

August 23, 2023

Ms. Jennifer Meyer Remediation and Redevelopment Program Wisconsin Department of Natural Resources 1027 West St. Paul Ave. Milwaukee, WI 53233 **Project # 40443A** 

Subject: Second Round of Commissioning for Community Within the Corridor – West Block –

Buildings 4 and 5

3212 W. Center St., 2727 N. 32nd St., and 2758 N. 33rd St., Milwaukee, WI 53210

BRRTS #: 02-41-587376, FID #: 341333190

Dear Ms. Meyer:

On behalf of the Community Within the Corridor Limited Partnership, K. Singh & Associates, Inc. (KSingh) is pleased to submit the results of second round of Commissioning of the Vapor Mitigation System for Buildings 4 and 5 for the Community Within the Corridor – West Block project. The first round of Commissioning for Buildings 4 and 5 was performed in January / February 2023.

Commissioning was performed in accordance with the Commissioning Plan that was approved by WDNR on May 23, 2022. This was intended to be performed concurrent with the Fifth Round of Commissioning of Buildings 6, 7, 8A and 8B but it was discovered that the exhaust vents on Building 5 were too close to air intakes and dryer vents for the laundromat in Building 5 that were installed after Commissioning Round 1 and prior to Commissioning Round 2. Commissioning Round 2 was delayed while the exhaust vents were relocated atop Building 5. The relocated exhaust vents are shown in Attachment A.

#### **Sub-slab Depressurization System Vacuum Measurements**

The sub-slab depressurization system installed in Buildings 4 and 5 was tested on 07/19/2023 and 07/20/2023. A handheld hammer drill was used to install vapor pins beneath the slab of the structure. A digital manometer was utilized to take measurements of vacuum below the slab after the vapor points passed a water dam test. Seventeen locations, which are identified as SVP-17 to SVP-33, were chosen to take measurements to get an accurate model of sub-slab depressurization from each suction point.

In accordance with a vapor mitigation system commissioning plan submitted by KSingh on April 21, 2022, a reading of -0.004 inches water was utilized to determine whether the system was adequately operating. Recorded measurements range from -0.008 to -0.506 inches of water, all of which are greater than the required vacuum.

The locations and results of July 2023 sub-slab depressurization measurements are depicted in Figure 1 and summarized in Table 1. The greatest vacuum measurement was observed in the southeastern portion of building 5. The vapor pins near  $32^{nd}$  street (SVP – 23 and SVP – 26) demonstrated the least vacuum readings. All the readings were significantly higher than the readings from the  $1^{st}$  Round of

Commissioning. Based on the buildings extents and the measured vacuum readings, the sub-slab depressurization system has met its depressurization requirements to date.

#### **Sub-slab TCE Measurements**

The vapor pins installed for the measurement of vacuum were utilized to obtain sub-slab soil vapor samples from the seventeen locations shown on Figure 1. The air samples were analyzed using a portable Gas Chromatograph (GC) System provided by Hartman Environmental Geoscience. The results of the GC analysis are shown alongside the vacuum measurements in Table 1. The greatest TCE reading at  $64.8 \text{ ug/m}^3$  was observed at SVP – 28 located in the southwest corner of Building 4. All the readings were less than the Vapor Risk Screening Level (VRSL) of  $70 \text{ µg/m}^3$ .

#### Passive Indoor Air Sampling

Following documentation of adequate sub-slab depressurization, passive air sampling was performed in accordance with the approved Commissioning Plan. A total of 10 passive air samplers were set up and sampled over a 1-week period from July 19, 2023, until July 27, 2023. The locations of the passive air samplers are included in Attachment C. A passive sampler was also placed at the children's breathing zone in the Play Area. Two additional passive air samplers (IA-6-BS and IA-8-1D) from the basement of Building 6 and the Stairwell in Building 8A, that were not located during the Fifth Round of Commissioning were also set up and the results are included in the analyses.

On July 27, 2023, the passive air samplers were submitted to Eurofins Air Toxics, LLC Folsom, CA for analysis for chlorinated solvents including Trichloroethylene (TCE), Tetrachloroethylene (PCE), cis-1,2-Dichloroethylene (cis-DCE), and trans-1,2-Dichloroethylene (trans-DCE). The results are included in Attachment D and summarized in Table 2.

No samples reported any exceedances of chlorinated solvents based on the most recent guidelines published by WDNR in August 2023.

#### Indoor Air Gas Chromatograph Sampling

Indoor Air samples were collected similar to the exhaust samples and analyzed using the portable GC. The values were then compared to the VALs of 2.1  $\mu$ g/m³. The locations of the samples are shown in Attachment C (eg. GC-5-01A) and the results of the sampling are documented in Table 3. No samples exceeded the TCE detection limit of 0.6  $\mu$ g/m³. and thus meet the VAL criteria.

#### **Exhaust Sampling**

Eleven Radonaway RP 265 fans were installed on the roof of buildings 4 and 5 as part of the vapor mitigation system. As part of commissioning, glass syringes were utilized to gather air quality samples from exhaust of the roof fans on July 25, 2023, and analyzed using the portable GC.

The results of the July 2023 exhaust fan air quality sampling are summarized in Table 4 and the locations of sampled fans are included in Figure 1. Results from the GC document concentrations of TCE in exhaust samples greater than their respective Vapor Action Levels (VAL). Based on the concentrations of TCE in the exhaust, it is concluded that TCE is being removed from the soil at a minimal rate.



#### **Conclusions and Recommendations**

The following conclusions were reached based on the commissioning:

- Based on the results of sub-slab vacuum measurements, the vapor mitigation system installed on the subject site adequately creates vacuum beneath the building slab for buildings 4 and 5.
- The sub-slab TCE results demonstrate compliance with the VRSL levels.
- Passive indoor air results show that there are no Residential Indoor Air VALs exceeded in buildings 4 and 5.
- Exhaust Fan emission sampling indicates that TCE is still present in the sub-slab and that minimal mass reduction is taking place.
- The indoor air samples, collected via passive samplers and syringe sampling, contain no detections of TCE in all the areas throughout Buildings 4 and 5.
- Based on the results from the second round of commissioning, the system is operating as intended.

We have the following recommendations:

We recommend that the third round of commissioning be scheduled for September 2023.

Robert I Reineha

Robert T. Reineke, P.E.

**Project Manager** 

Regular inspection and maintenance of the exhaust system is recommended.

Please contact us if you have any questions or seek clarification regarding this information.

Sincerely,

K. SINGH & ASSOCIATES, INC.

Sameer Neve, Ph.D. ENV SP Staff Environmental Engineer

Pratap N. Singh, Ph.D., P.E.

Principal Engineer

cc: Shane LaFave / Roers Companies Que El-Amin / Scott Crawford, Inc.



Attachments:

Figure 1 Repositioned Exhaust Fan Outlets

Figure 2 Sub-Slab Depressurization Locations and Results

Figure 3 Exhaust Fan Locations

Table 1 Vacuum Measurement and Sub-slab TCE Results

Table 2Passive Air Sampling ResultsTable 3Indoor Air Sampling ResultsTable 4Exhaust Fan Sampling Results

Attachment A Building 5 Exhaust Vents Relocation Figure

Attachment B Pictures

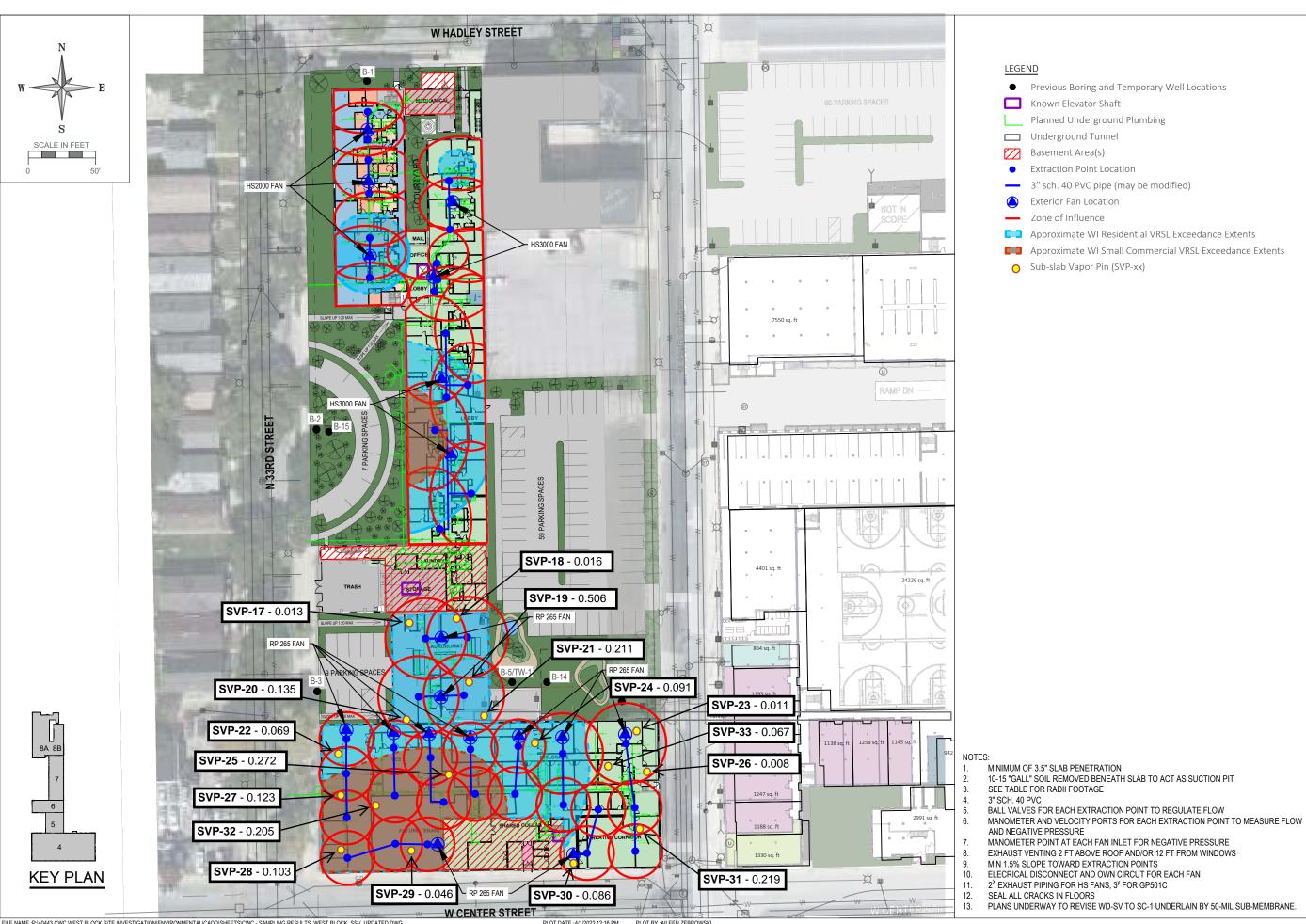
Attachment C Passive Air and Indoor Air Sampling Locations

Attachment D Passive Air Sampling Test Results



# **FIGURES**







Previous Boring and Temporary Well Locations

Known Elevator Shaft

Planned Underground Plumbing

Underground Tunnel

Basement Area(s)

Extraction Point Location

3" sch. 40 PVC pipe (may be modified)

Exterior Fan Location

Zone of Influence

Approximate WI Residential VRSL Exceedance Extents

Approximate WI Small Commercial VRSL Exceedance Extents

Sub-slab Vapor Pin (SVP-xx)

3636 North 124th Street Wauwatosa, WI 53222 262-821-1171

CONSULTANT

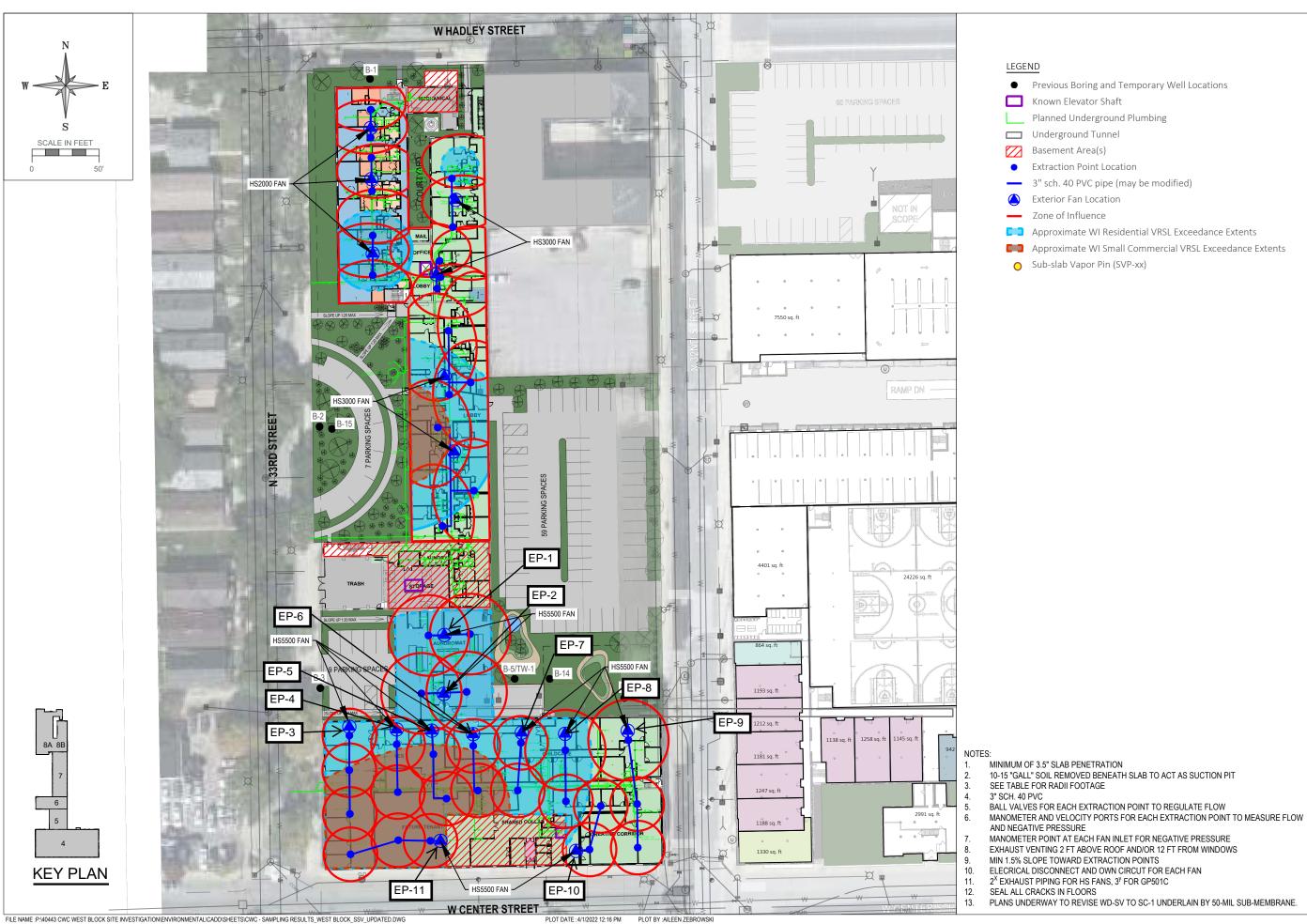
SITE INVESTIGATION REPORT
3212 W. CENTER ST., 2727 N. 32ND ST., 2758 N. 33RD ST.
COMMUNITY WITHIN THE CORRIDOR - WEST BLOCK
MILWAUKEE, WI 53210
PROJECT NUMBER: 40443

COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP

CLIENT:

Sub-slab Depressurization Location and Results (in inches H<sub>2</sub>O)

FIGURE 1



LEGEND

Previous Boring and Temporary Well Locations

Known Elevator Shaft

Planned Underground Plumbing

Underground Tunnel

Basement Area(s)

Extraction Point Location

3" sch. 40 PVC pipe (may be modified)

Exterior Fan Location

Zone of Influence

Approximate WI Residential VRSL Exceedance Extents

Approximate WI Small Commercial VRSL Exceedance Extents

Sub-slab Vapor Pin (SVP-xx)

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CONSULTANT

COMMUNITY WITHIN THE CORRIDOR LIMITED PARTNERSHIP

SITE INVESTIGATION REPORT
3212 W. CENTER ST., 2727 N. 32ND ST., 2758 N. 33RD ST.
COMMUNITY WITHIN THE CORRIDOR - WEST BLOCK
MILWAUKEE, WI 53210
PROJECT NUMBER: 40443

CLIENT:

06/02/2022

SHEET TITLE Exhaust Fan Locations

FIGURE 2

# **TABLES**



Table 1
Vacuum Measurement and Sub-Slab TCE Results

Sample Location	Date	Reading (inches H <sub>2</sub> O)	Sub-Slab TCE Readings (µg/m³)
SVP-17	7/20/2023	-0.013	0
SVP-18	7/20/2023	-0.016	11.2
SVP-19	7/19/2023	-0.506	0
SVP-20	7/19/2023	-0.135	0
SVP-21	7/19/2023	-0.211	1.04
SVP-22	7/19/2023	-0.069	8.49
SVP-23	7/19/2023	-0.011	0
SVP-24	7/19/2023	-0.091	0
SVP-25	7/19/2023	-0.272	2.22
SVP-26	7/19/2023	-0.008	0
SVP-27	7/19/2023	-0.123	8.79
SVP-28	7/19/2023	-0.103	64.8
SVP-29	7/19/2023	-0.046	11
SVP-30	7/19/2023	-0.086	0
SVP-31	7/19/2023	-0.219	0
SVP-32	7/19/2023	-0.205	11
SVP-33	7/19/2023	-0.067	0
		•	•

\*Readings were compared to a threshold value of 0.004 inches H2O and VRSL levels of 70  $\mu g/m^3$ 

TABLE 4 Passive Air Sampling Results

Community Within the Corridor - West Block - Buildings 4 and
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Sample ID	Units	Residential Indoor Air VAL*	IA-4-1A	IA-4-1B	IA-4-1C	IA-4-1D	IA-4-1E	IA-4-1F	IA-4-BS	IA-5-1A	IA-5-1B	OA-4/5	IA-6- Basement	IA-8-1D
Date			7/28/2023	7/28/2023	7/28/2023	7/28/2023	7/28/2023	7/28/2023	7/28/2023	7/28/2023	7/28/2023	7/28/2023	7/28/2023	7/28/2023
Trichloroethene	μg/m³	2.1	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11	<0.11
Tetrachloroethene	μg/m³	42	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	<0.13	0.17	0.23	0.30	<0.13	<0.13
cis-1,2-Dichloroethene	μg/m³	42	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14	<0.14
trans-1,2-Dichloroethene	μg/m³	42	0.58	<0.26	0.62	0.48	0.53	0.57	0.35	0.43	0.66	0.47	0.23	0.51

<sup>\*</sup>Based on WDNR Quick Look-Up Table dated May 2023



Table 3
Indoor Air Sampling Results

		1			1
ID	Unit	Date	Time	PCE (µg/m³)	TCE (µg/m³)
GC-4-01A	423	20-Jul	15:36	< 0.6	< 0.6
GC-4-01B	419	20-Jul	14:45	< 0.6	< 0.6
GC-4-01C	410	20-Jul	14:18	< 0.6	< 0.6
GC-4-01D	406	20-Jul	14:01	< 0.6	< 0.6
GC-4-01E	408	20-Jul	14:09	< 0.6	< 0.6
GC-4-01F	413	20-Jul	14:26	< 0.6	< 0.6
GC-4-01G	415	20-Jul	14:54	< 0.6	< 0.6
GC-4-01H	416	20-Jul	15:02	< 0.6	< 0.6
GC-4-01I	418	20-Jul	15:11	< 0.6	< 0.6
GC-4-01J	313	20-Jul	16:14	< 0.6	< 0.6
GC-4-01K	314	20-Jul	16:23	< 0.6	< 0.6
GC-4-01L	109	20-Jul	17:20	< 0.6	< 0.6
GC-4-01M	10	20-Jul	16:04	< 0.6	< 0.6
GC-4-01N	9	20-Jul	15:57	< 0.6	< 0.6
GC-4-010	орро 318	20-Jul	16:35	< 0.6	< 0.6
GC-5-01A	432	20-Jul	15:45	< 0.6	< 0.6
GC-5-01B	open area	20-Jul	17:03	< 0.6	< 0.6
GC-5-01C	504	20-Jul	16:52	< 0.6	< 0.6
GC-5-01D	ent	20-Jul	17:10	< 0.6	< 0.6
Rep	orting Limit	(µg/m³)		< 0.6	< 0.6

Table 4

Exhaust Fan Sampling Results

Exhaust Fan	Effluent TCE Concentration	Flow Rate	TCE Removal Rate	TCE Removal Rate
	(µg/m³)	(cfm)	(lbs/day)	(lbs/year)
EP - 1	3.93	91.02	0.00003	0.0117
EP -2	3.88	82.47	0.00003	0.0105
EP - 3	2.44	45.41	0.00001	0.0036
EP - 4	10.3	20.27	0.00002	0.0069
EP - 5	3.36	56.06	0.00002	0.0062
EP - 6	0.49	58.95	0.00000	0.0009
EP - 7	4.17	20.32	0.00001	0.0028
EP - 8	2.02	55.08	0.00001	0.0037
EP - 9	0.34	14.48	0.00000	0.0002
EP - 10	4.05	19.34	0.00001	0.0026
EP - 11	3.05	84.09	0.00002	0.0084
		Total	0.00016	0.05743

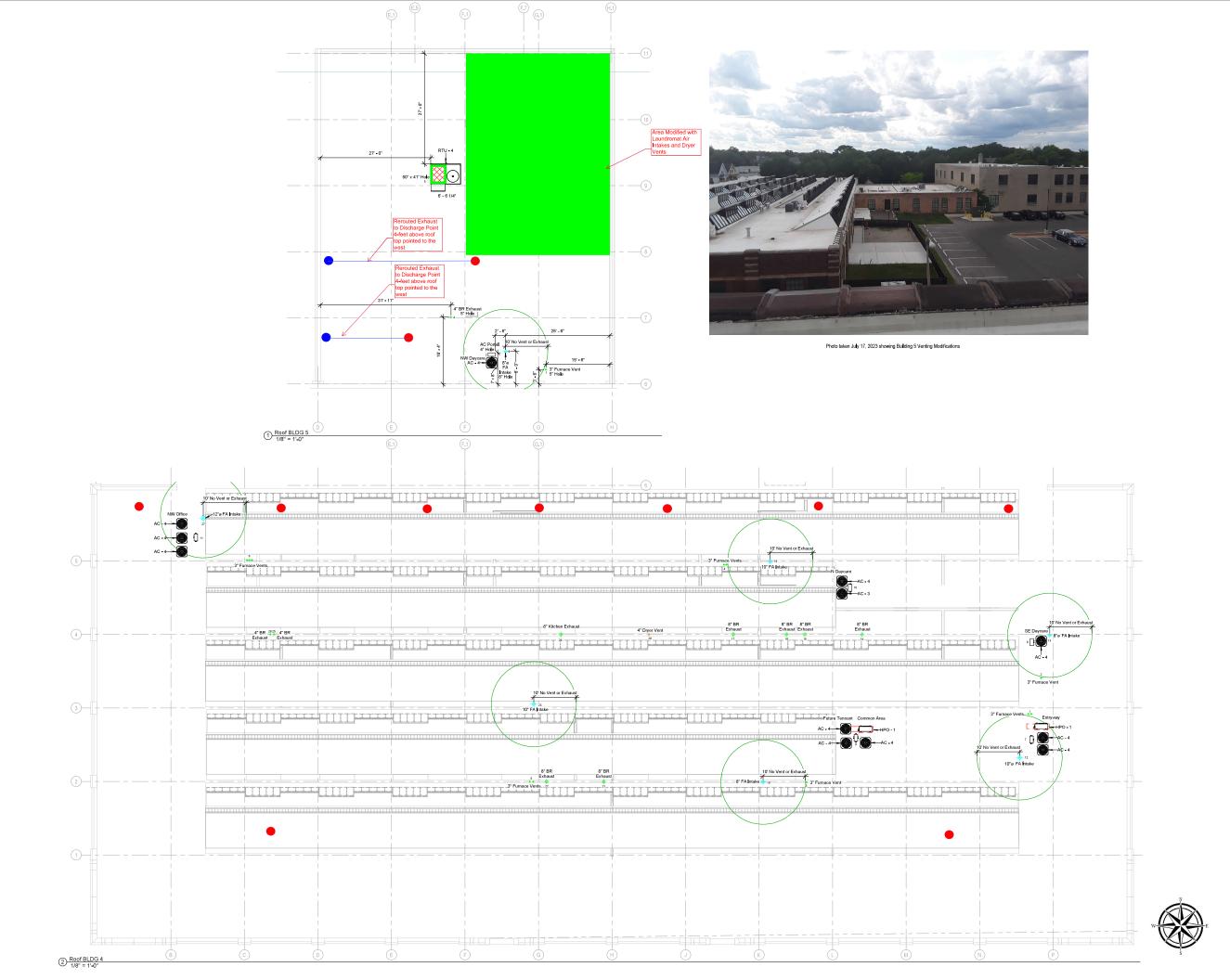
# **ATTACHMENTS**



# **ATTACHMENT A**

Building 5 Exhaust Vents Relocation Figure









2840 N. Brookfield Rd. Brookfield, WI 53045 262-786-4450 QUALITYHEATING.com

Project:

Community Within The Cooridor - West Block 2758 N. 33rd St Milwaukee, WI 53210

# Cooridor - West Block

SHEET NAME:

Roof BLDG 4 & 5

DRAWN BY:

DA / JC

DATE: 5/11/2021 2:21:25 PM

SCALE:

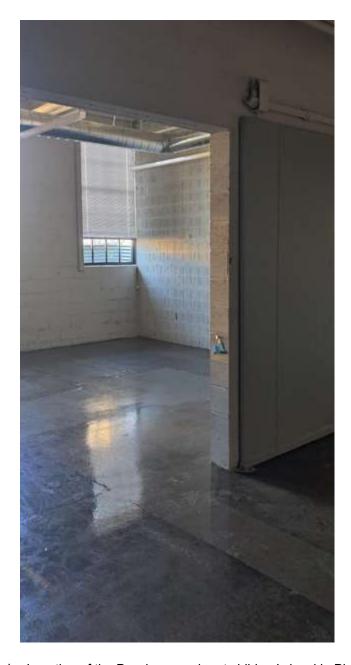
1/8" = 1'-0"

M-401

# **ATTACHMENT B**

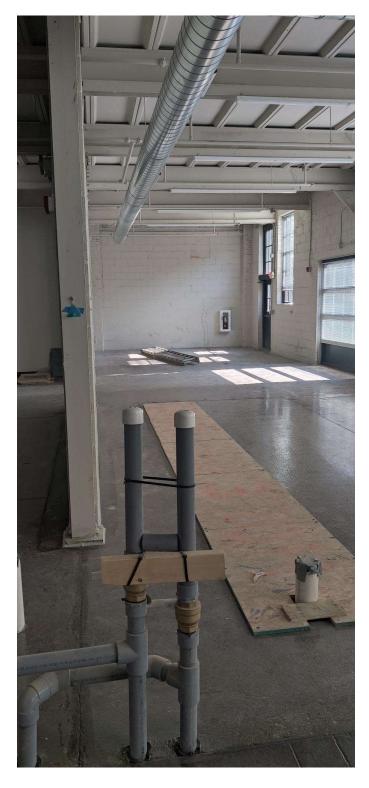
**Pictures** 





Picture1 – Location of the Passive sampler at children's level in Play area





Picture 2 – Passive Sampler Location in Building 5





Picture 3 – Exhaust Fan Outlets on Building 4



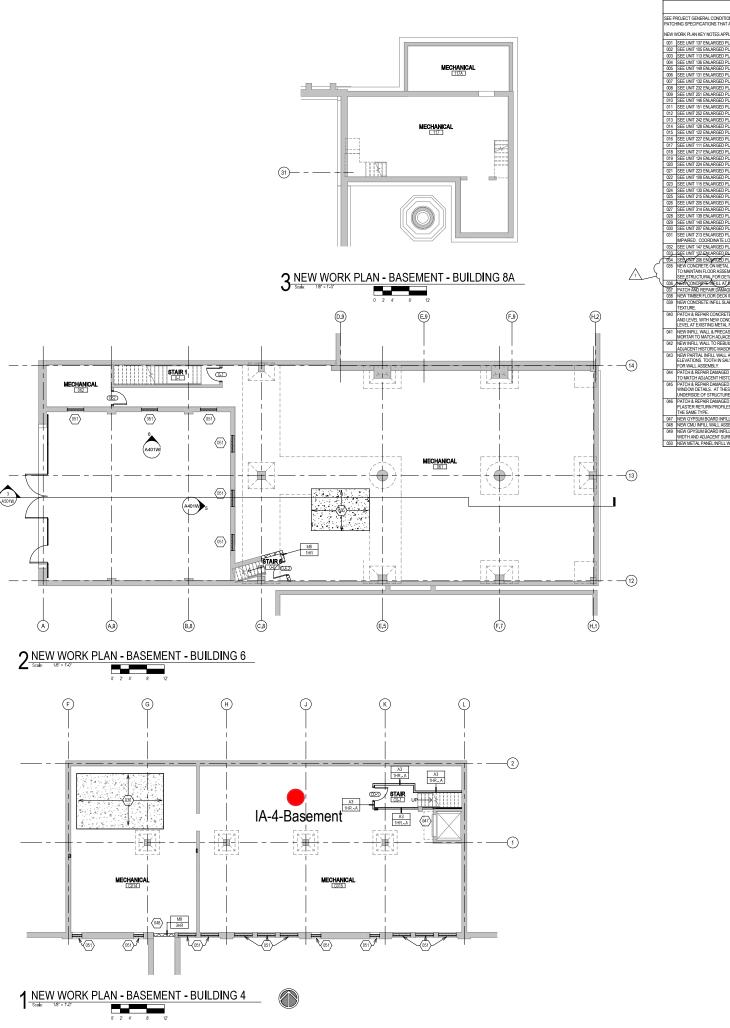
Picture 4 – Exhaust Fan Outlets on Building 4

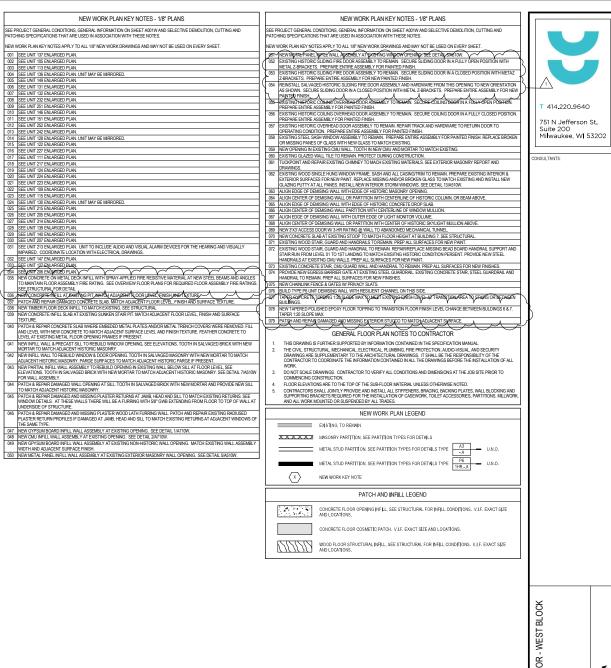


# ATTACHMENT C

Passive Air and Indoor Air Sampling Locations







2758 N. 33RD STREET MILWAUKEE, WI 53210

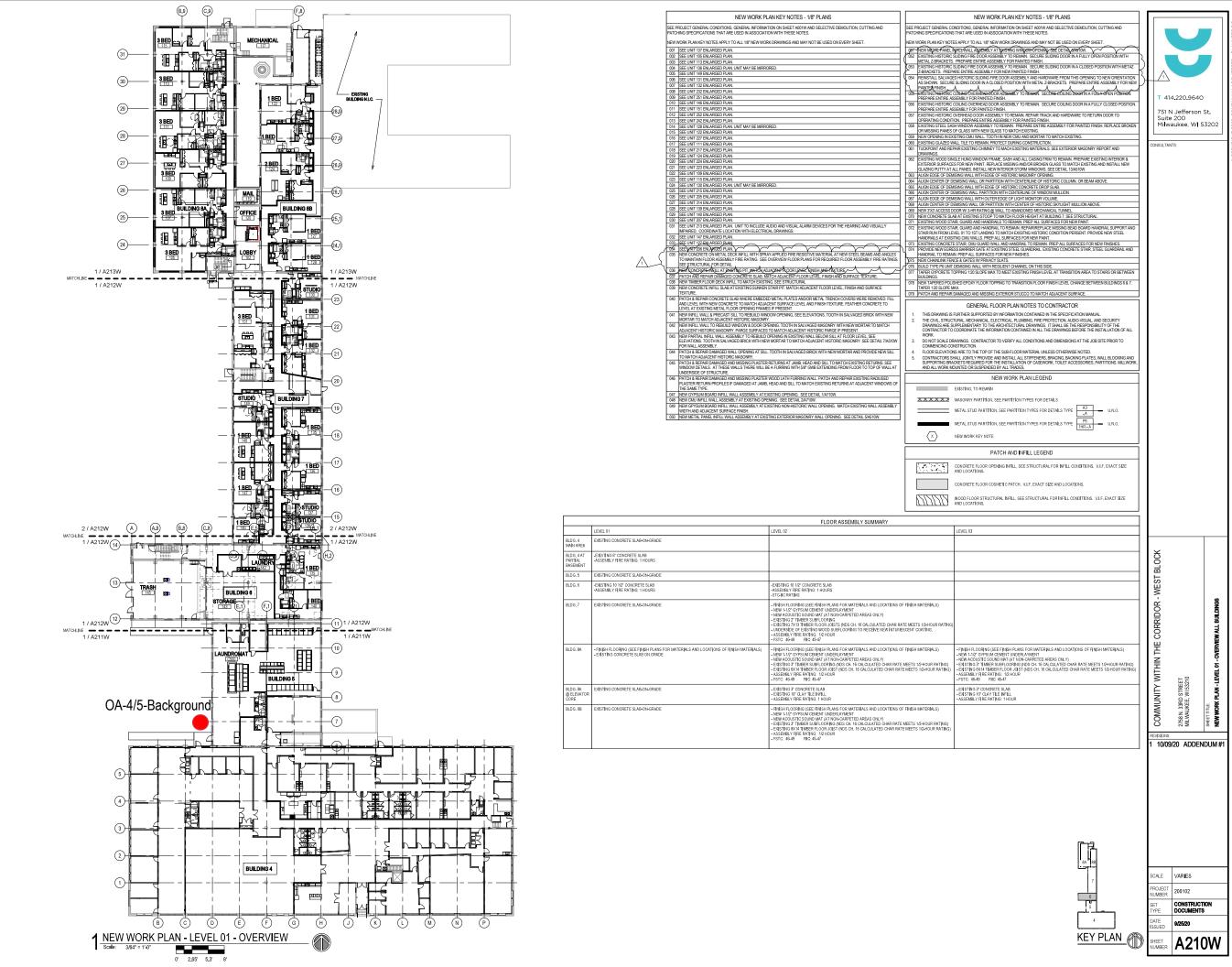
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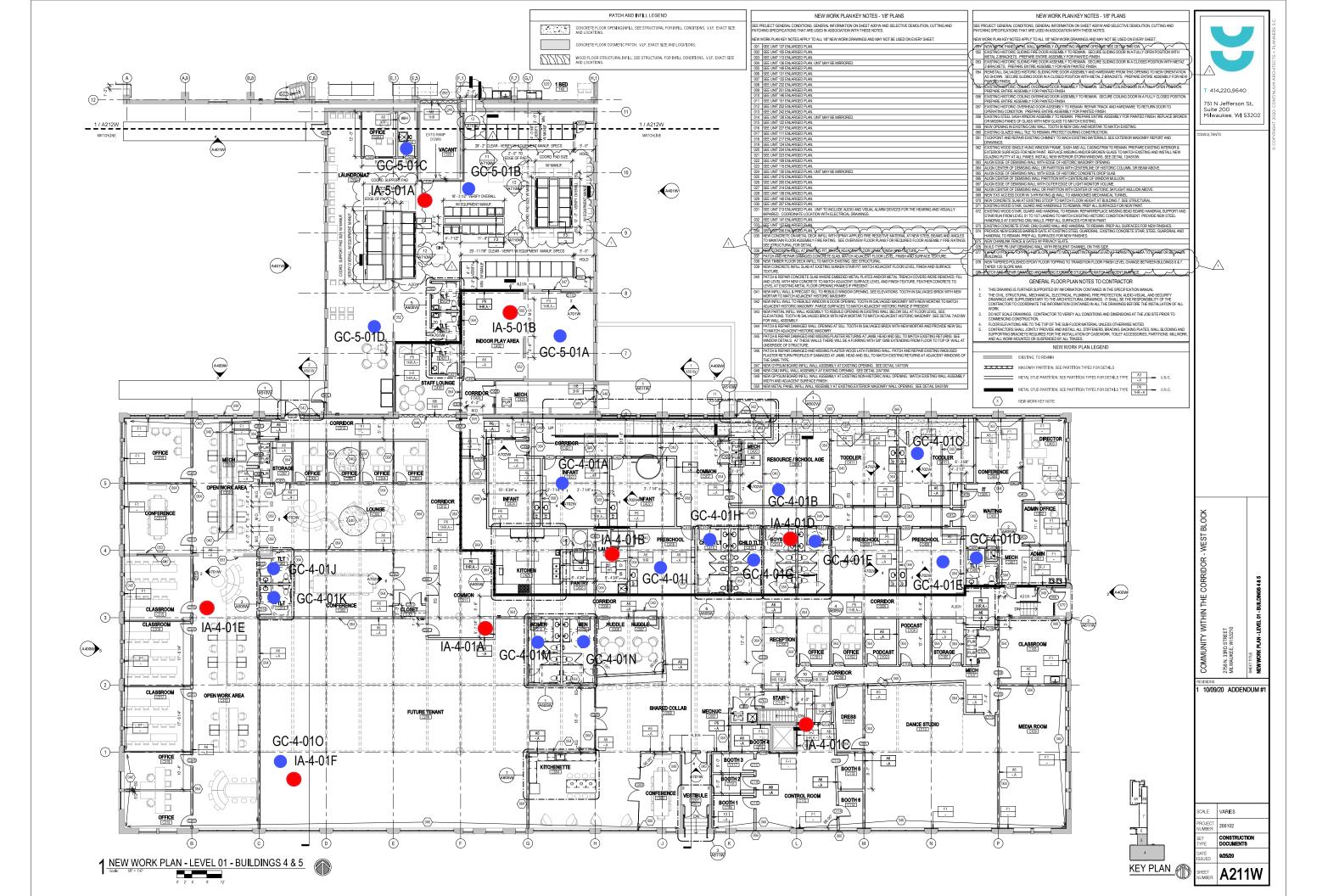
10/09/20 ADDENDUM#1

200102 CONSTRUCTION DOCUMENTS 9/25/20

A201W

KEY PLAN





# ATTACHMENT D

Passive Air Sampling Test Results





8/16/2023 Mr. Robert Reineke K Singh & Associates 3636 N 124th St

Wauwatosa WI 53222

Project Name: CWC - West Block SR

Project #: 40443A Workorder #: 2308061

Dear Mr. Robert Reineke

The following report includes the data for the above referenced project for sample(s) received on 8/3/2023 at Eurofins Air Toxics LLC.

The data and associated QC analyzed by Passive S.E. RAD130/SKC are compliant with the project requirements or laboratory criteria with the exception of the deviations noted in the attached case narrative.

Thank you for choosing Eurofins Air Toxics LLC. for your air analysis needs. Eurofins Air Toxics Inc. is committed to providing accurate data of the highest quality. Please feel free to contact the Project Manager: Jade White at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Jade White

Project Manager



#### WORK ORDER #: 2308061

Work Order Summary

CLIENT: Mr. Robert Reineke BILL TO: Mr. Robert Reineke

K Singh & Associates 3636 N 124th St Wauwatosa, WI 53222

Wauwatosa, WI 53222

K Singh & Associates

3636 N 124th St

PHONE: P.O.#

FAX: PROJECT # 40443A CWC - West Block SR

**DATE RECEIVED:** 08/03/2023 **CONTACT:** Jade White **DATE COMPLETED:** 08/16/2023

02A       IA-4-1B       Passive S.E. RAD130/S         03A       IA-4-1C       Passive S.E. RAD130/S         04A       IA-4-1D       Passive S.E. RAD130/S         05A       IA-4-1E       Passive S.E. RAD130/S         06A       IA-4-1F       Passive S.E. RAD130/S         07A       IA-4-BS       Passive S.E. RAD130/S         08A       IA-5-1A       Passive S.E. RAD130/S         10A       OA-4/5       Passive S.E. RAD130/S         11A       IA-6-BS       Passive S.E. RAD130/S         12A       IA-8-1D       Passive S.E. RAD130/S         13A       Lab Blank       Passive S.E. RAD130/S         14A       CCV       Passive S.E. RAD130/S         15A       LCS       Passive S.E. RAD130/S			
02A       IA-4-1B       Passive S.E. RAD130/S         03A       IA-4-1C       Passive S.E. RAD130/S         04A       IA-4-1D       Passive S.E. RAD130/S         05A       IA-4-1E       Passive S.E. RAD130/S         06A       IA-4-1F       Passive S.E. RAD130/S         07A       IA-4-BS       Passive S.E. RAD130/S         08A       IA-5-1A       Passive S.E. RAD130/S         10A       OA-4/5       Passive S.E. RAD130/S         11A       IA-6-BS       Passive S.E. RAD130/S         12A       IA-8-1D       Passive S.E. RAD130/S         13A       Lab Blank       Passive S.E. RAD130/S         14A       CCV       Passive S.E. RAD130/S         15A       LCS       Passive S.E. RAD130/S	FRACTION#	NAME	<u>TEST</u>
03A       IA-4-1C       Passive S.E. RAD130/S         04A       IA-4-1D       Passive S.E. RAD130/S         05A       IA-4-1E       Passive S.E. RAD130/S         06A       IA-4-1F       Passive S.E. RAD130/S         07A       IA-4-BS       Passive S.E. RAD130/S         08A       IA-5-1A       Passive S.E. RAD130/S         09A       IA-5-1B       Passive S.E. RAD130/S         10A       OA-4/5       Passive S.E. RAD130/S         11A       IA-6-BS       Passive S.E. RAD130/S         12A       IA-8-1D       Passive S.E. RAD130/S         13A       Lab Blank       Passive S.E. RAD130/S         14A       CCV       Passive S.E. RAD130/S         15A       LCS       Passive S.E. RAD130/S	01A	IA-4-1A	Passive S.E. RAD130/SKC
04A       IA-4-1D       Passive S.E. RAD130/S         05A       IA-4-1E       Passive S.E. RAD130/S         06A       IA-4-1F       Passive S.E. RAD130/S         07A       IA-4-BS       Passive S.E. RAD130/S         08A       IA-5-1A       Passive S.E. RAD130/S         10A       OA-4/5       Passive S.E. RAD130/S         11A       IA-6-BS       Passive S.E. RAD130/S         12A       IA-8-1D       Passive S.E. RAD130/S         13A       Lab Blank       Passive S.E. RAD130/S         14A       CCV       Passive S.E. RAD130/S         15A       LCS       Passive S.E. RAD130/S	02A	IA-4-1B	Passive S.E. RAD130/SKC
05A       IA-4-1E       Passive S.E. RAD130/S         06A       IA-4-1F       Passive S.E. RAD130/S         07A       IA-4-BS       Passive S.E. RAD130/S         08A       IA-5-1A       Passive S.E. RAD130/S         09A       IA-5-1B       Passive S.E. RAD130/S         10A       OA-4/5       Passive S.E. RAD130/S         11A       IA-6-BS       Passive S.E. RAD130/S         12A       IA-8-1D       Passive S.E. RAD130/S         13A       Lab Blank       Passive S.E. RAD130/S         14A       CCV       Passive S.E. RAD130/S         15A       LCS       Passive S.E. RAD130/S	03A	IA-4-1C	Passive S.E. RAD130/SKC
06A       IA-4-1F       Passive S.E. RAD130/S         07A       IA-4-BS       Passive S.E. RAD130/S         08A       IA-5-1A       Passive S.E. RAD130/S         09A       IA-5-1B       Passive S.E. RAD130/S         10A       OA-4/5       Passive S.E. RAD130/S         11A       IA-6-BS       Passive S.E. RAD130/S         12A       IA-8-1D       Passive S.E. RAD130/S         13A       Lab Blank       Passive S.E. RAD130/S         14A       CCV       Passive S.E. RAD130/S         15A       LCS       Passive S.E. RAD130/S	04A	IA-4-1D	Passive S.E. RAD130/SKC
07A       IA-4-BS       Passive S.E. RAD130/S         08A       IA-5-1A       Passive S.E. RAD130/S         09A       IA-5-1B       Passive S.E. RAD130/S         10A       OA-4/5       Passive S.E. RAD130/S         11A       IA-6-BS       Passive S.E. RAD130/S         12A       IA-8-1D       Passive S.E. RAD130/S         13A       Lab Blank       Passive S.E. RAD130/S         14A       CCV       Passive S.E. RAD130/S         15A       LCS       Passive S.E. RAD130/S	05A	IA-4-1E	Passive S.E. RAD130/SKC
08A       IA-5-1A       Passive S.E. RAD130/S         09A       IA-5-1B       Passive S.E. RAD130/S         10A       OA-4/5       Passive S.E. RAD130/S         11A       IA-6-BS       Passive S.E. RAD130/S         12A       IA-8-1D       Passive S.E. RAD130/S         13A       Lab Blank       Passive S.E. RAD130/S         14A       CCV       Passive S.E. RAD130/S         15A       LCS       Passive S.E. RAD130/S	06A	IA-4-1F	Passive S.E. RAD130/SKC
09A       IA-5-1B       Passive S.E. RAD130/S         10A       OA-4/5       Passive S.E. RAD130/S         11A       IA-6-BS       Passive S.E. RAD130/S         12A       IA-8-1D       Passive S.E. RAD130/S         13A       Lab Blank       Passive S.E. RAD130/S         14A       CCV       Passive S.E. RAD130/S         15A       LCS       Passive S.E. RAD130/S	07A	IA-4-BS	Passive S.E. RAD130/SKC
10A       OA-4/5       Passive S.E. RAD130/S         11A       IA-6-BS       Passive S.E. RAD130/S         12A       IA-8-1D       Passive S.E. RAD130/S         13A       Lab Blank       Passive S.E. RAD130/S         14A       CCV       Passive S.E. RAD130/S         15A       LCS       Passive S.E. RAD130/S	08A	IA-5-1A	Passive S.E. RAD130/SKC
11A IA-6-BS Passive S.E. RAD130/S 12A IA-8-1D Passive S.E. RAD130/S 13A Lab Blank Passive S.E. RAD130/S 14A CCV Passive S.E. RAD130/S 15A LCS Passive S.E. RAD130/S	09A	IA-5-1B	Passive S.E. RAD130/SKC
12A IA-8-1D Passive S.E. RAD130/S 13A Lab Blank Passive S.E. RAD130/S 14A CCV Passive S.E. RAD130/S 15A LCS Passive S.E. RAD130/S	10A	OA-4/5	Passive S.E. RAD130/SKC
13A Lab Blank Passive S.E. RAD130/S 14A CCV Passive S.E. RAD130/S 15A LCS Passive S.E. RAD130/S	11A	IA-6-BS	Passive S.E. RAD130/SKC
14A CCV Passive S.E. RAD130/S 15A LCS Passive S.E. RAD130/S	12A	IA-8-1D	Passive S.E. RAD130/SKC
15A LCS Passive S.E. RAD130/S	13A	Lab Blank	Passive S.E. RAD130/SKC
	14A	CCV	Passive S.E. RAD130/SKC
15AA LCSD Passive S.F. RAD130/S	15A	LCS	Passive S.E. RAD130/SKC
13111 ECSD Tussive S.E. Rub 130/K	15AA	LCSD	Passive S.E. RAD130/SKC

	The	ude player	
CERTIFIED BY:		0	DATE: 08/16/23
			-

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP – 209222, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP – T104704434-22-18, UT NELAP – CA009332022-14, VA NELAP - 12240, WA ELAP - C935 Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program) CA300005-017 Eurofins Environment Testing Northern California, LLC certifies that the test results contained in this report meet all requirements of the 2016 TNI Standard.

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#### LABORATORY NARRATIVE RAD130 Passive SE by Mod EPA TO-17 K Singh & Associates Workorder# 2308061

Twelve Radiello 130 (Solvent) samples were received on August 03, 2023. The laboratory analyzed the charcoal sorbent bed of the passive sampler following modified method EPA TO-17. The VOCs were chemically extracted using carbon disulfide and an aliquot of the extract was injected into a GC/MS for identification and quantification of volatile organic compounds (VOCs).

The mass of each target compound adsorbed by the sampler was converted to units of concentration using the sample deployment time and the sampling rate for each VOC. If sampling rates were calculated by the lab or the manufacturer, the concentration result has been flagged as an estimated value. Results are not corrected for desorption efficiency.

The reference method used for this procedure is EPA TO-17, which describes the collection of VOCs in ambient air using sorbents and analysis by GC/MS. Because TO-17 describes active sample collection using a pump and thermal desorption as the preparation step, several modifications are required. Modifications to TO-17 are listed in the table below:

Requirement	TO-17	ATL Modifications
Sample Collection	Pump pulls measured air volume through sorbent tube	VOCs in air adsorbed onto sorbent bed passively through diffusion
Sample Preparation	Thermal extraction	Solvent extraction
Sorbent tube conditioning	Condition newly packed tubes prior to use	Charcoal-based sorbent is a single use media and conditioning is conducted by vendor.
Instrumentation	Thermal desorption introduction system	Liquid injection introduction system
Internal Standard	Gas-phase internal standard introduced on the tube or focusing trap during analysis	Liquid-phase internal standard introduced on the tube at the time of extraction
Media and sample storage	<4 deg C, 30 days	Media shelf life is determined by vendor; sample hold-time is 6 months for the RAD130 and WMS. Sample preservation requirements are storage in a cool, solvent-free refrigerator and optional use of ice during shipping.
Internal Standard Recovery	+/-40% of daily CCV area	-50% to +100% of daily CCV area

#### **Receiving Notes**

There were no receiving discrepancies.

#### **Analytical Notes**

The uptake rates were corrected based on average field temperatures if provided. In the absence of field temperatures, the uptake rates determined at 25 deg C were used.

If validated uptake rates were not available, rates were estimated using the chemical's diffusion coefficient in air and the geometric constant of the sampler. Chemicals that are poorly retained by the sorbent over the sampling duration may exhibit a low bias. All concentrations calculated using estimated rates are qualified with a "C" flag.

To calculate ug/m3 concentrations in the Lab Blank, a sampling duration of 15814 minutes was applied. The assumed temperature used for the uptake rate is listed on the data page. If the field temperatures were provided, the rate was adjusted in the same manner as the field samples.

### **Definition of Data Qualifying Flags**

Ten qualifiers may have been used on the data analysis sheets and indicate as follows:

- B Compound present in laboratory blank greater than reporting limit (background subtraction not performed).
  - J Estimated value.
  - E Exceeds instrument calibration range.
  - S Saturated peak.
  - Q Exceeds quality control limits.
  - U Compound analyzed for but not detected above the reporting limit.
  - UJ- Non-detected compound associated with low bias in the CCV
  - N The identification is based on presumptive evidence.
  - C Estimated concentration due to calculated sampling rate
  - CN See case narrative explanation.

File extensions may have been used on the data analysis sheets and indicates as follows:

- a-File was requantified
- b-File was quantified by a second column and detector
- r1-File was requantified for the purpose of reissue



# **Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS**

Client Sample ID: IA-4-1A Lab ID#: 2308061-01A

	Rpt. Limit	Rpt. Limit	Amount	Amount	
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)	
trans-1,2-Dichloroethene	0.20	0.26	0.45 C	0.58 C	

Client Sample ID: IA-4-1B
Lab ID#: 2308061-02A
No Detections Were Found.

Client Sample ID: IA-4-1C

Lab ID#: 2308061-03A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)	
trans-1,2-Dichloroethene	0.20	0.26	0.48 C	0.62 C	

Client Sample ID: IA-4-1D Lab ID#: 2308061-04A

 Compound
 Rpt. Limit (ug)
 Rpt. Limit (ug/m3)
 Amount (ug/m3)
 Amount (ug/m3)

 trans-1,2-Dichloroethene
 0.20
 0.26
 0.37 C
 0.48 C

Client Sample ID: IA-4-1E

Lab ID#: 2308061-05A

	Kpt. Lillit	KPL LIIIIL	Alliount	Amount	
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)	
trans-1,2-Dichloroethene	0.20	0.26	0.41 C	0.53 C	

**Client Sample ID: IA-4-1F** 

Lab ID#: 2308061-06A

Compound	Rpt. Limit	Rpt. Limit	Amount	Amount
	(ug)	(ug/m3)	(ug)	(ug/m3)
trans-1,2-Dichloroethene	0.20	0.26	0.44 C	0.57 C



# **Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS**

Client Sample ID: IA-4-BS Lab ID#: 2308061-07A

	Rpt. Limit	Rpt. Limit	Amount	Amount	
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)	
trans-1,2-Dichloroethene	0.20	0.26	0.27 C	0.35 C	

Client Sample ID: IA-5-1A

Lab ID#: 2308061-08A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Tetrachloroethene	0.10	0.13	0.13	0.17
trans-1,2-Dichloroethene	0.20	0.26	0.33 C	0.43 C

**Client Sample ID: IA-5-1B** 

Lab ID#: 2308061-09A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)	
Tetrachloroethene	0.10	0.13	0.17	0.23	
trans-1,2-Dichloroethene	0.20	0.26	0.50 C	0.66 C	

Client Sample ID: OA-4/5

Lab ID#: 2308061-10A

Compound	Rpt. Limit (ug)	Kpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Tetrachloroethene	0.10	0.14	0.21	0.30
trans-1,2-Dichloroethene	0.20	0.29	0.33 C	0.47 C

**Client Sample ID: IA-6-BS** 

Lab ID#: 2308061-11A

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
trans-1,2-Dichloroethene	0.20	0.21	0.22 C	0.23 C

**Client Sample ID: IA-8-1D** 

Lab ID#: 2308061-12A



# Summary of Detected Compounds VOCS BY PASSIVE SAMPLER - GC/MS

Client Sample ID: IA-8-1D

Lab ID#: 2308061-12A

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
trans-1,2-Dichloroethene	0.20	0.28	0.36 C	0.51 C



# Client Sample ID: IA-4-1A Lab ID#: 2308061-01A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080711sim	Date of Collection: 7/28/23 1:20:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 12:21 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.11	Not Detected	Not Detected
Tetrachloroethene	0.10	0.13	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.10	0.12	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.26	0.45 C	0.58 C

C = Estimated concentration due to calculated sampling rate.

 $Temperature = 77.0F \ , \ duration \ time = 12873 \ minutes.$ 

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130



# Client Sample ID: IA-4-1B Lab ID#: 2308061-02A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080712sim	Date of Collection: 7/28/23 1:33:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 12:48 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.11	Not Detected	Not Detected
Tetrachloroethene	0.10	0.13	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.10	0.12	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.26	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 77.0F, duration time = 12863 minutes.

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130



# Client Sample ID: IA-4-1C Lab ID#: 2308061-03A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080713sim	Date of Collection: 7/28/23 1:16:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 01:15 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.11	Not Detected	Not Detected
Tetrachloroethene	0.10	0.13	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.10	0.12	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.26	0.48 C	0.62 C

C = Estimated concentration due to calculated sampling rate.

 $Temperature = 77.0F \ , \ duration \ time = 12857 \ minutes.$ 

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130



# Client Sample ID: IA-4-1D Lab ID#: 2308061-04A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080714sim	Date of Collection: 7/28/23 1:35:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 01:42 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.11	Not Detected	Not Detected
Tetrachloroethene	0.10	0.13	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.10	0.12	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.26	0.37 C	0.48 C

C = Estimated concentration due to calculated sampling rate.

Temperature = 77.0F, duration time = 12868 minutes.

		Method
Surrogates	%Recovery	Limits
Toluene-d8	96	70-130



# Client Sample ID: IA-4-1E Lab ID#: 2308061-05A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080715sim	Date of Collection: 7/28/23 1:22:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 02:09 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.11	Not Detected	Not Detected
Tetrachloroethene	0.10	0.13	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.10	0.12	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.26	0.41 C	0.53 C

C = Estimated concentration due to calculated sampling rate.

Temperature = 77.0F, duration time = 12892 minutes.

Surrogates	%Recovery	Method Limits
Toluene-d8	96	70-130



# Client Sample ID: IA-4-1F Lab ID#: 2308061-06A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080716sim	Date of Collection: 7/28/23 1:18:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 02:37 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.11	Not Detected	Not Detected
Tetrachloroethene	0.10	0.13	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.10	0.12	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.26	0.44 C	0.57 C

C = Estimated concentration due to calculated sampling rate.

 $Temperature = 77.0F \ , \ duration \ time = 12865 \ minutes.$ 

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130



# Client Sample ID: IA-4-BS Lab ID#: 2308061-07A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080717sim	Date of Collection: 7/28/23 2:34:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 03:04 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.11	Not Detected	Not Detected
Tetrachloroethene	0.10	0.13	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.10	0.12	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.26	0.27 C	0.35 C

C = Estimated concentration due to calculated sampling rate.

 $Temperature = 77.0F \ , \ duration \ time = 12905 \ minutes.$ 

		Method
Surrogates	%Recovery	Limits
Toluene-d8	96	70-130



# Client Sample ID: IA-5-1A Lab ID#: 2308061-08A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080718sim	Date of Collection: 7/28/23 1:05:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 03:31 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.11	Not Detected	Not Detected
Tetrachloroethene	0.10	0.13	0.13	0.17
cis-1,2-Dichloroethene	0.10	0.12	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.26	0.33 C	0.43 C

C = Estimated concentration due to calculated sampling rate.

 $Temperature = 77.0F \ , \ duration \ time = 12825 \ minutes.$ 

		Method
Surrogates	%Recovery	Limits
Toluene-d8	96	70-130



# Client Sample ID: IA-5-1B Lab ID#: 2308061-09A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080719sim	Date of Collection: 7/28/23 1:09:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 03:58 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.11	Not Detected	Not Detected
Tetrachloroethene	0.10	0.13	0.17	0.23
cis-1,2-Dichloroethene	0.10	0.12	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.26	0.50 C	0.66 C

C = Estimated concentration due to calculated sampling rate.

 $Temperature = 77.0F \ , \ duration \ time = 12834 \ minutes.$ 

		Method
Surrogates	%Recovery	Limits
Toluene-d8	96	70-130



# Client Sample ID: OA-4/5 Lab ID#: 2308061-10A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080720sim	Date of Collection: 7/28/23 1:01:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 04:26 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.12	Not Detected	Not Detected
Tetrachloroethene	0.10	0.14	0.21	0.30
cis-1,2-Dichloroethene	0.10	0.14	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.29	0.33 C	0.47 C

C = Estimated concentration due to calculated sampling rate.

Temperature = 77.0F, duration time = 11655 minutes.

		Method	
Surrogates	%Recovery	Limits	
Toluene-d8	97	70-130	



# Client Sample ID: IA-6-BS Lab ID#: 2308061-11A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080721sim	Date of Collection: 7/31/23 10:00:00 AM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 04:53 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.092	Not Detected	Not Detected
Tetrachloroethene	0.10	0.11	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.10	0.10	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.21	0.22 C	0.23 C

C = Estimated concentration due to calculated sampling rate.

 $Temperature = 77.0F \ , \ duration \ time = 15814 \ minutes.$ 

Surrogates	%Recovery	Method Limits
Toluene-d8	95	70-130



# Client Sample ID: IA-8-1D Lab ID#: 2308061-12A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080722sim	Date of Collection: 7/28/23 12:58:00 PM
Dil. Factor:	1.00	Date of Analysis: 8/7/23 05:20 PM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.12	Not Detected	Not Detected
Tetrachloroethene	0.10	0.14	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.10	0.14	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.28	0.36 C	0.51 C

C = Estimated concentration due to calculated sampling rate.

 $Temperature = 77.0F \ , \ duration \ time = 11666 \ minutes.$ 

		Method
Surrogates	%Recovery	Limits
Toluene-d8	95	70-130



# Client Sample ID: Lab Blank Lab ID#: 2308061-13A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080705sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 8/7/23 08:59 AM
		Date of Extraction: 8/7/23

	Rpt. Limit	Rpt. Limit	Amount	Amount
Compound	(ug)	(ug/m3)	(ug)	(ug/m3)
Trichloroethene	0.10	0.092	Not Detected	Not Detected
Tetrachloroethene	0.10	0.11	Not Detected	Not Detected
cis-1,2-Dichloroethene	0.10	0.10	Not Detected C	Not Detected C
trans-1,2-Dichloroethene	0.20	0.21	Not Detected C	Not Detected C

C = Estimated concentration due to calculated sampling rate.

Temperature = 77.0F, duration time = 15814 minutes.

		Method
Surrogates	%Recovery	Limits
Toluene-d8	94	70-130



# Client Sample ID: CCV Lab ID#: 2308061-14A

## **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080702sim	Date of Collection: NA
Dil. Factor:	1.00	Date of Analysis: 8/7/23 07:39 AM
		Date of Extraction: NA

Compound	%Recovery	
Trichloroethene	106	
Tetrachloroethene	104	
cis-1,2-Dichloroethene	94	
trans-1,2-Dichloroethene	95	
Container Types NA Net Applicable		

#### **Container Type: NA - Not Applicable**

Surrogates	%Recovery	Method Limits
Toluene-d8	107	70-130



# Client Sample ID: LCS Lab ID#: 2308061-15A

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name: 18080703sim Date of Collection: NA

Dil. Factor: 1.00 Date of Analysis: 8/7/23 08:06 AM

Date of Extraction: 8/7/23

Compound		Method Limits
	%Recovery	
Trichloroethene	105	70-130
Tetrachloroethene	97	70-130
cis-1,2-Dichloroethene	90	70-130
trans-1,2-Dichloroethene	96	70-130
Container Type: NA - Not Applicable		
		Method
Surrogates	%Recovery	Limits
Toluene-d8	99	70-130



# Client Sample ID: LCSD Lab ID#: 2308061-15AA

#### **VOCS BY PASSIVE SAMPLER - GC/MS**

File Name:	18080704sim	Date of Collection: NA

Dil. Factor: 1.00 Date of Analysis: 8/7/23 08:33 AM

Date of Extraction: 8/7/23

Compound	%Recovery	Method Limits
Trichloroethene	107	70-130
Tetrachloroethene	97	70-130
cis-1,2-Dichloroethene	95	70-130
trans-1,2-Dichloroethene	101	70-130
Container Type: NA - Not Applicable		
		Method
Surrogates	%Recovery	Limits
Toluene-d8	98	70-130