Technical Memorandum

To: Chris DeBoer, LHG, Washington State Department of Ecology
Amy Baker, U.S. Environmental Protection Agency

Date: January 6, 2025

From: Carolyn Wise, LHG Project No.: M0624.04.024

Re: November 2024 Compliance Monitoring–AOC 1
Northern State Multi Service Center, Sedro-Woolley, Washington
Agreed Order No. DE 16309, Cleanup ID: 10048

On behalf of the Port of Skagit (the Port), Maul Foster & Alongi, Inc. (MFA), has prepared this technical memorandum summarizing the fourth quarterly post-installation compliance monitoring event completed at the former laundry building area of concern (AOC 1) at the Northern State Multi Service Center (former Northern State Hospital site) (the Site). This Site is located at the Sedro-Woolley Innovation for Tomorrow Center property at 2070 Northern State Road in Sedro-Woolley, Washington (the Property) (see Figure 1). The Site is listed with the Washington State Department of Ecology (Ecology) under facility site ID 65415931 and cleanup site ID 10048.

Background

A summary of the interim remedial action, completed at AOC 1 between December 2023 and February 2024, is provided in the final completion report (MFA 2024a). Additional information regarding the Property background, site conditions, and interim sub-slab depressurization system (SSDS) construction details are provided in the interim action work plan (IAWP) and completion report (MFA 2023, 2024a).

Compliance Monitoring

Indoor and Ambient Air Sampling

On November 19, 2024, MFA collected three indoor air samples (INAIR01-111924 through INAIR03-111924) and one ambient air sample (OUTAIR02-111924) at AOC 1 (see Figure 2). Air samples were collected using 6-liter stainless steel Summa canisters with 8-hour flow controllers and analyzed for chlorinated volatile organic compounds (cVOCs). Sample canisters were placed 3 to 5 feet above the ground to allow for sample collection within the breathing zone. Photographs from the sampling event are provided in Attachment A. Field data were recorded on field sampling data sheets, provided as Attachment B.

Indoor air samples were collected to:

- Confirm that the construction process did not result in preferential pathways for vapor intrusion into the former laundry building, and
- Confirm the effectiveness of the SSDS.

The outdoor air sample was positioned outside and upwind of the building to capture potential ambient cVOC sources for the 8-hour indoor air sample collection period. Field staff deployed the sampler in a location that was free of discernible ambient sources of cVOCs. Atmospheric data (including wind speed and direction) from the nearest weather station was used to position the sample upwind of the building. Wind was forecasted to blow from the east on November 19, 2024; therefore, the ambient air sample was positioned on the east side of the building (see Figure 2). The reported wind directions throughout the day were from the east.

Analytical results are presented in the Table, laboratory analytical reports are provided in Attachment C, and a data validation memorandum is presented in Attachment D.

Indoor and outdoor air sample results were screened to Model Toxics Control Act (MTCA) Method B cleanup levels for indoor air. No indoor or outdoor air results exceeded MTCA Method B cleanup levels. All cVOCs were non-detect, with the exception of 1,2-dichloroethane (1,2-DCA).

Low concentrations of 1,2-DCA were detected in all three indoor air samples, with concentrations ranging from 0.065 to 0.073 micrograms per cubic meter (ug/m^3), as well as in the outdoor air sample at 0.053 ug/m^3. Low and consistent concentrations of 1,2-DCA have been detected in indoor and outdoor air during all previous compliance monitoring events and during the remedial investigation vapor sampling (MFA 2022, 2024a, 2024b, 2024c). All concentrations of 1,2-DCA detected to date were below the MTCA Method B cancer cleanup level (0.096 ug/m^3). 1,2-DCA has not been detected in sub-slab soil gas samples collected within the building (MFA 2022). Given the lack of sub-slab detections and low detections observed in both indoor and outdoor air or sub-slab soil gas, it is likely these detections are associated with an ambient source in the general surrounding area outside of the building.

Sub-Slab Pressure Measurements

On November 19, 2024, MFA measured the differential pressure at the three permanent sub-slab vapor pin locations (SB01 through SB03) to assess whether a vacuum was being generated across the slab of the former laundry building. The differential pressure was measured for approximately 5 minutes at each sub-slab vapor pin location until readings stabilized. The final differential pressure reading, date, time, and location were recorded on the SSDS inspection form (see Attachment E).

The differential pressure measurements from SB01 through SB03 were above the vacuum (i.e., negative pressure) goal of 0.001 inches of water column. The negative differential pressure measurements at each measuring point confirm continued effective differential pressure between the sub-slab and the indoor air.

Vent Pressure Monitoring

On November 19, 2024, MFA observed the vacuum (pressure differential) from the U-tube manometers at each vent riser pipe (VENT01 through VENT05) to confirm that the fans were functioning and that each vent riser was properly sealed. The differential pressure reading, date, time, and location were recorded on the SSDS inspection form (see Attachment E).

Manometer vacuum (i.e., negative pressure) readings at the five vent locations ranged from 1.9 to 2.9 inches of water column, above the anticipated pressure goal of between 0.5 and 1.75 inches of

water column. The observed pressure readings at each of the vent risers indicate that the SSDS is pulling a sufficient vacuum at the vent locations.

Conclusions

The negative differential pressure readings from the sub-slab vapor pins and U-tube manometers on the SSDS vents indicate that the system is operating as anticipated.

All cVOCs were non-detect in indoor and outdoor air samples, with the exception of low detections of 1,2-DCA below the MTCA Method B cancer cleanup level for indoor air. These low detections levels are consistent across indoor and outdoor air samples and are likely associated with an ambient source in the general surrounding area.

The results of the fourth compliance monitoring indicate the system is functioning within the anticipated operating conditions. The SSDS has continued to function properly, and no issues have been identified based on the quarterly inspections and sampling data, consistent with the previous three monitoring events.

Request for Modification to Compliance Monitoring

As described in the IAWP and completion report (MFA 2023, 2024a), four quarters of compliance monitoring have been completed to evaluate the functionality of the SSDS system and establish baseline operating conditions. Consistent with the IAWP, after four quarters of monitoring, changes to the monitoring plan may be proposed based on an evaluation of data with Ecology and EPA.

Since operation of the SSDS system in February 2024, four quarters of compliance monitoring have been conducted consistent with the IAWP. All four events noted the following conditions:

- Negative U-tube manometers on the SSDS vents.
- Negative differential pressure readings from the sub-slab vapor pins.
- All cVOCs were non-detect in indoor and outdoor air samples with the exception of low detections of 1,2-DCA below the MTCA Method B cancer cleanup level for indoor air.[1]
- Vent stack air emissions results indicated that the PCE and TCE small quantity emission rates (SQERs) associated with the SSDS are several orders of magnitude lower than their respective SQER value.
- No issues with the operation of the SSDS have been identified.

These consistent conditions indicate that the system is operating as anticipated. Therefore, MFA proposes the following modification to future compliance monitoring requirements:

- Discontinue collection of quarterly indoor and outdoor air samples.
- Discontinue collection of vent stack air emission samples.
- Discontinue collection of differential pressure readings from the sub-slab vapor pins.

Quarterly inspections of U-tube manometers on the SSDS vents will continue. If the modifications above are approved, Port staff will begin quarterly SSDS inspections for SSDS compliance monitoring in February 2025. A quarterly inspection form will be populated by Port staff for consistency in recorded measurements and observations between events (see Attachment F). Measurements

[1] These low 1,2-DCA detections levels have been consistent across indoor and outdoor air samples and are likely associated with an ambient source in the general surrounding area.

recorded during the inspection shall be retained on site for at least five years. Quarterly SSDS inspection reports will be provided to Ecology in the quarterly progress reports required under the Agreed Order.

If the system does not pull a sufficient vacuum at any of the vent risers, indoor air samples shall be collected within 10 business days, and the system repaired within 30 days of the initial observation (see Figure 3). In the event that indoor samples will be collected, Ecology will be notified prior to the sampling event and a technical memorandum summarizing sampling procedures, analytical results, and recommendations will be provided within 90 days of the initial vacuum observation to Ecology.

The remedial action described in the completion report is considered an interim remedial action at this time. A final remedial action for this AOC on the Site will be evaluated in the remedial investigation and feasibility study and documented in the forthcoming cleanup action plan.

Attachments

References

Limitations

Figures

Table

A—Field Photographs

B—Field Sampling Data Sheets

C—Analytical Laboratory Reports

D—Data Validation Memorandum

E—Sub-slab Depressurization Inspection Form

F—Port of Skagit Sub-Slab Depressurization Inspection Form

References

MFA. 2022. *Draft Remedial Investigation Report, Former Northern State Hospital, Sedro-Woolley, Washington.* Maul Foster & Alongi, Inc. Bellingham, Washington. June 9.

MFA. 2023. *Interim Action Work Plan—AOC 1, Northern State Multi Service Center, Sedro-Woolley, Washington.* Maul Foster & Alongi, Inc. Bellingham, Washington. August 24.

MFA. 2024a. *Completion Report—AOC 1, Northern State Multi Service Center, Sedro-Woolley, Washington.* Maul Foster & Alongi, Inc. Bellingham, Washington. June 18.

MFA. 2024b. Carolyn Wise, LHG, Maul Foster & Alongi, Inc. *May 2024 Compliance Monitoring—AOC 1, Northern State Multi Service Center, Sedro-Woolley, Washington, Agreed Order No. DE 16309, Cleanup ID: 10048*. Letter to Chris DeBoer, LHG, Washington State Department of Ecology, and Amy Baker, U.S. Environmental Protection Agency. July 15.

MFA. 2024c. Carolyn Wise, LHG, Maul Foster & Alongi, Inc. *August 2024 Compliance Monitoring—AOC 1, Northern State Multi Service Center, Sedro-Woolley, Washington, Agreed Order No. DE 16309, Cleanup ID: 10048*. Letter to Chris DeBoer, LHG, Washington State Department of Ecology, and Amy Baker, U.S. Environmental Protection Agency. October 11.

Limitations

The services undertaken in completing this technical 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 technical memorandum is solely for the use and information of our client unless otherwise noted. Any reliance on this report by a third party is at such party's sole risk.

Opinions and recommendations contained in this technical 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 technical memorandum.

Figures

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Path: X:\0624.04 Port of Skagit\18\Projects\Fig1-1 PropertyVicinity.mxd

TRACT A

Hansen Creek

Maintenance Building

Former Laundry Building

Powerhouse

POWERHOUSE DRIVE

DIV. 8

DIV. 9

Athletic Field

DIV. 5

TRACT C

TURNING POINT COURT

PLANTERS ROAD

Smith Hall

DIV. 6

Trevennen Building

Wilkes Hall

Thompson Hall

Valdez Hall

DIV. 7

HUB DRIVE

NORTHERN STATE ROAD

Denny Building

NORTH SOUND DRIVE

DIV. 2

Former Ward Building Area

DIV. 4

Douglas Building

Coleman Building

Brickyard Creek

DIV. 3

THOMPSON DRIVE

TRACT C

CHARLES JONES MEMORIAL CIRCLE

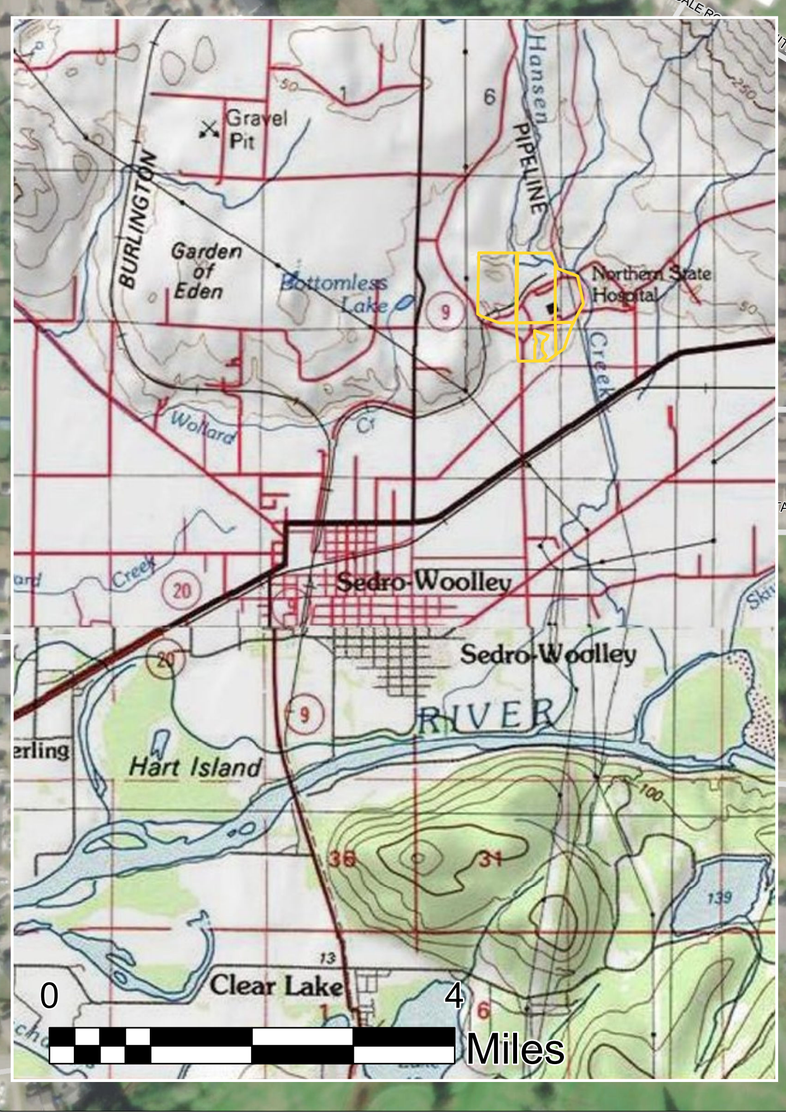
CHARLES JONES MEMORIAL CIRCLE

DIV. 1

FRUITDALE ROAD

TRACT B

STARFLOWER LANE



Source: Aerial photograph obtained from Esri ArcGIS Online; parcels and roads and streams data sets obtained from Skagit County; city limits data set obtained from City of Sedro-Woolley.

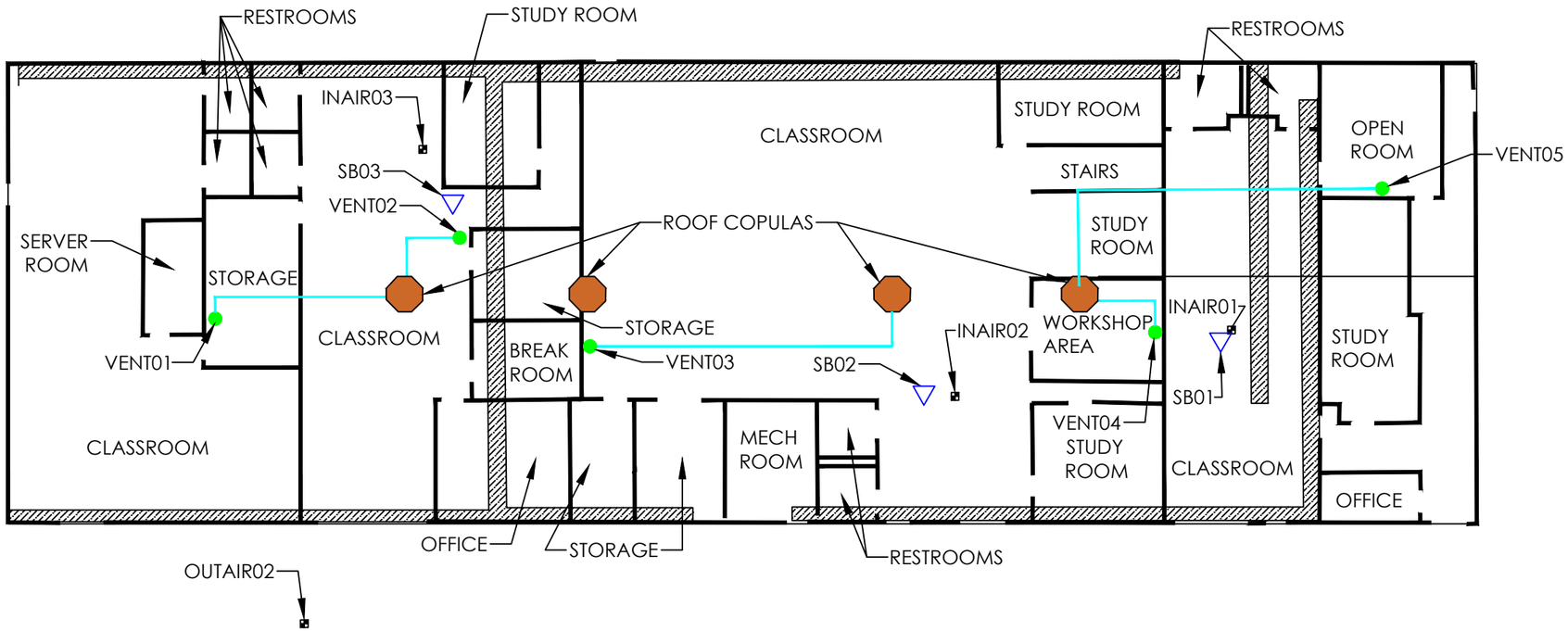
Legend

- Property Parcel and Parcel Name
- Northern State Recreational Area
- Sedro-Woolley City Limits (Post Annexation)
- Stream

Figure 1
Property Vicinity
Northern State Multi Service Center
Port of Skagit
Sedro-Woolley, Washington

0 500 1,000
Feet

Print Date: 6/7/2022
Approved By: cwise
Produced By: jroberts
Project: M0624.04.018



LEGEND:

- BUILDING FOOTPRINT
- VENT LOCATION/ FLOOR PENETRATION
- PIPE ROUTE
- INDOOR OR OUTDOOR AIR SAMPLE LOCATION
- SUB-SLAB VAPOR PIN
- PIPE TRENCH

NOTE:

1. INDOOR AND OUTDOOR AIR SAMPLE LOCATIONS AND PIPE TRENCH LOCATIONS ARE APPROXIMATE.

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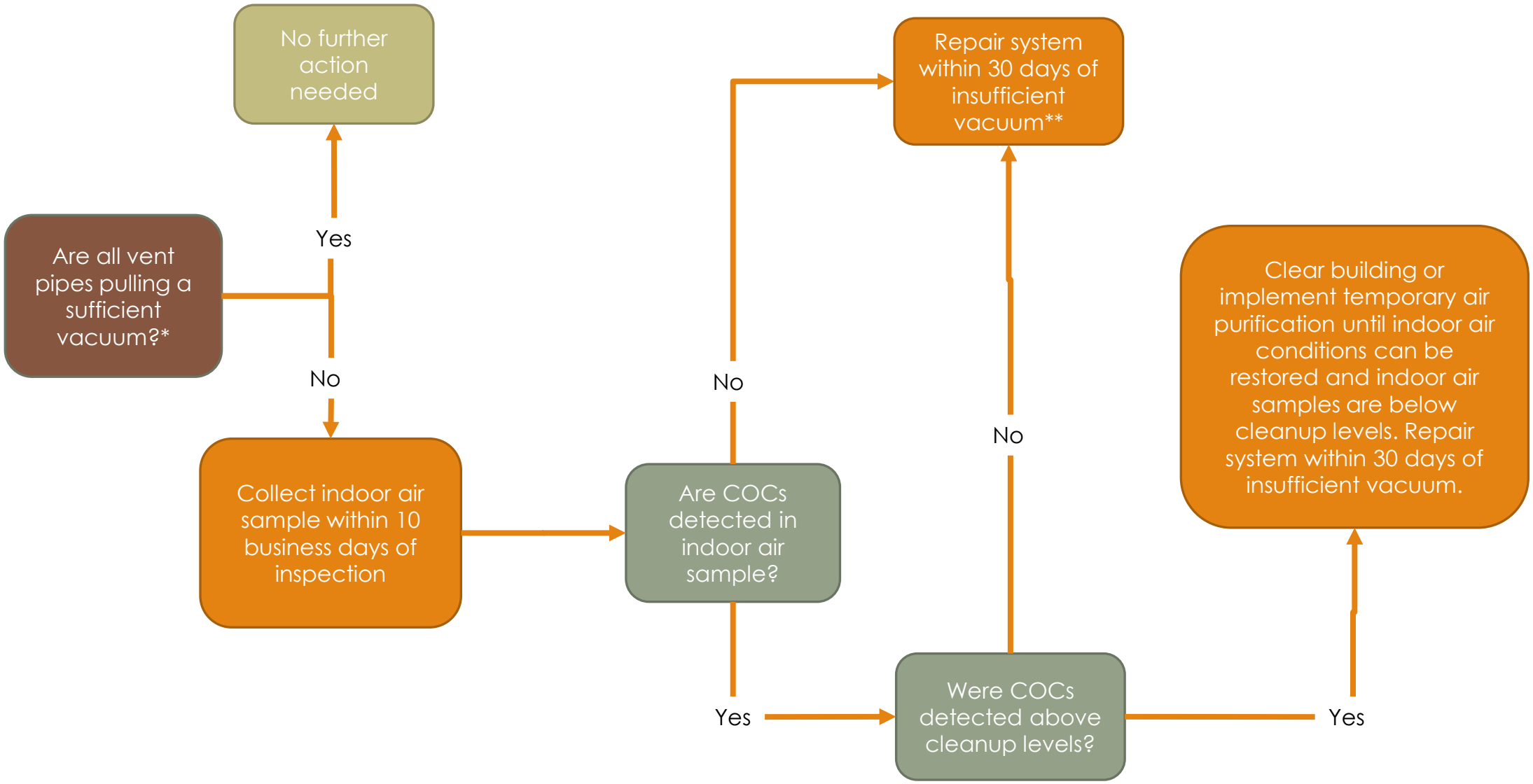
DRAWING NOT TO SCALE

Figure 2
Sub-Slab Depressurization System As-Built

Northern State Multi Service Center
Sedro-Woolley, WA

Figure 3. Quarterly Inspection Indoor Air Sampling Decision Tree

Northern State Multi Service Center
Sedro-Woolley, WA



Note
*Sufficient vacuum at manometer locations is considered anything above 0.5-inches of water column.
**System repair may include replacing fan, resealing joints, or restoring power to a fan. If an initial repair does not restore the vacuum, facility shall work to identify issue and correct within the original 30-day timeframe.
COCs = chemicals of concern.

Table

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Table
AOC 1: Indoor and Ambient (Outdoor) Air Analytical Results
Northern State Multi Service Center
Sedro-Woolley, Washington

Location Type:	MTCA Method B, Vapor Intrusion, Indoor Air[1]		Indoor Air												Ambient Air[a]			
Location:			INAIR01				INAIR02				INAIR03				OUTAIR02		OUTAIR03	OUTAIR04
Sample Name:			INAIR01-021424	INAIR01-052224	INAIR01-082224	INAIR01-111924	INAIR02-021424	INAIR02-052224	INAIR02-082224	INAIR02-111924	INAIR03-021424	INAIR03-052224	INAIR03-082224	INAIR03-111924	OUTAIR02-021424	OUTAIR02-111924	OUTAIR03-052224	OUTAIR04-082224
Collection Date:	Cancer	Noncancer	02/14/2024	05/22/2024	08/22/2024	11/19/2024	02/14/2024	05/22/2024	08/22/2024	11/19/2024	02/14/2024	05/22/2024	08/22/2024	11/19/2024	02/14/2024	11/19/2024	05/22/2024	08/22/2024
VOCs (ug/m^3)																		
1,1,1-Trichloroethane	NV	2,300	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U	0.55 U
1,1,2-Trichloroethane	0.16	0.091	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U	0.055 U
1,1-Dichloroethane	1.6	NV	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,1-Dichloroethene	NV	91	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
1,2-Dichloroethane	0.096	3.2	0.073	0.065	0.04 U	0.065	0.069	0.069	0.045	0.069	0.073	0.073	0.04 U	0.073	0.057	0.053	0.061	0.040
Chloroethane	NV	4,600	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U	2.6 U
cis-1,2-Dichloroethene	NV	18	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Tetrachloroethene	9.6	18	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U	6.8 U
trans-1,2-Dichloroethene	NV	18	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U	0.4 U
Trichloroethene	0.33	0.91	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U	0.11 U
Vinyl chloride	0.28	46	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U	0.26 U

Notes

Detections were compared to screening criteria and no exceedances were identified; non-detects (U) were not compared with screening criteria.

AOC = area of concern.

MTCA = Model Toxics Control Act.

NV = no value.

U = result is non-detect at the method reporting limit.

ug/m^3 = micrograms per cubic meter.

VOC = volatile organic compound.

[a]Ambient air locations are positioned upwind of the building, and may vary between sampling events based on the wind direction the day of collection.

Reference

[1]Ecology. 2024. *Cleanup Levels and Risk Calculation (CLARC) table.* Washington State Department of Ecology, Toxics Cleanup Program. July.

Attachment A

Field Photographs

MAUL FOSTER ALONGI

Photographs

Project Name: Northern State Multi Service Center—AOC 1 Interim Action Completion Report
Project Number: M0624.04.024
Location: Sedro-Woolley, Washington

Photo No. 1.

Description

Outdoor air sample OUTAIR02 on the east side of the building, collected on November 19, 2024.

Photo No. 2.

Description

Indoor air sample INAIR01 in the northern portion of the building, collected on November 19, 2024.

Photographs

Project Name: Northern State Multi Service Center—AOC 1 Interim Action Completion Report
Project Number: M0624.04.024
Location: Sedro-Woolley, Washington

Photo No. 3.

Description

Indoor air sample INAIR02 in the central portion of the building, collected on November 19, 2024.

Photo No. 4.

Description

Indoor air sample INAIR03 in the southern portion of the building, collected on November 19, 2024.

Attachment B

Field Sampling Data Sheets

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Sampler(s): B. Murphy

Vapor Field Sampling Data Sheet
Project: Former Northern State Hospital
Location: 2070 Northern State Road, Sedro-Woolley, Washington

Sample ID	Sample Type	Date	Summa Canister ID	Manifold ID	Canister Size (L)	Collection Duration	Sample			
							Begin Time	End Time	Initial Pressure ("Hg)[a]	Final Pressure ("Hg)
INAIR01-111924	Indoor Air	11/19/2024	35333	6608	6	8 hour	7:24	15:24	-30	-5
INAIR02-111924	Indoor Air	11/19/2024	18569	6604	6	8 hour	7:19	15:19	-29	-4
INAIR03-111924	Indoor Air	11/19/2024	18578	15212	6	8 hour	7:14	15:14	-30	-6
OUTAIR02-111924	Ambient Air	11/19/2024	37214	20497	6	8 hour	7:10	15:10	-30+	-4

Notes

"Hg = inches of mercury.

ID = identification.

L = liter.

ppm = parts per million.

[a]-30+ indicates that the vacuum gauge was above the maximum pressure value of 30"Hg.

Attachment C

Analytical Laboratory Reports

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FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
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December 2, 2024

Carolyn Wise, Project Manager
Maul Foster Alongi
1329 N State St, Suite 301
Bellingham, WA 98225

Dear Ms Wise:

Included are the results from the testing of material submitted on November 21, 2024 from the SWIFT Center - AOC 1 M0624.04.0.24, F&BI 411364 project. There are 8 pages included in this report.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
MFA1202R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on November 21, 2024 by Friedman & Bruya, Inc. from the Maul Foster Alongi SWIFT Center - AOC 1 M0624.04.0.24, F&BI 411364 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Maul Foster Alongi
411364 -01	INAIR01-111924
411364 -02	INAIR02-111924
411364 -03	INAIR03-111924
411364 -04	OUTAIR02-111924
411364 -05	OUTAIR05-111924

All quality control requirements were acceptable.

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INAIR01-111924	Client:	Maul Foster Alongi
Date Received:	11/21/24	Project:	M0624.04.0.24, F&BI 411364
Date Collected:	11/19/24	Lab ID:	411364-01
Date Analyzed:	11/25/24	Data File:	112520.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	95	70	130

Compounds:	Concentration ug/m3	ppbv
Vinyl chloride	<0.26	<0.1
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	0.065	0.016
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<6.8	<1

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INAIR02-111924	Client:	Maul Foster Alongi
Date Received:	11/21/24	Project:	M0624.04.0.24, F&BI 411364
Date Collected:	11/19/24	Lab ID:	411364-02
Date Analyzed:	11/25/24	Data File:	112519.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	95	70	130

Compounds:	Concentration ug/m3	ppbv
Vinyl chloride	<0.26	<0.1
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	0.069	0.017
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<6.8	<1

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	INAIR03-111924	Client:	Maul Foster Alongi
Date Received:	11/21/24	Project:	M0624.04.0.24, F&BI 411364
Date Collected:	11/19/24	Lab ID:	411364-03
Date Analyzed:	11/25/24	Data File:	112518.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	94	70	130

Compounds:	Concentration ug/m3	ppbv
Vinyl chloride	<0.26	<0.1
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	0.073	0.018
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<6.8	<1

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	OUTAIR02-111924	Client:	Maul Foster Alongi
Date Received:	11/21/24	Project:	M0624.04.0.24, F&BI 411364
Date Collected:	11/19/24	Lab ID:	411364-04
Date Analyzed:	11/25/24	Data File:	112517.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	97	70	130

Compounds:	Concentration ug/m3	ppbv
Vinyl chloride	<0.26	<0.1
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	0.053	0.013
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<6.8	<1

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	Maul Foster Alongi
Date Received:	Not Applicable	Project:	M0624.04.0.24, F&BI 411364
Date Collected:	Not Applicable	Lab ID:	04-2851 MB
Date Analyzed:	11/25/24	Data File:	112511.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	91	70	130

Compounds:	Concentration ug/m3	ppbv
Vinyl chloride	<0.26	<0.1
Chloroethane	<2.6	<1
1,1-Dichloroethene	<0.4	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1
1,1-Dichloroethane	<0.4	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1
1,2-Dichloroethane (EDC)	<0.04	<0.01
1,1,1-Trichloroethane	<0.55	<0.1
Trichloroethene	<0.11	<0.02
1,1,2-Trichloroethane	<0.055	<0.01
Tetrachloroethene	<6.8	<1

Date of Report: 12/02/24
Date Received: 11/21/24
Project: SWIFT Center - AOC 1 M0624.04.0.24, F&BI 411364

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD TO-15

Laboratory Code: 411388-03 1/6.5 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
Vinyl chloride	ug/m3	<1.7	<1.7	nm
Chloroethane	ug/m3	<17	<17	nm
1,1-Dichloroethene	ug/m3	<2.6	<2.6	nm
trans-1,2-Dichloroethene	ug/m3	<2.6	<2.6	nm
1,1-Dichloroethane	ug/m3	<2.6	<2.6	nm
cis-1,2-Dichloroethene	ug/m3	<2.6	<2.6	nm
1,2-Dichloroethane (EDC)	ug/m3	<0.26	<0.26	nm
1,1,1-Trichloroethane	ug/m3	<3.5	<3.5	nm
Trichloroethene	ug/m3	2.1	2.3	9
1,1,2-Trichloroethane	ug/m3	<0.35	<0.35	nm
Tetrachloroethene	ug/m3	<44	<44	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Vinyl chloride	ug/m3	35	93	70-130
Chloroethane	ug/m3	36	91	70-130
1,1-Dichloroethene	ug/m3	54	94	70-130
trans-1,2-Dichloroethene	ug/m3	54	96	70-130
1,1-Dichloroethane	ug/m3	55	97	70-130
cis-1,2-Dichloroethene	ug/m3	54	94	70-130
1,2-Dichloroethane (EDC)	ug/m3	55	108	70-130
1,1,1-Trichloroethane	ug/m3	74	104	70-130
Trichloroethene	ug/m3	73	99	70-130
1,1,2-Trichloroethane	ug/m3	74	105	70-130
Tetrachloroethene	ug/m3	92	104	70-130

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht – The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported between the method detection limit and the lowest calibration point. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

411364

SAMPLE CHAIN OF CUSTODY

11-21-24

Page # 1 of 1

Report To Carolyn Wise
Company Maul Foster & Alongi
Address 1329 N State St, Ste. 301
City, State, ZIP Bellingham, WA 98225
Phone 360-690-5982 Email cwise@maulfoster.com

SAMPLERS (signature): Brenden Murphy

PROJECT NAME & ADDRESS: SWIFT Center - AOC 1

PO #: M0624.04.024

NOTES:

INVOICE TO: accounting@maulfoster.com

TURNAROUND TIME
☒ Standard
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
X Default: Clean following final report delivery
Hold (Fee may apply):

SAMPLE INFORMATION										ANALYSIS REQUESTED						
Sample Name	Lab ID	Canister ID	Flow Cont. ID	Reporting Level: IA=Indoor Air SG=Soil Gas (Circle One)	Date Sampled	Initial Vac. ("Hg)	Field Initial Time	Final Vac. ("Hg)	Field Final Time	TO15 Full Scan	TO15 BTEXN	APH	Chlorinated VOCs	Helium		Notes
INAIR01-111924	01	35333	6608	(IA) / SG	11/19/24	30	7:24	-5	15:24				X			
INAIR02-111924	02	18569	6604	(IA) / SG	11/19/24	29	7:19	-4	15:19				X			
INAIR03-111924	03	18578	15212	(IA) / SG	11/19/24	30	7:14	-6	15:14				X			
OUTAIR02-111924	04	37214	20497	(IA) / SG	11/19/24	30+	7:10	-4	15:10				X			
OUTAIR05-111924	05	35335	20470	(IA) / SG	11/19/24	29	7:31	-3.5	15:31							archive
				IA / SG												
				IA / SG												
				IA / SG												

Friedman & Bruya, Inc.
5500 4th Avenue South
Seattle, WA 98108
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COCTO-15.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Brenden Murphy	Brenden Murphy	MFA	11/19/24	17:10
Received by: Nhan Phan	Nhan Phan	FEBI	11/21/24	1500
Relinquished by:				
Received by:		Samples received at 16 °C		

SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 411364 CLIENT MFA INITIALS/DATE: (NP) 11/21/24

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 16 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☐ YES ☑ NO

How did samples arrive?
☐ Over the Counter ☐ Picked up by F&BI ☑ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/Date: (NP) 11/21
*or other representative documents, letters, and/or shipping memos

Number of days samples have been sitting prior to receipt at laboratory 2 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

Sample ID's	☑ Yes ☐ No	☐ Not on COC/label
Date Sampled	☑ Yes ☐ No	☐ Not on COC/label
Time Sampled	☑ Yes ☐ No	☐ Not on COC/label
# of Containers	☑ Yes ☐ No	
Relinquished	☑ Yes ☐ No	
Requested analysis	☑ Yes ☐ On Hold	

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☐ NA ☐ YES ☑ NO

Number of unused TO15 canisters _____ **Number of unused TO17 tubes** _____

FROM:
(360) 433-0251
Maul Foster Alongi
1329 N State St
Ste 301
BELLINGHAM WA 98225
US

20NOV24
.00 LB
1946/ROSA2570
DIMMED: 21 X 10 X 10 IN
BILL 3rd PARTY

Part # 156297-435 ARL

Friedman & Bruya Inc.
5500 4th Ave S
(US)
SEATTLE WA 98108
(206) 285-8282
REF:
INV:
PO:
DEPT:

FedEx Ground

1 of 2
TRK# 7700 8204 3660
MASTER
98108

9622 0417 3 (000 448 2658) 2 00 7700 8204 3660

Attachment D

Data Validation Memorandum

MAUL FOSTER ALONGI

Data Validation Memorandum

Project No. M0624.04.024 | December 10, 2024 | Port of Skagit

Maul Foster & Alongi, Inc. (MFA), conducted an independent Stage 2A review of the quality of analytical results for indoor air and outdoor air samples collected on November 19, 2024, at the Northern State Multi Service Center site in Sedro-Woolley, Washington.

Friedman & Bruya, Inc. (F&B), performed the analyses. MFA reviewed F&B report number 411364. The analysis performed and the samples analyzed are listed in the following tables. One sample submitted on hold is indicated below.

Analysis	Reference
Volatile organic compounds	EPA TO-15

Notes
EPA = U.S. Environmental Protection Agency.
TO = toxic organics.

Samples Analyzed
Report 411364
INAIR01-111924
INAIR02-111924
INAIR03-111924
OUTAIR02-111924
OUTAIR05-111924 (hold)

Data Validation Procedures

Analytical results were evaluated according to applicable sections of U.S. Environmental Protection Agency (EPA) guidelines for data review (EPA 2020) and appropriate laboratory- and method-specific guidelines (EPA 1986, F&B 2022).

Based on the data quality assurance/quality control review described herein, the data, with the appropriate final data qualifiers assigned, are considered acceptable for their intended use. Final data qualifiers represent qualifiers originating from the laboratory and accepted by the reviewer, and data qualifiers assigned by the reviewer during validation.

Final data qualifier:

- U = result is non-detect at the method reporting limit (MRL).

Sample Conditions

Sample Custody

Sample custody was appropriately documented on the chain-of-custody form accompanying the report.

The reviewer confirmed that the gap in custody on the chain-of-custody form accompanying report 411364 is due to shipment via a third-party service.

Holding Times

Extractions and analyses were performed within the recommended holding times.

Preservation and Sample Storage

The samples were preserved and stored appropriately.

Reporting Limits

The laboratory evaluated results to MRLs.

Blank Results

Method Blanks

Laboratory method blanks are used to evaluate whether laboratory contamination was introduced during sample preparation and analysis. Laboratory method blank analyses were performed at the required frequencies, in accordance with laboratory- and method-specific requirements.

All laboratory method blank results were non-detect to MRLs.

Laboratory Control Sample and Laboratory Control Sample Duplicate Results

Laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) results are used to evaluate laboratory precision and accuracy. F&B did not report LCSD results; laboratory precision was evaluated using laboratory duplicate results. The LCS was prepared and analyzed at the required frequency, in accordance with laboratory- and method-specific requirements.

All LCS results were within acceptance limits for percent recovery.

Laboratory Duplicate Results

Laboratory duplicate results are used to evaluate laboratory precision and sample homogeneity. All laboratory duplicate samples were prepared and analyzed at the required frequency, in accordance with laboratory- and method-specific requirements.

Laboratory duplicate results greater than five times the MRL were evaluated using laboratory relative percent difference control limits. A secondary criterion was used when laboratory duplicate results were non-detect or less than five times the MRL. Results meet the secondary criterion if the absolute difference of the laboratory duplicate sample result and the parent sample result, or the MRL for non-detects, is equal to or less than the MRL value of the parent sample.

All laboratory duplicate results met the acceptance criteria.

Matrix Spike and Matrix Spike Duplicate Results

Matrix spike (MS) and matrix spike duplicate (MSD) results are used to evaluate laboratory precision, accuracy, and the effect of the sample matrix on sample preparation and target analyte recovery. F&B did not report MS or MSD results, in accordance with the method.

Surrogate Results

Surrogate results are used to evaluate laboratory performance of target organic compounds for individual samples.

All surrogate results were within percent recovery acceptance limits.

Field Duplicate Results

Field duplicate results are used to evaluate field precision and sample homogeneity. No field duplicate samples were submitted for analysis.

Data Package

The data package was reviewed for transcription errors, omissions, and anomalies.

None were found.

References

EPA. 1986. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.* EPA publication SW-846. 3rd ed. U.S. Environmental Protection Agency. Final updates I (1993), II (1995), IIA (1994), IIB (1995), III (1997), IIIA (1999), IIIB (2005), IV (2008), V (2015), VI phase I (2017), VI phase II (2018), VI phase III (2019), VII phase I (2019), and VII phase II (2020).

EPA. 2020. *National Functional Guidelines for Organic Superfund Methods Data Review.* EPA 540-R-20-005. U.S. Environmental Protection Agency, Office of Superfund Remediation and Technology Innovation: Washington, DC. November.

F&B. 2022. *Quality Assurance Manual.* Rev. 18. Friedman & Bruya, Inc.: Seattle, WA. December 9.

Attachment E

Sub-slab Depressurization Inspection Form

MAUL FOSTER ALONGI

MAUL FOSTER ALONGI

Quarterly Sub-slab Depressurization System (SSDS) Inspection
SWIFT Center—AOC 1 Interim Action
Port of Skagit
M0624.04.024

Name: B. Murphy Date: 11/19/24 Outdoor temp.: ~36°F

1. Power Supply

1.1 Is the power switch in "On" Position upon arrival? ☑ Yes ☐ No

1.2 If No, explain why power was off (if known) and steps taken to correct: _____

2. Manometer Gauge Reading

Table 2.1 Manometer Gauge Readings

(Make sure lower side of manometer gauge is at 0)

Location	Time	Manometer Condition Good?	Pressure (" WC)	Pressure Goal (" WC)	Measurement Above Goal?
VENT01	7:50	☑ Yes ☐ No	2.9	0.5 – 1.75	☑ Yes ☐ No
VENT02	7:56	☑ Yes ☐ No	1.9	0.5 – 1.75	☑ Yes ☐ No
VENT03	7:58	☑ Yes ☐ No	2.0	0.5 – 1.75	☑ Yes ☐ No
VENT04	8:00	☑ Yes ☐ No	2.4	0.5 – 1.75	☑ Yes ☐ No
VENT05	8:03	☑ Yes ☐ No	2.2	0.5 – 1.75	☑ Yes ☐ No

Notes:

If **No** is selected and blower operational, notify PM to identify corrective actions.

" WC = inches of water column.

3. Additional System Documentation

Table 3.1 System Checklist

Is the SSDS operating upon arrival?	☑ Yes ☐ No
Is the SSDS visually intact and undamaged?	☑ Yes ☐ No
Conduct a visual inspection of accessible system piping and pipe seals, connections, etc. Are the components free of any cracks, gaps, or changes?	☑ Yes ☐ No
Is the floor in generally good condition, with no cracks or penetrations observed?	☑ Yes ☐ No
Is the caulking on floor penetrations in good condition?	☑ Yes ☐ No

If the answer was **No** to any of the above, describe below and document corrective actions. Please describe any issues with the SSDS, if applicable:

_____

_____

4. Structural Changes

Table 4.1 System Checklist

Have there been any significant changes to the building's HVAC system?	☐ Yes ☑ No
Are any new buildings present near the subject structure that have emissions that could impact indoor air?	☐ Yes ☑ No
Has the building changed in use since last inspection?	☐ Yes ☑ No
Has the building undergone any physical modifications (additions, wall changes, new drains, etc.)	☐ Yes ☑ No

If the answer was **Yes** to any of the above, describe the changes below and photo document them:

_____

_____

5. Differential Pressure Readings

Existing sub-slab vapor pins are located on the floor of the building as shown on Figure 5-1 of Interim Action Work Plan.

Table 5.1 Final Differential Pressure Readings

Location	Time	Cap and Seal Secure Before Readings?	Final Pressure (" WC)	Pressure Goal (" WC)	Pressure Above Goal?	Weather	
						Wind Velocity/ Direction	Barometric Pressure (" Hg)
SB01	15:49	☑ Yes ☐ No	-0.025	-0.001	☑ Yes ☐ No	10 MPH E	29.67
SB02	15:40	☑ Yes ☐ No	-0.063	-0.001	☑ Yes ☐ No	10 MPH E	29.67
SB03	16:15	☑ Yes ☐ No	-0.002	-0.001	☑ Yes ☐ No	11 MPH E	29.64

Notes:

Measurements will be taken manually at each monitoring port using micromanometer with capability to measure as low as 0.001 " of WC).

" Hg = inches of mercury.

" WC = inches of water column.

Were all sub-slab vapor pins sealed/capped after differential pressure readings were measured?

☑ Yes ☐ No

Attachment F

Port of Skagit Sub-slab Depressurization Inspection Form

MAUL FOSTER ALONGI

Name: _____ Date: _____ Outdoor temp.: _____

1. Power Supply

1.1 Is the power switch in "On" Position upon arrival? ☐ Yes ☐ No

1.2 If No, explain why power was off (if known) and steps taken to correct: _____

_____

2. Manometer Gauge Reading

Table 2.1 Manometer Gauge Readings

(Make sure lower side of manometer gauge is at 0)

Location	Time	Manometer Condition Good?	Pressure (" WC)	Pressure Goal (" WC)	Measurement Above Goal?
VENT01		☐ Yes ☐ No		0.5 – 1.75	☐ Yes ☐ No
VENT02		☐ Yes ☐ No		0.5 – 1.75	☐ Yes ☐ No
VENT03		☐ Yes ☐ No		0.5 – 1.75	☐ Yes ☐ No
VENT04		☐ Yes ☐ No		0.5 – 1.75	☐ Yes ☐ No
VENT05		☐ Yes ☐ No		0.5 – 1.75	☐ Yes ☐ No

Notes:

If **No** is selected and blower operational, notify PM to identify corrective actions.

" WC = inches of water column.

3. Additional System Documentation

Table 3.1 System Checklist

Is the SSDS operating upon arrival?	☐ Yes ☐ No
Is the SSDS visually intact and undamaged?	☐ Yes ☐ No
Conduct a visual inspection of accessible system piping and pipe seals, connections, etc. Are the components free of any cracks, gaps, or changes?	☐ Yes ☐ No
Is the floor in generally good condition, with no cracks or penetrations observed?	☐ Yes ☐ No
Is the caulking on floor penetrations in good condition?	☐ Yes ☐ No

If the answer was **No** to any of the above, describe below and document corrective actions. Please describe any issues with the SSDS, if applicable:

_____

_____

4. Structural Changes

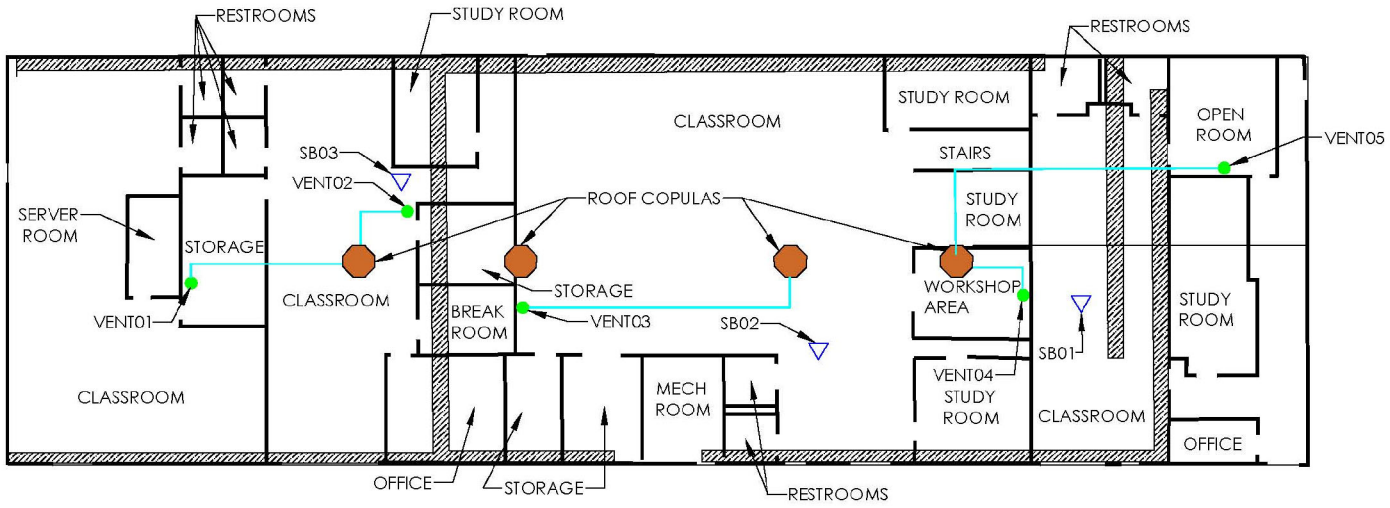
Table 4.1 System Checklist

Have there been any significant changes to the building's HVAC system?	☐ Yes ☐ No
Are any new buildings present near the subject structure that have emissions that could impact indoor air?	☐ Yes ☐ No
Has the building changed in use since last inspection?	☐ Yes ☐ No
Has the building undergone any physical modifications (additions, wall changes, new drains, etc.)	☐ Yes ☐ No

If the answer was **Yes** to any of the above, describe the changes below and photo document them:

_____

_____



NOTE:
1. PIPE TRENCH LOCATIONS ARE APPROXIMATE.

LEGEND:

- BUILDING FOOTPRINT
- VENT LOCATION/ FLOOR PENETRATION
- PIPE ROUTE
- SUB-SLAB VAPOR PIN
- PIPE TRENCH

DRAWING NOT TO SCALE

Sub-Slab Depressurization System As-Built

Northern State Multi Service Center
Sedro-Woolley, WA

MAUL FOSTER ALONGI
971.544.2139 (phone) | www.maulfoster.com