

June 29, 2016

Project Reference #16037

Mr. Mat Reimer
Redevelopment Authority of the City of Milwaukee
809 North Broadway
Milwaukee, WI 53202

RE: Summary of Vapor Intrusion Assessment Findings
3604 & 3614 N. 11th Street
Milwaukee, Wisconsin

Dear Mr. Reimer:

The Sigma Group, Inc. (Sigma) was retained by the Redevelopment Authority of the City of Milwaukee to perform a vapor intrusion assessment at 3604 & 3614 N. 11th Street in Milwaukee, Wisconsin (the "Site"). The purpose of the assessment was to further evaluate potential vapor intrusion pathways at the Site associated with the known chlorinated volatile organic compound (CVOC) groundwater contamination at the adjacent property located at 1003 W. Atkinson Ave. Specifically, sub-slab, interior, and outdoor (ambient) air samples were collected at select locations within the Site to evaluate potential vapor intrusion pathways from the adjacent property. This letter presents a summary of the results of the vapor intrusion assessment along with recommendations based on these results.

BACKGROUND

Based on information provided by the City of Milwaukee, the adjacent property located at 1003 W. Atkinson Ave. has known CVOC groundwater contamination. A vapor mitigation system was installed at the house at the adjacent residential property to the north located at 3618 N 11th St. based on previous results of a sub-slab vapor sample collected from the house. In order to evaluate the potential vapor intrusion pathway at the existing residential houses located at the Site, a vapor intrusion assessment was completed.

INVESTIGATION ACTIVITIES

Vapor Intrusion Investigation

In March 2016, two sub-slab vapor points, SSV-1 and SSV-2, were completed in the basements of 3614 N. 11th St and 3604 N 11th St. respectively. The sub-slab vapor sampling locations are illustrated in **Figure 1**.

For each sub-slab sampling point, a 5/8 inch diameter hole was drilled through the basement concrete floor slab using a hammer drill. The hole was then cleaned with a shop-vac and a 3/4-inch brush to remove any residual concrete dust and ensure a good seal at the sampling point. A 1/2-inch diameter Vapor Pin[®] fitted with a silicone sleeve (to create a seal) was installed in the drill hole with a dead blow hammer. Following the Vapor Pin[®] installation, the sample point was capped and sub-slab conditions were allowed to re-equilibrate overnight prior to sampling.

Appropriate lengths of new nylon tubing and new compression fittings/valves were used to connect the sub slab sampling point to a Summa canister supplied by the analytical laboratory. Each Summa canister was equipped with a flow regulator set to allow sample collection over a 30 minute period (limiting the rate of sample collection to less than 200 ml/minute). The tightness of the sampling line between the sample point and the Summa canister was tested using a hand powered vacuum pump with gauge.

A minimum vacuum of 50 inches of water was maintained for a minimum of 2 minutes for each sampling location. The tightness of the surface seal around each probe point was verified by installing a water dam around each sample point. An approximately 4-inch section of 2-inch diameter schedule-40 PVC was installed around the sample point and sealed to the surface of the concrete floor around the point using plumber's putty. Distilled water was poured into the dam around the point. The level of the water was monitored prior to sampling (and during sample collection) to verify that no water was lost and no leaks were present at the surface seal around the sample point.

Following completion of the tightness test and surface seal test, the sampling point was purged with a photo-ionization detector (PID) for a minimum of 5 minutes. Following purging with a PID, sample collection was initiated by opening the Summa canister valve. Sample collection was terminated after approximately 30 minutes while a small level of vacuum pressure remained in the Summa canister. The Summa canister and associated tubing was disconnected from the Vapor Pin[®], and the pin was left in place for future sampling. The sub-slab vapor samples were submitted for laboratory analysis of CVOCs.

Representative samples of the indoor air from the basement level of both buildings were collected over a 24-hour sampling period using a laboratory certified Summa canister between March 15 and 16, 2016. Sample AAS-1 was collected at 3614 N. 11th St. and sample AAS-2 was collected at 3604 N. 11th St. Collection of basement level air samples was not initiated until the sub-slab sampling points within each building had been installed and capped to prevent interference of sub-slab vapors with indoor air sampling. A sample of the outdoor (ambient) air (AAS-3) was also collected simultaneously with the basement air samples to evaluate the ambient air for the presence of CVOCs. All three air samples were submitted for laboratory analysis of CVOCs.

On May 18, 2016, the sub-slab vapor points were sampled again using the sampling procedure discussed above. Each sample train was tested for leaks by using a shut-in test for a duration of 2 minutes before sampling began. After the sampling was completed, the vapor points were removed, filled with sand, and patched with concrete. The sub-slab vapor samples were submitted for laboratory analysis of CVOCs.

INVESTIGATION RESULTS

Sub-Slab Vapor Analytical Results. Sub-slab vapor analytical results for the sub-slab vapor samples collected on the subject property are summarized in **Table 1**. The sub-slab vapor laboratory analytical report is included in **Attachment A**.

- *Chlorinated VOCs (CVOCs):* Laboratory analytical results indicate that CVOC constituents within samples collected at sampling points SSV-1 and SSV-2 in March and May 2016 were reported less than Vapor Risk Screening Levels (VRSLs) for

Subslab Vapor to Indoor Air Pathway calculated in accordance with applicable WDNR guidance.

Air Analytical Results. Indoor and ambient air analytical results for the air samples collected on the subject property are summarized in **Table 1**. The air sample laboratory analytical report is included in **Attachment A**.

- *Chlorinated VOCs (CVOCs):* Laboratory analytical results indicate that CVOC constituents within samples collected at sampling points AAS-1, AAS-2 and AAS-3 in March 2016 were reported less than applicable Vapor Action Levels (VALs).

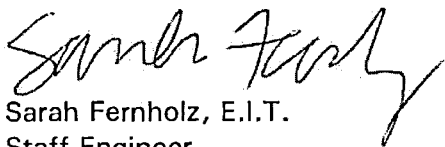
DISCUSSION

Based on sub-slab vapor and air analytical results, CVOC impacts associated with the adjacent property do not appear to have impacted indoor air at concentrations greater than VALs or sub-slab vapors at concentrations greater than VRSLs at the two subject properties.

Please call us at (414) 643-4200 if you have any questions.

Sincerely,

THE SIGMA GROUP, INC.



Sarah Fernholz, E.I.T.
Staff Engineer



Stephen Meer, P.E.
Project Engineer

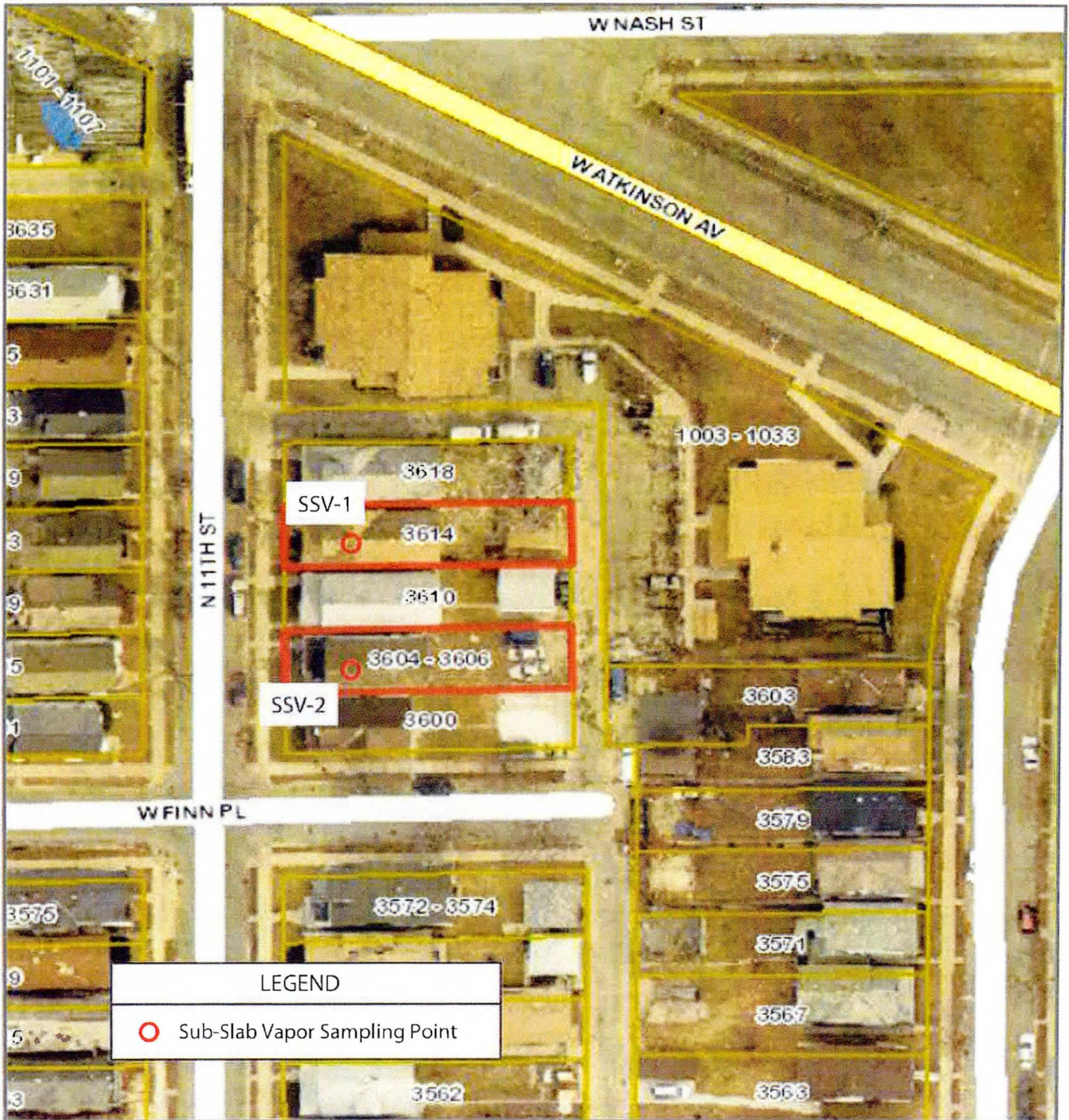
Enclosures:



Figure 1 – Sub-Slab Vapor Sample Locations

Table 1 – Sub-Slab Vapor & Indoor Air Analytical Data

Attachment A – Laboratory Analytical Report

FIGURE



Client: City of Milwaukee	 <p>www.thesigmagroup.com 1100 West Canal Street Milwaukee, WI 53233 414-441-4200</p>	
Site Address: 3604 & 3614 N. 11th St. Milwaukee, WI		
Project: #16037		<p>FIGURE 1 SUB-SLAB VAPOR SAMPLE LOCATIONS</p>

TABLE

Table 1
Sub-Slab Vapor & Indoor Air Analytical Data
3604 & 3614 N 11th Street, Milwaukee, Wisconsin
Sigma Project No. #16037

Sample Type:		Ambient Air Samples				VAL for Residential Indoor Air ²	VAL for Commercial / Industrial Indoor Air ³
Sample Identification:		AAS-1	AAS-2	AAS-3			
Date:		3/15/16 to 3/16/16	3/15/16 to 3/16/16	3/15/16 to 3/16/16			
Duration:		24 hrs	24 hrs	24 hrs			
Detected CVOCs (Summa canisters by EPA Method TO-15)							
cis-1,2-Dichloroethene	µg/m ³	<0.35	<0.38	<0.37		NS	NS
trans-1,2-Dichloroethene	µg/m ³	0.72 J	<0.60	<0.57		NS	NS
Tetrachloroethene (PCE)	µg/m ³	<0.40	<0.43	<0.41		42	180
Trichloroethene (TCE)	µg/m ³	<0.40	<0.43	<0.41		2.1	8.8
Vinyl Chloride	µg/m ³	<0.28	<0.30	<0.29		1.7	28
Sample Type:		Subslab Vapor Samples				Screening Level for Subslab Vapor to Indoor Air Pathway ⁴	Screening Level for Subslab Vapor to Indoor Air Pathway ⁵
Sample Identification:		SSV-1		SSV-2			
Date:		3/16/16	5/18/16	3/16/16	5/18/16		
Duration:		41 min	37 min	36 min	37 min		
Detected CVOCs (Summa canisters by EPA Method TO-15)							
cis-1,2-Dichloroethene	µg/m ³	<0.38	<0.37	<0.37	<0.37	NS	NS
trans-1,2-Dichloroethene	µg/m ³	<0.60	<0.57	<0.57	<0.57	NS	NS
Tetrachloroethene (PCE)	µg/m ³	<0.43	1.5	2.3	1.8	1,400	18,000
Trichloroethene (TCE)	µg/m ³	<0.43	<0.41	<0.41	<0.41	70	880
Vinyl Chloride	µg/m ³	<0.30	<0.29	<0.29	<0.29	57	2,800

Notes:

- Analytical units: µg/m³ = micrograms per cubic meter
- VAL for Residential Indoor Air = Vapor Action Level described in WDNR publication PUB-RR-800 "Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin" (dated December 2010) which in turn references EPA Region 3 Risk-Based Concentrations for residential air (Regional Screening Level Master Table - November 2012 [http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm]) and May 2012 "Indoor Air Vapor Action Levels for Various VOCs Quick Look-Up Table". VAL adjusted to 1-in-100,000 increase in lifetime cancer risk for carcinogens per WDNR publication PUB-RR-800; VAL is not adjusted for non-carcinogens (i.e., hazard index = 1).
- VAL for Commercial/Industrial Indoor Air = Vapor Action Level described in WDNR publication PUB-RR-800 "Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin" (dated December 2010) which in turn references EPA Region 3 Risk-Based Concentrations for industrial air (Regional Screening Level Master Table - November 2012 [http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/index.htm]) and May 2012 "Indoor Air Vapor Action Levels for Various VOCs Quick Look-Up Table". VAL adjusted to 1-in-100,000 increase in lifetime cancer risk for carcinogens per WDNR publication PUB-RR-800; VAL is not adjusted for non-carcinogens (i.e., hazard index = 1).
- Screening Level for Subslab Vapor to Indoor Air Pathway = Risk-based concentrations based on VALs for residential air (see note #2 above) which has been adjusted with an Attenuation Factor of 0.03 for the subslab vapor to ambient air pathway in a residential building as provided in WDNR publication PUB-RR-800 "Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin" (dated December 2010).
- Screening Level for Subslab Vapor to Indoor Air Pathway = Risk-based concentrations based on VALs for commercial/industrial air (see note #3 above) which has been adjusted with an Attenuation Factor of 0.01 for the subslab vapor to ambient air pathway in a large commercial/industrial building as provided in WDNR publication PUB-RR-800 "Addressing Vapor Intrusion at Remediation & Redevelopment Sites in Wisconsin" (dated December 2010).
- NA = not analyzed
- Laboratory flags: Enter flags as necessary
- Exceedances: **BOLD** = concentration exceeds Vapor Risk Screening Level

ATTACHMENT A
Laboratory Analytical Report



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

March 28, 2016

Steve Meer
Sigma Environmental Services
1300 W. Canal St.
Milwaukee, WI 53233

RE: Project: 16037
Pace Project No.: 10341789

Dear Steve Meer:

Enclosed are the analytical results for sample(s) received by the laboratory on March 17, 2016. 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
carolynne.trout@pacelabs.com
Project Manager

Enclosures

cc: JT Holcombe, The Sigma Group, Inc.



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 16037
Pace Project No.: 10341789

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
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 #:14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
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 - VWW #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
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
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
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: 16037
Pace Project No.: 10341789

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10341789001	AAS-1	Air	03/16/16 08:26	03/17/16 10:00
10341789002	AAS-2	Air	03/16/16 08:49	03/17/16 10:00
10341789003	AAS-3	Air	03/16/16 08:44	03/17/16 10:00
10341789004	SSV-1	Air	03/16/16 09:14	03/17/16 10:00
10341789005	SSV-2	Air	03/16/16 09:26	03/17/16 10:00

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SAMPLE ANALYTE COUNT

Project: 16037
Pace Project No.: 10341789

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10341789001	AAS-1	TO-15	MJL	5	PASI-M
10341789002	AAS-2	TO-15	MJL	5	PASI-M
10341789003	AAS-3	TO-15	MJL	5	PASI-M
10341789004	SSV-1	TO-15	MJL	5	PASI-M
10341789005	SSV-2	TO-15	MJL	5	PASI-M

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ANALYTICAL RESULTS

Project: 16037
 Pace Project No.: 10341789

Sample: AAS-1 Lab ID: 10341789001 Collected: 03/16/16 08:26 Received: 03/17/16 10:00 Matrix: Air									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR Analytical Method: TO-15									
cis-1,2-Dichloroethene	<0.35	ug/m3	1.2	0.35	1.44		03/26/16 17:41	156-59-2	
trans-1,2-Dichloroethene	0.72J	ug/m3	1.2	0.55	1.44		03/26/16 17:41	156-60-5	
Tetrachloroethene	<0.40	ug/m3	0.99	0.40	1.44		03/26/16 17:41	127-18-4	
Trichloroethene	<0.40	ug/m3	0.79	0.40	1.44		03/26/16 17:41	79-01-6	
Vinyl chloride	<0.28	ug/m3	0.37	0.28	1.44		03/26/16 17:41	75-01-4	

Sample: AAS-2 Lab ID: 10341789002 Collected: 03/16/16 08:49 Received: 03/17/16 10:00 Matrix: Air									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR Analytical Method: TO-15									
cis-1,2-Dichloroethene	<0.38	ug/m3	1.3	0.38	1.55		03/26/16 18:10	156-59-2	
trans-1,2-Dichloroethene	<0.60	ug/m3	1.3	0.60	1.55		03/26/16 18:10	156-60-5	
Tetrachloroethene	<0.43	ug/m3	1.1	0.43	1.55		03/26/16 18:10	127-18-4	
Trichloroethene	<0.43	ug/m3	0.85	0.43	1.55		03/26/16 18:10	79-01-6	
Vinyl chloride	<0.30	ug/m3	0.40	0.30	1.55		03/26/16 18:10	75-01-4	

Sample: AAS-3 Lab ID: 10341789003 Collected: 03/16/16 08:44 Received: 03/17/16 10:00 Matrix: Air									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR Analytical Method: TO-15									
cis-1,2-Dichloroethene	<0.37	ug/m3	1.2	0.37	1.49		03/26/16 18:39	156-59-2	
trans-1,2-Dichloroethene	<0.57	ug/m3	1.2	0.57	1.49		03/26/16 18:39	156-60-5	
Tetrachloroethene	<0.41	ug/m3	1.0	0.41	1.49		03/26/16 18:39	127-18-4	
Trichloroethene	<0.41	ug/m3	0.82	0.41	1.49		03/26/16 18:39	79-01-6	
Vinyl chloride	<0.29	ug/m3	0.39	0.29	1.49		03/26/16 18:39	75-01-4	

Sample: SSV-1 Lab ID: 10341789004 Collected: 03/16/16 09:14 Received: 03/17/16 10:00 Matrix: Air									
Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR Analytical Method: TO-15									
cis-1,2-Dichloroethene	<0.38	ug/m3	1.3	0.38	1.55		03/26/16 19:07	156-59-2	
trans-1,2-Dichloroethene	<0.60	ug/m3	1.3	0.60	1.55		03/26/16 19:07	156-60-5	
Tetrachloroethene	<0.43	ug/m3	1.1	0.43	1.55		03/26/16 19:07	127-18-4	
Trichloroethene	<0.43	ug/m3	0.85	0.43	1.55		03/26/16 19:07	79-01-6	
Vinyl chloride	<0.30	ug/m3	0.40	0.30	1.55		03/26/16 19:07	75-01-4	

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ANALYTICAL RESULTS

Project: 16037
Pace Project No.: 10341789

Sample: SSV-2 Lab ID: 10341789005 Collected: 03/16/16 09:26 Received: 03/17/16 10:00 Matrix: Air

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR		Analytical Method: TO-15							
cis-1,2-Dichloroethene	<0.37	ug/m3	1.2	0.37	1.49		03/26/16 19:36	156-59-2	
trans-1,2-Dichloroethene	<0.57	ug/m3	1.2	0.57	1.49		03/26/16 19:36	156-60-5	
Tetrachloroethene	2.3	ug/m3	1.0	0.41	1.49		03/26/16 19:36	127-18-4	
Trichloroethene	<0.41	ug/m3	0.82	0.41	1.49		03/26/16 19:36	79-01-6	
Vinyl chloride	<0.29	ug/m3	0.39	0.29	1.49		03/26/16 19:36	75-01-4	

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QUALITY CONTROL DATA

Project: 16037
Pace Project No.: 10341789

QC Batch: AIR/25548 Analysis Method: TO-15
QC Batch Method: TO-15 Analysis Description: TO15 MSV AIR Low Level
Associated Lab Samples: 10341789001, 10341789002, 10341789003, 10341789004, 10341789005

METHOD BLANK: 2217916 Matrix: Air
Associated Lab Samples: 10341789001, 10341789002, 10341789003, 10341789004, 10341789005

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,2-Dichloroethene	ug/m3	<0.25	0.81	03/26/16 13:18	
Tetrachloroethene	ug/m3	<0.28	0.69	03/26/16 13:18	
trans-1,2-Dichloroethene	ug/m3	<0.38	0.81	03/26/16 13:18	
Trichloroethene	ug/m3	<0.28	0.55	03/26/16 13:18	
Vinyl chloride	ug/m3	<0.20	0.26	03/26/16 13:18	

LABORATORY CONTROL SAMPLE: 2217917

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
cis-1,2-Dichloroethene	ug/m3	40.3	47.3	117	65-139	
Tetrachloroethene	ug/m3	69	76.5	111	60-142	
trans-1,2-Dichloroethene	ug/m3	40.3	47.2	117	67-137	
Trichloroethene	ug/m3	54.6	63.1	115	60-144	
Vinyl chloride	ug/m3	26	29.1	112	63-135	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

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QUALIFIERS

Project: 16037
Pace Project No.: 10341789

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor and percent moisture.

LOQ - Limit of Quantitation adjusted for dilution factor and percent moisture.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

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 at or above the adjusted LOD.

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.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 16037
Pace Project No.: 10341789

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10341789001	AAS-1	TO-15	AIR/25548		
10341789002	AAS-2	TO-15	AIR/25548		
10341789003	AAS-3	TO-15	AIR/25548		
10341789004	SSV-1	TO-15	AIR/25548		
10341789005	SSV-2	TO-15	AIR/25548		

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10341789



AIR: CHAIN-OF-CUSTODY / Analytical Request Document

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

24147

Page: 1 of 1

Section A
Required Client Information:

Section B
Required Project Information:

Section C
Invoice Information:

Company: The Sigma Group
 Address: 1300 W Canal St
Milwaukee, WI 53233
 Email To: dschwartz@thesigmagroup.com
 Phone: 414-643-4200 Fax: 414-643-4210
 Requested Due Date/TAT:

Report To: Daniel Schwartz
 Copy To: Steve Meer
 Purchase Order No.: 16037
 Project Name:
 Project Number: 16037

Attention: Daniel Schwartz
 Company Name: The Sigma Group
 Address: 1300 W Canal St, Milwaukee, WI 53233
 Pace Quote Reference:
 Pace Project Manager/Sales Rep.
 Pace Profile #:

Program
 UST Superfund Emissions Clean Air Act
 Voluntary Clean Up Dry Clean RCRA Other
 Location of Sampling by State: WI
 Reporting Units: ug/m³ mg/m³
 PPBV PPMV
 Other
 Report Level: II III IV Other Standard

ITEM #	Section D Required Client Information AIR SAMPLE ID Sample IDs MUST BE UNIQUE	Valid Media Codes MEDIA CODE Tedlar Bag TB 1 Liter Summa Can 1LC 6 Liter Summa Can 6LC Low Volume Puff LVP High Volume Puff HVP Other PM10	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		COMPOSITE -						PM10	3C-Fixed Gas (%)	TO-3	TO-3M (Methane)	TO-4 (PCPs)	TO-13 (PAH)	TO-14	TO-15		TO-15 Short List*		
					DATE	TIME	DATE	TIME																
1	AAS-1		GLL	-	3/15/16	9:37	3/16/16	8:26	27	2	2303	0404									X	601		
2	AAS-2							8:49	29	4	2656	0128										X	602	
3	AAS-3							8:44	28.5	3	2851	0381										X	003	
4	SSV-1			8.3	3/16/16	8:55	3/16/16	9:14	21	4	0817	0818										X	004	
5	SSV-2			5.8		8:50		9:26	27	3.5	2160	0633										X	005	
6																								
7																								
8																								
9																								
10																								
11																								
12																								

Comments:
 Short List =
 PCE, TCE, cis-1,2-DCE,
 trans-1,2-DCE, vinyl chloride

RELINQUISHED BY / AFFILIATION	DATE	TIME	ACCEPTED BY / AFFILIATION	DATE	TIME	SAMPLE CONDITIONS					
Daniel Schwartz / Sigma	3/16/16	11:30	[Signature]	3/16	1000	AMS	Y	Y	Y	Y	Y
							Y	Y	Y	Y	Y
							Y	Y	Y	Y	Y
							Y	Y	Y	Y	Y

SAMPLER NAME AND SIGNATURE
 PRINT Name of SAMPLER: Daniel Schwartz
 SIGNATURE of SAMPLER: [Signature]
 DATE Signed (MM/DD/YY): 3/16/16


Temp in °C
 Received on Ice
 Custody Sealed Cooler
 Samples Intact

ORIGINAL

Air Sample Condition Upon Receipt

Client Name: Sigma Group

Project #: **WO#: 10341789**



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

Tracking Number: 663750355341, 663750355352

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

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

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

Temp. (TO17 and TO13 samples only) (°C): X Corrected Temp (°C): A Thermom. Used: B88A912167504 72337080
 B88A9132521491 80512447
Temp should be above freezing to 6°C Correction Factor: X Date & Initials of Person Examining Contents: 3/12/16

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 checked="" 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> Airbag Filter TDT Passive		11.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.

Samples Received:

Canisters			Canisters		
Sample Number	Can ID	Flow Controller ID	Sample Number	Can ID	Flow Controller ID
AAS-1	2303	0404			
AAS-2	2656	0128			
AAS-3	2831	0381			
SSU-1	0817	0818			
SSU-2	2160	0633			

CLIENT NOTIFICATION/RESOLUTION Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: AMP Date: 3/12/16

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)



Pace Analytical Services, Inc.
1700 Elm Street - Suite 200
Minneapolis, MN 55414
(612)607-1700

May 24, 2016

Steve Meer
Sigma Environmental Services
1300 W. Canal St.
Milwaukee, WI 53233

RE: Project: 16037 3604 & 3614 N 11th St
Pace Project No.: 10349043

Dear Steve Meer:

Enclosed are the analytical results for sample(s) received by the laboratory on May 19, 2016. 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
carolynne.trout@pacelabs.com
Project Manager

Enclosures

cc: JT Holcombe, The Sigma Group, Inc.



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: 16037 3604 & 3614 N 11th St
Pace Project No.: 10349043

Minnesota Certification IDs

1700 Elm Street SE Suite 200, Minneapolis, MN 55414
525 N 8th Street, Salina, KS 67401
A2LA Certification #: 2926.01
Alaska Certification #: UST-078
Alaska Certification #MN00064
Alabama Certification #40770
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 #: 14-008r
Georgia Certification #: 959
Georgia EPD #: Pace
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
Nevada Certification #: MN_00064
Nebraska Certification #: Pace
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
West Virginia Certification #: 382
West Virginia DHHR #:9952C
Wisconsin Certification #: 999407970

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SAMPLE SUMMARY

Project: 16037 3604 & 3614 N 11th St
Pace Project No.: 10349043

Lab ID	Sample ID	Matrix	Date Collected	Date Received
10349043001	SSV-1	Air	05/18/16 09:14	05/19/16 09:20
10349043002	SSV-2	Air	05/18/16 09:22	05/19/16 09:20

REPORT OF LABORATORY ANALYSIS

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SAMPLE ANALYTE COUNT

Project: 16037 3604 & 3614 N 11th St
Pace Project No.: 10349043

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
10349043001	SSV-1	TO-15	MLS	5	PASI-M
10349043002	SSV-2	TO-15	MLS	5	PASI-M

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ANALYTICAL RESULTS

Project: 16037 3604 & 3614 N 11th St
 Pace Project No.: 10349043

Sample: SSV-1 Lab ID: 10349043001 Collected: 05/18/16 09:14 Received: 05/19/16 09:20 Matrix: Air

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR		Analytical Method: TO-15							
cis-1,2-Dichloroethene	<0.37	ug/m3	1.2	0.37	1.49		05/19/16 20:04	156-59-2	
trans-1,2-Dichloroethene	<0.57	ug/m3	1.2	0.57	1.49		05/19/16 20:04	156-60-5	
Tetrachloroethene	1.5	ug/m3	1.0	0.41	1.49		05/19/16 20:04	127-18-4	
Trichloroethene	<0.41	ug/m3	0.82	0.41	1.49		05/19/16 20:04	79-01-6	
Vinyl chloride	<0.29	ug/m3	0.39	0.29	1.49		05/19/16 20:04	75-01-4	

Sample: SSV-2 Lab ID: 10349043002 Collected: 05/18/16 09:22 Received: 05/19/16 09:20 Matrix: Air

Parameters	Results	Units	LOQ	LOD	DF	Prepared	Analyzed	CAS No.	Qual
TO15 MSV AIR		Analytical Method: TO-15							
cis-1,2-Dichloroethene	<0.37	ug/m3	1.2	0.37	1.49		05/19/16 21:00	156-59-2	
trans-1,2-Dichloroethene	<0.57	ug/m3	1.2	0.57	1.49		05/19/16 21:00	156-60-5	
Tetrachloroethene	1.8	ug/m3	1.0	0.41	1.49		05/19/16 21:00	127-18-4	
Trichloroethene	<0.41	ug/m3	0.82	0.41	1.49		05/19/16 21:00	79-01-6	
Vinyl chloride	<0.29	ug/m3	0.39	0.29	1.49		05/19/16 21:00	75-01-4	

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA

Project: 16037 3604 & 3614 N 11th St
 Pace Project No.: 10349043

QC Batch: AIR/25942 Analysis Method: TO-15
 QC Batch Method: TO-15 Analysis Description: TO15 MSV AIR Low Level
 Associated Lab Samples: 10349043001, 10349043002

METHOD BLANK: 2264447 Matrix: Air
 Associated Lab Samples: 10349043001, 10349043002

Parameter	Units	Blank Result	Reporting Limit	Analyzed	Qualifiers
cis-1,2-Dichloroethene	ug/m3	<0.25	0.81	05/19/16 18:38	
Tetrachloroethene	ug/m3	<0.28	0.69	05/19/16 18:38	
trans-1,2-Dichloroethene	ug/m3	<0.38	0.81	05/19/16 18:38	
Trichloroethene	ug/m3	<0.28	0.55	05/19/16 18:38	
Vinyl chloride	ug/m3	<0.20	0.26	05/19/16 18:38	

LABORATORY CONTROL SAMPLE: 2264448

Parameter	Units	Spike Conc.	LCS Result	LCS % Rec	% Rec Limits	Qualifiers
cis-1,2-Dichloroethene	ug/m3	43.5	42.6	98	65-139	
Tetrachloroethene	ug/m3	72.4	75.8	105	60-142	
trans-1,2-Dichloroethene	ug/m3	41.1	43.1	105	67-137	
Trichloroethene	ug/m3	57.4	60.2	105	60-144	
Vinyl chloride	ug/m3	26.5	31.1	118	63-135	

SAMPLE DUPLICATE: 2265179

Parameter	Units	10349043001 Result	Dup Result	RPD	Max RPD	Qualifiers
cis-1,2-Dichloroethene	ug/m3	<0.37	<0.37			25
Tetrachloroethene	ug/m3	1.5	1.5	1		25
trans-1,2-Dichloroethene	ug/m3	<0.57	<0.57			25
Trichloroethene	ug/m3	<0.41	<0.41			25
Vinyl chloride	ug/m3	<0.29	<0.29			25

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

REPORT OF LABORATORY ANALYSIS

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QUALIFIERS

Project: 16037 3604 & 3614 N 11th St
Pace Project No.: 10349043

DEFINITIONS

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above LOD.

J - Estimated concentration at or above the LOD and below the LOQ.

LOD - Limit of Detection adjusted for dilution factor and percent moisture.

LOQ - Limit of Quantitation adjusted for dilution factor and percent moisture.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

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 at or above the adjusted LOD.

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.

LABORATORIES

PASI-M Pace Analytical Services - Minneapolis

REPORT OF LABORATORY ANALYSIS

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QUALITY CONTROL DATA CROSS REFERENCE TABLE

Project: 16037 3604 & 3614 N 11th St
Pace Project No.: 10349043

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
10349043001	SSV-1	TO-15	AIR/25942		
10349043002	SSV-2	TO-15	AIR/25942		

REPORT OF LABORATORY ANALYSIS

Air Sample Condition Upon Receipt

Client Name: Sigma Enviro Project #: _____

WO# : 10349043



10349043

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

Tracking Number: 6637S0367106, 6637S0366296

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 Tin Can Other: _____

Temp Blank rec: Yes No

Temp. (TO17 and TO13 samples only) (°C): X Corrected Temp (°C): X

Thermom. Used: B88A912167504 B88A0143310098

151401163
 151401164

Temp should be above freezing to 6°C Correction Factor: X

Date & initials of Person Examining Contents: 5/19/16

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 checked="" 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: Air Can <u>Airbag</u> Filter TDT Passive		11.
Sample Labels Match COC?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> N/A	12.

Samples Received:

Canisters			Canisters		
Sample Number	Can ID	Flow Controller ID	Sample Number	Can ID	Flow Controller ID

CLIENT NOTIFICATION/RESOLUTION

Field Data Required? Yes No

Person Contacted: _____ Date/Time: _____

Comments/Resolution: _____

Project Manager Review: Carolynne Trout

Date: 5/19/16