MEMORANDUM

To: Priscilla Tomlinson
Washington State Department of Ecology

Date: May 14, 2021

From: Heather Good, LHG

Project No.: 1803.01.05

RE: March and April 2021 Slab Inspection and Vapor Intrusion Priority Monitoring
Precision Engineering, Inc., Seattle, Washington
Agreed Order No. DE 18079; Facility Site ID 2056; Cleanup Site ID 4532

Maul Foster & Alongi, Inc. (MFA) prepared this memorandum to describe results from the second quarterly slab inspection and vapor intrusion priority (VIP) air monitoring event conducted at the Precision Engineering, Inc., site. Activities were conducted in accordance with the Washington State Department of Ecology (Ecology)-approved VIP work plan, included as Section 7 of MFA's draft vapor report.[1]

SLAB INSPECTION

A site visit was conducted on March 22, 2021, to inspect slab conditions. Slab inspection documentation includes an inspection form summarizing observed slab conditions, a figure showing locations of slab conditions noted in the inspection form, and photographs taken during the site reconnaissance (see Attachment A).

MFA observed localized areas of unsealed cracks; groundwater seepage; and minimal, surficial degradation of crack sealant, but overall, the slab appeared to be in good condition (see Attachment A). Since the last slab inspection on December 17, 2020, an additional unsealed crack and two additional areas of groundwater seepage were identified in Warehouse 3. Additionally, an area in Warehouse 2 previously marked as having cracking sealant showed further degradation, with sealant coming out of seams in the slab. Cracks where sealant is no longer present do not appear to extend through the slab and do not pose a concern at this time.

[1] MFA. Vapor report: vapor intrusion assessment, interim remedial actions, vapor intrusion priority work plan, Precision Engineering, Inc., site. Prepared for Dick Morgan. Maul Foster & Alongi, Inc., Bellingham, Washington. November 6, 2020.

AIR MONITORING

Radiello 130 passive vapor samplers were deployed over a three-week period from March 22, 2021, to April 12, 2021, in three locations: the office (RAD1), the sewing room (RAD4), and Warehouse 1 (RAD5) (see the attached figure).

The samples and a trip blank were analyzed for trichloroethene (TCE) by U.S. Environmental Protection Agency Method TO-17. The laboratory analytical report is provided as Attachment B. Analytical data and the laboratory's internal quality assurance and quality control data were reviewed to assess whether they met project-specific data quality objectives. A data validation memorandum summarizing data evaluation procedures, data usability, and deviations from specific field and/or laboratory methods is included as Attachment C. The data are considered acceptable for their intended use, with the appropriate data qualifiers assigned.

TCE was detected in all three samples at concentrations ranging from 0.44 to 0.95 micrograms per cubic liter (ug/m^3), below Ecology's workplace scenario short-term action limit of 7.5 ug/m^3 provided in Implementation Memorandum No. 22,[2] but above the Model Toxics Control Act Method B indoor air cleanup level of 0.33 ug/m^3 (see the attached table).

DISCUSSION AND RECOMMENDATIONS

The slab was observed to be in generally good condition, aside from the minor issues noted in Attachment A. TCE in indoor air from confirmation vapor sampling conducted immediately after implementation of the interim remedial actions ranged in concentration from 1.4 to 2.6 ug/m^3.[3] Samples collected during this monitoring event were lower than results from that initial confirmation vapor sampling and below the short-term action limit, therefore, the minor slab issues do not appear to be contributing to worsening conditions. Based on these findings, MFA does not recommend resuming air purification.

MFA will continue to visually monitor the slab conditions and conduct air monitoring, as described in the VIP work plan. The next quarterly event is scheduled for June 2021.

ATTACHMENTS

Limitations
Table
Figure
Attachment A—Slab Inspection Documentation
Attachment B—Analytical Lab Report
Attachment C—Data Validation Memorandum

[2] Ecology. Implementation memorandum no. 22: vapor intrusion investigations and short-term trichloroethene toxicity. Washington State Department of Ecology, Lacey, Washington. October 1, 2019.
[3] See footnote 1.

LIMITATIONS

The services undertaken in completing this memorandum were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This memorandum is solely for the use and information of our client unless otherwise noted. Any reliance on this memorandum by a third party is at such party's sole risk.

Opinions and recommendations contained in this memorandum apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this memorandum.

TABLE

Table
Vapor Intrusion Priority Monitoring Analytical Results
Precision Engineering, Inc.
Dick Morgan
Seattle, Washington

Location:	MTCA Method B VI CUL[a]	Indoor Air Action Level, Workplace Scenario[1]	RAD1		RAD4		RAD5	
Sample Name:			RAD1-121720	RAD1-032221	RAD4-121720	RAD4-032221	RAD5-121720	RAD5-032221
Collection Start Date:			12/17/2020	03/22/2021	12/17/2020	03/22/2021	12/17/2020	03/22/2021
Collection End Date:			01/07/2021	04/12/2021	01/07/2021	04/12/2021	01/07/2021	04/12/2021
VOCs (ug/m^3)								
Trichloroethene	0.33	7.5	0.54	0.44	0.87	0.95	0.77	0.71

NOTES:

Each sample was collected over a three-week period, using Radiello® R130 passive indoor air samplers.

Shading indicates an exceedance of MTCA Method B VI CUL.

CUL = cleanup level.

MTCA = Model Toxics Control Act.

ug/m^3 = micrograms per cubic meter.

VI = vapor intrusion.

VOC = volatile organic compound.

[a]The MTCA Method B VI CUL is the basis for the Lower Duwamish Waterway preliminary cleanup level for trichloroethene in indoor air at the site.

REFERENCE:

[1]Ecology. Implementation memorandum no. 22: vapor intrusion investigations and short-term trichloroethene toxicity. Washington State Department of Ecology, Lacey, Washington. October 1, 2019.

FIGURE

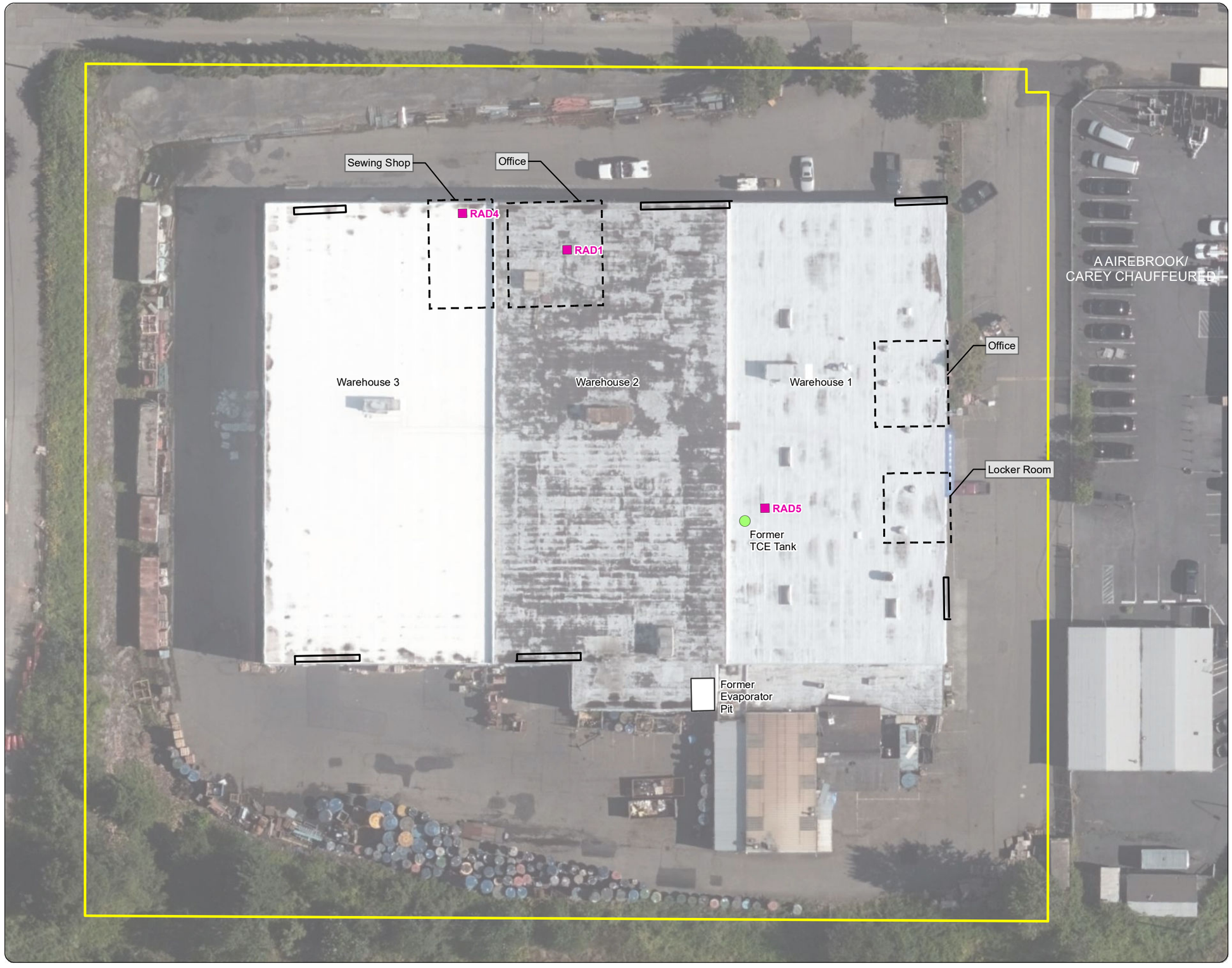

Figure
Vapor Intrusion Priority Monitoring Locations

Precision Engineering, Inc.
Seattle, Washington

Legend

- Passive Sampler

Property Features

- Second Story Areas (Approximate)
- Overhead Door (Approximate)
- Property Parcel

NOTES:
All sample locations are approximate.
TCE = trichloroethene.

0 20 40
Feet

Source:
Aerial photograph obtained from Mapbox.
Parcel data obtained from King County GIS.

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Path: X:\1803.01_04\Projects\Slab_Inspections\Fig_VaporMonitoringLocations.mxd
Print Date: 5/10/2021
Approved By: hgood
Produced By: abixby
Project: 1803.01

ATTACHMENT A

SLAB INSPECTION DOCUMENTATION

Slab Inspection Form
Precision Engineering, Inc.
Dick Morgan
Seattle, Washington

Date:	3/22/2021
Weather:	Partly cloudy, 48° Fahrenheit
Precipitation (prior 24 hours.):	0.08 inches on 3/21/2021
Completed By:	E. Lundeen, EIT, Maul Foster & Alongi, Inc.

General Observations:

The majority of cracks did not have a noticeable change in condition from the December 17, 2020 inspection. An additional unsealed area was identified in Warehouse 1 and two additional areas of groundwater seepage were identified in Warehouse 3.

The evaporator pit cap appears to be in good condition.

Specific Observations:

Slab Sealing:

In Warehouse 1, the sealed cracks are generally in good condition. There is minimal cracking or flaking of sealant. A few unsealed cracks were identified in areas that had been covered with inventory during the crack sealing work (see the attached figure).

In Warehouse 2, most of the sealed cracks are generally in good condition. A few areas show minor cracking and flaking of sealant, but these appear to be surficial. One area previously identified as having minor cracking now has sealant coming out of shallow slab seams.

In Warehouse 3, MFA observed areas of groundwater seepage that no longer have sealant present. These areas should be monitored (see the attached figure). In a few areas, the sealant has come out of shallow slab seams.

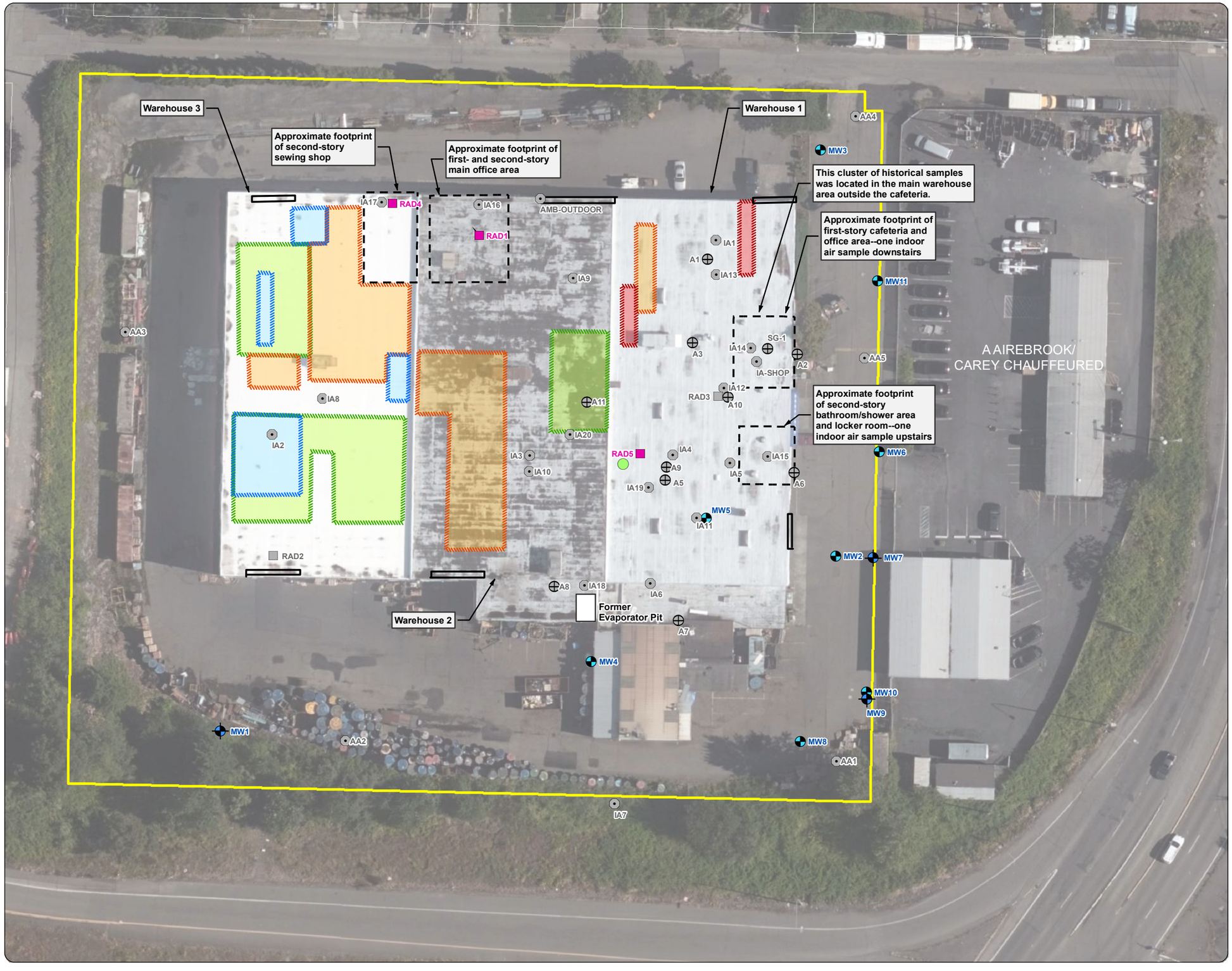
Evaporator Pit Cap:

The former evaporator pit was backfilled with compacted gravel and capped with concrete on April 13, 2020. The cap is currently in good condition.

The former evaporator pit is currently covered with heavy equipment, but the exposed areas appear to be intact, with no visible damage to the concrete.

No settling or bulging was observed.

Figure
March 2021
Slab Inspection
Precision Engineering, Inc.
Seattle, Washington



Legend

Slab Inspection Areas
- Unsealed Cracks and Seams[(a)]
- Groundwater Seepage
- Minor Sealant Flaking and Cracking
- Sealant Peeling from Seams[(a)]

Vapor Sample Locations
- Passive Sampler

Previous Vapor Sample Locations
- Indoor/Ambient Air
- Sub-slab Soil Gas
- Passive Sampler

Property Features
- Former Trichloroethane Tank
- Shallow Monitoring Well
- Deep Monitoring Well
- Overhead Door (Approximate)
- Property Parcel
- King County Parcel

NOTES:
The slab inspection was conducted by Evelyn Lundeen on March 22, 2021.
Well locations for MW1 to MW8 were surveyed by Duncanson, Inc. All other feature locations are approximate.
(a) Seams are approximately 1-centimeter deep, linear depressions in the concrete slab with a visible bottom. Seams are not anticipated to contribute to vapor intrusion.

0 25 50
Feet

Source:
Aerial photograph obtained from Mapbox.
Parcel data obtained from King County GIS.

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Path: X:\1803.01_04\Projects\Slab_Inspections\Fig_March2021_SlabInspectionLocations.mxd
Print Date: 4/26/2021
Approved By: hgood
Produced By: abixby
Project: 1803.01.05

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PHOTOGRAPHS

Project Name: Precision Engineering, Inc.
March 2021 Slab Inspection
Project Number: 1803.01.05
Location: 1231 S Director Street, Seattle, Washington

Photo No. 1.

Description
Typical sealed crack in Warehouse 1. No cracking or flaking of the sealant was observed.

Photo No. 2.

Description
Typical sealed crack in Warehouse 1. No cracking or flaking of the sealant was observed.

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PHOTOGRAPHS

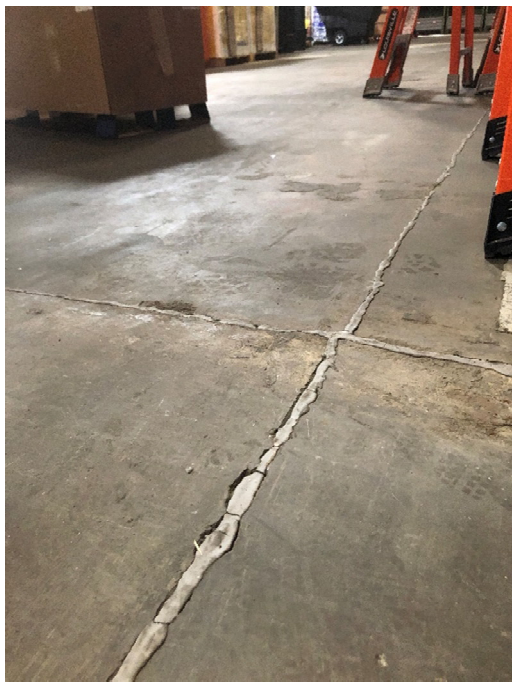
Project Name: Precision Engineering, Inc.
March 2021 Slab Inspection
Project Number: 1803.01.05
Location: 1231 S Director Street, Seattle, Washington

Photo No. 3.

Description
Crack with gaps in sealant, which may indicate a lack of a seal in the north portion of Warehouse 1. This area was covered by inventory during the previous inspection.

Photo No. 4.

Description
Cracking and flaking sealant in Warehouse 1. The crack does not appear to extend through the slab.



PHOTOGRAPHS

Project Name: Precision Engineering, Inc.
March 2021 Slab Inspection
Project Number: 1803.01.05
Location: 1231 S Director Street, Seattle, Washington

Photo No. 5.

Description
Typical cracking and flaking of sealant in Warehouse 2.

Photo No. 6.

Description
Example of sealant flaking out of a crack in an area of Warehouse 2 with high amounts of vehicle activity. The Crack does not appear to extend into the slab.

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PHOTOGRAPHS

Project Name: Precision Engineering, Inc.
March 2021 Slab Inspection
Project Number: 1803.01.05
Location: 1231 S Director Street, Seattle, Washington

Photo No. 7.

Description
Former evaporation pit covered by heavy equipment and inventory.

Photo No. 8.

Description
New area of groundwater seepage observed in Warehouse 3.

PHOTOGRAPHS

Project Name: Precision Engineering, Inc.
March 2021 Slab Inspection
Project Number: 1803.01.05
Location: 1231 S Director Street, Seattle, Washington

Photo No. 9.

Description
New area of groundwater seepage observed in Warehouse 3.

Photo No. 10.

Description
Peeling sealant in seams in Warehouse 3. Seams are approximately 1 centimeter deep and do not appear to extend through the slab.

PHOTOGRAPHS

Project Name: Precision Engineering, Inc.
March 2021 Slab Inspection
Project Number: 1803.01.05
Location: 1231 S Director Street, Seattle, Washington

Photo No. 11.

Description
Cracking sealant in Warehouse 3.

Photo No. 12.

Description
Large sealant patch in Warehouse 3.

PHOTOGRAPHS

Project Name: Precision Engineering, Inc.
March 2021 Slab Inspection
Project Number: 1803.01.05
Location: 1231 S Director Street, Seattle, Washington

Photo No. 13.

Description
Cracking and flaking sealant in Warehouse 3.

ATTACHMENT B

ANALYTICAL LAB REPORT

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4/15/2021
Ms. Heather Good
Maul Foster and Alongi Inc.
1329 North State Street
Suite 301
Bellingham WA 98225

Project Name: Precision Engineering
Project #: 1803.01.01-05
Workorder #: 2104244

Dear Ms. Heather Good

The following report includes the data for the above referenced project for sample(s) received on 4/13/2021 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: Alexandra Winslow at 916-985-1000 if you have any questions regarding the data in this report.

Regards,

Alexandra Winslow

Project Manager

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WORK ORDER #: 2104244

Work Order Summary

CLIENT:	Ms. Heather Good Maul Foster and Alongi Inc. 1329 North State Street Suite 301 Bellingham, WA 98225	**BILL TO:**	Accounts Payable Maul Foster and Alongi Inc. 400 E. Mill Plain Blvd Suite 400 Vancouver, WA 98660
PHONE:	360-594-6262	**P.O. #**	
FAX:	360-594-6270	**PROJECT #**	1803.01.01-05 Precision Engineering
DATE RECEIVED:	04/13/2021	**CONTACT:**	Alexandra Winslow
DATE COMPLETED:	04/15/2021		

FRACTION #	NAME	TEST
01A	RAD1-032221	Passive S.E. RAD130/SKC
02A	RAD4-032221	Passive S.E. RAD130/SKC
03A	RAD5-032221	Passive S.E. RAD130/SKC
04A	Trip Blank	Passive S.E. RAD130/SKC
05A	Lab Blank	Passive S.E. RAD130/SKC
06A	LCS	Passive S.E. RAD130/SKC
06AA	LCSD	Passive S.E. RAD130/SKC

CERTIFIED BY: Heidi Hayes DATE: 04/15/21

Technical Director

Certification numbers: AZ Licensure AZ0775, FL NELAP – E87680, LA NELAP – 02089, NH NELAP - 209220, NJ NELAP - CA016, NY NELAP - 11291, TX NELAP - T104704434-20-16, UT NELAP – CA009332020-12, VA NELAP - 10615, WA NELAP - C935
Name of Accreditation Body: NELAP/ORELAP (Oregon Environmental Laboratory Accreditation Program)
Accreditation number: CA300005-014, Effective date: 10/18/2020, Expiration date: 10/17/2021.
Eurofins Air Toxics, LLC certifies that the test results contained in this report meet all requirements of the NELAC standards

180 BLUE RAVINE ROAD, SUITE B FOLSOM, CA - 95630
(916) 985-1000 . (800) 985-5955 . FAX (916) 351-8279

LABORATORY NARRATIVE
RAD130 Passive SE by Mod EPA TO-17
Maul Foster and Alongi Inc.
Workorder# 2104244

Four Radiello 130 (Solvent) samples were received on April 13, 2021. 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.

To calculate ug/m3 concentrations in the Lab Blank and Trip Blank, a sampling duration of 30240 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

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

Client Sample ID: RAD1-032221

Lab ID#: 2104244-01A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	0.048	0.91	0.44

Client Sample ID: RAD4-032221

Lab ID#: 2104244-02A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	0.048	2.0	0.95

Client Sample ID: RAD5-032221

Lab ID#: 2104244-03A

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	0.048	1.5	0.71

Client Sample ID: Trip Blank

Lab ID#: 2104244-04A

No Detections Were Found.

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Client Sample ID: RAD1-032221

Lab ID#: 2104244-01A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	**18041410sim**	**Date of Collection: 4/12/21 1:20:00 PM**
Dil. Factor:	**1.00**	**Date of Analysis: 4/14/21 11:30 AM**
		Date of Extraction: 4/14/21

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	0.048	0.91	0.44

Temperature = 77.0F , duration time = 30240 minutes.
Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	76	70-130

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Client Sample ID: RAD4-032221

Lab ID#: 2104244-02A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	**18041411sim**	**Date of Collection: 4/12/21 1:30:00 PM**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/14/21 11:55 AM**	
		Date of Extraction: 4/14/21	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	0.048	2.0	0.95

Temperature = 77.0F , duration time = 30240 minutes.
Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	77	70-130

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Client Sample ID: RAD5-032221

Lab ID#: 2104244-03A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	**18041412sim**	**Date of Collection: 4/12/21 1:35:00 PM**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/14/21 12:21 PM**	
		Date of Extraction: 4/14/21	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	0.048	1.5	0.71

Temperature = 77.0F , duration time = 30240 minutes.
Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	78	70-130

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Client Sample ID: Trip Blank

Lab ID#: 2104244-04A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	**18041413sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/14/21 12:47 PM**	
		Date of Extraction: 4/14/21	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	0.048	Not Detected	Not Detected

Temperature = 77.0F , duration time = 30240 minutes.
Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	78	70-130

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Client Sample ID: Lab Blank

Lab ID#: 2104244-05A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	**18041408sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/14/21 10:38 AM**	
		Date of Extraction: 4/14/21	

Compound	Rpt. Limit (ug)	Rpt. Limit (ug/m3)	Amount (ug)	Amount (ug/m3)
Trichloroethene	0.10	0.048	Not Detected	Not Detected

Temperature = 77.0F , duration time = 30240 minutes.
Container Type: Radiello 130 (Solvent)

Surrogates	%Recovery	Method Limits
Toluene-d8	77	70-130

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Client Sample ID: LCS

Lab ID#: 2104244-06A

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	**18041403sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/14/21 08:26 AM**	
		Date of Extraction: 4/14/21	

Compound	%Recovery	Method Limits
Trichloroethene	94	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	77	70-130

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Client Sample ID: LCSD

Lab ID#: 2104244-06AA

VOCS BY PASSIVE SAMPLER - GC/MS

File Name:	**18041404sim**	**Date of Collection: NA**	
Dil. Factor:	**1.00**	**Date of Analysis: 4/14/21 08:51 AM**	
		Date of Extraction: 4/14/21	

Compound	%Recovery	Method Limits
Trichloroethene	96	70-130

Container Type: NA - Not Applicable

Surrogates	%Recovery	Method Limits
Toluene-d8	77	70-130

ATTACHMENT C

DATA VALIDATION MEMORANDUM

DATA QUALITY ASSURANCE/QUALITY CONTROL REVIEW

PROJECT NO. 1803.01.05 | APRIL 15, 2021 | PRECISION ENGINEERING, INC.

Maul Foster & Alongi, Inc., conducted an independent review of the quality of analytical results for indoor air samples collected at the Precision Engineering, Inc., site located at 1231 S Director Street in Seattle, Washington. The samples were collected from March 22 to April 12, 2021.

Eurofins Air Toxics (Eurofins) performed the analyses. Eurofins report number 2104244 was reviewed. The analyses performed and samples analyzed are listed in the tables below.

Analysis	**Reference**
TCE—Radiello 130	EPA TO-17 Modified
NOTES: EPA = U.S. Environmental Protection Agency. TCE = trichloroethene.	

Report 2104244
Samples Analyzed
RAD1-032221
RAD4-032221
RAD5-032221
Trip Blank

DATA QUALIFICATIONS

Analytical results were evaluated according to applicable sections of U.S. Environmental Protection Agency (EPA) procedures (EPA, 2017) and appropriate laboratory and method-specific guidelines (EPA, 1986; Eurofins, 2021).

The data are considered acceptable for their intended use, with the appropriate data qualifiers assigned.

HOLDING TIMES, PRESERVATION, AND SAMPLE STORAGE

Holding Times

Analyses were performed within the recommended holding time criteria.

Preservation and Sample Storage

The samples were stored appropriately.

BLANKS

Method Blanks

Laboratory method blank analyses were performed at the required frequencies. For purposes of data qualification, the method blanks were associated with all samples prepared in the analytical batch.

The laboratory method blank was non-detect to the laboratory reporting limit for trichloroethene.

Trip Blanks

According to report 2104244, a trip blank sample was submitted to Eurofins for EPA Method TO-17 modified analysis. Eurofins noted that the trip blank sample volume was calculated based on a sampling duration of 30,240 minutes (3 weeks).

The trip blank was non-detect to the method reporting limit.

SURROGATE RECOVERY RESULTS

The samples were spiked with surrogate compounds to evaluate laboratory performance on individual samples. All surrogate recoveries were within acceptance limits.

LABORATORY DUPLICATE RESULTS

Duplicate results are used to evaluate laboratory precision. Laboratory duplicate results were not reported.

LABORATORY CONTROL SAMPLE/LABORATORY CONTROL SAMPLE DUPLICATE RESULTS

A laboratory control sample/laboratory control sample duplicate (LCS/LCSD) is spiked with target analytes to provide information on laboratory precision and accuracy. The LCS/LCSD samples were extracted and analyzed at the required frequency.

All LCS and LCSD results were within acceptance limits for percent recovery and relative percent difference.

FIELD DUPLICATE RESULTS

Field duplicate samples measure both field and laboratory precision. No field duplicates were submitted for analysis.

REPORTING LIMITS

Eurofins used routine reporting limits for non-detect results.

DATA PACKAGE

The data packages were reviewed for transcription errors, omissions, and anomalies. No issues were found.

REFERENCES

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