August 30, 2022
File: PE5222-LET.02

Azure Urban Developments Inc.
929 Richmond Road
Ottawa, Ontario
K2A 3T7

Attention: **Mr. John Thomas**

Subject: **Air Quality Assessment Program**
Residential Properties
377 and 381 Winona Avenue
Ottawa, Ontario

Consulting Engineers
9 Auriga Drive
Ottawa, Ontario
K2E 7T9
Tel: (613) 226-7381

Geotechnical Engineering
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Hydrogeology
Materials Testing
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Noise and Vibration Studies

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Dear Sir,

Further to the request and authorization of Azure Urban Developments Inc., Paterson Group (Paterson) has carried out an air quality assessment program of the indoor ambient air within two residential buildings at 377 and 381 Winona Avenue, in the City of Ottawa, Ontario.

Background

According to the findings of a previous Phase II ESA, carried out by Paterson in October 2021, the groundwater below the subject property is impacted with VOC parameters from an off-site source. The parameters identified included cis-1,2- Dichloroethylene, Tetrachloroethylene, Trichloroethylene and Vinyl Chloride. It was concluded that the groundwater quality was indicative of a regional groundwater plume. Based on the findings of the Phase II ESA, it was recommended that a Human Health Risk Assessment be completed for due diligence purposes.

Following the conclusions of the Phase II ESA, Paterson provided the groundwater data to Novatox to complete a Human Health Risk Assessment (HHRA). In August of 2022, Paterson received a copy of the HHRA report. The Novatox report presented the quantitative conclusions of the risks associated with the identified groundwater data. The report concluded that the potential risks were elevated as a result of the groundwater conditions, however, these findings were noted to be based on modelled calculations. It was recommended that an indoor air monitoring program be conducted to determine if the groundwater contaminants are migrating into the basement areas of the residential buildings.

The purpose of this air sampling program has been to assess the potential for VOC vapour intrusion into the basements of the residential buildings due to the presence of elevated levels of volatile organic compounds (VOCs) detected in the groundwater on the subject site. This letter summarizes our observations and analytical results from the air sampling program.

Air Sampling Program

Overview

The air sampling program was conducted over a 24-hour period between August 15 and August 16, 2022, and consisted of placing one air sampling canister within the basement of 377 Winona Avenue (AS1) and one within the basement of 381 Winona Avenue (AS2). A third canister (OA1) was placed outside on the exterior of 377 Winona Avenue to provide the background air quality results for comparison to the interior air sample results.

At the time of the sampling program, these basement units were observed to be unfinished and vacant of any tenants, and were noted to consist primarily of empty space, with the exception of some areas used for general storage purposes.

Air Sampling Protocol

The criteria against which to measure indoor air contaminant concentrations were selected from the *"2016 Modified Generic Risk Assessment (MGRA) Model: Recommended Health Based Indoor Air Criteria (HBIAC)"* as referenced by the MECP document entitled, *"(Draft) Technical Guidance for Soil Vapour Intrusion Assessment"*, dated January 2021.

Using a "SUMMA" air canister, equipped with a 24-hour regulator unit, each canister was allowed to collect the ambient air from a breathing zone height of approximately 1.5 m above the ground surface. After the 24-hour period had expired, Paterson personnel returned to the subject site to shut off the air intakes on each canister to allow for transport to a laboratory facility for analytical testing. The final vacuum pressure reading displayed on the regulator was recorded for laboratory QA/QC purposes.

Air Analysis

The air sampling program was carried out over a 24-hour period between August 15 and 16, 2022. Two indoor air samples were obtained from the basements of the residential buildings 377 Winona Avenue (Sample AS1), 381 Winona Avenue (Sample AS2), in addition to one outdoor sample (Sample OA1). All samples were submitted to Bureau Veritas for testing of VOC parameters. The analytical results from the air sampling program are presented below in Table 1.

Table 1
Analytical Test Results – Ambient Air
VOCs

Parameter	Air Samples (µg/m³)			HBIAC Residential Property Use (µg/m³)
	August 16, 2022			
	AS1 (377 Winona)	AS2 (381 Winona)	OA1 (Exterior)	
Dichlorodifluoromethane (FREON 12)	2.56	2.63	2.56	n/v
1,2-Dichlorotetrafluoroethane	<1.19	<1.19	<1.19	n/v
Chloromethane	1.08	0.924	0.960	n/v
Vinyl Chloride	<0.0511	<0.0511	<0.0511	0.126
Chloroethane	<0.792	<0.792	<0.792	n/v
1,3-Butadiene	<1.11	<1.11	<1.11	n/v
Trichlorofluoromethane (FREON 11)	1.61	1.78	1.62	n/v
Ethanol (ethyl alcohol)	23.3	27.6	3.74	n/v
Trichlorotrifluoroethane	<1.15	<1.15	<1.15	n/v
2-Propanol	10.0	<2.46	<2.46	n/v
2-Propanone (Acetone)	52.8	13.3	6.06	2,500
Methyl Ethyl Ketone (2-Butanone)	3.88	1.07	0.714	1,000
Methyl Isobutyl Ketone	<0.410	<0.410	<0.410	626
Methyl Butyl Ketone (2-Hexanone)	<4.1	<4.10	<4.10	n/v
Methyl t-butyl ether (MTBE)	<0.361	<0.361	<0.361	4.28
Ethyl Acetate	7.64	4.28	<3.60	n/v
1,1-Dichloroethylene	<0.198	<0.198	<0.198	16.5
cis-1,2-Dichloroethylene	<0.198	<0.198	<0.198	31.36
trans-1,2-Dichloroethylene	98.2	<0.396	<0.396	165
Methylene Chloride (Dichloromethane)	1.23	1.05	0.519	155
Chloroform	0.344	0.453	<0.195	20.9
Carbon Tetrachloride	**0.659**	**0.642**	**0.716**	0.417
1,1-Dichloroethane	<0.202	<0.202	<0.202	118
1,2-Dichloroethane	0.0554	0.0504	0.0431	286
Ethylene Dibromide	<0.0768	<0.0768	<0.0768	0.572
1,1,1-Trichloroethane	<0.273	<0.273	<0.273	797
1,1,2-Trichloroethane	<0.0655	<0.0655	<0.0655	0.0695
1,1,2,2-Tetrachloroethane	<0.0185	<0.0185	<0.0185	0.01920
cis-1,3-Dichloropropene	<0.227	<0.227	<0.227	n/v
trans-1,3-Dichloropropene	<0.227	<0.227	<0.227	n/v
1,2-Dichloropropane	1.12	<0.231	<0.231	2.71
Bromomethane	<0.194	<0.194	<0.194	1.04
Bromoform	<10.3	<1.03	<1.03	n/v
Bromodichloromethane	<1.34	<1.34	<1.34	n/v
Dibromochloromethane	<1.70	<1.70	<1.70	n/v
Trichloroethylene	<0.269	<0.269	<0.269	0.401
Tetrachloroethylene	<0.339	<0.339	<0.339	283
Benzene	0.422	**0.801**	0.234	0.506
Toluene	5.8	18.1	0.805	104
Ethylbenzene	0.358	1.01	<0.217	209
p+m-Xylene	1.20	4.26	<0.434	n/v
o-Xylene	0.612	1.7	<0.217	n/v
Styrene	0.902	<0.213	<0.213	54.2

Notes:
- n/v – No value for this parameter
- (bracketed) – Method detection limit exceeds selected MECP standards due to high analyte concentration
- **Bold and Underlined** – value exceeds selected MECP standards

Table 1 (Continued)
Analytical Test Results – Ambient Air
VOCs

Parameter	Air Samples (µg/m³)			HBIAC Residential Property Use (µg/m³)
	August 16, 2022			
	AS1 (377 Winona)	AS2 (381 Winona)	OA1 (Exterior)	
4-ethyltoluene	<2.46	<2.46	<2.46	n/v
1,3,5-Trimethylbenzene	<2.45	<2.45	<2.45	n/v
1,2,4-Trimethylbenzene	<2.45	3.07	<2.45	n/v
Chlorobenzene	<0.230	<0.230	<0.230	209
Benzyl chloride	<2.59	<2.59	<2.59	n/v
1,3-Dichlorobenzene	<2.40	<2.40	<2.40	n/v
1,4-Dichlorobenzene	<0.301	<0.301	<0.301	251
1,2-Dichlorobenzene	<0.301	<0.301	<0.301	125
1,2,4-Trichlorobenzene	<0.742	<0.742	<0.742	1.67
Hexachlorobutadiene	<0.0501	<0.0501	<0.0501	0.0506
Hexane	1.59	1.45	0.365	521
Heptane	<1.23	<1.23	<1.23	n/v
Cyclohexane	<0.688	<0.688	<0.688	n/v
Tetrahydrofuran	<1.18	<1.18	<1.18	n/v
1,4-Dioxane	<3.60	<3.60	<3.60	751
Naphthalene	**2.81**	0.618	<0.524	0.772
Total Xylenes	1.81	5.96	<0.651	542
1,1,1,2-Tetrachloroethane	<0.144	<0.144	<0.144	0.150
Vinyl Bromide	<0.875	<0.875	<0.875	n/v
Propene	1.10	<0.861	<0.861	n/v
2,2,4-Trimethylpentane	<0.934	<0.934	<0.934	n/v
Carbon Disulfide	<1.56	<1.56	<1.56	n/v
Vinyl Acetate	<0.704	<0.704	<0.704	n/v

Notes:
- n/v – No value for this parameter
- (bracketed) – Method detection limit exceeds selected MECP standards due to high analyte concentration
- **Bold and Underlined** – value exceeds selected MECP standards

Based on the analytical test results, no detectable concentrations of the four contaminants identified within the groundwater were identified in the air samples.

Assessment and Recommendations

Assessment

Based on the findings of the air testing program, cis-1,2-Dichloroethylene, Tetrachloroethylene, Trichloroethylene and Vinyl Chloride were not detected above the laboratory's method detection limit in either interior air sample. Therefore, the migration of VOC vapours from the groundwater into the residential buildings is considered to be of low risk and does not pose a health concern to the building's occupants.

The concentration of Benzene in 381 Winona Avenue, Naphthalene in 377 Winona Avenue, and Carbon Tetrachloride were noted to exceed the MECP's HBIAC Residential Standards. Carbon Tetrachloride was also identified in the outdoor air sample, and at higher concentration than inside. Therefore, the Carbon Tetrachloride is considered to have originated outside. Naphthalene is commonly associated with interior sources such as insecticides, moth balls, air fresheners while. Benzene is commonly associated with automobile exhaust, gasoline and paint/finishing products. Although these concentrations were detected above the HBIAC criteria, when compared to the findings of a literature review on background indoor air levels of VOCs in Canadian Homes (completed by the Ontario Ministry of Environment, Conservation and Parks), these indoor concentrations were noted to be below the normal indoor residential concentrations for Ottawa residential buildings. Therefore, no further action is required at this time.

Closure

This air quality assessment program has been prepared in general accordance with the agreed upon scope of work. Should any conditions be encountered at the subject site that differ from our findings, we request that we be notified immediately in order to allow for a reassessment.

This report was prepared for the sole use of Azure Urban Developments Inc. Permission and notification from Azure Urban Developments Inc. and Paterson Group will be required prior to the release of this report to any other party.

We trust that this submission will satisfy your present requirements. If you have any questions regarding this report, please contact the undersigned.

Paterson Group Inc.

Mark St Pierre, P.Eng.

Mark D'Arcy, P.Eng.

Report Distribution:

- ❑ Azure Urban Developments Inc.
- ❑ Paterson Group Inc.

Attachments:

- ❑ Laboratory Certificates of Analysis

Your P.O. #: 55544
Your Project #: PE5222
Your C.O.C. #: 43969

Attention: Mark St Pierre

Paterson Group Inc
9 Auriga Drive
Ottawa, ON
CANADA K2E 7T9

Report Date: 2022/08/22
Report #: R7264090
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C2N2724
Received: 2022/08/16, 16:00

Sample Matrix: Air
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Canister Pressure (TO-15)	3	N/A	2022/08/18	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air by GC/MS/SIM (1)	3	N/A	2022/08/18	BRL SOP-00304	EPA TO-15 m
Volatile Organics in Air (TO-15) (2)	3	N/A	2022/08/18	BRL SOP-00304	EPA TO-15 m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

(1) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO15. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO15 on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister underwent a leak check prior to shipment.

Please Note: SUMMA® canister samples will be retained by Bureau Veritas for a period of 5 calendar days from the date of this report, after which time they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.

(2) Air sampling canisters have been cleaned in accordance with U.S. EPA Method TO15. At the end of the cleaning, evacuation, and pressurization cycles, one canister was selected and was pressurized with Zero Air. This canister was then analyzed via TO15 on a GC/MS. The canister must have been found to contain <0.2 ppbv concentration of all target analytes in order for the batch to have been considered clean. Each canister also underwent a leak check prior to shipment.

Please Note: SUMMA® canister samples will be retained by Bureau Veritas for a period of 5 calendar days or as contractually agreed from the date of this report, after which time they will be cleaned for reuse. If you require a longer sample storage period, please contact your service representative.

Encryption Key

Marinela Sim
Project Manager
22 Aug 2022 17:26:23

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Marinela Sim, Project Manager
Email: Marinela.Sim@bureauveritas.com
Phone# (905)817-5828

==========

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Job #: C2N2724
Report Date: 2022/08/22

Paterson Group Inc
Client Project #: PE5222
Your P.O. #: 55544
Sampler Initials: MSP

RESULTS OF ANALYSES OF AIR

Bureau Veritas ID		TLT553	TLT554	TLT555	
Sampling Date		2022/08/16	2022/08/16	2022/08/16	
COC Number		43969	43969	43969	
	UNITS	AS1	AS2	OA1	QC Batch
Volatile Organics					
Pressure on Receipt	psig	(-3.6)	(-3.3)	(-3.4)	8173960

QC Batch = Quality Control Batch

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		TLT553				TLT554				
Sampling Date		2022/08/16				2022/08/16				
COC Number		43969				43969				
	UNITS	AS1	RDL	ug/m3	DL (ug/m3)	AS2	RDL	ug/m3	DL (ug/m3)	QC Batch
Volatile Organics										
2-Propanone	ppbv	22.2	0.40	52.8	0.950	5.59	0.10	13.3	0.238	8175910
Dichlorodifluoromethane (FREON 12)	ppbv	0.52	0.20	2.56	0.989	0.53	0.20	2.63	0.989	8173962
1,2-Dichlorotetrafluoroethane	ppbv	<0.17	0.17	<1.19	1.19	<0.17	0.17	<1.19	1.19	8173962
Chloromethane	ppbv	0.52	0.30	1.08	0.620	0.45	0.30	0.924	0.620	8173962
Vinyl Chloride	ppbv	<0.020	0.020	<0.0511	0.0511	<0.020	0.020	<0.0511	0.0511	8175910
Chloroethane	ppbv	<0.30	0.30	<0.792	0.792	<0.30	0.30	<0.792	0.792	8173962
1,3-Butadiene	ppbv	<0.50	0.50	<1.11	1.11	<0.50	0.50	<1.11	1.11	8173962
Trichlorofluoromethane (FREON 11)	ppbv	0.29	0.20	1.61	1.12	0.32	0.20	1.78	1.12	8173962
Ethanol (ethyl alcohol)	ppbv	12.3	2.0	23.3	3.77	14.6	2.0	27.6	3.77	8173962
Trichlorotrifluoroethane	ppbv	<0.15	0.15	<1.15	1.15	<0.15	0.15	<1.15	1.15	8173962
2-propanol	ppbv	4.1	1.0	10.0	2.46	<1.0	1.0	<2.46	2.46	8173962
Methyl Ethyl Ketone (2-Butanone)	ppbv	1.32	0.10	3.88	0.295	0.36	0.10	1.07	0.295	8175910
Methyl Isobutyl Ketone	ppbv	<0.10	0.10	<0.410	0.410	<0.10	0.10	<0.410	0.410	8175910
Methyl Butyl Ketone (2-Hexanone)	ppbv	<1.0	1.0	<4.10	4.10	<1.0	1.0	<4.10	4.10	8173962
Methyl t-butyl ether (MTBE)	ppbv	<0.10	0.10	<0.361	0.361	<0.10	0.10	<0.361	0.361	8175910
Ethyl Acetate	ppbv	2.1	1.0	7.64	3.60	1.2	1.0	4.28	3.60	8173962
1,1-Dichloroethylene	ppbv	<0.050	0.050	<0.198	0.198	<0.050	0.050	<0.198	0.198	8175910
cis-1,2-Dichloroethylene	ppbv	<0.050	0.050	<0.198	0.198	<0.050	0.050	<0.198	0.198	8175910
trans-1,2-Dichloroethylene	ppbv	24.8	0.40	98.2	1.59	<0.10	0.10	<0.396	0.396	8175910
Methylene Chloride(Dichloromethane)	ppbv	0.354	0.050	1.23	0.174	0.301	0.050	1.05	0.174	8175910
Chloroform	ppbv	0.070	0.040	0.344	0.195	0.093	0.040	0.453	0.195	8175910
Carbon Tetrachloride	ppbv	0.105	0.050	0.659	0.315	0.102	0.050	0.642	0.315	8175910
1,1-Dichloroethane	ppbv	<0.050	0.050	<0.202	0.202	<0.050	0.050	<0.202	0.202	8175910
1,2-Dichloroethane	ppbv	0.014	0.010	0.0554	0.0405	0.012	0.010	0.0504	0.0405	8175910
Ethylene Dibromide	ppbv	<0.010	0.010	<0.0768	0.0768	<0.010	0.010	<0.0768	0.0768	8175910
1,1,1-Trichloroethane	ppbv	<0.050	0.050	<0.273	0.273	<0.050	0.050	<0.273	0.273	8175910
1,1,2-Trichloroethane	ppbv	<0.012	0.012	<0.0655	0.0655	<0.012	0.012	<0.0655	0.0655	8175910
1,1,2,2-Tetrachloroethane	ppbv	<0.0027	0.0027	<0.0185	0.0185	<0.0027	0.0027	<0.0185	0.0185	8175910
cis-1,3-Dichloropropene	ppbv	<0.050	0.050	<0.227	0.227	<0.050	0.050	<0.227	0.227	8175910
trans-1,3-Dichloropropene	ppbv	<0.050	0.050	<0.227	0.227	<0.050	0.050	<0.227	0.227	8175910
1,2-Dichloropropane	ppbv	0.243	0.050	1.12	0.231	<0.050	0.050	<0.231	0.231	8175910
Bromomethane	ppbv	<0.050	0.050	<0.194	0.194	<0.050	0.050	<0.194	0.194	8175910
Bromoform	ppbv	<0.10	0.10	<1.03	1.03	<0.10	0.10	<1.03	1.03	8175910
Bromodichloromethane	ppbv	<0.20	0.20	<1.34	1.34	<0.20	0.20	<1.34	1.34	8173962
Dibromochloromethane	ppbv	<0.20	0.20	<1.70	1.70	<0.20	0.20	<1.70	1.70	8173962

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Bureau Veritas Job #: C2N2724
Report Date: 2022/08/22

Paterson Group Inc
Client Project #: PE5222
Your P.O. #: 55544
Sampler Initials: MSP

VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		TLT553				TLT554				
Sampling Date		2022/08/16				2022/08/16				
COC Number		43969				43969				
	UNITS	AS1	RDL	ug/m3	DL (ug/m3)	AS2	RDL	ug/m3	DL (ug/m3)	QC Batch
Trichloroethylene	ppbv	<0.050	0.050	<0.269	0.269	<0.050	0.050	<0.269	0.269	8175910
Tetrachloroethylene	ppbv	<0.050	0.050	<0.339	0.339	<0.050	0.050	<0.339	0.339	8175910
Benzene	ppbv	0.132	0.050	0.422	0.160	0.251	0.050	0.801	0.160	8175910
Toluene	ppbv	1.54	0.050	5.80	0.188	4.82	0.050	18.1	0.188	8175910
Ethylbenzene	ppbv	0.082	0.050	0.358	0.217	0.234	0.050	1.01	0.217	8175910
p+m-Xylene	ppbv	0.28	0.10	1.20	0.434	0.98	0.10	4.26	0.434	8175910
o-Xylene	ppbv	0.141	0.050	0.612	0.217	0.392	0.050	1.70	0.217	8175910
Styrene	ppbv	0.212	0.050	0.902	0.213	<0.050	0.050	<0.213	0.213	8175910
4-ethyltoluene	ppbv	<0.50	0.50	<2.46	2.46	<0.50	0.50	<2.46	2.46	8173962
1,3,5-Trimethylbenzene	ppbv	<0.50	0.50	<2.45	2.45	<0.50	0.50	<2.45	2.45	8173962
1,2,4-Trimethylbenzene	ppbv	<0.50	0.50	<2.45	2.45	0.63	0.50	3.07	2.45	8173962
Chlorobenzene	ppbv	<0.050	0.050	<0.230	0.230	<0.050	0.050	<0.230	0.230	8175910
Benzyl chloride	ppbv	<0.50	0.50	<2.59	2.59	<0.50	0.50	<2.59	2.59	8173962
1,3-Dichlorobenzene	ppbv	<0.40	0.40	<2.40	2.40	<0.40	0.40	<2.40	2.40	8173962
1,4-Dichlorobenzene	ppbv	<0.050	0.050	<0.301	0.301	<0.050	0.050	<0.301	0.301	8175910
1,2-Dichlorobenzene	ppbv	<0.050	0.050	<0.301	0.301	<0.050	0.050	<0.301	0.301	8175910
1,2,4-Trichlorobenzene	ppbv	<0.10	0.10	<0.742	0.742	<0.10	0.10	<0.742	0.742	8175910
Hexachlorobutadiene	ppbv	<0.0047	0.0047	<0.0501	0.0501	<0.0047	0.0047	<0.0501	0.0501	8175910
Hexane	ppbv	0.45	0.10	1.59	0.352	0.41	0.10	1.45	0.352	8175910
Heptane	ppbv	<0.30	0.30	<1.23	1.23	<0.30	0.30	<1.23	1.23	8173962
Cyclohexane	ppbv	<0.20	0.20	<0.688	0.688	<0.20	0.20	<0.688	0.688	8173962
Tetrahydrofuran	ppbv	<0.40	0.40	<1.18	1.18	<0.40	0.40	<1.18	1.18	8173962
1,4-Dioxane	ppbv	<1.0	1.0	<3.60	3.60	<1.0	1.0	<3.60	3.60	8173962
Naphthalene	ppbv	0.54	0.10	2.81	0.524	0.12	0.10	0.618	0.524	8175910
Total Xylenes	ppbv	0.42	0.15	1.81	0.651	1.37	0.15	5.96	0.651	8175910
1,1,1,2-Tetrachloroethane	ppbv	<0.021	0.021	<0.144	0.144	<0.021	0.021	<0.144	0.144	8175910
Vinyl Bromide	ppbv	<0.20	0.20	<0.875	0.875	<0.20	0.20	<0.875	0.875	8173962
Propene	ppbv	0.64	0.50	1.10	0.861	<0.50	0.50	<0.861	0.861	8173962
2,2,4-Trimethylpentane	ppbv	<0.20	0.20	<0.934	0.934	<0.20	0.20	<0.934	0.934	8173962
Carbon Disulfide	ppbv	<0.50	0.50	<1.56	1.56	<0.50	0.50	<1.56	1.56	8173962
Vinyl Acetate	ppbv	<0.20	0.20	<0.704	0.704	<0.20	0.20	<0.704	0.704	8173962
Surrogate Recovery (%)										
Bromochloromethane	%	97		N/A	N/A	99		N/A	N/A	8175910
D5-Chlorobenzene	%	95		N/A	N/A	95		N/A	N/A	8175910
Difluorobenzene	%	90		N/A	N/A	93		N/A	N/A	8175910

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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Bureau Veritas Job #: C2N2724
Report Date: 2022/08/22

Paterson Group Inc
Client Project #: PE5222
Your P.O. #: 55544
Sampler Initials: MSP

VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		TLT553				TLT554				
Sampling Date		2022/08/16				2022/08/16				
COC Number		43969				43969				
	UNITS	**AS1**	**RDL**	**ug/m3**	**DL (ug/m3)**	**AS2**	**RDL**	**ug/m3**	**DL (ug/m3)**	**QC Batch**
Bromochloromethane	%	97		N/A	N/A	99		N/A	N/A	8173962
D5-Chlorobenzene	%	95		N/A	N/A	95		N/A	N/A	8173962
Difluorobenzene	%	90		N/A	N/A	93		N/A	N/A	8173962

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		TLT555				
Sampling Date		2022/08/16				
COC Number		43969				
	UNITS	OA1	RDL	ug/m3	DL (ug/m3)	QC Batch
Volatile Organics						
2-Propanone	ppbv	2.55	0.10	6.06	0.238	8175910
Dichlorodifluoromethane (FREON 12)	ppbv	0.52	0.20	2.56	0.989	8173962
1,2-Dichlorotetrafluoroethane	ppbv	<0.17	0.17	<1.19	1.19	8173962
Chloromethane	ppbv	0.47	0.30	0.960	0.620	8173962
Vinyl Chloride	ppbv	<0.020	0.020	<0.0511	0.0511	8175910
Chloroethane	ppbv	<0.30	0.30	<0.792	0.792	8173962
1,3-Butadiene	ppbv	<0.50	0.50	<1.11	1.11	8173962
Trichlorofluoromethane (FREON 11)	ppbv	0.29	0.20	1.62	1.12	8173962
Ethanol (ethyl alcohol)	ppbv	2.0	1.0	3.74	1.88	8173962
Trichlorotrifluoroethane	ppbv	<0.15	0.15	<1.15	1.15	8173962
2-propanol	ppbv	<1.0	1.0	<2.46	2.46	8173962
Methyl Ethyl Ketone (2-Butanone)	ppbv	0.24	0.10	0.714	0.295	8175910
Methyl Isobutyl Ketone	ppbv	<0.10	0.10	<0.410	0.410	8175910
Methyl Butyl Ketone (2-Hexanone)	ppbv	<1.0	1.0	<4.10	4.10	8173962
Methyl t-butyl ether (MTBE)	ppbv	<0.10	0.10	<0.361	0.361	8175910
Ethyl Acetate	ppbv	<1.0	1.0	<3.60	3.60	8173962
1,1-Dichloroethylene	ppbv	<0.050	0.050	<0.198	0.198	8175910
cis-1,2-Dichloroethylene	ppbv	<0.050	0.050	<0.198	0.198	8175910
trans-1,2-Dichloroethylene	ppbv	<0.10	0.10	<0.396	0.396	8175910
Methylene Chloride(Dichloromethane)	ppbv	0.149	0.050	0.519	0.174	8175910
Chloroform	ppbv	<0.040	0.040	<0.195	0.195	8175910
Carbon Tetrachloride	ppbv	0.114	0.050	0.716	0.315	8175910
1,1-Dichloroethane	ppbv	<0.050	0.050	<0.202	0.202	8175910
1,2-Dichloroethane	ppbv	0.011	0.010	0.0431	0.0405	8175910
Ethylene Dibromide	ppbv	<0.010	0.010	<0.0768	0.0768	8175910
1,1,1-Trichloroethane	ppbv	<0.050	0.050	<0.273	0.273	8175910
1,1,2-Trichloroethane	ppbv	<0.012	0.012	<0.0655	0.0655	8175910
1,1,2,2-Tetrachloroethane	ppbv	<0.0027	0.0027	<0.0185	0.0185	8175910
cis-1,3-Dichloropropene	ppbv	<0.050	0.050	<0.227	0.227	8175910
trans-1,3-Dichloropropene	ppbv	<0.050	0.050	<0.227	0.227	8175910
1,2-Dichloropropane	ppbv	<0.050	0.050	<0.231	0.231	8175910
Bromomethane	ppbv	<0.050	0.050	<0.194	0.194	8175910
Bromoform	ppbv	<0.10	0.10	<1.03	1.03	8175910
Bromodichloromethane	ppbv	<0.20	0.20	<1.34	1.34	8173962
Dibromochloromethane	ppbv	<0.20	0.20	<1.70	1.70	8173962

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		TLT555				
Sampling Date		2022/08/16				
COC Number		43969				
	UNITS	OA1	RDL	ug/m3	DL (ug/m3)	QC Batch
Trichloroethylene	ppbv	<0.050	0.050	<0.269	0.269	8175910
Tetrachloroethylene	ppbv	<0.050	0.050	<0.339	0.339	8175910
Benzene	ppbv	0.073	0.050	0.234	0.160	8175910
Toluene	ppbv	0.214	0.050	0.805	0.188	8175910
Ethylbenzene	ppbv	<0.050	0.050	<0.217	0.217	8175910
p+m-Xylene	ppbv	<0.10	0.10	<0.434	0.434	8175910
o-Xylene	ppbv	<0.050	0.050	<0.217	0.217	8175910
Styrene	ppbv	<0.050	0.050	<0.213	0.213	8175910
4-ethyltoluene	ppbv	<0.50	0.50	<2.46	2.46	8173962
1,3,5-Trimethylbenzene	ppbv	<0.50	0.50	<2.45	2.45	8173962
1,2,4-Trimethylbenzene	ppbv	<0.50	0.50	<2.45	2.45	8173962
Chlorobenzene	ppbv	<0.050	0.050	<0.230	0.230	8175910
Benzyl chloride	ppbv	<0.50	0.50	<2.59	2.59	8173962
1,3-Dichlorobenzene	ppbv	<0.40	0.40	<2.40	2.40	8173962
1,4-Dichlorobenzene	ppbv	<0.050	0.050	<0.301	0.301	8175910
1,2-Dichlorobenzene	ppbv	<0.050	0.050	<0.301	0.301	8175910
1,2,4-Trichlorobenzene	ppbv	<0.10	0.10	<0.742	0.742	8175910
Hexachlorobutadiene	ppbv	<0.0047	0.0047	<0.0501	0.0501	8175910
Hexane	ppbv	0.10	0.10	0.365	0.352	8175910
Heptane	ppbv	<0.30	0.30	<1.23	1.23	8173962
Cyclohexane	ppbv	<0.20	0.20	<0.688	0.688	8173962
Tetrahydrofuran	ppbv	<0.40	0.40	<1.18	1.18	8173962
1,4-Dioxane	ppbv	<1.0	1.0	<3.60	3.60	8173962
Naphthalene	ppbv	<0.10	0.10	<0.524	0.524	8175910
Total Xylenes	ppbv	<0.15	0.15	<0.651	0.651	8175910
1,1,1,2-Tetrachloroethane	ppbv	<0.021	0.021	<0.144	0.144	8175910
Vinyl Bromide	ppbv	<0.20	0.20	<0.875	0.875	8173962
Propene	ppbv	<0.50	0.50	<0.861	0.861	8173962
2,2,4-Trimethylpentane	ppbv	<0.20	0.20	<0.934	0.934	8173962
Carbon Disulfide	ppbv	<0.50	0.50	<1.56	1.56	8173962
Vinyl Acetate	ppbv	<0.20	0.20	<0.704	0.704	8173962
Surrogate Recovery (%)						
Bromochloromethane	%	99		N/A	N/A	8175910
D5-Chlorobenzene	%	90		N/A	N/A	8175910
Difluorobenzene	%	93		N/A	N/A	8175910

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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VOLATILE ORGANICS BY GC/MS (AIR)

Bureau Veritas ID		TLT555				
Sampling Date		2022/08/16				
COC Number		43969				
	UNITS	OA1	RDL	ug/m3	DL (ug/m3)	QC Batch
Bromochloromethane	%	99		N/A	N/A	8173962
D5-Chlorobenzene	%	90		N/A	N/A	8173962
Difluorobenzene	%	93		N/A	N/A	8173962

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
N/A = Not Applicable

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GENERAL COMMENTS

Sample TLT553 [AS1] : Propene is a mixture of both propene and propane and this represents the highest possible concentration of propene. Ethanol was analyzed at a 2X dilution, acetone and trans-1,2-dichloroethylene were analyzed at a 4X dilution. The DL's were adjusted accordingly.

Sample TLT554 [AS2] : Ethanol was analyzed at a 2X dilution. The DL's were adjusted accordingly.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8173962	IB2	Spiked Blank	Bromochloromethane	2022/08/18		109	%	60 - 140
			D5-Chlorobenzene	2022/08/18		113	%	60 - 140
			Difluorobenzene	2022/08/18		113	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2022/08/18		96	%	70 - 130
			1,2-Dichlorotetrafluoroethane	2022/08/18		92	%	70 - 130
			Chloromethane	2022/08/18		96	%	70 - 130
			Chloroethane	2022/08/18		96	%	70 - 130
			1,3-Butadiene	2022/08/18		100	%	70 - 130
			Trichlorofluoromethane (FREON 11)	2022/08/18		96	%	70 - 130
			Ethanol (ethyl alcohol)	2022/08/18		89	%	70 - 130
			Trichlorotrifluoroethane	2022/08/18		91	%	70 - 130
			2-propanol	2022/08/18		99	%	70 - 130
			Methyl Butyl Ketone (2-Hexanone)	2022/08/18		120	%	70 - 130
			Ethyl Acetate	2022/08/18		99	%	70 - 130
			Bromodichloromethane	2022/08/18		92	%	70 - 130
			Dibromochloromethane	2022/08/18		97	%	70 - 130
			4-ethyltoluene	2022/08/18		108	%	70 - 130
			1,3,5-Trimethylbenzene	2022/08/18		108	%	70 - 130
			1,2,4-Trimethylbenzene	2022/08/18		111	%	70 - 130
			Benzyl chloride	2022/08/18		131 (1)	%	70 - 130
			1,3-Dichlorobenzene	2022/08/18		100	%	70 - 130
			Heptane	2022/08/18		103	%	70 - 130
			Cyclohexane	2022/08/18		99	%	70 - 130
			Tetrahydrofuran	2022/08/18		96	%	70 - 130
			1,4-Dioxane	2022/08/18		114	%	70 - 130
			Vinyl Bromide	2022/08/18		99	%	70 - 130
			Propene	2022/08/18		92	%	70 - 130
			2,2,4-Trimethylpentane	2022/08/18		102	%	70 - 130
			Carbon Disulfide	2022/08/18		99	%	70 - 130
			Vinyl Acetate	2022/08/18		97	%	70 - 130
8173962	IB2	Method Blank	Bromochloromethane	2022/08/18		112	%	60 - 140
			D5-Chlorobenzene	2022/08/18		97	%	60 - 140
			Difluorobenzene	2022/08/18		100	%	60 - 140
			Dichlorodifluoromethane (FREON 12)	2022/08/18	<0.20		ppbv	
			1,2-Dichlorotetrafluoroethane	2022/08/18	<0.17		ppbv	
			Chloromethane	2022/08/18	<0.30		ppbv	
			Chloroethane	2022/08/18	<0.30		ppbv	
			1,3-Butadiene	2022/08/18	<0.50		ppbv	
			Trichlorofluoromethane (FREON 11)	2022/08/18	<0.20		ppbv	
			Ethanol (ethyl alcohol)	2022/08/18	<1.0		ppbv	
			Trichlorotrifluoroethane	2022/08/18	<0.15		ppbv	
			2-propanol	2022/08/18	<1.0		ppbv	
			Methyl Butyl Ketone (2-Hexanone)	2022/08/18	<1.0		ppbv	
			Ethyl Acetate	2022/08/18	<1.0		ppbv	
			Bromodichloromethane	2022/08/18	<0.20		ppbv	
			Dibromochloromethane	2022/08/18	<0.20		ppbv	
			4-ethyltoluene	2022/08/18	<0.50		ppbv	
			1,3,5-Trimethylbenzene	2022/08/18	<0.50		ppbv	
			1,2,4-Trimethylbenzene	2022/08/18	<0.50		ppbv	
			Benzyl chloride	2022/08/18	<0.50		ppbv	
			1,3-Dichlorobenzene	2022/08/18	<0.40		ppbv	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Heptane	2022/08/18	<0.30		ppbv	
			Cyclohexane	2022/08/18	<0.20		ppbv	
			Tetrahydrofuran	2022/08/18	<0.40		ppbv	
			1,4-Dioxane	2022/08/18	<1.0		ppbv	
			Vinyl Bromide	2022/08/18	<0.20		ppbv	
			Propene	2022/08/18	<0.50		ppbv	
			2,2,4-Trimethylpentane	2022/08/18	<0.20		ppbv	
			Carbon Disulfide	2022/08/18	<0.50		ppbv	
			Vinyl Acetate	2022/08/18	<0.20		ppbv	
8175910	IB2	Spiked Blank	2-Propanone	2022/08/18		105	%	70 - 130
			Bromochloromethane	2022/08/18		109	%	60 - 140
			D5-Chlorobenzene	2022/08/18		113	%	60 - 140
			Difluorobenzene	2022/08/18		113	%	60 - 140
			Vinyl Chloride	2022/08/18		94	%	70 - 130
			Methyl Ethyl Ketone (2-Butanone)	2022/08/18		112	%	70 - 130
			Methyl Isobutyl Ketone	2022/08/18		107	%	70 - 130
			Methyl t-butyl ether (MTBE)	2022/08/18		87	%	70 - 130
			1,1-Dichloroethylene	2022/08/18		95	%	70 - 130
			cis-1,2-Dichloroethylene	2022/08/18		93	%	70 - 130
			trans-1,2-Dichloroethylene	2022/08/18		92	%	70 - 130
			Methylene Chloride(Dichloromethane)	2022/08/18		95	%	70 - 130
			Chloroform	2022/08/18		97	%	70 - 130
			Carbon Tetrachloride	2022/08/18		98	%	70 - 130
			1,1-Dichloroethane	2022/08/18		92	%	70 - 130
			1,2-Dichloroethane	2022/08/18		94	%	70 - 130
			Ethylene Dibromide	2022/08/18		102	%	70 - 130
			1,1,1-Trichloroethane	2022/08/18		97	%	70 - 130
			1,1,2-Trichloroethane	2022/08/18		100	%	70 - 130
			1,1,2,2-Tetrachloroethane	2022/08/18		93	%	70 - 130
			cis-1,3-Dichloropropene	2022/08/18		105	%	70 - 130
			trans-1,3-Dichloropropene	2022/08/18		109	%	70 - 130
			1,2-Dichloropropane	2022/08/18		102	%	70 - 130
			Bromomethane	2022/08/18		89	%	70 - 130
			Bromoform	2022/08/18		100	%	70 - 130
			Trichloroethylene	2022/08/18		98	%	70 - 130
			Tetrachloroethylene	2022/08/18		96	%	70 - 130
			Benzene	2022/08/18		97	%	70 - 130
			Toluene	2022/08/18		103	%	70 - 130
			Ethylbenzene	2022/08/18		108	%	70 - 130
			p+m-Xylene	2022/08/18		109	%	70 - 130
			o-Xylene	2022/08/18		106	%	70 - 130
			Styrene	2022/08/18		109	%	70 - 130
			Chlorobenzene	2022/08/18		99	%	70 - 130
			1,4-Dichlorobenzene	2022/08/18		104	%	70 - 130
			1,2-Dichlorobenzene	2022/08/18		99	%	70 - 130
			1,2,4-Trichlorobenzene	2022/08/18		113	%	70 - 130
			Hexachlorobutadiene	2022/08/18		106	%	70 - 130
			Hexane	2022/08/18		94	%	70 - 130
			Naphthalene	2022/08/18		140 (1)	%	70 - 130
			Total Xylenes	2022/08/18		108	%	70 - 130
			1,1,1,2-Tetrachloroethane	2022/08/18		104	%	70 - 130

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
8175910	IB2	Method Blank	2-Propanone	2022/08/18	<0.10		ppbv	
			Bromochloromethane	2022/08/18		112	%	60 - 140
			D5-Chlorobenzene	2022/08/18		97	%	60 - 140
			Difluorobenzene	2022/08/18		100	%	60 - 140
			Vinyl Chloride	2022/08/18	<0.020		ppbv	
			Methyl Ethyl Ketone (2-Butanone)	2022/08/18	<0.10		ppbv	
			Methyl Isobutyl Ketone	2022/08/18	<0.10		ppbv	
			Methyl t-butyl ether (MTBE)	2022/08/18	<0.10		ppbv	
			1,1-Dichloroethylene	2022/08/18	<0.050		ppbv	
			cis-1,2-Dichloroethylene	2022/08/18	<0.050		ppbv	
			trans-1,2-Dichloroethylene	2022/08/18	<0.10		ppbv	
			Methylene Chloride(Dichloromethane)	2022/08/18	<0.050		ppbv	
			Chloroform	2022/08/18	<0.040		ppbv	
			Carbon Tetrachloride	2022/08/18	<0.050		ppbv	
			1,1-Dichloroethane	2022/08/18	<0.050		ppbv	
			1,2-Dichloroethane	2022/08/18	<0.010		ppbv	
			Ethylene Dibromide	2022/08/18	<0.010		ppbv	
			1,1,1-Trichloroethane	2022/08/18	<0.050		ppbv	
			1,1,2-Trichloroethane	2022/08/18	<0.012		ppbv	
			1,1,2,2-Tetrachloroethane	2022/08/18	<0.0027		ppbv	
			cis-1,3-Dichloropropene	2022/08/18	<0.050		ppbv	
			trans-1,3-Dichloropropene	2022/08/18	<0.050		ppbv	
			1,2-Dichloropropane	2022/08/18	<0.050		ppbv	
			Bromomethane	2022/08/18	<0.050		ppbv	
			Bromoform	2022/08/18	<0.10		ppbv	
			Trichloroethylene	2022/08/18	<0.050		ppbv	
			Tetrachloroethylene	2022/08/18	<0.050		ppbv	
			Benzene	2022/08/18	<0.050		ppbv	
			Toluene	2022/08/18	<0.050		ppbv	
			Ethylbenzene	2022/08/18	<0.050		ppbv	
			p+m-Xylene	2022/08/18	<0.10		ppbv	
			o-Xylene	2022/08/18	<0.050		ppbv	
			Styrene	2022/08/18	<0.050		ppbv	
			Chlorobenzene	2022/08/18	<0.050		ppbv	
			1,4-Dichlorobenzene	2022/08/18	<0.050		ppbv	
			1,2-Dichlorobenzene	2022/08/18	<0.050		ppbv	
			1,2,4-Trichlorobenzene	2022/08/18	<0.10		ppbv	
			Hexachlorobutadiene	2022/08/18	<0.0047		ppbv	
			Hexane	2022/08/18	<0.10		ppbv	
			Naphthalene	2022/08/18	<0.10		ppbv	
			Total Xylenes	2022/08/18	<0.15		ppbv	
			1,1,1,2-Tetrachloroethane	2022/08/18	<0.021		ppbv	

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

Bureau Veritas 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.bvlabs.com

Bureau Veritas Job #: C2N2724
Report Date: 2022/08/22

Paterson Group Inc
Client Project #: PE5222
Your P.O. #: 55544
Sampler Initials: MSP

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:

Anke Macfarlane, Laboratory Manager, VOC

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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