Associated Environmental Group, LLC

May 1, 2019

Ms. Tahni Madden
CHI Franciscan Health
1149 Market Street, MS-10-06
Tacoma, Washington 98402-3515

RE: Vapor Mitigation System & Indoor Air Sampling Results
Franciscan Medical Clinic
4550 Fauntleroy Way SW
Seattle, Washington 98126-3471
AEG Project No. 18-172

Dear Ms. Madden:

Associated Environmental Group, LLC (AEG) completed the installation of a remote telemetry monitoring system and collected sub-slab vapor samples from the operating vapor mitigation system at the Franciscan Medical Clinic, located at the above-referenced address in Seattle, Washington (Site). To monitor the operation of the sub-slab depressurization (SSD) fan (currently mounted on the roof of the clinic), AEG installed a telemetry unit to provide a means to access the system remotely (24/7 access). The monitoring unit will notify AEG and anyone designated of changes to the system operations, including vacuum drops and power failures. The system monitors if vacuum is present, and will go into alarm if that condition changes. This will help improve the continuous operation of the SSD, and provide for quick response time for repairs.

During installation of the telemetry system on April 4, 2019, AEG also collected sub-slab vapor samples from the three independent SSD locations (exam room #3, employee break room, and the storage room). Samples were collected using 1-liter Summa canisters to provide a quantitative value for the reduction of volatile organic compounds (VOCs) removed from beneath the concrete floor. The samples were collected using a 10-minute sampling duration, and were delivered to Friedman & Bruya, Inc. laboratory in Seattle, Washington for VOC analysis by EPA Method TO-15.

The laboratory results indicated the SSD points in all three locations were removing VOCs that have the potential to be entering the working space in the lower floor of the building. Detected constituents with corresponding screening levels are summarized in Table 1, *Summary of Sub-Slab Vapor Analytical Results from Sub-Slab Depressurization Points,* and the laboratory sampling reports are attached.

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One chemical of interest that was detected at all three sample locations was ethanol. This is a compound that is common in gasoline and does not have a MTCA cleanup level. However, ethanol has an Occupational Safety and Health Administration (OSHA) permissible exposure limit (PEL) and an American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value (TLV) of 1,000 micrograms per cubic meter (µg/m^3). The sample from Exam Room #3 reported an ethanol concentration of 1,100 µg/m^3.

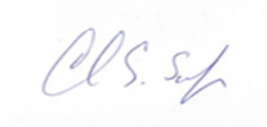
Concurrent with AEG's Site activities, NOW Environmental Services, Inc. (NOW) performed a follow-up round of indoor air testing on April 4 and 5, 2019. Indoor air samples were collected within Exam Room #3 and the Storage Room using Summa canisters, 8- and 24-hour sampling durations, and were analyzed for VOCs. Analytical results indicated all constituents in indoor air were either non-detect or below MTCA Method B indoor air cleanup levels and OSHA PELs. Selected pages of NOW's report presenting the analytical results are attached.

CLOSING

The Site work was completed to assess the effectiveness of the SSD system installed by AEG. The SSD system was to address health concerns and redirect the petroleum vapors detected within the lower floor of the building to outside air. AEG had intended to operate the SSD system until such time that BP West Coast Products, LLC (BP) finishes their investigation of the petroleum impact to Site subsurface associated with the adjacent Shell site to the west. Based on the most recent NOW sampling results, the indoor air quality is still below the risk levels for the employees working at the clinic. AEG would recommend continued seasonal indoor air and SSD vapor sampling to confirm any seasonal changes to the VOC levels, and to ensure continued monitoring of the potential risk levels for employees.

Sincerely,

Associated Environmental Group, LLC



Charles S. Swift, R.S.A.
Project Manager

Scott Rose, L.H.G.
Senior Hydrogeologist

Attachments:

Table 1 – *Summary of Sub-Slab Vapor Analytical Results from Sub-Slab Depressurization Points*

NOW Environmental Services Indoor Air Results

Friedman & Bruya, Inc. Laboratory Report, dated April 23, 2019

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Table 1

Summary of Sub-Slab Vapor Analytical Results from Sub-Slab Depressurization Points

Franciscan Medical Clinic, West Seattle

Sample Number		Storage Room	Exam Room No. 3	Employee Break Room	Method B Sub-Slab Screening Level[1]	Method B Indoor Air Cleanup Level[2]	OSHA PEL (8-Hour TWA)	ACGIH TLVs (8-Hour TWA)
Date Collected		4/5/2019	4/5/2019	4/5/2019				
Gasoline-Related Constituents								
APH - Air-Phase Hydrocarbons	EC5-8 Aliphatics	**330**	**210**	**110**	90,000	2,700	NL	NL
	EC9-12 Aliphatics	**180**	**120**	**91**	4,700	140	NL	NL
	EC9-10 Aromatics	<37	<40	<40	6,000	180	NL	NL
Gasoline-Range Organics[3]		**510**	**330**	**201**	NL	140	NL	NL
Volatile Organic Compounds	Hexane	**7.9**	<5.6	<5.6	7.8	320	500,000	50,000
	Benzene	**0.82 fb**	<0.51	<0.51	10.7*	0.321*	10,000	500
	Toluene	**17**	**6.8**	**3.1**	76,200	2,290	200,000	20,000
	Ethylbenzene	**4.4**	**0.89**	**0.97**	15,200	457	100,000	20,000
	m,p-Xylene	**9.4**	**2.3**	**2.5**	1,520.0	45.7	100,000	100,000
	o,p-Xylene	**4.0**	**1.0**	**0.99**	1,520.0	45.7	100,000	100,000
	Naphthalene	<0.39	<0.42	<0.42	2.45*	0.0735*	10,000	10,000
	Ethanol	**190 ve**	**1,100 ve**	**180 ve**	NL	NL	1,000	1,000

Notes:

All values presented in micrograms per cubic meter ($\mu g/m^3$)

< = Not detected above laboratory reporting limits

fb = The analyte was detected in the method blank.

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

* Cancer screening level (all other constituents listed do not have cancer values)

[1]An exceedance of Ecology's Method B sub-slab screening level indicates the constituent is present at a concentration in sub-slab vapor that has the potential to migrate into indoor air.

[2]An exceedance of Ecology's Method B cleanup level for indoor air indicates that, for the Site to receive a determination of No Further Action, mitigation is required via either removal of the source or redirection of vapors from the breathing zone.

[3]Gasoline-Range Organics were estimated using the sum of the results for APH EC5-8, APH EC9-12, and APH EC9-10

Red Bold indicates the detected concentration exceeds one or more regulatory levels

Bold indicates the detected concentration is below all regulatory levels

OSHA PEL = U.S. Department of Labor, Occupational Safety and Health Administration Permissible Exposure Limit. Federal regulatory standard.

TWA = Time-Weighted Average.

NL = Not Listed; no values have been established for these constituents.

ACGIH TLVs = American Conference of Governmental Industrial Hygienists Threshold Limit Values. ACGIH® is a private, not-for-profit, nongovernmental corporation. It is not a standards setting body. ACGIH® is a scientific association that develops recommendations or guidelines to assist in the control of occupational health hazards. TLVs® are health-based values and are not intended to be used as legal standards. Threshold Limit Values (TLVs®) refer to airborne concentrations of chemical substances and represent conditions under which it is believed that nearly all workers may be repeatedly exposed, day after day, over a working lifetime, without adverse effects.

3. Air Assessment and Analytical Procedures

The following data has been collected over the past half a year. The sampling carried out on April 4th and 5th were taken after the vapor scrubber added to the building to divert gasoline vapors was modified.

3.1 Vapor Intrusion Volatile Organic Compounds

EXAM ROOM 3

Compound	5/3/18 ug/m3 8 hour sample	5/23/18 ug/m3 8 hour sample	9/7/18 ug/m3 8 hour sample	9/20/18 ug/m3 24 hour sample	1/18/19 ug/m3 8 hour sample	1/18/19 ug/m3 24 hour sample	4/4/19 ug/m3 24 hour sample	4/4/19 ug/m3 8 hour sample	Ecology Indoor Air Cleanup Levels ug/m3	OSHA Permissable Exposure Limit per 8 hr day ug/m3
Benzene	0.282	0.196	0.114	0.305	0.543	0.637	ND	ND	0.320	1,000
Ethyl benzene	0.997	ND	ND	ND	ND	ND	ND	ND	457	100,000
Gasoline Range Organics	6,430	268	22.9	6.16	41.5	42.9	73.2	60.3	140	300,000 (Proposed no current limit)
Heptane	143	3.03	ND	0.402	ND	ND	ND	ND	320	500,000
Xylene (o,m,p)	4.59	ND	ND	ND	ND	ND	ND	ND	45.7	100,000
Toluene	2.47	0.834	ND	1.13	4.54	1.95	1.75	1.79	2,290	200,000

STORAGE

Compound	5/3/18 ug/m3 8 hour sample	5/23/18 ug/m3 8 hour sample	9/7/18 ug/m3 8 hour sample	9/20/18 ug/m3 24 hour sample	1/18/19 ug/m3 8 hour sample	1/18/19 ug/m3 24 hour sample	4/4/19 ug/m3 24 hour sample	4/4/19 ug/m3 8 hour sample	Ecology Indoor Air Cleanup Levels ug/m3	OSHA Permissable Exposure Limit per 8 hr day ug/m3
Benzene	0.305	-	0.110	0.165	0.458	0.820	ND	ND	0.320	1,000
Ethyl benzene	2.07	-	ND	ND	ND	ND	ND	ND	457	100,000
Gasoline Range Organics	7,902	-	28.0	18.1	74.4	55.9	73.2	60.3	140	300,000 (Proposed no current limit)
Heptane	234	-	ND	0.433	ND	ND	ND	ND	320	500,000
Xylene (o,m,p)	11.22	-	ND	1.232	ND	ND	ND	ND	45.7	100,000
Toluene	5.25	-	0.678	0.613	ND	1.97	1.75	1.79	2,290	200,000

Samples were collected in the pressurized mode, which air is drawn through the inlet and sampling system with a pump. The air is pumped into an initially evacuated SUMMA® passivated canister by the sample, which regulates the rate and duration of sampling. At the end of the sampling the period the canisters were pressurized to about 1 atmospheres absolute. Sampling duration for this assessment was for 8 hours or 24 hours, as noted, for 64 various compounds.

The samples were analyzed using gas chromatography/mass spectrometry (GC/MS) under an established QA/quality control (QC) program. Laboratory analytical procedures have been developed based on the concepts contain in both TO-15 and 8260B.

The TO-15 method is an EPA-recognized sampling concept for VOC sampling and speciation. This method of sampling was chosen because a relatively large sample volume can be collected, and multiple dilutions and re-analyses can occur to ensure identification and quantification of target VOCs within the working range of the method. The quantitation limits were set at 5 parts per billion or less.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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April 23, 2019

Charlie Swift, Project Manager
AEG
605 11th Ave SE
Suite 201
Tacoma, WA 98501

Dear Mr. Swift:

Included are the results from the testing of material submitted on April 5, 2019 from the Franciscan West Seattle, F&BI 904131 project. There are 13 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
AEG0423R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on April 5, 2019 by Friedman & Bruya, Inc. from the AEG Franciscan West Seattle, F&BI 904131 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	AEG
904131 -01	SR
904131 -02	E3
904131 -03	BR

Methylene chloride in the TO-15 laboratory control sample failed the acceptance criteria. In addition, benzene was detected in the TO-15 method blank at a level greater than one tenth the concentration detected in sample SR. The data were flagged accordingly.

All other quality control requirements were acceptable.

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	SR	Client:	AEG
Date Received:	04/05/19	Project:	Franciscan West Seattle, F&BI 904131
Date Collected:	04/05/19	Lab ID:	904131-01 1/1.5
Date Analyzed:	04/19/19	Data File:	041826.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	107	70	130

Compounds:	Concentration ug/m3
APH EC5-8 aliphatics	330
APH EC9-12 aliphatics	180
APH EC9-10 aromatics	<37

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	E3	Client:	AEG
Date Received:	04/05/19	Project:	Franciscan West Seattle, F&BI 904131
Date Collected:	04/05/19	Lab ID:	904131-02 1/1.6
Date Analyzed:	04/19/19	Data File:	041827.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	101	70	130

Compounds:	Concentration ug/m3
APH EC5-8 aliphatics	210
APH EC9-12 aliphatics	120
APH EC9-10 aromatics	<40

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	BR	Client:	AEG
Date Received:	04/05/19	Project:	Franciscan West Seattle, F&BI 904131
Date Collected:	04/05/19	Lab ID:	904131-03 1/1.6
Date Analyzed:	04/19/19	Data File:	041828.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	107	70	130

Compounds:	Concentration ug/m3
APH EC5-8 aliphatics	110
APH EC9-12 aliphatics	91
APH EC9-10 aromatics	<40

Analysis For Volatile Compounds By Method MA-APH

Client Sample ID:	Method Blank	Client:	AEG
Date Received:	Not Applicable	Project:	Franciscan West Seattle, F&BI 904131
Date Collected:	Not Applicable	Lab ID:	09-0784 mb
Date Analyzed:	04/18/19	Data File:	041820.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	111	70	130

Compounds:	Concentration ug/m3
APH EC5-8 aliphatics	<46
APH EC9-12 aliphatics	<35
APH EC9-10 aromatics	<25

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	SR	Client:	AEG
Date Received:	04/05/19	Project:	Franciscan West Seattle, F&BI 904131
Date Collected:	04/05/19	Lab ID:	904131-01 1/1.5
Date Analyzed:	04/19/19	Data File:	041826.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	101	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	Concentration ug/m3	Concentration ppbv
Propene	<1	<0.6	1,2-Dichloropropane	<0.35	<0.075
Dichlorodifluoromethane	2.1	0.43	1,4-Dioxane	<0.54	<0.15
Chloromethane	<3.1	<1.5	2,2,4-Trimethylpentane	<7	<1.5
F-114	<1	<0.15	Methyl methacrylate	<6.1	<1.5
Vinyl chloride	<0.38	<0.15	Heptane	<6.1	<1.5
1,3-Butadiene	<0.033	<0.015	Bromodichloromethane	<0.1	<0.015
Butane	9.4	4.0	Trichloroethene	<0.4	<0.075
Bromomethane	<2.3	<0.6	cis-1,3-Dichloropropene	<0.68	<0.15
Chloroethane	<4	<1.5	4-Methyl-2-pentanone	<6.1	<1.5
Vinyl bromide	<0.66	<0.15	trans-1,3-Dichloropropene	<0.68	<0.15
Ethanol	190 ve	100 ve	Toluene	17	4.5
Acrolein	<1.4	<0.6	1,1,2-Trichloroethane	<0.16	<0.03
Pentane	9.2	3.1	2-Hexanone	<6.1	<1.5
Trichlorofluoromethane	<3.4	<0.6	Tetrachloroethene	<10	<1.5
Acetone	60	25	Dibromochloromethane	<0.13	<0.015
2-Propanol	55	22	1,2-Dibromoethane (EDB)	<0.12	<0.015
1,1-Dichloroethene	<0.59	<0.15	Chlorobenzene	<0.69	<0.15
trans-1,2-Dichloroethene	<0.59	<0.15	Ethylbenzene	4.4	1.0
Methylene chloride	<130 jl	<37 jl	1,1,2,2-Tetrachloroethane	<0.21	<0.03
t-Butyl alcohol (TBA)	<18	<6	Nonane	<7.9	<1.5
3-Chloropropene	<1.9	<0.6	Isopropylbenzene	<3.7	<0.75
CFC-113	<1.1	<0.15	2-Chlorotoluene	<7.8	<1.5
Carbon disulfide	<9.3	<3	Propylbenzene	<3.7	<0.75
Methyl t-butyl ether (MTBE)	<2.7	<0.75	4-Ethyltoluene	<3.7	<0.75
Vinyl acetate	<11	<3	m,p-Xylene	9.4	2.2
1,1-Dichloroethane	<0.61	<0.15	o-Xylene	4.0	0.91
cis-1,2-Dichloroethene	<0.59	<0.15	Styrene	6.2	1.4
Hexane	7.9	2.2	Bromoform	<3.1	<0.3
Chloroform	0.25	0.051	Benzyl chloride	<0.078	<0.015
Ethyl acetate	<11	<3	1,3,5-Trimethylbenzene	<3.7	<0.75
Tetrahydrofuran	29	9.7	1,2,4-Trimethylbenzene	<3.7	<0.75
2-Butanone (MEK)	6.5	2.2	1,3-Dichlorobenzene	<0.9	<0.15
1,2-Dichloroethane (EDC)	0.77	0.19	1,4-Dichlorobenzene	<0.36	<0.06
1,1,1-Trichloroethane	<0.82	<0.15	1,2-Dichlorobenzene	<0.9	<0.15
Carbon tetrachloride	<0.94	<0.15	1,2,4-Trichlorobenzene	<1.1	<0.15
Benzene	0.82 fb	0.26 fb	Naphthalene	<0.39	<0.075
Cyclohexane	39	11	Hexachlorobutadiene	<0.32	<0.03

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	E3	Client:	AEG
Date Received:	04/05/19	Project:	Franciscan West Seattle, F&BI 904131
Date Collected:	04/05/19	Lab ID:	904131-02 1/1.6
Date Analyzed:	04/19/19	Data File:	041827.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

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

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	Concentration ug/m3	Concentration ppbv
Propene	<1.1	<0.64	1,2-Dichloropropane	<0.37	<0.08
Dichlorodifluoromethane	2.4	0.48	1,4-Dioxane	<0.58	<0.16
Chloromethane	<3.3	<1.6	2,2,4-Trimethylpentane	<7.5	<1.6
F-114	<1.1	<0.16	Methyl methacrylate	<6.6	<1.6
Vinyl chloride	<0.41	<0.16	Heptane	<6.6	<1.6
1,3-Butadiene	<0.035	<0.016	Bromodichloromethane	<0.11	<0.016
Butane	<3.8	<1.6	Trichloroethene	4.1	0.76
Bromomethane	<2.5	<0.64	cis-1,3-Dichloropropene	<0.73	<0.16
Chloroethane	<4.2	<1.6	4-Methyl-2-pentanone	<6.6	<1.6
Vinyl bromide	<0.7	<0.16	trans-1,3-Dichloropropene	<0.73	<0.16
Ethanol	1,100 ve	610 ve	Toluene	6.8	1.8
Acrolein	<1.5	<0.64	1,1,2-Trichloroethane	<0.17	<0.032
Pentane	<4.7	<1.6	2-Hexanone	<6.6	<1.6
Trichlorofluoromethane	<3.6	<0.64	Tetrachloroethene	<11	<1.6
Acetone	52	22	Dibromochloromethane	<0.14	<0.016
2-Propanol	420 ve	170 ve	1,2-Dibromoethane (EDB)	<0.12	<0.016
1,1-Dichloroethene	0.88	0.22	Chlorobenzene	<0.74	<0.16
trans-1,2-Dichloroethene	<0.63	<0.16	Ethylbenzene	0.89	0.20
Methylene chloride	<140 jl	<40 jl	1,1,2,2-Tetrachloroethane	<0.22	<0.032
t-Butyl alcohol (TBA)	<19	<6.4	Nonane	<8.4	<1.6
3-Chloropropene	<2	<0.64	Isopropylbenzene	<3.9	<0.8
CFC-113	1.4	0.18	2-Chlorotoluene	<8.3	<1.6
Carbon disulfide	<10	<3.2	Propylbenzene	<3.9	<0.8
Methyl t-butyl ether (MTBE)	<2.9	<0.8	4-Ethyltoluene	<3.9	<0.8
Vinyl acetate	<11	<3.2	m,p-Xylene	2.3	0.54
1,1-Dichloroethane	<0.65	<0.16	o-Xylene	1.0	0.24
cis-1,2-Dichloroethene	<0.63	<0.16	Styrene	<1.4	<0.32
Hexane	<5.6	<1.6	Bromoform	<3.3	<0.32
Chloroform	2.2	0.46	Benzyl chloride	<0.083	<0.016
Ethyl acetate	<12	<3.2	1,3,5-Trimethylbenzene	<3.9	<0.8
Tetrahydrofuran	1.9	0.65	1,2,4-Trimethylbenzene	<3.9	<0.8
2-Butanone (MEK)	7.0	2.4	1,3-Dichlorobenzene	<0.96	<0.16
1,2-Dichloroethane (EDC)	0.097	0.024	1,4-Dichlorobenzene	<0.38	<0.064
1,1,1-Trichloroethane	<0.87	<0.16	1,2-Dichlorobenzene	<0.96	<0.16
Carbon tetrachloride	<1	<0.16	1,2,4-Trichlorobenzene	<1.2	<0.16
Benzene	<0.51	<0.16	Naphthalene	<0.42	<0.08
Cyclohexane	<11	<3.2	Hexachlorobutadiene	<0.34	<0.032

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	BR	Client:	AEG
Date Received:	04/05/19	Project:	Franciscan West Seattle, F&BI 904131
Date Collected:	04/05/19	Lab ID:	904131-03 1/1.6
Date Analyzed:	04/19/19	Data File:	041828.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	101	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	Concentration ug/m3	Concentration ppbv
Propene	1.2	0.70	1,2-Dichloropropane	<0.37	<0.08
Dichlorodifluoromethane	2.4	0.48	1,4-Dioxane	<0.58	<0.16
Chloromethane	<3.3	<1.6	2,2,4-Trimethylpentane	<7.5	<1.6
F-114	<1.1	<0.16	Methyl methacrylate	<6.6	<1.6
Vinyl chloride	<0.41	<0.16	Heptane	<6.6	<1.6
1,3-Butadiene	<0.035	<0.016	Bromodichloromethane	<0.11	<0.016
Butane	<3.8	<1.6	Trichloroethene	13	2.5
Bromomethane	<2.5	<0.64	cis-1,3-Dichloropropene	<0.73	<0.16
Chloroethane	<4.2	<1.6	4-Methyl-2-pentanone	<6.6	<1.6
Vinyl bromide	<0.7	<0.16	trans-1,3-Dichloropropene	<0.73	<0.16
Ethanol	180 ve	96 ve	Toluene	3.1	0.81
Acrolein	<1.5	<0.64	1,1,2-Trichloroethane	<0.17	<0.032
Pentane	<4.7	<1.6	2-Hexanone	<6.6	<1.6
Trichlorofluoromethane	<3.6	<0.64	Tetrachloroethene	43	6.4
Acetone	37	16	Dibromochloromethane	<0.14	<0.016
2-Propanol	95	39	1,2-Dibromoethane (EDB)	<0.12	<0.016
1,1-Dichloroethene	3.6	0.90	Chlorobenzene	<0.74	<0.16
trans-1,2-Dichloroethene	<0.63	<0.16	Ethylbenzene	0.97	0.22
Methylene chloride	<140 jl	<40 jl	1,1,2,2-Tetrachloroethane	<0.22	<0.032
t-Butyl alcohol (TBA)	<19	<6.4	Nonane	<8.4	<1.6
3-Chloropropene	<2	<0.64	Isopropylbenzene	<3.9	<0.8
CFC-113	5.5	0.71	2-Chlorotoluene	<8.3	<1.6
Carbon disulfide	<10	<3.2	Propylbenzene	<3.9	<0.8
Methyl t-butyl ether (MTBE)	<2.9	<0.8	4-Ethyltoluene	<3.9	<0.8
Vinyl acetate	<11	<3.2	m,p-Xylene	2.5	0.58
1,1-Dichloroethane	0.78	0.19	o-Xylene	0.99	0.23
cis-1,2-Dichloroethene	<0.63	<0.16	Styrene	<1.4	<0.32
Hexane	<5.6	<1.6	Bromoform	<3.3	<0.32
Chloroform	0.38	0.078	Benzyl chloride	<0.083	<0.016
Ethyl acetate	<12	<3.2	1,3,5-Trimethylbenzene	<3.9	<0.8
Tetrahydrofuran	2.9	0.97	1,2,4-Trimethylbenzene	<3.9	<0.8
2-Butanone (MEK)	15	5.0	1,3-Dichlorobenzene	<0.96	<0.16
1,2-Dichloroethane (EDC)	0.078	0.019	1,4-Dichlorobenzene	<0.38	<0.064
1,1,1-Trichloroethane	3.4	0.62	1,2-Dichlorobenzene	<0.96	<0.16
Carbon tetrachloride	<1	<0.16	1,2,4-Trichlorobenzene	<1.2	<0.16
Benzene	<0.51	<0.16	Naphthalene	<0.42	<0.08
Cyclohexane	<11	<3.2	Hexachlorobutadiene	<0.34	<0.032

Analysis For Volatile Compounds By Method TO-15

Client Sample ID:	Method Blank	Client:	AEG
Date Received:	Not Applicable	Project:	Franciscan West Seattle, F&BI 904131
Date Collected:	Not Applicable	Lab ID:	09-0784 mb
Date Analyzed:	04/18/19	Data File:	041820.D
Matrix:	Air	Instrument:	GCMS7
Units:	ug/m3	Operator:	bat/MS

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
4-Bromofluorobenzene	105	70	130

Compounds:	Concentration ug/m3	Concentration ppbv	Compounds:	Concentration ug/m3	Concentration ppbv
Propene	<0.69	<0.4	1,2-Dichloropropane	<0.23	<0.05
Dichlorodifluoromethane	<0.49	<0.1	1,4-Dioxane	<0.36	<0.1
Chloromethane	<2.1	<1	2,2,4-Trimethylpentane	<4.7	<1
F-114	<0.7	<0.1	Methyl methacrylate	<4.1	<1
Vinyl chloride	<0.26	<0.1	Heptane	<4.1	<1
1,3-Butadiene	<0.022	<0.01	Bromodichloromethane	<0.067	<0.01
Butane	<2.4	<1	Trichloroethene	<0.27	<0.05
Bromomethane	<1.6	<0.4	cis-1,3-Dichloropropene	<0.45	<0.1
Chloroethane	<2.6	<1	4-Methyl-2-pentanone	<4.1	<1
Vinyl bromide	<0.44	<0.1	trans-1,3-Dichloropropene	<0.45	<0.1
Ethanol	<7.5	<4	Toluene	<0.38	<0.1
Acrolein	<0.92	<0.4	1,1,2-Trichloroethane	<0.11	<0.02
Pentane	<3	<1	2-Hexanone	<4.1	<1
Trichlorofluoromethane	<2.2	<0.4	Tetrachloroethene	<6.8	<1
Acetone	<4.8	<2	Dibromochloromethane	<0.085	<0.01
2-Propanol	<8.6	<3.5	1,2-Dibromoethane (EDB)	<0.077	<0.01
1,1-Dichloroethene	<0.4	<0.1	Chlorobenzene	<0.46	<0.1
trans-1,2-Dichloroethene	<0.4	<0.1	Ethylbenzene	<0.43	<0.1
Methylene chloride	<87 jl	<25 jl	1,1,2,2-Tetrachloroethane	<0.14	<0.02
t-Butyl alcohol (TBA)	<12	<4	Nonane	<5.2	<1
3-Chloropropene	<1.3	<0.4	Isopropylbenzene	<2.5	<0.5
CFC-113	<0.77	<0.1	2-Chlorotoluene	<5.2	<1
Carbon disulfide	<6.2	<2	Propylbenzene	<2.5	<0.5
Methyl t-butyl ether (MTBE)	<1.8	<0.5	4-Ethyltoluene	<2.5	<0.5
Vinyl acetate	<7	<2	m,p-Xylene	<0.87	<0.2
1,1-Dichloroethane	<0.4	<0.1	o-Xylene	<0.43	<0.1
cis-1,2-Dichloroethene	<0.4	<0.1	Styrene	<0.85	<0.2
Hexane	<3.5	<1	Bromoform	<2.1	<0.2
Chloroform	<0.049	<0.01	Benzyl chloride	<0.052	<0.01
Ethyl acetate	<7.2	<2	1,3,5-Trimethylbenzene	<2.5	<0.5
Tetrahydrofuran	<0.29	<0.1	1,2,4-Trimethylbenzene	<2.5	<0.5
2-Butanone (MEK)	<2.9	<1	1,3-Dichlorobenzene	<0.6	<0.1
1,2-Dichloroethane (EDC)	<0.04	<0.01	1,4-Dichlorobenzene	<0.24	<0.04
1,1,1-Trichloroethane	<0.55	<0.1	1,2-Dichlorobenzene	<0.6	<0.1
Carbon tetrachloride	<0.63	<0.1	1,2,4-Trichlorobenzene	<0.74	<0.1
Benzene	<0.32	<0.1	Naphthalene	<0.26	<0.05
Cyclohexane	<6.9	<2	Hexachlorobutadiene	<0.21	<0.02

Date of Report: 04/23/19
Date Received: 04/05/19
Project: Franciscan West Seattle, F&BI 904131

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AIR SAMPLES FOR VOLATILES BY METHOD MA-APH

Laboratory Code: 904133-03 1/1.6 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	RPD (Limit 30)
APH EC5-8 aliphatics	ug/m3	140	140	0
APH EC9-12 aliphatics	ug/m3	190	190	0
APH EC9-10 aromatics	ug/m3	<40	<40	nm

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
APH EC5-8 aliphatics	ug/m3	45	83	70-130
APH EC9-12 aliphatics	ug/m3	45	104	70-130
APH EC9-10 aromatics	ug/m3	45	83	70-130

Date of Report: 04/23/19
Date Received: 04/05/19
Project: Franciscan West Seattle, F&BI 904131

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Propene	ppbv	5	110	70-130
Dichlorodifluoromethane	ppbv	5	106	70-130
Chloromethane	ppbv	5	112	70-130
F-114	ppbv	5	108	70-130
Vinyl chloride	ppbv	5	110	70-130
1,3-Butadiene	ppbv	5	107	70-130
Butane	ppbv	5	106	70-130
Bromomethane	ppbv	5	93	70-130
Chloroethane	ppbv	5	107	70-130
Ethanol	ppbv	5	95	70-130
Acrolein	ppbv	5	93	70-130
Pentane	ppbv	5	106	70-130
Trichlorofluoromethane	ppbv	5	105	70-130
Acetone	ppbv	5	96	70-130
2-Propanol	ppbv	5	101	70-130
1,1-Dichloroethene	ppbv	5	106	70-130
trans-1,2-Dichloroethene	ppbv	5	106	70-130
Methylene chloride	ppbv	5	65 vo	70-130
t-Butyl alcohol (TBA)	ppbv	5	107	70-130
3-Chloropropene	ppbv	5	104	70-130
CFC-113	ppbv	5	107	70-130
Carbon disulfide	ppbv	5	104	70-130
Methyl t-butyl ether (MTBE)	ppbv	5	100	70-130
Vinyl acetate	ppbv	5	102	70-130
1,1-Dichloroethane	ppbv	5	106	70-130
cis-1,2-Dichloroethene	ppbv	5	105	70-130
Hexane	ppbv	5	101	70-130
Chloroform	ppbv	5	106	70-130
Ethyl acetate	ppbv	5	99	70-130
Tetrahydrofuran	ppbv	5	100	70-130
2-Butanone (MEK)	ppbv	5	104	70-130
1,2-Dichloroethane (EDC)	ppbv	5	107	70-130
1,1,1-Trichloroethane	ppbv	5	108	70-130
Carbon tetrachloride	ppbv	5	106	70-130
Benzene	ppbv	5	99	70-130
Cyclohexane	ppbv	5	104	70-130
1,2-Dichloropropane	ppbv	5	106	70-130
1,4-Dioxane	ppbv	5	97	70-130
2,2,4-Trimethylpentane	ppbv	5	101	70-130
Methyl methacrylate	ppbv	5	106	70-130
Heptane	ppbv	5	105	70-130

Date of Report: 04/23/19
Date Received: 04/05/19
Project: Franciscan West Seattle, F&BI 904131

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

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Bromodichloromethane	ppbv	5	106	70-130
Trichloroethene	ppbv	5	102	70-130
cis-1,3-Dichloropropene	ppbv	5	102	70-130
4-Methyl-2-pentanone	ppbv	5	103	70-130
trans-1,3-Dichloropropene	ppbv	5	102	70-130
Toluene	ppbv	5	105	70-130
1,1,2-Trichloroethane	ppbv	5	109	70-130
2-Hexanone	ppbv	5	103	70-130
Tetrachloroethene	ppbv	5	105	70-130
Dibromochloromethane	ppbv	5	107	70-130
1,2-Dibromoethane (EDB)	ppbv	5	106	70-130
Chlorobenzene	ppbv	5	105	70-130
Ethylbenzene	ppbv	5	100	70-130
1,1,2,2-Tetrachloroethane	ppbv	5	99	70-130
Nonane	ppbv	5	89	70-130
Isopropylbenzene	ppbv	5	100	70-130
2-Chlorotoluene	ppbv	5	102	70-130
Propylbenzene	ppbv	5	99	70-130
4-Ethyltoluene	ppbv	5	102	70-130
m,p-Xylene	ppbv	10	99	70-130
o-Xylene	ppbv	5	99	70-130
Styrene	ppbv	5	102	70-130
Bromoform	ppbv	5	103	70-130
Benzyl chloride	ppbv	5	104	70-130
1,3,5-Trimethylbenzene	ppbv	5	101	70-130
1,2,4-Trimethylbenzene	ppbv	5	101	70-130
1,3-Dichlorobenzene	ppbv	5	101	70-130
1,4-Dichlorobenzene	ppbv	5	99	70-130
1,2-Dichlorobenzene	ppbv	5	102	70-130
1,2,4-Trichlorobenzene	ppbv	5	103	70-130
Naphthalene	ppbv	5	91	70-130
Hexachlorobutadiene	ppbv	5	105	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. 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 below the lowest calibration standard. 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.

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.

904131

SAMPLE CHAIN OF CUSTODY

ME 04/05/19

Report To AEZ CHARLIE

Company AEZ

Address 605 11th AVE SE #201

City, State, ZIP OLYMPIA, WA 98501

Phone 3603527835 Email STOMBARDI@AEZWA.COM CSWIFT@AEZWA.COM

SAMPLERS (signature)

PROJECT NAME FRANCISCAN WEST SEATTLE

PO #

NOTES:

INVOICE TO AEZ

Page # ____ of ____

TURNAROUND TIME
☒ Standard
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Archive Samples
☐ Other

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	TO15 cVOCs	APH	Helium		VAPOR Notes RUSH
SR	01	3250		IA / SG	4.5.19	20	1038	3	1042	X			X			SYSTEM UNDER VAC
E3	02	3389		IA / SG	4.5.19	27	1102	3	1107	X			X			11
BR	03	~~2348~~ 2438		IA / SG	4.5.19	28	1050	3	1056	X			X			11
				IA / SG												* TPH GX
				IA / SG												
				IA / SG												
				IA / SG												Samples received at 20 °C
				IA / SG												

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:	STEPHANIE LOMBARDI	AEZ	4.5.19	1150
Received by:	VINA	FBI	4/5/19	11:50
Relinquished by:				
Received by:				

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3012 16th Avenue West
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Ph. (206) 285-8282
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