody seal, if present, is intact.	American Commission of the Commission of Com	
2) The cooler or samples do not appear to have been	Mariando e Mariando Prim	and the same of th
compromised or tampered with.	AND THE RESIDENCE OF THE PROPERTY OF THE PROPE	er gelden gelde frank in de gelden geloop geloop geloop geloop geloop geloop geloop geloop geloop ge
CALL CALLS AND A CALL CONTRACTOR OF THE CALL CALL CALL CALL CALL CALL CALL CAL	22	
3) Samples were received on ice.	and framework to the second	
3) 28111/162 MOLE LOCALLA DE CONTRACTOR DE LA CONTRACTOR		
a de la contraction de la cont	NA I	ત્રા કર્યું અમાં માટે પ્રત્યું અને માટે કર્યું અને માટે કર્યું અને માટે કર્યું એક માટે કર્યું એક અને માટે કર્યો કર્યો કર્યો કર્યો કર્યું કર્યા માટે કર્યો ક
4) Cooler Temperature is acceptable.	AMAZINA MARKANIA MARK	
	1 1/1	
5) Cooler Temperature is recorded.	Company of the second s	CONTRACTOR VIOLENCE V
Constructive State of the Construction of the		* And the Annual Control of the Annual Contr
6) COC is filled out in ink and legible.	The state of the s	ym ag y gliffold for all fills for his fill for the standard fills and a fill for the standard for the stand
And the format of the format of the second o	Anapaga,	The state of the s
7) COC is filled out with all pertinent information.	A control to the second control of the secon	And the second of the second o
with the state of		**
8) Field Sampler's name present on COC.	The state of the s	
8) FIELD Sampler's Harrie prosent		STREET, STREET
the Landing Time		The state of the contract of t
Samples are received within Holding Time.		
	<del></del>	The state of the s
10) Sample containers have legible labels.	The second section is the second section of the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the second section is the second section in the second section in the section is the second section in the section is the second section in the section is the section in the sectio	And the state of t
Constitute of contributions of the property of the contribution of		
11) Containers/media are not broken or leaking and valves	SERVICE	and the second s
and caps are closed tightly.	NEW PROPERTY CONTRACTOR OF THE PROPERTY OF THE	Amenger (Ald Control of the Security Amenger (Ald Million Control of the Security And Security (Ald Million Control of the Security And Security (Ald Million Control of the Security And
ATIC CAPS ATC CIOSSE TO SECURIO CONTRACTOR C		
12) Sample collection date/times are provided.		
12) Sample Collection Catorina Collection Co		
the contribute at a 1990	Will from	AND THE COMMENT OF THE PRODUCTION OF THE PRODUCT
13) Appropriate sample/media containers are used.	aniario e produkto a reservina de la competica del ania de la constanta de la constanta de la constanta de la c	
		٠ - ا
14) There is sufficient volume for all regusted	Wangaritani	The state of the s
analyses, including any requested MS/MSDs.	the state of the s	- God and Springer and Springer and Color Springer
AT 1 Commission of the processing processing processing and the processing of the processing and the processing processin	NA	
15) Trip blanks provided if applicable.		s7 Date/Time:
19) Lish nice was by	of False statement	45° ±
Doc #278 Rev. 5 October 2014 Log-in Techn	ician Initials: PC	Date/Time: 7.31.15
DOC AS to Mear of Arrests was a		Franch Franch
		10:13
		<b>₩</b>

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## APPENDIX C DSCA RISK CALCULATORS

#### DSCA Soil Gas Risk Calculator - Cumulative Risk for Non-Residential Worker

Version 3, 1/16/2015

DSCA ID No: DC600013

Name/Address of DSCA Site: Cunningham Cleaners, 104 S. Sharon Amity Road, Charlotte, Mecklenburg County Name/Address of Sampling Location: Sun Trust Bank, 207 S. Sharon Amity Road, Charlotte, Mecklenburg County

7/28/2015 VMP-1 Sampling Date: Sample ID:

		Soil Gas Concentration	Calculated Indoor Air Concentration	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non- Carcinogens @ THQ = 0.2	Calculated Carcinogenic Risk	Calculated Non- Carcinogenic Hazard Quotient
CAS	Chemical Name	(ug/m <sup>3</sup> )	(ug/m <sup>3</sup> )	(ug/m3)	(ug/m3)	CR	HI
127-18-4	Tetrachloroethylene	72	0.72	4.72E+01	3.50E+01	1.53E-08	0.0041
79-01-6	Trichloroethylene	81	0.81	2.99E+00	1.75E+00	2.71E-07	0.0925
75-01-4	Vinyl Chloride	7.3	0.073	2.79E+00	8.76E+01	2.62E-08	0.0002

Cumulative:	3.12E-07	0.10

#### Notes:

Calculated indoor air concentrations determined using the following formula:

Calculated Indoor Air Concentration = Soil Gas Concentration x AF

Where,

AF = non-residential attenuation factor = 0.010

- 2. Target indoor air concentrations calculated using the EPA Vapor Intrusion Screening Level (VISL) Calculator, which is based on the EPA Regional Screening Levels. Note that concentrations are equivalent to the Inactive Hazardous Sites Branch (IHSB) VISLs.
- 3. Cumulative carcinogenic risk (CR) and hazard index (HI) calculated using the following formulas, per the procedure detailed in the EPA Regional Screening Levels User's Guide.

$$CR = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)] \times 10^{-6}$$

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on carcinogenic risk of 10<sup>-6</sup>

 $HI = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)]$ 

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on hazard quotient of 1\*

\* = Tabulated values are based on a hazard quotient of 0.2. These values are multiplied by 5 to convert to a hazard quotient of 1.

#### DSCA Soil Gas Risk Calculator - Cumulative Risk for Resident

Version 3, 1/16/2015

DSCA ID No: DC600013

Cunningham Cleaners, 104 S. Sharon Amity Road, Charlotte, Mecklenburg County Sun Trust Bank, 207 S. Sharon Amity Road, Charlotte, Mecklenburg County Name/Address of DSCA Site: Name/Address of Sampling Location:

Sampling Date: 7/28/2015 VMP-1 Sample ID:

		Soil Gas Concentration	Calculated Indoor Air Concentration	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non- Carcinogens @ THQ = 0.2	Calculated Carcinogenic Risk	Calculated Non- Carcinogenic Hazard Quotient
CAS	Chemical Name	(ug/m <sup>3</sup> )	(ug/m³)	(ug/m3)	(ug/m3)	CR	HI
127-18-4	Tetrachloroethylene	72	2.160	1.08E+01	8.34E+00	2.00E-07	0.0518
79-01-6	Trichloroethylene	81	2.430	4.78E-01	4.17E-01	5.08E-06	1.1651
75-01-4	Vinyl Chloride	7.3	0.219	1.68E-01	2.09E+01	1.31E-06	0.0021

Cumulative:	6.59E-06	1.22

#### Notes:

Calculated indoor air concentrations determined using the following formula:

Calculated Indoor Air Concentration = Soil Gas Concentration x AF

Where,

AF = residential attenuation factor = 0.03

- 2. Target indoor air concentrations calculated using the EPA Vapor Intrusion Screening Level (VISL) Calculator, which is based on the EPA Regional Screening Levels. Note that concentrations are equivalent to the Inactive Hazardous Sites Branch (IHSB) VISLs.
- 3. Cumulative carcinogenic risk (CR) and hazard index (HI) calculated using the following formulas, per the procedure detailed in the EPA Regional Screening Levels User's Guide.

 $CR = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)] \times 10^{-6}$ 

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on carcinogenic risk of 10<sup>-6</sup>

 $HI = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)]$ 

Where,
Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on hazard quotient of 1\*

\* = Tabulated values are based on a hazard quotient of 0.2. These values are multiplied by 5 to convert to a hazard quotient of 1.

#### DSCA Soil Gas Risk Calculator - Cumulative Risk for Non-Residential Worker

Version 3, 1/16/2015

DSCA ID No: DC600013

Name/Address of DSCA Site: Cunningham Cleaners, 104 S. Sharon Amity Road, Charlotte, Mecklenburg County

Name/Address of Sampling Location: Sun Trust Bank, 207 S. Sharon Amity Road, Charlotte, Mecklenburg County

7/28/2015 VMP-2 Sampling Date: Sample ID:

		Soil Gas Concentration	Calculated Indoor Air Concentration	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non- Carcinogens @ THQ = 0.2	Calculated Carcinogenic Risk	Calculated Non- Carcinogenic Hazard Quotient
CAS	Chemical Name	(ug/m³)	(ug/m <sup>3</sup> )	(ug/m3)	(ug/m3)	CR	HI
127-18-4	Tetrachloroethylene	48	0.48	4.72E+01	3.50E+01	1.02E-08	0.0027
79-01-6	Trichloroethylene	71	0.71	2.99E+00	1.75E+00	2.37E-07	0.0811

Cumulative:	2.48E-07	0.08

#### Notes:

1. Calculated indoor air concentrations determined using the following formula:

Calculated Indoor Air Concentration = Soil Gas Concentration x AF

Where.

AF = non-residential attenuation factor = 0.010

- 2. Target indoor air concentrations calculated using the EPA Vapor Intrusion Screening Level (VISL) Calculator, which is based on the EPA Regional Screening Levels. Note that concentrations are equivalent to the Inactive Hazardous Sites Branch (IHSB) VISLs.
- 3. Cumulative carcinogenic risk (CR) and hazard index (HI) calculated using the following formulas, per the procedure detailed in the EPA Regional Screening Levels User's Guide.

 $CR = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_y/SL_z)] \times 10^{-6}$ 

Where,

Conc = indoor air concentration for constituent of concern

SL = target indoor air concentration for constituent of concern based on carcinogenic risk of 10<sup>-6</sup>

 $\mathsf{HI} = [(\mathsf{Conc}_x/\mathsf{SL}_x) + (\mathsf{Conc}_y/\mathsf{SL}_y) + (\mathsf{Conc}_z/\mathsf{SL}_z)]$ 

Conc = indoor air concentration for constituent of concern

\* = Tabulated values are based on a hazard quotient of 0.2. These values are multiplied by 5 to convert to a hazard quotient of 1.

#### DSCA Soil Gas Risk Calculator - Cumulative Risk for Resident

Version 3, 1/16/2015

DSCA ID No: DC600013

Cunningham Cleaners, 104 S. Sharon Amity Road, Charlotte, Mecklenburg County Sun Trust Bank, 207 S. Sharon Amity Road, Charlotte, Mecklenburg County Name/Address of DSCA Site: Name/Address of Sampling Location:

Sampling Date:

7/28/2015 VMP-2 Sample ID:

		Soil Gas Concentration	Calculated Indoor Air Concentration	Target Indoor Air Conc. for Carcinogens @ TCR = 1E-06	Target Indoor Air Conc. for Non- Carcinogens @ THQ = 0.2	Calculated Carcinogenic Risk	Calculated Non- Carcinogenic Hazard Quotient
CAS	Chemical Name	(ug/m³)	(ug/m³)	(ug/m3)	(ug/m3)	CR	HI
127-18-4	Tetrachloroethylene	48	1.440	1.08E+01	8.34E+00	1.33E-07	0.0345
79-01-6	Trichloroethylene	71	2.130	4.78E-01	4.17E-01	4.45E-06	1.0212

Cumulative:	4.59E-06	1.06

Notes:
1. Calculated indoor air concentrations determined using the following formula:

Calculated Indoor Air Concentration = Soil Gas Concentration x AF

- AF = residential attenuation factor = 0.03

  2. Target indoor air concentrations calculated using the EPA Vapor Intrusion Screening Level (VISL) Calculator, which is based on the EPA Regional Screening Levels. Note that concentrations are equivalent to the Inactive Hazardous Sites Branch (IHSB) VISLs.
- 3. Cumulative carcinogenic risk (CR) and hazard index (HI) calculated using the following formulas, per the procedure detailed in the EPA Regional Screening Levels User's Guide.

 $CR = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)] \times 10^{-6}$ 

Where,
Conc = indoor air concentration for constituent of concern SL = target indoor air concentration for constituent of concern based on carcinogenic risk of 10<sup>-6</sup>

 $HI = [(Conc_x/SL_x) + (Conc_y/SL_y) + (Conc_z/SL_z)]$ 

Conc = indoor air concentration for constituent of concern
SL = target indoor air concentration for constituent of concern based on hazard quotient of 1\*

\* = Tabulated values are based on a hazard quotient of 0.2. These values are multiplied by 5 to convert to a hazard quotient of 1.