GALLAGHER BASSETT SERVICES, INC.

VOLATILE ORGANIC COMPOUND INDOOR AIR QUALITY ASSESSMENT

MARSHALL PUBLIC SCHOOL DISTRICT
MARSHALL HIGH SCHOOL
805 SOUTH MIAMI AVENUE
MARSHALL, MISSOURI

MAY 18, 2022

PREPARED BY:

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J.S. HELD PROJECT NO. 21111804

JS|HELD

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1.0 INTRODUCTION

J.S. Held LLC (J.S. Held) was retained by Gallagher Bassett Services Inc. (Gallagher Bassett) to perform a follow-up indoor air quality (IAQ) assessment for volatile organic compounds (VOCs) for the Marshall Public School District at Marshall High School located at 805 South Miami Avenue in Marshall, Missouri. J.S. Held previously conducted air sampling for VOCs on March 30, 2022, after employees at the high school expressed concerns over health issues when they returned to the property following a fire and fire restoration activities. J.S. Held issued a report of its findings from that assessment dated April 10, 2022, and recommended the use of mild heat and additional ventilation to reduce the amounts of VOCs within the building.

J.S. Held performed the follow-up air testing for VOCs after the restoration contractor, ServPro of Marshall, performed additional restoration and mitigation work based on J.S. Held's recommendations provided in the April 10, 2022 report. The follow-up assessment was performed on May 2, 2022, by Mr. James Harvey, a Senior Industrial Hygienist with J.S. Held. Representative photographs collected during the assessment are provided in **Appendix A,** a sample location diagram is included in **Appendix B** for all samples collected, and laboratory analytical reports are included in **Appendix C.**

2.0 OBSERVATIONS

Six-millimeter polyethylene sheeting with a zip-door entry was observed to be covering the doorway to Room 4. An air scrubber was also observed in operation within Room 4. The air scrubber was turned off by J.S. Held prior to collecting the VOC air sample in that room. J.S. Held also observed several of the ServPro boxes that were being used to store contents from throughout the building to be open. No additional visual changes regarding mitigation and restoration work were observed anywhere in the building since the last visit on March 30, 2022.

3.0 DIRECT MEASUREMENT OF AMBIENT INDOOR CONDITIONS

Direct read instruments were used to collect data at the school for temperature and relative humidity.

3.1 Temperature and Relative Humidity (RH)

Many factors such as personal activity and clothing may affect personal comfort in a building. Generally, acceptable indoor levels for relative humidity should range from 20 to 60 percent (%). Maximum occupant comfort is normally achieved when relative humidity is between 30 to 50%. Normal temperature ranges considered are 68 to 75 degrees Fahrenheit (°F) in the winter and 73 to 79°F in the summer. These are normally

associated with sedentary or slightly active individuals. Temperature and humidity readings were collected using a Kestrel thermal-hygrometer and were between 70.0 and 72.2 °F and 31.2 and 34.6 %, respectively. Industry standard guidelines recommend relative humidity within an occupied space should be maintained below 65% (The American Society of Heating, Refrigerating and Air-Conditioning Engineers) or 60% (EPA) to prevent an indoor environment conducive to mold growth. Based on these guidelines, relative humidity levels identified within the building are not conducive to mold growth.

4.0 LABORATORY ANALYSIS OF AIR SAMPLES FOR VOLATILE ORGANIC COMPOUNDS (VOCs)

J.S. Held collected air samples for laboratory analysis of VOCs at the Marshall Public High School on May 2, 2022. Samples were also analyzed for microbial volatile organic compounds (MVOCs). A sample location diagram is included in **Appendix B** and laboratory analytical reports are included as **Appendix C**.

4.1 SAMPLING METHOD

J.S. Held collected a total of nine (9) air samples from within the property, eight (8) of the samples were collected from within the reportedly impacted main building and one (1) air sample was collected for comparison purposes from the reportedly non-impacted gymnasium building, in order to evaluate for the presence of total VOCs, and MVOCs. The samples were collected using multi-matrix thermal desorption tubes attached to air sampling pumps supplied by and calibrated prior to sampling by the laboratory, Enthalpy Analytical LLC (Enthalpy). Samples were collected at the required flow rate of 200 milliliters of air per minute. The sample collection duration was increased to a period of 4-hours from the previous 2-hour period. In increasing the sampling duration the volume of the samples was increased providing a proportional lowering of the detection limit for these compounds. The sample tubes were capped on both ends, inserted with padding into individual cardboard containers and secured with screw-top lids. The containers were shipped to Enthalpy under chain of custody. Enthalpy is an American Industrial Hygiene Association (AIHA) accredited testing laboratory, Laboratory ID #166272.

In the laboratory, the chemist can identify the types and amounts of volatile organic chemicals, or VOCs, collected in the air sample by thermally desorbing the chemicals off the tube and into a gas chromatograph where the retention times and peak amounts are compared to known standards. Enthalpy uses methods NIOSH 2549 and ISO 16000-6 for analysis of total and microbial organic chemicals.

4.2 CRITERIA FOR COMPARISON OF DATA

The test results for samples analyzed for VOCs will be compared to three criteria; the Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs)

and the American Conference of Governmental Industrial Hygienists (ACGIH) Threshold Limit Values (TLVs), as well as a survey of homes conducted by the New York State Department of Health (NYS DOH). The PELs and TLVs provide acceptable exposures for person working 40-hours per week on either an 8-hour time-weighted averages (TWAs) basis or short-term exposure limits of usually 15 minutes (STELs). The NYS DOH survey provides typical levels of the chemicals in homes using home heating oil throughout New York and are therefore useful in comparing non-occupational exposures to the general public on a 24-hour per day, 365-day per year basis.

Additionally, the test results for the samples collected on May 2, 2022 will be compared to results from the previous sampling results from March 30, 2022.

4.3 LABORATORY ANALYSIS

4.3.1 Total VOC's

Enthalpy analyzed each sample for total VOCs, or tVOCs. With the exception of Room 31, total VOC concentrations within the impacted area ranged from 2,400 to 3,900 nanograms per liter (ng/L). (See first row in data summary table below.) The sample collected from within Room 31 was reported to contain non-detectable amounts of VOCs, or less than the detection limit of 200 ng/L. The tVOC concentration within the non-impacted area, specifically the hall outside of the little theater, was reported to be 470 ng/L. Enthalpy then analyzed each of the sample tubes to obtain results for individual types of VOC's present. See list of chemical compounds on the laboratory data sheets included in **Appendix C**. A comparison table with the top five VOCs given in bold typeface (in ng/L) for each of the nine samples is provided below:

Compound/Room	***7***	***10***	***3***	***4***	***26***	***Hall at Rooms 36 & 37***	***31***	***14***	***Hall at Little Theater***
Total VOC's	2,800	3,700	2,400	2,400	3,900	2,400	< 200	3,000	470
TO-17 Compounds									
Acetone	29.0	33.0	26.0	24.0	44.0	36.0	< 0.5	34.0	**10.0**
Ethanol	**510.0**	**770.0**	**400.0**	**440.0**	**860.0**	**370.0**	**5.9**	**630.0**	**30.0**
Isopropanol	**53.0**	**68.0**	36.0	35.0	**72.0**	46.0	< 0.1	**55.0**	5.0
Semi-Quantitative Compounds									
Butane (C 4)	9.0	11.0	9.0	8.0	15.0	10.0	< 2.0	10.0	**9.0**
C-8 C-10 Hydrocarbon	3.0	4.0	3.0	2.0	< 2.0	< 2.0	**3.0**	< 2.0	< 2.0

Compound/Room	*7*	*10*	*3*	*4*	*26*	*Hall at Rooms 36 & 37*	*31*	*14*	*Hall at Little Theater*
Decanal	6.0	7.0	< 2.0	< 2.0	6.0	4.0	**2.0**	< 2.0	< 2.0
Diethylene glycol	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	**2.0**	< 2.0	< 2.0
Dipropylene glycol methyl ether	**210.0**	**290.0**	**120.0**	130.0	**320.0**	**140.0**	< 2.0	**190.0**	6.0
Ethylene Glycol	41.0	36.0	**51.0**	**36.0**	39.0	**78.0**	< 2.0	41.0	< 2.0
Hexyl Cellosolve	7.0	11.0	< 2.0	< 2.0	6.0	< 2.0	**8.0**	< 2.0	< 2.0
2-Methylbutane	4.0	2.0	3.0	3.0	8.0	3.0	< 2.0	4.0	**6.0**
Pentane (C 5)	19.0	22.0	16.0	14.0	21.0	12.0	< 2.0	18.0	**10.0**
Texanol-A	**97.0**	**130.0**	**130.0**	**130.0**	**110.0**	**77.0**	< 2.0	**160.0**	< 2.0
Texanol-B	**120.0**	**160.0**	**160.0**	**160.0**	**130.0**	**93.0**	< 2.0	**190.0**	3.0

The major VOCs found and identified above: ethanol, ethylene glycol, dipropylene glycol methyl ether, Texanol-A, Texanol-B and isopropanol, are typical ingredients found in either paints and/or common household cleaning products.

A table comparing the top 5 VOCs found May 2, 2022 to those found previously on March 30, 2022 is included in **Appendix D** as **Table 1**. The eight (8) chemicals previously found to have the highest concentrations among all the sample locations were again found to have the highest concentrations, however, the concentrations of those chemicals have been significantly reduced since the initial testing on March 30, 2022: acetone, ethanol, isoproponal, butane, dipropylene glycol methyl ether, ethylene glycol, Texanol-A, and Texanol-B. The laboratory results from the sampling on May 2, 2022 for the eight compounds noted were reported at concentrations less than or similar to those of the sampling on March 30, 2022, with the exception or Room 26 and to a lesser extent in the hallway between rooms 36 and 37 where some of the concentrations of individual chemicals had increased.

Additionally, seven (7) compounds have been added to the top five VOC list, however, the concentrations of these chemicals are very low and occurred mainly as a result of lowering the detection limits of all chemicals identified; Ethylacetate, C8-C10 Hydrocabon, Decanol, Diethylene Glycol, Hexyl Cellosolve, 2-Methylbutane, and Pentane (C-5). Most of these newly identified compounds were reported in the sample collected from within Room 31 and were reported at very low concentrations.

Review of the test results for all other VOCs found with lesser concentrations in the nine (9) samples revealed lower concentrations of the following seventy-seven (77) compounds given in ng/L:

Compound/Room	***7***	***10***	***3***	***4***	***26***	***SE Hallway between Rooms 36 & 3 7***	***31***	***14***	***Hall Outside of Little Theater***
TO-17 Compounds									
Acetonitrile	< 0.2	< 0.2	< 0.2	0.2	0.4	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	0.2	0.2	0.3	0.3	0.3	0.2	< 0.1	0.3	0.3
Carbon Disulfide	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.1	< 0.1	0.1	< 0.1
Carbon Tetrachloride	0.5	0.6	0.6	0.5	0.8	1.2	< 0.1	0.6	0.5
2-Chloroethanol	0.4	0.6	0.3	0.3	0.7	0.4	< 0.1	0.6	0.2
Chloroform	0.2	0.2	0.2	0.1	0.3	0.2	< 0.1	0.2	0.1
Cyclohexane	0.1	0.2	0.2	0.1	0.6	0.3	< 0.1	0.3	0.3
trans 1,4-Dichloro-2-butene	0.3	0.4	0.3	0.3	0.4	0.3	< 0.1	0.4	0.1
cis 1,4-Dichloro-2-butene	< 0.1	0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dichlorobenzene	0.8	1.0	0.7	0.6	1.7	1.5	< 0.1	1.0	0.1
1,2-Dichloroethane	0.1	< 0.1	0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1
1,2-Dichloropropane	< 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1
1,4-Dioxane	< 0.2	< 0.2	< 0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Ethylacetate	3.0	4.1	2.8	2.8	18.0	4.8	< 0.1	3.9	0.2
Ethylbenzene	0.2	0.3	0.3	0.2	0.4	0.3	< 0.1	0.3	0.3
4-Ethyltoluene	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	0.1
Hexane (C 6)	0.5	0.6	0.5	0.4	1.1	1.4	< 0.1	0.6	0.6
Isooctane	0.1	0.2	0.2	0.1	0.6	0.2	< 0.1	0.2	0.2
Isopropylbenzene	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
p-Isopropyltoluene	0.3	0.4	0.2	0.2	0.4	0.2	< 0.1	0.3	< 0.1
2-Methyl-1-propanol	0.7	0.7	0.6	0.5	0.8	0.8	< 0.1	0.7	< 0.1
4-Methyl-2-pentanone	1.0	1.1	0.8	0.7	1.9	1.2	< 0.1	1.0	1.0
Methylene Chloride	0.3	0.4	0.4	0.3	0.6	1.1	< 0.1	0.4	0.3
Naphthalene	0.3	0.3	0.2	0.2	0.4	0.8	< 0.2	0.3	< 0.2
n-Propylbenzene	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Styrene	0.4	0.5	0.5	0.4	0.7	0.4	< 0.1	0.5	< 0.1
1,1,2,2-Tetrachloroethane	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Tetrachloroethene	0.2	0.2	0.1	0.2	0.1	< 0.1	< 0.1	0.1	< 0.1
Tetrahydrofuran	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1
Toluene	3.1	3.5	4.3	3.6	6.6	3.2	< 0.1	3.3	1.2
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5	0.5	0.6	0.5	0.5	0.5	< 0.1	0.5	0.6

Compound/Room	***7***	***10***	***3***	***4***	***26***	***SE Hallway between Rooms 36 & 3 7***	***31***	***14***	***Hall Outside of Little Theater***
1,1,2-Trichloroethane	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
Trichloroethene	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1
1,3,5-Trimethylbenzene	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	0.1
1,2,4-Trimethylbenzene	1.7	2.2	1.7	1.7	2.6	1.7	< 0.1	2.0	0.7
m,p-Xylene	0.7	0.7	0.8	0.7	1.3	1.0	< 0.2	0.7	0.9
o-Xylene	0.2	0.3	0.3	0.2	0.5	0.3	< 0.1	0.3	0.3
SEMI QUANTITATIVE COMPOUNDS									
2,6-Dimethyl-7-octen-2-ol	3.0	3.0	2.0	< 2.0	5.0	3.0	< 2.0	4.0	< 2.0
Acetaldehyde	19.0	23.0	13.0	21.0	25.0	13.0	< 2.0	15.0	< 2.0
Acetic Acid	3.0	4.0	4.0	4.0	4.0	2.0	< 2.0	4.0	< 2.0
Acetophenone	< 2.0	2.0	< 2.0	< 2.0	3.0	2.0	< 2.0	2.0	< 2.0
Benzaldehyde	4.0	6.0	4.0	4.0	7.0	4.0	< 2.0	5.0	< 2.0
1-Butanol	12.0	16.0	12.0	12.0	20.0	16.0	< 2.0	14.0	< 2.0
1-Butoxy-2-propanol	3.0	3.0	2.0	2.0	4.0	2.0	< 2.0	3.0	< 2.0
2-Butoxyethanol	14.0	19.0	13.0	13.0	26.0	17.0	< 2.0	23.0	< 2.0
Butoxyethoxyethanol	27.0	35.0	12.0	11.0	42.0	14.0	< 2.0	30.0	< 2.0
4-tert-Butylcyclohexyl acetate	3.0	< 2.0	< 2.0	< 2.0	4.0	< 2.0	< 2.0	3.0	< 2.0
C5-C7 Hydrocarbon	< 2.0	3.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.0	< 2.0
C11-C13 – Hydrocarbon	< 2.0	3.0	< 2.0	< 2.0	3.0	2.0	< 2.0	2.0	< 2.0
C12-C14 Hydrocarbon[1]	< 2.0	3.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0
C12-C14 Hydrocarbon[2]	< 2.0	< 2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	2.0	< 2.0
C13-C15 Hydrocarbon	< 2.0	3.0	< 2.0	< 2.0	2.0	< 2.0	< 2.0	< 2.0	< 2.0
C14-C16 Hydrocarbon	2.0	2.0	3.0	2.0	< 2.0	10.0	< 2.0	< 2.0	< 2.0
C7-C9 Hydrocarbon	7.0	9.0	7.0	8.0	15.0	9.0	< 2.0	8.0	< 2.0
Diethylene glycol ethyl ether	11.0	16.0	9.0	8.0	23.0	12.0	< 2.0	18.0	4.0
Dodecamethylcyclohexasiloxane (D6)	< 2.0	2.0	< 2.0	< 2.0	4.0	< 2.0	< 2.0	3.0	< 2.0
Dodecane (C 12)	5.0	7.0	4.0	4.0	7.0	5.0	< 2.0	6.0	< 2.0
2-Ethyl-1-hexanol	14.0	16.0	15.0	13.0	19.0	17.0	< 2.0	17.0	< 2.0
2-Ethylhexylacetate	< 2.0	2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	< 2.0	< 2.0
4-Hydroxyl-4-methyl-2-pentanone	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.0	< 2.0	< 2.0	< 2.0
Hexamethylcyclotrisiloxane (D3)	< 2.0	< 2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	< 2.0	< 2.0
Isobutane	3.0	3.0	2.0	2.0	5.0	3.0	< 2.0	3.0	< 2.0
Isohexadecane	< 2.0	2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	2.0	< 2.0
Isoprene	3.0	3.0	2.0	< 2.0	6.0	3.0	< 2.0	4.0	< 2.0
Limonene	17.0	23.0	9.0	9.0	19.0	12.0	< 2.0	23.0	< 2.0

Compound/Room	*7*	*10*	*3*	*4*	*26*	*SE Hallway between Rooms 36 & 3 7*	*31*	*14*	*Hall Outside of Little Theater*
Menthol	< 2.0	< 2.0	< 2.0	< 2.0	4.0	2.0	< 2.0	2.0	< 2.0
Methoxy-2-propanol	< 2.0	2.0	< 2.0	< 2.0	4.0	2.0	< 2.0	2.0	< 2.0
Methyl ethyl ketone	< 2.0	< 2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	< 2.0	3.0
Nonanal	7.0	9.0	7.00	6.0	8.0	6.0	< 2.0	7.0	< 2.0
1-Propoxy-2-Proponal	< 2.0	< 2.0	< 2.0	< 2.0	2.0	< 2.0	< 2.0	< 2.0	< 2.0
1-Propanol	2.0	2.0	< 2.0	< 2.0	4.0	6.0	< 2.0	3.0	< 2.0
2-Pentanone	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	3.0
n-Propylacetate	5.0	6.0	4.0	3.0	9.0	5.0	< 2.0	6.0	< 2.0
Propylene glycol	9.0	10.0	11.0	7.0	12.0	12.0	< 2.0	10.0	2.0
Tetradecane (C 14)	3.0	4.0	3.0	3.0	4.0	3.0	< 2.0	4.0	< 2.0
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	37.0	42.0	10.0	10.0	27.0	14.0	< 2.0	18.0	< 2.0
Tridecane (C 13)	4.0	5.0	3.0	3.0	5.0	4.0	< 2.0	4.0	< 2.0

A comparison table of the laboratory analytical results from the above seventy-seven (77) VOCs, including the top five VOCs compounds, from sampling performed on March 30, 2022 and May 2, 2022, is included in **Appendix D** as **Table 2**. Compounds previously unidentified have been highlighted in **Table 2** as have those concentrations which were reported to be higher than the previous testing on March 30, 2022.

Of the compounds found with detectable concentrations on May 2, 2022, thirty (30) of those compounds were previously not identified on March 30, 2022. The majority of the previously unidentified compounds were reported in the sample collected from within Room 26. The concentrations of the previously unidentified compounds were at or only slightly above the detection limit for most of those compounds.

Table 3, included in **Appendix D**, provides a comparison of the May 2, 2022 test results to levels found in a NYS DOH survey of homes, ACGIH TLVs and OSHA PEL's. While not all the chemicals analyzed by Enthalpy for the nine (9) samples collected within Marshall High School were included in the NYS DOH survey or have TLVs or PELs, for the chemicals analyzed by both groups, the chemicals listed in **Table 3** had concentrations above the amounts found in the NYS DOH survey for one or more of the nine (9) samples collected inside Marshall High School. Those chemicals are also identified in the below table. In all cases, all chemicals

listed in the summary tables and laboratory data sheets were well below their respective TLVs and PELs by several orders of magnitude.

VOCs with concentrations above the NYS DOH Survey of Homes.

Compound	Room 10	Room 14	Room 26	Hall between Rooms 36 & 37
1,4-Dichlorobenzene			X	X
Limonene (d-Limonene)	X	X		

When compared to the sampling conducted on March 30, 2022 the concentrations of the above compounds have been reduced significantly and are no longer above the NYS DOH Upper Fence limits in the sample locations 3, 4, 7, and 31. Concentrations of airborne 1,4 Dichlorobenzene were reduced from 3.5 ng/L to 1.7 ng/L in Room 26 and from 4.4 ng/L to 1.5 ng/L in the hall between rooms 36 and 37. Concentrations of Limonene were reduced from 70 ng/L to 23 ng/L in Room 10 and from 42 ng/L to 23 ng/L in Room 14.

Compounds previously identified to be above the NYS DOH Upper Fence Limit: Carbon Tetrachloride, Ethanol, and 4-Methyl 2-Pentanone, were now reported to be below the NYS DOH Upper Fence Limits.

4.3.2 Total Microbial VOCs

The laboratory also analyzed the test results for a sub-group of VOCs typically found during microbial growth and designated as microbial or mVOCs. Only one of the nine air samples collected on May 2, 2022 was reported to be above the laboratory's criteria for possible mold activity, of 8 ng/L. The sample collected in Room 26 had 9 ng/L mVOCs compared to 7 ng/L or less for the other eight air samples collected on that date.

4.4 Discussion

Based upon the results of the Enthalpy IAQ Comp-Air Survey sample analysis and comparing the laboratory result from May 2, 2022 with the sample results from March 30, 2022, concentrations of VOCs within the building have been significantly reduced throughout the main building.

- The chemicals with the highest concentrations previously are the same as the chemicals currently with the highest concentrations, however, the amounts of those concentrations have been significantly reduced, to about half or less than previously found.
- Most of the chemicals present previously have been significantly reduced in airborne concentration.

- Some of the chemicals present previously have either stayed at very low airborne concentration or have increased very slightly, but still remain at very low levels.
- A few chemicals not present previously have now been detected, but only at low concentrations and mainly as a result of reducing the detection limit by doubling the sampling duration.
- In most cases the above comments occurred fairly uniformly in all areas tested, except for Room 26 where more of the chemicals increased slightly in concentration than in other areas tested, and to a lesser degree in the hall between Rooms 36 & 37.
- In no cases were concentrations found to be unacceptable in the air in the areas and rooms in which samples were collected.

5.0 LIMITATIONS

J.S. Held documented property conditions "as-is" during the assessment on May 2, 2022. Recommendations provided in this report are based upon the condition of the areas reported to be impacted as evaluated at the time of the assessment.

6.0 CONCLUSIONS

J.S. Held was retained by Gallagher Bassett to perform an indoor air quality (IAQ) assessment for the Marshall Public School District at the Marshall High School located at 805 South Miami Avenue in Marshall, Missouri. The assessment was conducted to assess a potential indoor air quality concern after fire and smoke restoration was performed. The assessment was performed on March 30, 2022, by Industrial Hygienist Mr. James Harvey. The assessment included a visual inspection, the collection of digital photographs to document general conditions, and the collection of air samples for VOCs.

Based upon J.S. Held's assessment, review of the laboratory analytical reports, and comparison of concentrations of VOCs from the analytical laboratory reports with the OSHA PEL, ACGIH TLV, and NYS DOH Survey, airborne VOC levels are well within the amounts considered to be acceptable and were in compliance with both the TLV and PEL. After the completion of the additional restoration work the concentrations of VOCs have been significantly reduced from the previous sampling on March 30, 2022. Based on the current levels identified in this report, and levels considered to be acceptable by OSHA and the ACGIH, further health issues from VOCs should no longer be an issue.

APPENDICES

APPENDIX A

PHOTOGRAPHS

Figure (1) –Hallway outside Room 4 and Room 3.

Figure (2) – Polysheeting covering door to Room 4.

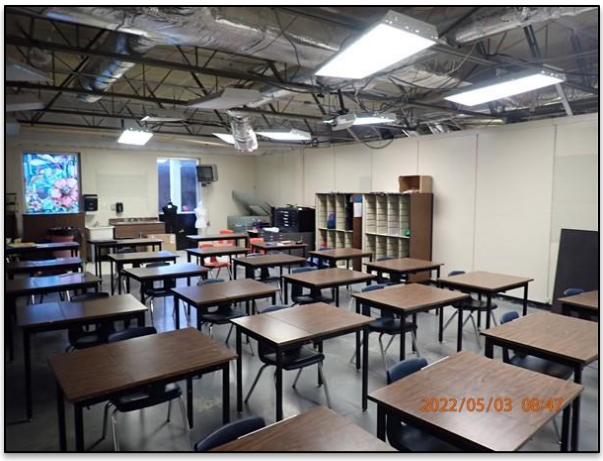


Figure (3) – Overview of Room 3.

Figure (4) – VOC sample Room 3.

Figure (5) – Overview of Room 4 filled with storage boxes.

Figure (6) – VOC sample Room 7.

Figure (7) –Overview of Room 26.

Figure (8) – VOC Sample Room 26 top of file cabinet.

Figure (9) – VOC sample Room 4.

Figure (10) – Air scrubber located in Room 4.

Figure (11) – VOC sample hallway between rooms 36 and 27.

Figure (12) – VOC sample collected outside of little theatre in gymnasium building.

APPENDIX B

COMPREHENSIVE AIR SURVEY SAMPLE LOCATION DIAGRAM

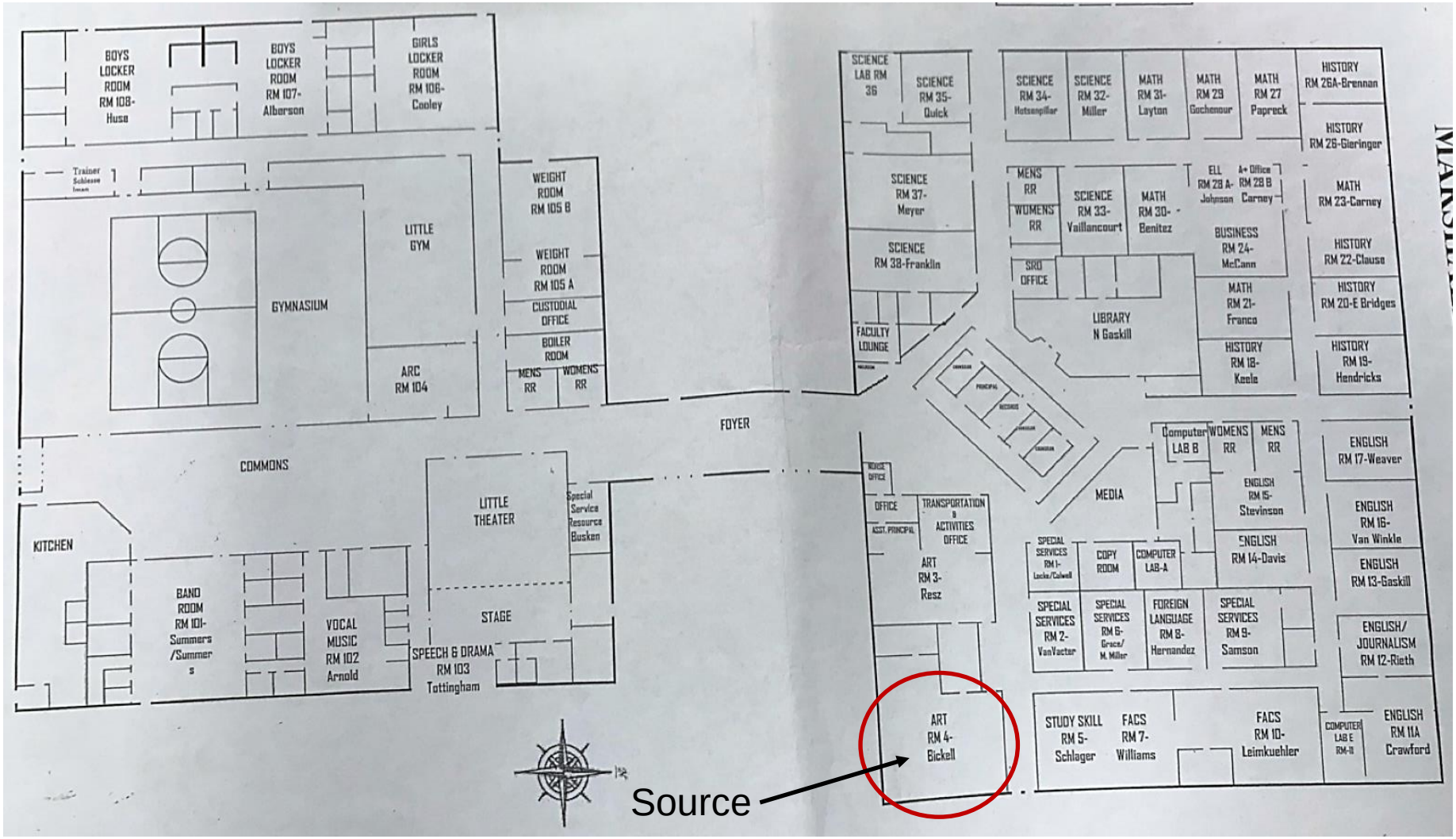
Comprehensive Air Survey Sample Location Diagram
Appendix B

Legend

● # Air Sample Location

Comprehensive Air Survey Sample Location Diagram Gallagher Bassett Services **Marshall Public High School** 805 South Miami Avenue Marshall, Missouri	**DATE ASSESSED:** May 2, 2022 **DESIGNED:** J. Harvey **PROJECT NO.** 21111804	JS HELD

Marshall High School - Overview



Comprehensive Air Survey Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

DATE ASSESSED: May 2, 2022

DESIGNED: J. Harvey

PROJECT NO. 21111804

JS|HELD

Marshall High School

Air Samples Location Descriptions:

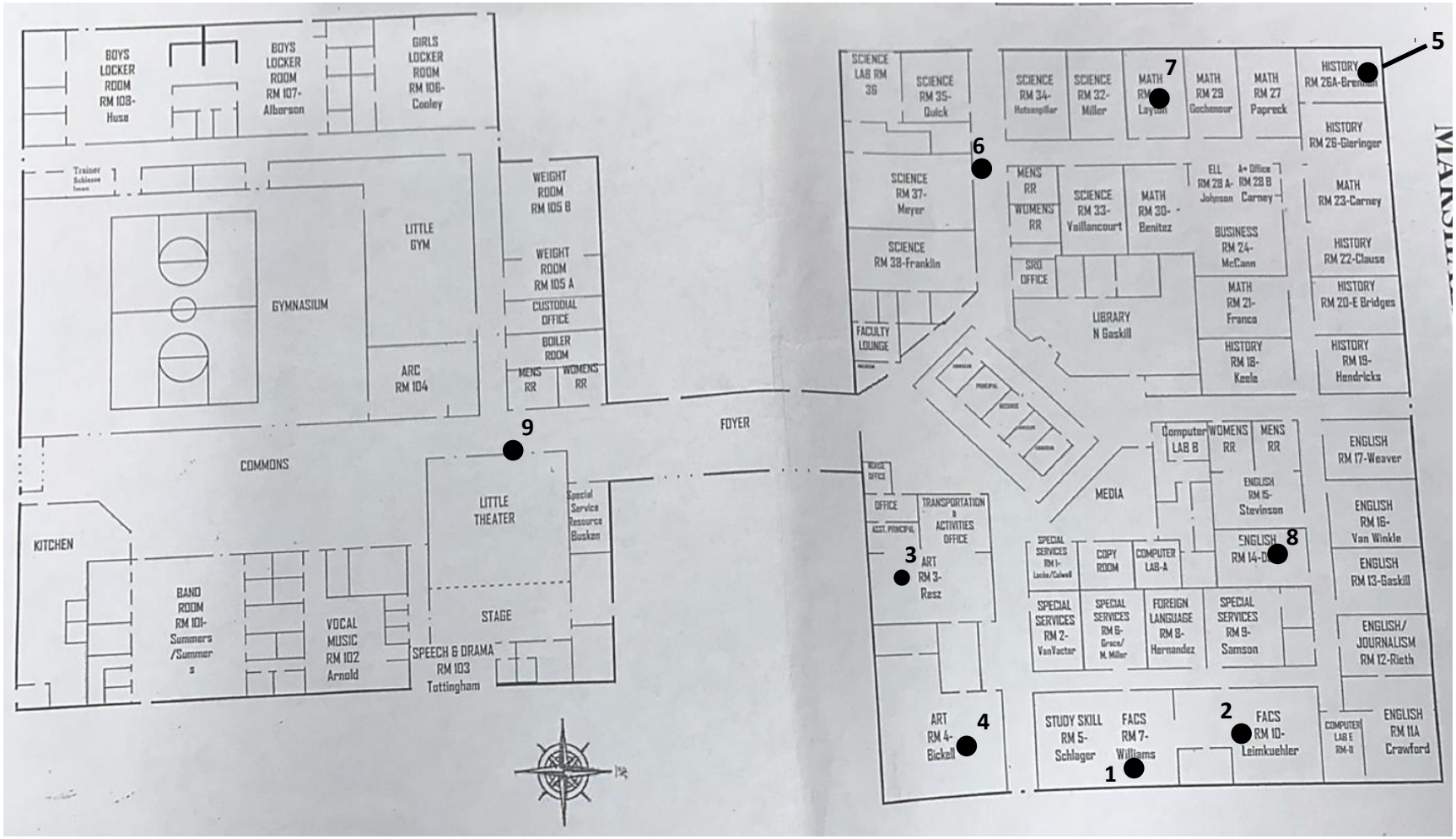
1: Room 7.
2: Room 10.
3: Room 3.
4: Room 4.
5: Room 26.
6: Southeast hall between rooms 36 and 37.
7: Room 31.
8: Room 14.
9: Hall outside of little theatre.

Comprehensive Air Survey Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

DATE ASSESSED:	May 2, 2022
DESIGNED:	J. Harvey
PROJECT NO.	21111804

JS|HELD

Marshall High School



Comprehensive Air Survey Sample Location Diagram
Gallagher Bassett Services
Marshall Public High School
805 South Miami Avenue
Marshall, Missouri

DATE ASSESSED: May 2, 2022

DESIGNED: J. Harvey

PROJECT NO. 21111804

JS|HELD

APPENDIX C

ENTHALPY COMPREHENSIVE AIR SURVEY LABORATORY ANALYTICAL REPORT

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Jericho, NY 11753	**COC:** **Laboratory ID:**	**100195** **100195-3**
Sampled By:	J. Harvey		
Project:	Marshall Public H.S.21111804		
Location:	805 South Miami Ave Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	05/04/2022 05/04/2022 05/04/2022 05/09/2022
Client Sample ID:	Room 7		
Volume:	48 L		
Date Sampled:	05/02/2022		
Sample Type:	TDT AI291		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. **Sample Summary:** listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. **Top 5:** listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. **TO17 Compounds:** listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. **Semiquantitative Compounds:** listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. **Supplemental Information: Odorants:** listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. **Supplemental Information: EPA Hazardous Air Pollutants (HAPs):** listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. **Additional Information:** definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	2800	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	5	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	210	34	2	911	DPGME
Texanol-B	74367-34-3	120	14	2	1127	
Texanol-A	74367-33-2	97	11	2	1121	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	510	270	1.0	480	J*
Isopropanol	67-63-0	53	21	0.5	517	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**29**	**12**	0.5	509	
Acetonitrile	75-05-8	< 0.2	< 0.1	0.2	522	
Acrylonitrile	107-13-1	< 0.1	< 0.05	0.1	543	
Benzene	71-43-2	**0.2**	**0.07**	0.1	631	
Bromobenzene	108-86-1	< 0.1	< 0.02	0.1	866	
Bromochloromethane	74-97-5	< 0.1	< 0.02	0.1	603	
Bromodichloromethane	75-27-4	< 0.1	< 0.02	0.1	682	
Bromoform	75-25-2	< 0.1	< 0.01	0.1	837	
1,3-Butadiene	106-99-0	< 0.1	< 0.05	0.1	389	
tert-Butylbenzene	98-06-6	< 0.1	< 0.02	0.1	900	
sec-Butylbenzene	135-98-8	< 0.1	< 0.02	0.1	914	
n-Butylbenzene	104-51-8	< 0.1	< 0.02	0.1	949	
Carbon Disulfide	75-15-0	< 0.1	< 0.03	0.1	520	
Carbon Tetrachloride	56-23-5	**0.5**	**0.08**	0.1	623	
Chlorobenzene	108-90-7	< 0.1	< 0.02	0.1	791	
Chlorodibromomethane	124-48-1	< 0.1	< 0.01	0.1	759	
2-Chloroethanol	107-07-3	**0.4**	**0.1**	0.1	675	
Chloroform	67-66-3	**0.2**	**0.03**	0.1	608	
Chloroprene	126-99-8	< 0.1	< 0.03	0.1	571	
3-Chloropropene	107-05-1	< 0.1	< 0.03	0.1	527	
4-Chlorotoluene	106-43-4	< 0.1	< 0.02	0.1	883	
2-Chlorotoluene	95-49-8	< 0.1	< 0.02	0.1	877	
Cyclohexane	110-82-7	**0.1**	**0.04**	0.1	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.2	< 0.02	0.2	991	

Client Sample ID: Room 7
Laboratory ID: 100195-3

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.1	< 0.01	0.1	766	
Dibromomethane	74-95-3	< 0.1	< 0.01	0.1	674	
trans 1,4-Dichloro-2-butene	110-57-6	**0.3**	**0.06**	0.1	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.1	< 0.02	0.1	848	
1,2-Dichlorobenzene	95-50-1	< 0.1	< 0.02	0.1	951	
1,3-Dichlorobenzene	541-73-1	< 0.1	< 0.02	0.1	923	
1,4-Dichlorobenzene	106-46-7	**0.8**	**0.1**	0.1	930	
1,1-Dichloroethane	75-34-3	< 0.1	< 0.03	0.1	567	
1,2-Dichloroethane	107-06-2	**0.1**	**0.03**	0.1	633	
cis 1,2-Dichloroethene	156-59-2	< 0.1	< 0.03	0.1	593	
trans 1,2-Dichloroethene	156-60-5	< 0.1	< 0.03	0.1	548	
1,1-Dichloroethene	75-35-4	< 0.1	< 0.03	0.1	508	
2,2-Dichloropropane	594-20-7	< 0.1	< 0.02	0.1	593	
1,2-Dichloropropane	78-87-5	< 0.1	< 0.02	0.1	670	
1,3-Dichloropropane	142-28-9	< 0.1	< 0.02	0.1	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.1	< 0.02	0.1	729	
1,1-Dichloropropene	563-58-6	< 0.1	< 0.02	0.1	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.1	< 0.02	0.1	701	
Diethyl ether	60-29-7	< 0.1	< 0.03	0.1	493	
1,4-Dioxane	123-91-1	< 0.2	< 0.06	0.2	673	
Ethanol	64-17-5	**510**	**270**	1.0	480	J*
Ethylacetate	141-78-6	**3.0**	**0.8**	0.1	594	
Ethylbenzene	100-41-4	**0.2**	**0.06**	0.1	795	
Ethylmethacrylate	97-63-2	< 0.1	< 0.02	0.1	731	
4-Ethyltoluene	622-96-8	< 0.1	< 0.02	0.1	878	
Hexachlorobutadiene	87-68-3	< 0.1	< 0.01	0.1	1036	
Hexane (C 6)	110-54-3	**0.5**	**0.1**	0.1	562	
Isooctane	540-84-1	**0.1**	**0.03**	0.1	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**53**	**21**	0.5	517	J*
Isopropylbenzene	98-82-8	< 0.1	< 0.02	0.1	846	

Client Sample ID: Room 7
Laboratory ID: 100195-3

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.3**	**0.05**	0.1	924	
Methacrylonitrile	126-98-7	< 0.1	< 0.04	0.1	600	
Methyl methacrylate	80-62-6	< 0.1	< 0.03	0.1	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.1	< 0.03	0.1	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.7**	**0.2**	0.1	624	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1**	**0.2**	0.1	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.1	< 0.03	0.1	595	
Methylene Chloride	75-09-2	**0.3**	**0.1**	0.1	533	
2-Methylnaphthalene	91-57-6	< 0.2	< 0.04	0.2	1095	
Naphthalene	91-20-3	**0.3**	**0.05**	0.2	1042	
Nitrobenzene	98-95-3	< 0.4	< 0.08	0.4	999	
Pentachloroethane	76-01-7	< 0.1	< 0.01	0.1	902	
Propionitrile	107-12-0	< 0.1	< 0.05	0.1	593	
n-Propylbenzene	103-65-1	< 0.1	< 0.02	0.1	871	
Styrene	100-42-5	**0.4**	**0.1**	0.1	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.1	< 0.02	0.1	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.1	< 0.02	0.1	794	
Tetrachloroethene	127-18-4	**0.2**	**0.02**	0.1	746	
Tetrahydrofuran	109-99-9	< 0.1	< 0.03	0.1	604	
Toluene	108-88-3	**3.1**	**0.8**	0.1	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.06**	0.1	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.1	< 0.01	0.1	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.1	< 0.01	0.1	1052	
1,1,2-Trichloroethane	79-00-5	< 0.1	< 0.02	0.1	739	
1,1,1-Trichloroethane	71-55-6	< 0.1	< 0.02	0.1	616	
Trichloroethene	79-01-6	< 0.1	< 0.02	0.1	660	
1,2,3-Trichloropropane	96-18-4	< 0.1	< 0.02	0.1	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.1	< 0.02	0.1	881	
1,2,4-Trimethylbenzene	95-63-6	**1.7**	**0.3**	0.1	903	
m,p-Xylene	108-38-3; 106-42-3	**0.7**	**0.2**	0.2	802	

Client Sample ID: Room 7
Laboratory ID: 100195-3

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.2**	**0.05**	0.1	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	3	0.4	2	962	
Acetaldehyde	75-07-0	19	11	2	398	
Acetic Acid	64-19-7	3	1	2	629	L*
Benzaldehyde	100-52-7	4	1	2	901	
Butane (C 4)	106-97-8	9	4	2	382	
1-Butanol	71-36-3	12	4	2	653	
1-Butoxy-2-propanol	5131-66-8	3	0.5	2	863	
2-Butoxyethanol	111-76-2	14	3	2	842	
Butoxyethoxyethanol	112-34-5	27	4	2	1028	
4-tert-Butylcyclohexyl acetate	32210-23-4	3	0.3	2	1078	
C14-C16 Hydrocarbon	N/A	2	N/A	2	1208	
C7-C9 Hydrocarbon	N/A	7	N/A	2	754	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS 123-86-4); one is hexanal (CAS 66-25-1)
C8-C10 Hydrocarbon	N/A	3	N/A	2	1073	Contains oxygen; appears to be dimethyl isosorbide (CAS 5306-85-4)
Decanal	112-31-2	6	0.9	2	1032	
Diethylene glycol ethyl ether	111-90-0	11	2	2	921	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	210	34	2	911	DPGME
Dodecane (C 12)	112-40-3	5	0.7	2	1008	
2-Ethyl-1-hexanol	104-76-7	14	3	2	935	
Ethylene Glycol	107-21-1	41	16	2	714	
Hexyl cellosolve	112-25-4	7	1	2	985	
Isobutane	75-28-5	3	1	2	357	

Client Sample ID: Room 7
Laboratory ID: 100195-3

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Isoprene	78-79-5	3	1	2	496	
Limonene	138-86-3 or 5989-27-5	17	3	2	921	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
2-Methylbutane	78-78-4	4	1	2	446	
Nonanal	124-19-6	7	1	2	982	
Pentane (C 5)	109-66-0	19	6	2	473	
1-Propanol	71-23-8	2	0.9	2	568	
n-Propylacetate	109-60-4	5	1	2	674	
Propylene glycol	57-55-6	9	3	2	746	
Tetradecane (C 14)	629-59-4	3	0.4	2	1096	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	37	4	2	1134	
Texanol-A	74367-33-2	97	11	2	1121	
Texanol-B	74367-34-3	120	14	2	1127	
Tridecane (C 13)	629-50-5	4	0.5	2	1053	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	19	11	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetic Acid	64-19-7	3	1	0 - 204,000	pungent, vinegar,
Acetone	67-64-1	29	12	400 - 11,745,000	sweet, fruity, etherous
Benzaldehyde	100-52-7	4	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.2	0.07	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	9	4	421 - 5,048,000	natural gas
1-Butanol	71-36-3	12	4	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	14	3	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.5	0.08	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
2-Chloroethanol	107-07-3	0.4	0.1	360 -	ethereal
Chloroform	67-66-3	0.2	0.03	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.1	0.04	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	0.8	0.1	121 - 15,000	camphor, mothballs
1,2-Dichloroethane	107-06-2	0.1	0.03	4,300 - 988,000	sweet
Diethylene glycol ethyl ether	111-90-0	11	2	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	510	270	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	14	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	3.0	0.8	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.2	0.06	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	41	16	5,120 -	-
Hexane (C 6)	110-54-3	0.5	0.1	1,500 - 248,000	gasoline
Isoprene	78-79-5	3	1	47 - 3,590	aromatic
Isopropanol	67-63-0	53	21	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	17	3	2 - 310	lemon, plastic, citrus, rubber, terpeny

Client Sample ID: Room 7
Laboratory ID: 100195-3

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
2-Methyl-1-propanol	78-83-1	0.7	0.2	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	1	0.2	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.3	0.1	1,200 - 440,000	sweet
Naphthalene	91-20-3	0.3	0.05	2 - 1,012	tar, creosote, mothballs, empyreumatic
Pentane (C 5)	109-66-0	19	6	1,290 - 1,147,000	sweet
1-Propanol	71-23-8	2	0.9	31 - 10,172,000	sweet, alcohol
n-Propylacetate	109-60-4	5	1	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	9	3	5,140 -	-
Styrene	100-42-5	0.4	0.1	3 - 61,000	sharp, sweet
Tetrachloroethene	127-18-4	0.2	0.02	767 - 71,000	etherish
Toluene	108-88-3	3.1	0.8	21 - 157,000	sour, burnt
1,2,4-Trimethylbenzene	95-63-6	1.7	0.3	6 - 2,400	aromatic
m,p-Xylene	108-38-3; 106-42-3	0.7	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.2	0.05	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.2	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.5	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.2	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	0.8	Carcinogen	Moth balls/crystals; room deodorant
1,2-Dichloroethane	107-06-2	0.1	Carcinogen; 4,000 ng/L (1,000 ppb)	PVC production; solvent for rubber, insecticides, oils, waxes, gums, resins; rug and upholstery cleaners
Ethylbenzene	100-41-4	0.2	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.3	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	0.3	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.4	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Tetrachloroethene	127-18-4	0.2	Carcinogen	Dry cleaning; adhesives, automotive cleaners, polishes
Toluene	108-88-3	3.1	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	0.7	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.2	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of the quality indicators. It allows comparison of multiple samples with each other or with target l

$$TVOC\ \left(\frac{ng}{L}\right) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$$

The following formula depicts the calcul Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily

$$Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$$

derived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as the reference point allows the resulting retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, car

$$RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$$

ormula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x
RTn – retention time of n-alkane eluting before target compound x

RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Jericho, NY 11753	**COC:** **Laboratory ID:**	**100195** **100195-4**
Sampled By:	J. Harvey		
Project:	Marshall Public H.S.21111804		
Location:	805 South Miami Ave Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	05/04/2022 05/04/2022 05/04/2022 05/09/2022
Client Sample ID:	Room 10		
Volume:	48 L		
Date Sampled:	05/02/2022		
Sample Type:	TDT XX828		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. **Sample Summary:** listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. **Top 5:** listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. **TO17 Compounds:** listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. **Semiquantitative Compounds:** listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. **Supplemental Information: Odorants:** listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. **Supplemental Information: EPA Hazardous Air Pollutants (HAPs):** listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. **Additional Information:** definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	3700	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	5	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	290	47	2	911	DPGME
Texanol-B	74367-34-3	160	17	2	1127	
Texanol-A	74367-33-2	130	14	2	1121	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	770	400	1.0	480	J*
Isopropanol	67-63-0	68	27	0.5	517	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**33**	**14**	0.5	509	
Acetonitrile	75-05-8	< 0.2	< 0.1	0.2	522	
Acrylonitrile	107-13-1	< 0.1	< 0.05	0.1	543	
Benzene	71-43-2	**0.2**	**0.07**	0.1	631	
Bromobenzene	108-86-1	< 0.1	< 0.02	0.1	866	
Bromochloromethane	74-97-5	< 0.1	< 0.02	0.1	603	
Bromodichloromethane	75-27-4	< 0.1	< 0.02	0.1	682	
Bromoform	75-25-2	< 0.1	< 0.01	0.1	837	
1,3-Butadiene	106-99-0	< 0.1	< 0.05	0.1	389	
tert-Butylbenzene	98-06-6	< 0.1	< 0.02	0.1	900	
sec-Butylbenzene	135-98-8	< 0.1	< 0.02	0.1	914	
n-Butylbenzene	104-51-8	< 0.1	< 0.02	0.1	949	
Carbon Disulfide	75-15-0	< 0.1	< 0.03	0.1	520	
Carbon Tetrachloride	56-23-5	**0.6**	**0.09**	0.1	623	
Chlorobenzene	108-90-7	< 0.1	< 0.02	0.1	791	
Chlorodibromomethane	124-48-1	< 0.1	< 0.01	0.1	759	
2-Chloroethanol	107-07-3	**0.6**	**0.2**	0.1	675	
Chloroform	67-66-3	**0.2**	**0.04**	0.1	608	
Chloroprene	126-99-8	< 0.1	< 0.03	0.1	571	
3-Chloropropene	107-05-1	< 0.1	< 0.03	0.1	527	
4-Chlorotoluene	106-43-4	< 0.1	< 0.02	0.1	883	
2-Chlorotoluene	95-49-8	< 0.1	< 0.02	0.1	877	
Cyclohexane	110-82-7	**0.2**	**0.05**	0.1	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.2	< 0.02	0.2	991	

Client Sample ID: Room 10
Laboratory ID: 100195-4

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.1	< 0.01	0.1	766	
Dibromomethane	74-95-3	< 0.1	< 0.01	0.1	674	
trans 1,4-Dichloro-2-butene	110-57-6	**0.4**	**0.08**	0.1	865	
cis 1,4-Dichloro-2-butene	1476-11-5	**0.1**	**0.03**	0.1	848	
1,2-Dichlorobenzene	95-50-1	< 0.1	< 0.02	0.1	951	
1,3-Dichlorobenzene	541-73-1	< 0.1	< 0.02	0.1	923	
1,4-Dichlorobenzene	106-46-7	**1.0**	**0.2**	0.1	930	
1,1-Dichloroethane	75-34-3	< 0.1	< 0.03	0.1	567	
1,2-Dichloroethane	107-06-2	< 0.1	< 0.03	0.1	633	
cis 1,2-Dichloroethene	156-59-2	< 0.1	< 0.03	0.1	593	
trans 1,2-Dichloroethene	156-60-5	< 0.1	< 0.03	0.1	548	
1,1-Dichloroethene	75-35-4	< 0.1	< 0.03	0.1	508	
2,2-Dichloropropane	594-20-7	< 0.1	< 0.02	0.1	593	
1,2-Dichloropropane	78-87-5	< 0.1	< 0.02	0.1	670	
1,3-Dichloropropane	142-28-9	< 0.1	< 0.02	0.1	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.1	< 0.02	0.1	729	
1,1-Dichloropropene	563-58-6	< 0.1	< 0.02	0.1	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.1	< 0.02	0.1	701	
Diethyl ether	60-29-7	< 0.1	< 0.03	0.1	493	
1,4-Dioxane	123-91-1	< 0.2	< 0.06	0.2	673	
Ethanol	64-17-5	**770**	**400**	1.0	480	J*
Ethylacetate	141-78-6	**4.1**	**1.1**	0.1	594	
Ethylbenzene	100-41-4	**0.3**	**0.06**	0.1	795	
Ethylmethacrylate	97-63-2	< 0.1	< 0.02	0.1	731	
4-Ethyltoluene	622-96-8	< 0.1	< 0.02	0.1	878	
Hexachlorobutadiene	87-68-3	< 0.1	< 0.01	0.1	1036	
Hexane (C 6)	110-54-3	**0.6**	**0.2**	0.1	562	
Isooctane	540-84-1	**0.2**	**0.03**	0.1	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**68**	**27**	0.5	517	J*
Isopropylbenzene	98-82-8	< 0.1	< 0.02	0.1	846	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.4**	**0.07**	0.1	924	
Methacrylonitrile	126-98-7	< 0.1	< 0.04	0.1	600	
Methyl methacrylate	80-62-6	< 0.1	< 0.03	0.1	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.1	< 0.03	0.1	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.7**	**0.2**	0.1	624	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.1**	**0.3**	0.1	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.1	< 0.03	0.1	595	
Methylene Chloride	75-09-2	**0.4**	**0.1**	0.1	533	
2-Methylnaphthalene	91-57-6	< 0.2	< 0.04	0.2	1095	
Naphthalene	91-20-3	**0.3**	**0.06**	0.2	1042	
Nitrobenzene	98-95-3	< 0.4	< 0.08	0.4	999	
Pentachloroethane	76-01-7	< 0.1	< 0.01	0.1	902	
Propionitrile	107-12-0	< 0.1	< 0.05	0.1	593	
n-Propylbenzene	103-65-1	< 0.1	< 0.02	0.1	871	
Styrene	100-42-5	**0.5**	**0.1**	0.1	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.1	< 0.02	0.1	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.1	< 0.02	0.1	794	
Tetrachloroethene	127-18-4	**0.2**	**0.02**	0.1	746	
Tetrahydrofuran	109-99-9	< 0.1	< 0.03	0.1	604	
Toluene	108-88-3	**3.5**	**0.9**	0.1	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.07**	0.1	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.1	< 0.01	0.1	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.1	< 0.01	0.1	1052	
1,1,2-Trichloroethane	79-00-5	< 0.1	< 0.02	0.1	739	
1,1,1-Trichloroethane	71-55-6	< 0.1	< 0.02	0.1	616	
Trichloroethene	79-01-6	< 0.1	< 0.02	0.1	660	
1,2,3-Trichloropropane	96-18-4	< 0.1	< 0.02	0.1	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.1	< 0.02	0.1	881	
1,2,4-Trimethylbenzene	95-63-6	**2.2**	**0.4**	0.1	903	
m,p-Xylene	108-38-3; 106-42-3	**0.7**	**0.2**	0.2	802	

Client Sample ID: Room 10
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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.3**	**0.06**	0.1	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	3	0.5	2	962	
Acetaldehyde	75-07-0	23	13	2	398	
Acetic Acid	64-19-7	4	2	2	629	L*
Acetophenone	98-86-2	2	0.5	2	979	
Benzaldehyde	100-52-7	6	1	2	902	
Butane (C 4)	106-97-8	11	4	2	382	
1-Butanol	71-36-3	16	5	2	653	
1-Butoxy-2-propanol	5131-66-8	3	0.6	2	864	
2-Butoxyethanol	111-76-2	19	4	2	842	
Butoxyethoxyethanol	112-34-5	35	5	2	1028	
C11-C13 Hydrocarbon	N/A	3	N/A	2	1014	
C12-C14 Hydrocarbon	N/A	3	N/A	2	1036	Cyclic; contains oxygen
C13-C15 Hydrocarbon	N/A	3	N/A	2	1078	Contains oxygen
C14-C16 Hydrocarbon	N/A	2	N/A	2	1050	May contain nitrogen
C5-C7 Hydrocarbon	N/A	3	N/A	2	897	Contains oxygen; appears to be 1,2-pentanediol (CAS 5343-92-0)
C7-C9 Hydrocarbon	N/A	9	N/A	2	754	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS 123-86-4); one is hexanal (CAS 66-25-1)
C8-C10 Hydrocarbon	N/A	4	N/A	2	1073	Contains oxygen; appears to be dimethyl isosorbide (CAS 5306-85-4)
Decanal	112-31-2	7	1	2	1032	
Diethylene glycol ethyl ether	111-90-0	16	3	2	921	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	290	47	2	911	DPGME
Dodecamethylcyclohexasiloxane (D6)	540-97-6	2	0.1	2	1050	

Client Sample ID: Room 10
Laboratory ID: 100195-4

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dodecane (C 12)	112-40-3	7	1	2	1008	
2-Ethyl-1-hexanol	104-76-7	16	3	2	935	
Ethylene Glycol	107-21-1	36	14	2	714	
2-Ethylhexylacetate	103-09-3	2	0.3	2	995	
Hexyl cellosolve	112-25-4	11	2	2	985	
Isobutane	75-28-5	3	1	2	357	
Isohexadecane	4390-04-9	2	0.2	2	1077	
Isoprene	78-79-5	3	1	2	496	
Limonene	138-86-3 or 5989-27-5	23	4	2	921	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Methoxy-2-propanol	107-98-2	2	0.6	2	653	PGME
2-Methylbutane	78-78-4	4	1	2	446	
Nonanal	124-19-6	9	2	2	982	
Pentane (C 5)	109-66-0	22	7	2	473	
1-Propanol	71-23-8	2	0.9	2	568	
n-Propylacetate	109-60-4	6	2	2	674	
Propylene glycol	57-55-6	10	3	2	746	
Tetradecane (C 14)	629-59-4	4	0.5	2	1096	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	42	5	2	1134	
Texanol-A	74367-33-2	130	14	2	1121	
Texanol-B	74367-34-3	160	17	2	1127	
Tridecane (C 13)	629-50-5	5	0.7	2	1053	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	23	13	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetic Acid	64-19-7	4	2	0 - 204,000	pungent, vinegar,
Acetone	67-64-1	33	14	400 - 11,745,000	sweet, fruity, etherous
Acetophenone	98-86-2	2	0.5	0 - 590	sweet, almond, pungent, oranges, river water
Benzaldehyde	100-52-7	6	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.2	0.07	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	11	4	421 - 5,048,000	natural gas
1-Butanol	71-36-3	16	5	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	19	4	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.6	0.09	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
2-Chloroethanol	107-07-3	0.6	0.2	360 -	ethereal
Chloroform	67-66-3	0.2	0.04	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.2	0.05	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	1.0	0.2	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	16	3	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	770	400	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	16	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	4.1	1.1	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.3	0.06	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	36	14	5,120 -	-
Hexane (C 6)	110-54-3	0.6	0.2	1,500 - 248,000	gasoline
Isoprene	78-79-5	3	1	47 - 3,590	aromatic
Isopropanol	67-63-0	68	27	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	23	4	2 - 310	lemon, plastic, citrus, rubber, terpeny

Client Sample ID: Room 10
Laboratory ID: 100195-4

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Methoxy-2-propanol	107-98-2	2	0.6	8,390 - 33,000	etherish, ammonia
2-Methyl-1-propanol	78-83-1	0.7	0.2	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	1.1	0.3	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.4	0.1	1,200 - 440,000	sweet
Naphthalene	91-20-3	0.3	0.06	2 - 1,012	tar, creosote, mothballs, empyreumatic
Pentane (C 5)	109-66-0	22	7	1,290 - 1,147,000	sweet
1-Propanol	71-23-8	2	0.9	31 - 10,172,000	sweet, alcohol
n-Propylacetate	109-60-4	6	2	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	10	3	5,140 -	-
Styrene	100-42-5	0.5	0.1	3 - 61,000	sharp, sweet
Tetrachloroethene	127-18-4	0.2	0.02	767 - 71,000	etherish
Toluene	108-88-3	3.5	0.9	21 - 157,000	sour, burnt
1,2,4-Trimethylbenzene	95-63-6	2.2	0.4	6 - 2,400	aromatic
m,p-Xylene	108-38-3; 106-42-3	0.7	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.06	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.2	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.6	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.2	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	1.0	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.4	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	0.3	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.5	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Tetrachloroethene	127-18-4	0.2	Carcinogen	Dry cleaning; adhesives, automotive cleaners, polishes
Toluene	108-88-3	3.5	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	0.7	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of the quality indicators. It allows comparison of multiple samples with each other or with target l
The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ lerived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as the reference point allows the resulting retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, car $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ ormula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x
RTn – retention time of n-alkane eluting before target compound x

RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Jericho, NY 11753	**COC:** **Laboratory ID:**	**100195** **100195-1**
Sampled By:	J. Harvey		
Project:	Marshall Public H.S.21111804		
Location:	805 South Miami Ave Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	05/04/2022 05/04/2022 05/04/2022 05/09/2022
Client Sample ID:	Room 3		
Volume:	48 L		
Date Sampled:	05/02/2022		
Sample Type:	TDT AG175		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	2400	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	5	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Texanol-B	74367-34-3	160	18	2	1127	
Texanol-A	74367-33-2	130	15	2	1121	
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	120	19	2	911	DPGME
Ethylene Glycol	107-21-1	51	20	2	714	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	400	210	1.0	480	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**26**	**11**	0.5	509	
Acetonitrile	75-05-8	< 0.2	< 0.1	0.2	522	
Acrylonitrile	107-13-1	< 0.1	< 0.05	0.1	543	
Benzene	71-43-2	**0.3**	**0.09**	0.1	631	
Bromobenzene	108-86-1	< 0.1	< 0.02	0.1	866	
Bromochloromethane	74-97-5	< 0.1	< 0.02	0.1	603	
Bromodichloromethane	75-27-4	< 0.1	< 0.02	0.1	682	
Bromoform	75-25-2	< 0.1	< 0.01	0.1	837	
1,3-Butadiene	106-99-0	< 0.1	< 0.05	0.1	389	
tert-Butylbenzene	98-06-6	< 0.1	< 0.02	0.1	900	
sec-Butylbenzene	135-98-8	< 0.1	< 0.02	0.1	914	
n-Butylbenzene	104-51-8	< 0.1	< 0.02	0.1	949	
Carbon Disulfide	75-15-0	< 0.1	< 0.03	0.1	520	
Carbon Tetrachloride	56-23-5	**0.6**	**0.09**	0.1	623	
Chlorobenzene	108-90-7	< 0.1	< 0.02	0.1	791	
Chlorodibromomethane	124-48-1	< 0.1	< 0.01	0.1	759	
2-Chloroethanol	107-07-3	**0.3**	**0.1**	0.1	675	
Chloroform	67-66-3	**0.2**	**0.03**	0.1	608	
Chloroprene	126-99-8	< 0.1	< 0.03	0.1	571	
3-Chloropropene	107-05-1	< 0.1	< 0.03	0.1	527	
4-Chlorotoluene	106-43-4	< 0.1	< 0.02	0.1	883	
2-Chlorotoluene	95-49-8	< 0.1	< 0.02	0.1	877	
Cyclohexane	110-82-7	**0.2**	**0.05**	0.1	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.2	< 0.02	0.2	991	

Client Sample ID: Room 3
Laboratory ID: 100195-1

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.1	< 0.01	0.1	766	
Dibromomethane	74-95-3	< 0.1	< 0.01	0.1	674	
trans 1,4-Dichloro-2-butene	110-57-6	**0.3**	**0.06**	0.1	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.1	< 0.02	0.1	848	
1,2-Dichlorobenzene	95-50-1	< 0.1	< 0.02	0.1	951	
1,3-Dichlorobenzene	541-73-1	< 0.1	< 0.02	0.1	923	
1,4-Dichlorobenzene	106-46-7	**0.7**	**0.1**	0.1	930	
1,1-Dichloroethane	75-34-3	< 0.1	< 0.03	0.1	567	
1,2-Dichloroethane	107-06-2	**0.1**	**0.03**	0.1	633	
cis 1,2-Dichloroethene	156-59-2	< 0.1	< 0.03	0.1	593	
trans 1,2-Dichloroethene	156-60-5	< 0.1	< 0.03	0.1	548	
1,1-Dichloroethene	75-35-4	< 0.1	< 0.03	0.1	508	
2,2-Dichloropropane	594-20-7	< 0.1	< 0.02	0.1	593	
1,2-Dichloropropane	78-87-5	< 0.1	< 0.02	0.1	670	
1,3-Dichloropropane	142-28-9	< 0.1	< 0.02	0.1	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.1	< 0.02	0.1	729	
1,1-Dichloropropene	563-58-6	< 0.1	< 0.02	0.1	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.1	< 0.02	0.1	701	
Diethyl ether	60-29-7	< 0.1	< 0.03	0.1	493	
1,4-Dioxane	123-91-1	< 0.2	< 0.06	0.2	673	
Ethanol	64-17-5	**400**	**210**	1.0	480	J*
Ethylacetate	141-78-6	**2.8**	**0.8**	0.1	594	
Ethylbenzene	100-41-4	**0.3**	**0.07**	0.1	795	
Ethylmethacrylate	97-63-2	< 0.1	< 0.02	0.1	731	
4-Ethyltoluene	622-96-8	< 0.1	< 0.02	0.1	878	
Hexachlorobutadiene	87-68-3	< 0.1	< 0.01	0.1	1036	
Hexane (C 6)	110-54-3	**0.5**	**0.1**	0.1	562	
Isooctane	540-84-1	**0.2**	**0.03**	0.1	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**36**	**14**	0.5	517	
Isopropylbenzene	98-82-8	< 0.1	< 0.02	0.1	846	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.2**	**0.04**	0.1	924	
Methacrylonitrile	126-98-7	< 0.1	< 0.04	0.1	600	
Methyl methacrylate	80-62-6	< 0.1	< 0.03	0.1	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.1	< 0.03	0.1	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.6**	**0.2**	0.1	624	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**0.8**	**0.2**	0.1	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.1	< 0.03	0.1	595	
Methylene Chloride	75-09-2	**0.4**	**0.1**	0.1	533	
2-Methylnaphthalene	91-57-6	< 0.2	< 0.04	0.2	1095	
Naphthalene	91-20-3	**0.2**	**0.04**	0.2	1042	
Nitrobenzene	98-95-3	< 0.4	< 0.08	0.4	999	
Pentachloroethane	76-01-7	< 0.1	< 0.01	0.1	902	
Propionitrile	107-12-0	< 0.1	< 0.05	0.1	593	
n-Propylbenzene	103-65-1	< 0.1	< 0.02	0.1	871	
Styrene	100-42-5	**0.5**	**0.1**	0.1	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.1	< 0.02	0.1	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.1	< 0.02	0.1	794	
Tetrachloroethene	127-18-4	**0.1**	**0.02**	0.1	746	
Tetrahydrofuran	109-99-9	< 0.1	< 0.03	0.1	604	
Toluene	108-88-3	**4.3**	**1.1**	0.1	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.6**	**0.07**	0.1	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.1	< 0.01	0.1	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.1	< 0.01	0.1	1052	
1,1,2-Trichloroethane	79-00-5	< 0.1	< 0.02	0.1	739	
1,1,1-Trichloroethane	71-55-6	< 0.1	< 0.02	0.1	616	
Trichloroethene	79-01-6	< 0.1	< 0.02	0.1	660	
1,2,3-Trichloropropane	96-18-4	< 0.1	< 0.02	0.1	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.1	< 0.02	0.1	881	
1,2,4-Trimethylbenzene	95-63-6	**1.7**	**0.3**	0.1	903	
m,p-Xylene	108-38-3; 106-42-3	**0.8**	**0.2**	0.2	802	

Client Sample ID: Room 3
Laboratory ID: 100195-1

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.3**	**0.06**	0.1	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	2	0.3	2	962	
Acetaldehyde	75-07-0	13	7	2	397	
Acetic Acid	64-19-7	4	1	2	629	L*
Benzaldehyde	100-52-7	4	1	2	901	
Butane (C 4)	106-97-8	9	4	2	382	
1-Butanol	71-36-3	12	4	2	652	
1-Butoxy-2-propanol	5131-66-8	2	0.4	2	863	
2-Butoxyethanol	111-76-2	13	3	2	842	
Butoxyethoxyethanol	112-34-5	12	2	2	1028	
C14-C16 Hydrocarbon	N/A	3	N/A	2	1208	
C7-C9 Hydrocarbon	N/A	7	N/A	2	754	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS 123-86-4); one is hexanal (CAS 66-25-1)
C8-C10 Hydrocarbon	N/A	3	N/A	2	1032	Contains oxygen; may be 2,2,4-trimethyl-1,3-pentanediol (CAS 144-19-4)
Diethylene glycol ethyl ether	111-90-0	9	2	2	921	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	120	19	2	911	DPGME
Dodecane (C 12)	112-40-3	4	0.6	2	1008	
2-Ethyl-1-hexanol	104-76-7	15	3	2	935	
Ethylene Glycol	107-21-1	51	20	2	714	
Isobutane	75-28-5	2	0.9	2	357	
Isoprene	78-79-5	2	0.8	2	495	
Limonene	138-86-3 or 5989-27-5	9	2	2	921	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
2-Methylbutane	78-78-4	3	1	2	445	

Client Sample ID: Room 3
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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Nonanal	124-19-6	7	1	2	982	
Pentane (C 5)	109-66-0	16	5	2	473	
1-Propanol	71-23-8	3	1	2	568	
n-Propylacetate	109-60-4	4	0.9	2	674	
Propylene glycol	57-55-6	11	4	2	746	
Tetradecane (C 14)	629-59-4	3	0.4	2	1096	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	10	1	2	1134	
Texanol-A	74367-33-2	130	15	2	1121	
Texanol-B	74367-34-3	160	18	2	1127	
Tridecane (C 13)	629-50-5	3	0.4	2	1053	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	13	7	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetic Acid	64-19-7	4	1	0 - 204,000	pungent, vinegar,
Acetone	67-64-1	26	11	400 - 11,745,000	sweet, fruity, etherous
Benzaldehyde	100-52-7	4	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.3	0.09	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	9	4	421 - 5,048,000	natural gas
1-Butanol	71-36-3	12	4	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	13	3	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.6	0.09	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
2-Chloroethanol	107-07-3	0.3	0.1	360 -	ethereal
Chloroform	67-66-3	0.2	0.03	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.2	0.05	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	0.7	0.1	121 - 15,000	camphor, mothballs
1,2-Dichloroethane	107-06-2	0.1	0.03	4,300 - 988,000	sweet
Diethylene glycol ethyl ether	111-90-0	9	2	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	400	210	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	15	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	2.8	0.8	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.3	0.07	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	51	20	5,120 -	-
Hexane (C 6)	110-54-3	0.5	0.1	1,500 - 248,000	gasoline
Isoprene	78-79-5	2	0.8	47 - 3,590	aromatic
Isopropanol	67-63-0	36	14	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	9	2	2 - 310	lemon, plastic, citrus, rubber, terpeny

Client Sample ID: Room 3
Laboratory ID: 100195-1

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
2-Methyl-1-propanol	78-83-1	0.6	0.2	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	0.8	0.2	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.4	0.1	1,200 - 440,000	sweet
Naphthalene	91-20-3	0.2	0.04	2 - 1,012	tar, creosote, mothballs, empyreumatic
Pentane (C 5)	109-66-0	16	5	1,290 - 1,147,000	sweet
1-Propanol	71-23-8	3	1	31 - 10,172,000	sweet, alcohol
n-Propylacetate	109-60-4	4	0.9	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	11	4	5,140 -	-
Styrene	100-42-5	0.5	0.1	3 - 61,000	sharp, sweet
Tetrachloroethene	127-18-4	0.1	0.02	767 - 71,000	etherish
Toluene	108-88-3	4.3	1.1	21 - 157,000	sour, burnt
1,2,4-Trimethylbenzene	95-63-6	1.7	0.3	6 - 2,400	aromatic
m,p-Xylene	108-38-3; 106-42-3	0.8	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.06	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.3	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.6	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.2	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	0.7	Carcinogen	Moth balls/crystals; room deodorant
1,2-Dichloroethane	107-06-2	0.1	Carcinogen; 4,000 ng/L (1,000 ppb)	PVC production; solvent for rubber, insecticides, oils, waxes, gums, resins; rug and upholstery cleaners
Ethylbenzene	100-41-4	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.4	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	0.2	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.5	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Tetrachloroethene	127-18-4	0.1	Carcinogen	Dry cleaning; adhesives, automotive cleaners, polishes
Toluene	108-88-3	4.3	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	0.8	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of the quality indicators. It allows comparison of multiple samples with each other or with target l
The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ lerived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as the reference point allows the resulting retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, car $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ ormula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x
RTn – retention time of n-alkane eluting before target compound x

RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Jericho, NY 11753	**COC:** **Laboratory ID:**	**100195** **100195-2**
Sampled By:	J. Harvey		
Project:	Marshall Public H.S.21111804		
Location:	805 South Miami Ave Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	05/04/2022 05/04/2022 05/04/2022 05/09/2022
Client Sample ID:	Room 4		
Volume:	48 L		
Date Sampled:	05/02/2022		
Sample Type:	TDT AH377		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. **Sample Summary:** listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. **Top 5:** listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. **TO17 Compounds:** listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. **Semiquantitative Compounds:** listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. **Supplemental Information: Odorants:** listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. **Supplemental Information: EPA Hazardous Air Pollutants (HAPs):** listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. **Additional Information:** definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	2400	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	5	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Texanol-B	74367-34-3	160	18	2	1126	
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	130	21	2	911	DPGME
Texanol-A	74367-33-2	130	14	2	1121	
Ethylene Glycol	107-21-1	36	14	2	714	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	440	230	1.0	480	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**24**	**10**	0.5	509	
Acetonitrile	75-05-8	**0.2**	**0.1**	0.2	522	
Acrylonitrile	107-13-1	< 0.1	< 0.05	0.1	543	
Benzene	71-43-2	**0.3**	**0.08**	0.1	631	
Bromobenzene	108-86-1	< 0.1	< 0.02	0.1	866	
Bromochloromethane	74-97-5	< 0.1	< 0.02	0.1	603	
Bromodichloromethane	75-27-4	< 0.1	< 0.02	0.1	682	
Bromoform	75-25-2	< 0.1	< 0.01	0.1	837	
1,3-Butadiene	106-99-0	< 0.1	< 0.05	0.1	389	
tert-Butylbenzene	98-06-6	< 0.1	< 0.02	0.1	900	
sec-Butylbenzene	135-98-8	< 0.1	< 0.02	0.1	914	
n-Butylbenzene	104-51-8	< 0.1	< 0.02	0.1	949	
Carbon Disulfide	75-15-0	< 0.1	< 0.03	0.1	520	
Carbon Tetrachloride	56-23-5	**0.5**	**0.08**	0.1	623	
Chlorobenzene	108-90-7	< 0.1	< 0.02	0.1	791	
Chlorodibromomethane	124-48-1	< 0.1	< 0.01	0.1	759	
2-Chloroethanol	107-07-3	**0.3**	**0.09**	0.1	675	
Chloroform	67-66-3	**0.1**	**0.03**	0.1	608	
Chloroprene	126-99-8	< 0.1	< 0.03	0.1	571	
3-Chloropropene	107-05-1	< 0.1	< 0.03	0.1	527	
4-Chlorotoluene	106-43-4	< 0.1	< 0.02	0.1	883	
2-Chlorotoluene	95-49-8	< 0.1	< 0.02	0.1	877	
Cyclohexane	110-82-7	**0.1**	**0.04**	0.1	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.2	< 0.02	0.2	991	

Client Sample ID: Room 4
Laboratory ID: 100195-2

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.1	< 0.01	0.1	766	
Dibromomethane	74-95-3	< 0.1	< 0.01	0.1	674	
trans 1,4-Dichloro-2-butene	110-57-6	**0.3**	**0.06**	0.1	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.1	< 0.02	0.1	848	
1,2-Dichlorobenzene	95-50-1	< 0.1	< 0.02	0.1	951	
1,3-Dichlorobenzene	541-73-1	< 0.1	< 0.02	0.1	923	
1,4-Dichlorobenzene	106-46-7	**0.6**	**0.1**	0.1	930	
1,1-Dichloroethane	75-34-3	< 0.1	< 0.03	0.1	567	
1,2-Dichloroethane	107-06-2	< 0.1	< 0.03	0.1	633	
cis 1,2-Dichloroethene	156-59-2	< 0.1	< 0.03	0.1	593	
trans 1,2-Dichloroethene	156-60-5	< 0.1	< 0.03	0.1	548	
1,1-Dichloroethene	75-35-4	< 0.1	< 0.03	0.1	508	
2,2-Dichloropropane	594-20-7	< 0.1	< 0.02	0.1	593	
1,2-Dichloropropane	78-87-5	< 0.1	< 0.02	0.1	670	
1,3-Dichloropropane	142-28-9	< 0.1	< 0.02	0.1	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.1	< 0.02	0.1	729	
1,1-Dichloropropene	563-58-6	< 0.1	< 0.02	0.1	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.1	< 0.02	0.1	701	
Diethyl ether	60-29-7	< 0.1	< 0.03	0.1	493	
1,4-Dioxane	123-91-1	**0.2**	**0.07**	0.2	673	
Ethanol	64-17-5	**440**	**230**	1.0	480	J*
Ethylacetate	141-78-6	**2.8**	**0.8**	0.1	594	
Ethylbenzene	100-41-4	**0.2**	**0.06**	0.1	795	
Ethylmethacrylate	97-63-2	< 0.1	< 0.02	0.1	731	
4-Ethyltoluene	622-96-8	< 0.1	< 0.02	0.1	878	
Hexachlorobutadiene	87-68-3	< 0.1	< 0.01	0.1	1036	
Hexane (C 6)	110-54-3	**0.4**	**0.1**	0.1	562	
Isooctane	540-84-1	**0.1**	**0.03**	0.1	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**35**	**14**	0.5	517	
Isopropylbenzene	98-82-8	< 0.1	< 0.02	0.1	846	

Client Sample ID: Room 4
Laboratory ID: 100195-2

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.2**	**0.04**	0.1	924	
Methacrylonitrile	126-98-7	< 0.1	< 0.04	0.1	600	
Methyl methacrylate	80-62-6	< 0.1	< 0.03	0.1	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.1	< 0.03	0.1	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.5**	**0.2**	0.1	625	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**0.7**	**0.2**	0.1	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.1	< 0.03	0.1	595	
Methylene Chloride	75-09-2	**0.3**	**0.09**	0.1	533	
2-Methylnaphthalene	91-57-6	< 0.2	< 0.04	0.2	1095	
Naphthalene	91-20-3	**0.2**	**0.04**	0.2	1042	
Nitrobenzene	98-95-3	< 0.4	< 0.08	0.4	999	
Pentachloroethane	76-01-7	< 0.1	< 0.01	0.1	902	
Propionitrile	107-12-0	< 0.1	< 0.05	0.1	593	
n-Propylbenzene	103-65-1	< 0.1	< 0.02	0.1	871	
Styrene	100-42-5	**0.4**	**0.09**	0.1	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.1	< 0.02	0.1	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.1	< 0.02	0.1	794	
Tetrachloroethene	127-18-4	**0.2**	**0.03**	0.1	746	
Tetrahydrofuran	109-99-9	< 0.1	< 0.03	0.1	604	
Toluene	108-88-3	**3.6**	**0.9**	0.1	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.06**	0.1	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.1	< 0.01	0.1	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.1	< 0.01	0.1	1052	
1,1,2-Trichloroethane	79-00-5	< 0.1	< 0.02	0.1	739	
1,1,1-Trichloroethane	71-55-6	< 0.1	< 0.02	0.1	616	
Trichloroethene	79-01-6	< 0.1	< 0.02	0.1	660	
1,2,3-Trichloropropane	96-18-4	< 0.1	< 0.02	0.1	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.1	< 0.02	0.1	881	
1,2,4-Trimethylbenzene	95-63-6	**1.7**	**0.3**	0.1	903	
m,p-Xylene	108-38-3; 106-42-3	**0.7**	**0.2**	0.2	802	

Client Sample ID: Room 4
Laboratory ID: 100195-2

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.2**	**0.05**	0.1	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetaldehyde	75-07-0	21	12	2	397	
Acetic Acid	64-19-7	4	1	2	629	L*
Benzaldehyde	100-52-7	4	0.9	2	901	
Butane (C 4)	106-97-8	8	3	2	382	
1-Butanol	71-36-3	12	4	2	653	
1-Butoxy-2-propanol	5131-66-8	2	0.4	2	863	
2-Butoxyethanol	111-76-2	13	3	2	842	
Butoxyethoxyethanol	112-34-5	11	2	2	1028	
C14-C16 Hydrocarbon	N/A	2	N/A	2	1178	Contains oxygen; appears to be 2,6-di-tert-butyl-4-hydroxy-4-methylcyclohexa-2,5-dien-1-one (CAS 10396-80-2)
C7-C9 Hydrocarbon	N/A	8	N/A	2	754	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS 123-86-4); one is hexanal (CAS 66-25-1)
C8-C10 Hydrocarbon	N/A	2	N/A	2	1032	Contains oxygen; may be 2,2,4-trimethyl-1,3-pentanediol (CAS 144-19-4)
Diethylene glycol ethyl ether	111-90-0	8	1	2	921	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	130	21	2	911	DPGME
Dodecane (C 12)	112-40-3	4	0.6	2	1007	
2-Ethyl-1-hexanol	104-76-7	13	2	2	935	
Ethylene Glycol	107-21-1	36	14	2	714	
Isobutane	75-28-5	2	0.9	2	357	
Limonene	138-86-3 or 5989-27-5	9	2	2	921	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
2-Methylbutane	78-78-4	3	1	2	445	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Nonanal	124-19-6	6	1	2	982	
Pentane (C 5)	109-66-0	14	5	2	473	
n-Propylacetate	109-60-4	3	0.7	2	674	
Propylene glycol	57-55-6	7	2	2	746	
Tetradecane (C 14)	629-59-4	3	0.3	2	1096	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	10	1	2	1134	
Texanol-A	74367-33-2	130	14	2	1121	
Texanol-B	74367-34-3	160	18	2	1126	
Tridecane (C 13)	629-50-5	3	0.4	2	1053	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	21	12	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetic Acid	64-19-7	4	1	0 - 204,000	pungent, vinegar,
Acetone	67-64-1	24	10	400 - 11,745,000	sweet, fruity, etherous
Acetonitrile	75-05-8	0.2	0.1	13,000 - 1,161,000	etherish
Benzaldehyde	100-52-7	4	0.9	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.3	0.08	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	8	3	421 - 5,048,000	natural gas
1-Butanol	71-36-3	12	4	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	13	3	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.5	0.08	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
2-Chloroethanol	107-07-3	0.3	0.09	360 -	ethereal
Chloroform	67-66-3	0.1	0.03	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.1	0.04	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	0.6	0.1	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	8	1	200 - 1,090	ethereal, mild, pleasant
1,4-Dioxane	123-91-1	0.2	0.07	800 - 2,609,000	sweet, alcohol
Ethanol	64-17-5	440	230	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	13	2	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	2.8	0.8	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.2	0.06	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	36	14	5,120 -	-
Hexane (C 6)	110-54-3	0.4	0.1	1,500 - 248,000	gasoline
Isopropanol	67-63-0	35	14	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	9	2	2 - 310	lemon, plastic, citrus, rubber, terpeny

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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
2-Methyl-1-propanol	78-83-1	0.5	0.2	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	0.7	0.2	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.3	0.09	1,200 - 440,000	sweet
Naphthalene	91-20-3	0.2	0.04	2 - 1,012	tar, creosote, mothballs, empyreumatic
Pentane (C 5)	109-66-0	14	5	1,290 - 1,147,000	sweet
n-Propylacetate	109-60-4	3	0.7	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	7	2	5,140 -	-
Styrene	100-42-5	0.4	0.09	3 - 61,000	sharp, sweet
Tetrachloroethene	127-18-4	0.2	0.03	767 - 71,000	etherish
Toluene	108-88-3	3.6	0.9	21 - 157,000	sour, burnt
1,2,4-Trimethylbenzene	95-63-6	1.7	0.3	6 - 2,400	aromatic
m,p-Xylene	108-38-3; 106-42-3	0.7	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.2	0.05	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.3	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.5	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.1	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	0.6	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.2	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.3	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	0.2	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.4	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Tetrachloroethene	127-18-4	0.2	Carcinogen	Dry cleaning; adhesives, automotive cleaners, polishes
Toluene	108-88-3	3.6	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	0.7	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.2	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of the quality indicators. It allows comparison of multiple samples with each other or with target l
The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ lerived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as the reference point allows the resulting retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, car $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ ormula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x
RTn – retention time of n-alkane eluting before target compound x

RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Jericho, NY 11753	**COC:** **Laboratory ID:**	**100195** **100195-6**
Sampled By:	J. Harvey		
Project:	Marshall Public H.S.21111804		
Location:	805 South Miami Ave Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	05/04/2022 05/04/2022 05/04/2022 05/09/2022
Client Sample ID:	Room 26		
Volume:	48 L		
Date Sampled:	05/02/2022		
Sample Type:	TDT AC237		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. **Sample Summary:** listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. **Top 5:** listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. **TO17 Compounds:** listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. **Semiquantitative Compounds:** listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. **Supplemental Information: Odorants:** listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. **Supplemental Information: EPA Hazardous Air Pollutants (HAPs):** listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. **Additional Information:** definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	3900	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	9	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	320	51	2	911	DPGME
Texanol-B	74367-34-3	130	15	2	1127	
Texanol-A	74367-33-2	110	12	2	1121	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	860	450	1.0	480	J*
Isopropanol	67-63-0	72	29	0.5	517	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**44**	**18**	0.5	509	
Acetonitrile	75-05-8	**0.4**	**0.2**	0.2	522	
Acrylonitrile	107-13-1	< 0.1	< 0.05	0.1	543	
Benzene	71-43-2	**0.3**	**0.1**	0.1	631	
Bromobenzene	108-86-1	< 0.1	< 0.02	0.1	866	
Bromochloromethane	74-97-5	< 0.1	< 0.02	0.1	603	
Bromodichloromethane	75-27-4	< 0.1	< 0.02	0.1	682	
Bromoform	75-25-2	< 0.1	< 0.01	0.1	837	
1,3-Butadiene	106-99-0	< 0.1	< 0.05	0.1	389	
tert-Butylbenzene	98-06-6	< 0.1	< 0.02	0.1	900	
sec-Butylbenzene	135-98-8	< 0.1	< 0.02	0.1	914	
n-Butylbenzene	104-51-8	< 0.1	< 0.02	0.1	949	
Carbon Disulfide	75-15-0	**0.2**	**0.06**	0.1	520	
Carbon Tetrachloride	56-23-5	**0.8**	**0.1**	0.1	623	
Chlorobenzene	108-90-7	< 0.1	< 0.02	0.1	791	
Chlorodibromomethane	124-48-1	< 0.1	< 0.01	0.1	759	
2-Chloroethanol	107-07-3	**0.7**	**0.2**	0.1	675	
Chloroform	67-66-3	**0.3**	**0.05**	0.1	608	
Chloroprene	126-99-8	< 0.1	< 0.03	0.1	571	
3-Chloropropene	107-05-1	< 0.1	< 0.03	0.1	527	
4-Chlorotoluene	106-43-4	< 0.1	< 0.02	0.1	883	
2-Chlorotoluene	95-49-8	< 0.1	< 0.02	0.1	877	
Cyclohexane	110-82-7	**0.6**	**0.2**	0.1	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.2	< 0.02	0.2	991	

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Laboratory ID: 100195-6

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.1	< 0.01	0.1	766	
Dibromomethane	74-95-3	< 0.1	< 0.01	0.1	674	
trans 1,4-Dichloro-2-butene	110-57-6	**0.4**	**0.08**	0.1	865	
cis 1,4-Dichloro-2-butene	1476-11-5	**0.1**	**0.03**	0.1	848	
1,2-Dichlorobenzene	95-50-1	< 0.1	< 0.02	0.1	951	
1,3-Dichlorobenzene	541-73-1	< 0.1	< 0.02	0.1	923	
1,4-Dichlorobenzene	106-46-7	**1.7**	**0.3**	0.1	930	
1,1-Dichloroethane	75-34-3	< 0.1	< 0.03	0.1	567	
1,2-Dichloroethane	107-06-2	**0.2**	**0.04**	0.1	633	
cis 1,2-Dichloroethene	156-59-2	< 0.1	< 0.03	0.1	593	
trans 1,2-Dichloroethene	156-60-5	< 0.1	< 0.03	0.1	548	
1,1-Dichloroethene	75-35-4	< 0.1	< 0.03	0.1	508	
2,2-Dichloropropane	594-20-7	< 0.1	< 0.02	0.1	593	
1,2-Dichloropropane	78-87-5	**0.3**	**0.06**	0.1	670	
1,3-Dichloropropane	142-28-9	< 0.1	< 0.02	0.1	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.1	< 0.02	0.1	729	
1,1-Dichloropropene	563-58-6	< 0.1	< 0.02	0.1	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.1	< 0.02	0.1	701	
Diethyl ether	60-29-7	< 0.1	< 0.03	0.1	493	
1,4-Dioxane	123-91-1	< 0.2	< 0.06	0.2	673	
Ethanol	64-17-5	**860**	**450**	1.0	480	J*
Ethylacetate	141-78-6	**18**	**4.8**	0.1	594	
Ethylbenzene	100-41-4	**0.4**	**0.1**	0.1	795	
Ethylmethacrylate	97-63-2	< 0.1	< 0.02	0.1	731	
4-Ethyltoluene	622-96-8	**0.1**	**0.03**	0.1	878	
Hexachlorobutadiene	87-68-3	< 0.1	< 0.01	0.1	1036	
Hexane (C 6)	110-54-3	**1.1**	**0.3**	0.1	562	
Isooctane	540-84-1	**0.6**	**0.1**	0.1	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**72**	**29**	0.5	517	J*
Isopropylbenzene	98-82-8	**0.1**	**0.02**	0.1	846	

Client Sample ID: Room 26
Laboratory ID: 100195-6

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.4**	**0.07**	0.1	924	
Methacrylonitrile	126-98-7	< 0.1	< 0.04	0.1	600	
Methyl methacrylate	80-62-6	< 0.1	< 0.03	0.1	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.1	< 0.03	0.1	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.8**	**0.3**	0.1	624	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.9**	**0.5**	0.1	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.1	< 0.03	0.1	595	
Methylene Chloride	75-09-2	**0.6**	**0.2**	0.1	533	
2-Methylnaphthalene	91-57-6	< 0.2	< 0.04	0.2	1095	
Naphthalene	91-20-3	**0.4**	**0.08**	0.2	1042	
Nitrobenzene	98-95-3	< 0.4	< 0.08	0.4	999	
Pentachloroethane	76-01-7	< 0.1	< 0.01	0.1	902	
Propionitrile	107-12-0	< 0.1	< 0.05	0.1	593	
n-Propylbenzene	103-65-1	**0.1**	**0.02**	0.1	871	
Styrene	100-42-5	**0.7**	**0.2**	0.1	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.1	< 0.02	0.1	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.1	< 0.02	0.1	794	
Tetrachloroethene	127-18-4	**0.1**	**0.02**	0.1	746	
Tetrahydrofuran	109-99-9	< 0.1	< 0.03	0.1	604	
Toluene	108-88-3	**6.6**	**1.7**	0.1	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.07**	0.1	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.1	< 0.01	0.1	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.1	< 0.01	0.1	1052	
1,1,2-Trichloroethane	79-00-5	**0.1**	**0.02**	0.1	739	
1,1,1-Trichloroethane	71-55-6	< 0.1	< 0.02	0.1	616	
Trichloroethene	79-01-6	**0.1**	**0.02**	0.1	660	
1,2,3-Trichloropropane	96-18-4	< 0.1	< 0.02	0.1	867	
1,3,5-Trimethylbenzene	108-67-8	**0.1**	**0.02**	0.1	881	
1,2,4-Trimethylbenzene	95-63-6	**2.6**	**0.5**	0.1	903	
m,p-Xylene	108-38-3; 106-42-3	**1.3**	**0.3**	0.2	802	

Client Sample ID: Room 26
Laboratory ID: 100195-6

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.5**	**0.1**	0.1	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	5	0.8	2	962	
Acetaldehyde	75-07-0	25	14	2	398	
Acetic Acid	64-19-7	4	2	2	629	L*
Acetophenone	98-86-2	3	0.6	2	979	
Benzaldehyde	100-52-7	7	2	2	902	
Butane (C 4)	106-97-8	15	6	2	382	
1-Butanol	71-36-3	20	6	2	653	
1-Butoxy-2-propanol	5131-66-8	4	0.7	2	863	
2-Butoxyethanol	111-76-2	26	5	2	842	
Butoxyethoxyethanol	112-34-5	42	6	2	1028	
4-tert-Butylcyclohexyl acetate	32210-23-4	4	0.5	2	1078	
C11-C13 Hydrocarbon	N/A	3	N/A	2	1014	
C12-C14 Hydrocarbon	N/A	3	N/A	2	1036	Cyclic; contains oxygen
C13-C15 Hydrocarbon	N/A	2	N/A	2	1087	
C7-C9 Hydrocarbon	N/A	15	N/A	2	754	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS 123-86-4); one is hexanal (CAS 66-25-1)
Decanal	112-31-2	6	0.9	2	1032	
Diethylene glycol ethyl ether	111-90-0	23	4	2	921	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	320	51	2	911	DPGME
Dodecamethylcyclohexasiloxane (D6)	540-97-6	4	0.2	2	1050	
Dodecane (C 12)	112-40-3	7	1	2	1008	
2-Ethyl-1-hexanol	104-76-7	19	4	2	935	
Ethylene Glycol	107-21-1	39	15	2	714	

Client Sample ID: Room 26
Laboratory ID: 100195-6

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
2-Ethylhexylacetate	103-09-3	3	0.4	2	995	
Hexamethylcyclotrisiloxane (D3)	541-05-9	3	0.3	2	734	
Hexyl cellosolve	112-25-4	6	0.9	2	985	
Isobutane	75-28-5	5	2	2	357	
Isohexadecane	4390-04-9	3	0.3	2	1077	
Isoprene	78-79-5	6	2	2	495	
Limonene	138-86-3 or 5989-27-5	19	3	2	921	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Menthol	89-78-1 or 1490-04-6	4	0.6	2	1028	
Methoxy-2-propanol	107-98-2	4	1	2	653	PGME
Methyl ethyl ketone	78-93-3	3	0.9	2	590	
2-Methylbutane	78-78-4	8	3	2	446	
Nonanal	124-19-6	8	1	2	982	
Pentane (C 5)	109-66-0	21	7	2	473	
1-Propanol	71-23-8	4	2	2	568	
1-Propoxy-2-propanol	1569-01-3	2	0.4	2	785	
n-Propylacetate	109-60-4	9	2	2	674	
Propylene glycol	57-55-6	12	4	2	746	
Tetradecane (C 14)	629-59-4	4	0.5	2	1096	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	27	3	2	1134	
Texanol-A	74367-33-2	110	12	2	1121	
Texanol-B	74367-34-3	130	15	2	1127	
Tridecane (C 13)	629-50-5	5	0.7	2	1053	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

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Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	25	14	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetic Acid	64-19-7	4	2	0 - 204,000	pungent, vinegar,
Acetone	67-64-1	44	18	400 - 11,745,000	sweet, fruity, etherous
Acetonitrile	75-05-8	0.4	0.2	13,000 - 1,161,000	etherish
Acetophenone	98-86-2	3	0.6	0 - 590	sweet, almond, pungent, oranges, river water
Benzaldehyde	100-52-7	7	2	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.3	0.1	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	15	6	421 - 5,048,000	natural gas
1-Butanol	71-36-3	20	6	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	26	5	43 - 390	sweet, ester, musty
Carbon Disulfide	75-15-0	0.2	0.06	16 - 32,000	vegetable, sulfide, medicinal
Carbon Tetrachloride	56-23-5	0.8	0.1	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
2-Chloroethanol	107-07-3	0.7	0.2	360 -	ethereal
Chloroform	67-66-3	0.3	0.05	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.6	0.2	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	1.7	0.3	121 - 15,000	camphor, mothballs
1,2-Dichloroethane	107-06-2	0.2	0.04	4,300 - 988,000	sweet
1,2-Dichloropropane	78-87-5	0.3	0.06	260 - 8,660	sweet
Diethylene glycol ethyl ether	111-90-0	23	4	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	860	450	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	19	4	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	18	4.8	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.4	0.1	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	39	15	5,120 -	-

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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Hexane (C 6)	110-54-3	1.1	0.3	1,500 - 248,000	gasoline
Isoprene	78-79-5	6	2	47 - 3,590	aromatic
Isopropanol	67-63-0	72	29	1,000 - 2,197,000	sharp, rubbing alcohol
Isopropylbenzene	98-82-8	0.1	0.02	8 - 1,300	sharp
Limonene	138-86-3 or 5989-27-5	19	3	2 - 310	lemon, plastic, citrus, rubber, terpeny
Menthol	89-78-1 or 1490-04-6	4	0.6	0 - 10,640	caraway, cool, minty, menthol, peppermint, sweet, woody
Methoxy-2-propanol	107-98-2	4	1	8,390 - 33,000	etherish, ammonia
Methyl ethyl ketone	78-93-3	3	0.9	70 - 339,000	sweet, sharp
2-Methyl-1-propanol	78-83-1	0.8	0.3	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	1.9	0.5	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.6	0.2	1,200 - 440,000	sweet
Naphthalene	91-20-3	0.4	0.08	2 - 1,012	tar, creosote, mothballs, empyreumatic
Pentane (C 5)	109-66-0	21	7	1,290 - 1,147,000	sweet
1-Propanol	71-23-8	4	2	31 - 10,172,000	sweet, alcohol
n-Propylacetate	109-60-4	9	2	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	12	4	5,140 -	-
Styrene	100-42-5	0.7	0.2	3 - 61,000	sharp, sweet
Tetrachloroethene	127-18-4	0.1	0.02	767 - 71,000	etherish
Toluene	108-88-3	6.6	1.7	21 - 157,000	sour, burnt
Trichloroethene	79-01-6	0.1	0.02	500 - 167,000	ether, solvent
1,3,5-Trimethylbenzene	108-67-8	0.1	0.02	6 - 2,400	aromatic
1,2,4-Trimethylbenzene	95-63-6	2.6	0.5	6 - 2,400	aromatic
m,p-Xylene	108-38-3; 106-42-3	1.3	0.3	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.5	0.1	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.3	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.8	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.3	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	1.7	Carcinogen	Moth balls/crystals; room deodorant
1,2-Dichloroethane	107-06-2	0.2	Carcinogen; 4,000 ng/L (1,000 ppb)	PVC production; solvent for rubber, insecticides, oils, waxes, gums, resins; rug and upholstery cleaners
Ethylbenzene	100-41-4	0.4	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Isopropylbenzene	98-82-8	0.1		
Methylene Chloride	75-09-2	0.6	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	0.4	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.7	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Tetrachloroethene	127-18-4	0.1	Carcinogen	Dry cleaning; adhesives, automotive cleaners, polishes
Toluene	108-88-3	6.6	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
Trichloroethene	79-01-6	0.1	Carcinogen	Dry cleaning; degreasers and cleaners for home/automotive; varnish removers; anesthetic
m,p-Xylene	108-38-3; 106-42-3	1.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.5	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of the quality indicators. It allows comparison of multiple samples with each other or with target l
The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ lerived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as the reference point allows the resulting retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, car $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ ormula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x
RTn – retention time of n-alkane eluting before target compound x

RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Jericho, NY 11753	**COC:** **Laboratory ID:**	**100195** **100195-8**
Sampled By:	J. Harvey		
Project:	Marshall Public H.S.21111804		
Location:	805 South Miami Ave Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	05/04/2022 05/04/2022 05/04/2022 05/09/2022
Client Sample ID:	Hall		
Volume:	48 L		
Date Sampled:	05/02/2022		
Sample Type:	TDT AJ794		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. Sample Summary: listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. Top 5: listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. TO17 Compounds: listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. Semiquantitative Compounds: listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. Supplemental Information: Odorants: listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. Supplemental Information: EPA Hazardous Air Pollutants (HAPs): listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. Additional Information: definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	2400	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	6	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	140	22	2	911	DPGME
Texanol-B	74367-34-3	93	10	2	1127	
Ethylene Glycol	107-21-1	78	30	2	714	
Texanol-A	74367-33-2	77	9	2	1121	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	370	200	1.0	480	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**36**	**15**	0.5	509	
Acetonitrile	75-05-8	< 0.2	< 0.1	0.2	522	
Acrylonitrile	107-13-1	< 0.1	< 0.05	0.1	543	
Benzene	71-43-2	**0.2**	**0.07**	0.1	631	
Bromobenzene	108-86-1	< 0.1	< 0.02	0.1	866	
Bromochloromethane	74-97-5	< 0.1	< 0.02	0.1	603	
Bromodichloromethane	75-27-4	< 0.1	< 0.02	0.1	682	
Bromoform	75-25-2	< 0.1	< 0.01	0.1	837	
1,3-Butadiene	106-99-0	< 0.1	< 0.05	0.1	389	
tert-Butylbenzene	98-06-6	< 0.1	< 0.02	0.1	900	
sec-Butylbenzene	135-98-8	< 0.1	< 0.02	0.1	914	
n-Butylbenzene	104-51-8	< 0.1	< 0.02	0.1	949	
Carbon Disulfide	75-15-0	**0.1**	**0.03**	0.1	520	
Carbon Tetrachloride	56-23-5	**1.2**	**0.2**	0.1	623	
Chlorobenzene	108-90-7	< 0.1	< 0.02	0.1	791	
Chlorodibromomethane	124-48-1	< 0.1	< 0.01	0.1	759	
2-Chloroethanol	107-07-3	**0.4**	**0.1**	0.1	675	
Chloroform	67-66-3	**0.2**	**0.04**	0.1	608	
Chloroprene	126-99-8	< 0.1	< 0.03	0.1	571	
3-Chloropropene	107-05-1	< 0.1	< 0.03	0.1	527	
4-Chlorotoluene	106-43-4	< 0.1	< 0.02	0.1	883	
2-Chlorotoluene	95-49-8	< 0.1	< 0.02	0.1	877	
Cyclohexane	110-82-7	**0.3**	**0.08**	0.1	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.2	< 0.02	0.2	991	

Client Sample ID: Hall
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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.1	< 0.01	0.1	766	
Dibromomethane	74-95-3	< 0.1	< 0.01	0.1	674	
trans 1,4-Dichloro-2-butene	110-57-6	**0.3**	**0.06**	0.1	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.1	< 0.02	0.1	848	
1,2-Dichlorobenzene	95-50-1	< 0.1	< 0.02	0.1	951	
1,3-Dichlorobenzene	541-73-1	< 0.1	< 0.02	0.1	923	
1,4-Dichlorobenzene	106-46-7	**1.5**	**0.3**	0.1	930	
1,1-Dichloroethane	75-34-3	< 0.1	< 0.03	0.1	567	
1,2-Dichloroethane	107-06-2	< 0.1	< 0.03	0.1	633	
cis 1,2-Dichloroethene	156-59-2	< 0.1	< 0.03	0.1	593	
trans 1,2-Dichloroethene	156-60-5	< 0.1	< 0.03	0.1	548	
1,1-Dichloroethene	75-35-4	< 0.1	< 0.03	0.1	508	
2,2-Dichloropropane	594-20-7	< 0.1	< 0.02	0.1	593	
1,2-Dichloropropane	78-87-5	< 0.1	< 0.02	0.1	670	
1,3-Dichloropropane	142-28-9	< 0.1	< 0.02	0.1	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.1	< 0.02	0.1	729	
1,1-Dichloropropene	563-58-6	< 0.1	< 0.02	0.1	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.1	< 0.02	0.1	701	
Diethyl ether	60-29-7	< 0.1	< 0.03	0.1	493	
1,4-Dioxane	123-91-1	< 0.2	< 0.06	0.2	673	
Ethanol	64-17-5	**370**	**200**	1.0	480	J*
Ethylacetate	141-78-6	**4.8**	**1.3**	0.1	594	
Ethylbenzene	100-41-4	**0.3**	**0.06**	0.1	795	
Ethylmethacrylate	97-63-2	< 0.1	< 0.02	0.1	731	
4-Ethyltoluene	622-96-8	< 0.1	< 0.02	0.1	878	
Hexachlorobutadiene	87-68-3	< 0.1	< 0.01	0.1	1036	
Hexane (C 6)	110-54-3	**1.4**	**0.4**	0.1	562	
Isooctane	540-84-1	**0.2**	**0.03**	0.1	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**46**	**19**	0.5	517	
Isopropylbenzene	98-82-8	< 0.1	< 0.02	0.1	846	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.2**	**0.04**	0.1	924	
Methacrylonitrile	126-98-7	< 0.1	< 0.04	0.1	600	
Methyl methacrylate	80-62-6	< 0.1	< 0.03	0.1	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.1	< 0.03	0.1	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.8**	**0.2**	0.1	625	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.2**	**0.3**	0.1	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.1	< 0.03	0.1	595	
Methylene Chloride	75-09-2	**1.1**	**0.3**	0.1	533	
2-Methylnaphthalene	91-57-6	< 0.2	< 0.04	0.2	1095	
Naphthalene	91-20-3	**0.8**	**0.1**	0.2	1042	
Nitrobenzene	98-95-3	< 0.4	< 0.08	0.4	999	
Pentachloroethane	76-01-7	< 0.1	< 0.01	0.1	902	
Propionitrile	107-12-0	< 0.1	< 0.05	0.1	593	
n-Propylbenzene	103-65-1	< 0.1	< 0.02	0.1	871	
Styrene	100-42-5	**0.4**	**0.09**	0.1	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.1	< 0.02	0.1	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.1	< 0.02	0.1	794	
Tetrachloroethene	127-18-4	< 0.1	< 0.02	0.1	746	
Tetrahydrofuran	109-99-9	< 0.1	< 0.03	0.1	604	
Toluene	108-88-3	**3.2**	**0.8**	0.1	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.06**	0.1	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.1	< 0.01	0.1	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.1	< 0.01	0.1	1052	
1,1,2-Trichloroethane	79-00-5	< 0.1	< 0.02	0.1	739	
1,1,1-Trichloroethane	71-55-6	< 0.1	< 0.02	0.1	616	
Trichloroethene	79-01-6	< 0.1	< 0.02	0.1	660	
1,2,3-Trichloropropane	96-18-4	< 0.1	< 0.02	0.1	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.1	< 0.02	0.1	881	
1,2,4-Trimethylbenzene	95-63-6	**1.7**	**0.3**	0.1	903	
m,p-Xylene	108-38-3; 106-42-3	**1.0**	**0.2**	0.2	802	

Client Sample ID: Hall
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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
o-Xylene	95-47-6	**0.3**	**0.07**	0.1	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	3	0.4	2	962	
Acetaldehyde	75-07-0	13	7	2	398	
Acetic Acid	64-19-7	2	0.9	2	630	L*
Acetophenone	98-86-2	2	0.5	2	979	
Benzaldehyde	100-52-7	4	1	2	902	
Butane (C 4)	106-97-8	10	4	2	382	
1-Butanol	71-36-3	16	5	2	653	
1-Butoxy-2-propanol	5131-66-8	2	0.4	2	864	
2-Butoxyethanol	111-76-2	17	3	2	842	
Butoxyethoxyethanol	112-34-5	14	2	2	1028	
C11-C13 Hydrocarbon	N/A	2	N/A	2	1014	
C14-C16 Hydrocarbon	N/A	10	N/A	2	1208	
C7-C9 Hydrocarbon	N/A	9	N/A	2	754	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS 123-86-4); one is hexanal (CAS 66-25-1)
Decanal	112-31-2	4	0.6	2	1032	
Diethylene glycol ethyl ether	111-90-0	12	2	2	921	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	140	22	2	911	DPGME
Dodecane (C 12)	112-40-3	5	0.7	2	1008	
2-Ethyl-1-hexanol	104-76-7	17	3	2	935	
Ethylene Glycol	107-21-1	78	30	2	714	
4-Hydroxy-4-methyl-2-pentanone	123-42-2	2	0.5	2	809	Diacetone alcohol
Isobutane	75-28-5	3	1	2	358	
Isoprene	78-79-5	3	1	2	496	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Limonene	138-86-3 or 5989-27-5	12	2	2	921	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Menthol	89-78-1 or 1490-04-6	2	0.3	2	1028	
Methoxy-2-propanol	107-98-2	2	0.6	2	654	PGME
2-Methylbutane	78-78-4	3	1	2	446	
Nonanal	124-19-6	6	1	2	982	
Pentane (C 5)	109-66-0	12	4	2	474	
1-Propanol	71-23-8	6	3	2	568	
n-Propylacetate	109-60-4	5	1	2	674	
Propylene glycol	57-55-6	12	4	2	746	
Tetradecane (C 14)	629-59-4	3	0.4	2	1096	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	14	2	2	1134	
Texanol-A	74367-33-2	77	9	2	1121	
Texanol-B	74367-34-3	93	10	2	1127	
Tridecane (C 13)	629-50-5	4	0.5	2	1053	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

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Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	13	7	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetic Acid	64-19-7	2	0.9	0 - 204,000	pungent, vinegar,
Acetone	67-64-1	36	15	400 - 11,745,000	sweet, fruity, etherous
Acetophenone	98-86-2	2	0.5	0 - 590	sweet, almond, pungent, oranges, river water
Benzaldehyde	100-52-7	4	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.2	0.07	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	10	4	421 - 5,048,000	natural gas
1-Butanol	71-36-3	16	5	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	17	3	43 - 390	sweet, ester, musty
Carbon Disulfide	75-15-0	0.1	0.03	16 - 32,000	vegetable, sulfide, medicinal
Carbon Tetrachloride	56-23-5	1.2	0.2	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
2-Chloroethanol	107-07-3	0.4	0.1	360 -	ethereal
Chloroform	67-66-3	0.2	0.04	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.3	0.08	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	1.5	0.3	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	12	2	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	370	200	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	17	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	4.8	1.3	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.3	0.06	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	78	30	5,120 -	-
Hexane (C 6)	110-54-3	1.4	0.4	1,500 - 248,000	gasoline
4-Hydroxy-4-methyl-2-pentanone	123-42-2	2	0.5	270 - 13,000	faint, minty, sweet
Isoprene	78-79-5	3	1	47 - 3,590	aromatic

Client Sample ID: Hall
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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Isopropanol	67-63-0	46	19	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	12	2	2 - 310	lemon, plastic, citrus, rubber, terpeny
Menthol	89-78-1 or 1490-04-6	2	0.3	0 - 10,640	caraway, cool, minty, menthol, peppermint, sweet, woody
Methoxy-2-propanol	107-98-2	2	0.6	8,390 - 33,000	etherish, ammonia
2-Methyl-1-propanol	78-83-1	0.8	0.2	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	1.2	0.3	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	1.1	0.3	1,200 - 440,000	sweet
Naphthalene	91-20-3	0.8	0.1	2 - 1,012	tar, creosote, mothballs, empyreumatic
Pentane (C 5)	109-66-0	12	4	1,290 - 1,147,000	sweet
1-Propanol	71-23-8	6	3	31 - 10,172,000	sweet, alcohol
n-Propylacetate	109-60-4	5	1	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	12	4	5,140 -	-
Styrene	100-42-5	0.4	0.09	3 - 61,000	sharp, sweet
Toluene	108-88-3	3.2	0.8	21 - 157,000	sour, burnt
1,2,4-Trimethylbenzene	95-63-6	1.7	0.3	6 - 2,400	aromatic
m,p-Xylene	108-38-3; 106-42-3	1.0	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.07	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.2	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	1.2	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.2	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	1.5	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	1.1	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	0.8	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.4	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Toluene	108-88-3	3.2	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	1.0	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of the quality indicators. It allows comparison of multiple samples with each other or with target l

$$TVOC\ \left(\frac{ng}{L}\right) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$$

The following formula depicts the calcul Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily derived from the Ideal Gas Law.

$$Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$$

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as the reference point allows the resulting retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, car ormula derived from the Kovats isothermal retention index.

$$RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$$

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x
RTn – retention time of n-alkane eluting before target compound x

RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Jericho, NY 11753	**COC:** **Laboratory ID:**	**100195** **100195-7**
Sampled By:	J. Harvey		
Project:	Marshall Public H.S.21111804		
Location:	805 South Miami Ave Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	05/04/2022 05/04/2022 05/04/2022 05/09/2022
Client Sample ID:	Room 31		
Volume:	48 L		
Date Sampled:	05/02/2022		
Sample Type:	TDT ZZ695		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. **Sample Summary:** listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. **Top 5:** listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. **TO17 Compounds:** listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. **Semiquantitative Compounds:** listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. **Supplemental Information: Odorants:** listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. **Supplemental Information: EPA Hazardous Air Pollutants (HAPs):** listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. **Additional Information:** definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	< 200	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	< 3	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Hexyl cellosolve	112-25-4	8	1	2	985	
C8-C10 Hydrocarbon	N/A	3	N/A	2	1073	Contains oxygen; appears to be dimethyl isosorbide (CAS 5306-85-4)
Decanal	112-31-2	2	0.4	2	1032	
Diethylene glycol	111-46-6	2	0.5	2	924	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	5.9	3.1	1.0	480	

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	< 0.5	< 0.2	0.5	509	
Acetonitrile	75-05-8	< 0.2	< 0.1	0.2	522	
Acrylonitrile	107-13-1	< 0.1	< 0.05	0.1	543	
Benzene	71-43-2	< 0.1	< 0.03	0.1	631	
Bromobenzene	108-86-1	< 0.1	< 0.02	0.1	866	
Bromochloromethane	74-97-5	< 0.1	< 0.02	0.1	603	
Bromodichloromethane	75-27-4	< 0.1	< 0.02	0.1	682	
Bromoform	75-25-2	< 0.1	< 0.01	0.1	837	
1,3-Butadiene	106-99-0	< 0.1	< 0.05	0.1	389	
tert-Butylbenzene	98-06-6	< 0.1	< 0.02	0.1	900	
sec-Butylbenzene	135-98-8	< 0.1	< 0.02	0.1	914	
n-Butylbenzene	104-51-8	< 0.1	< 0.02	0.1	949	
Carbon Disulfide	75-15-0	< 0.1	< 0.03	0.1	520	
Carbon Tetrachloride	56-23-5	< 0.1	< 0.02	0.1	623	
Chlorobenzene	108-90-7	< 0.1	< 0.02	0.1	791	
Chlorodibromomethane	124-48-1	< 0.1	< 0.01	0.1	759	
2-Chloroethanol	107-07-3	< 0.1	< 0.03	0.1	675	
Chloroform	67-66-3	< 0.1	< 0.02	0.1	608	
Chloroprene	126-99-8	< 0.1	< 0.03	0.1	571	
3-Chloropropene	107-05-1	< 0.1	< 0.03	0.1	527	
4-Chlorotoluene	106-43-4	< 0.1	< 0.02	0.1	883	
2-Chlorotoluene	95-49-8	< 0.1	< 0.02	0.1	877	
Cyclohexane	110-82-7	< 0.1	< 0.03	0.1	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.2	< 0.02	0.2	991	

Client Sample ID: Room 31
Laboratory ID: 100195-7

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.1	< 0.01	0.1	766	
Dibromomethane	74-95-3	< 0.1	< 0.01	0.1	674	
trans 1,4-Dichloro-2-butene	110-57-6	< 0.1	< 0.02	0.1	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.1	< 0.02	0.1	848	
1,2-Dichlorobenzene	95-50-1	< 0.1	< 0.02	0.1	951	
1,3-Dichlorobenzene	541-73-1	< 0.1	< 0.02	0.1	923	
1,4-Dichlorobenzene	106-46-7	< 0.1	< 0.02	0.1	930	
1,1-Dichloroethane	75-34-3	< 0.1	< 0.03	0.1	567	
1,2-Dichloroethane	107-06-2	< 0.1	< 0.03	0.1	633	
cis 1,2-Dichloroethene	156-59-2	< 0.1	< 0.03	0.1	593	
trans 1,2-Dichloroethene	156-60-5	< 0.1	< 0.03	0.1	548	
1,1-Dichloroethene	75-35-4	< 0.1	< 0.03	0.1	508	
2,2-Dichloropropane	594-20-7	< 0.1	< 0.02	0.1	593	
1,2-Dichloropropane	78-87-5	< 0.1	< 0.02	0.1	670	
1,3-Dichloropropane	142-28-9	< 0.1	< 0.02	0.1	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.1	< 0.02	0.1	729	
1,1-Dichloropropene	563-58-6	< 0.1	< 0.02	0.1	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.1	< 0.02	0.1	701	
Diethyl ether	60-29-7	< 0.1	< 0.03	0.1	493	
1,4-Dioxane	123-91-1	< 0.2	< 0.06	0.2	673	
Ethanol	64-17-5	**5.9**	**3.1**	1.0	480	
Ethylacetate	141-78-6	< 0.1	< 0.03	0.1	594	
Ethylbenzene	100-41-4	< 0.1	< 0.02	0.1	795	
Ethylmethacrylate	97-63-2	< 0.1	< 0.02	0.1	731	
4-Ethyltoluene	622-96-8	< 0.1	< 0.02	0.1	878	
Hexachlorobutadiene	87-68-3	< 0.1	< 0.01	0.1	1036	
Hexane (C 6)	110-54-3	< 0.1	< 0.03	0.1	562	
Isooctane	540-84-1	< 0.1	< 0.02	0.1	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	< 0.5	< 0.2	0.5	517	
Isopropylbenzene	98-82-8	< 0.1	< 0.02	0.1	846	

Client Sample ID: Room 31
Laboratory ID: 100195-7

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	< 0.1	< 0.02	0.1	924	
Methacrylonitrile	126-98-7	< 0.1	< 0.04	0.1	600	
Methyl methacrylate	80-62-6	< 0.1	< 0.03	0.1	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.1	< 0.03	0.1	547	MTBE
2-Methyl-1-propanol	78-83-1	< 0.1	< 0.03	0.1		Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	< 0.1	< 0.03	0.1	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.1	< 0.03	0.1	595	
Methylene Chloride	75-09-2	< 0.1	< 0.03	0.1	533	
2-Methylnaphthalene	91-57-6	< 0.2	< 0.04	0.2	1095	
Naphthalene	91-20-3	< 0.2	< 0.04	0.2	1042	
Nitrobenzene	98-95-3	< 0.4	< 0.08	0.4	999	
Pentachloroethane	76-01-7	< 0.1	< 0.01	0.1	902	
Propionitrile	107-12-0	< 0.1	< 0.05	0.1	593	
n-Propylbenzene	103-65-1	< 0.1	< 0.02	0.1	871	
Styrene	100-42-5	< 0.1	< 0.02	0.1	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.1	< 0.02	0.1	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.1	< 0.02	0.1	794	
Tetrachloroethene	127-18-4	< 0.1	< 0.02	0.1	746	
Tetrahydrofuran	109-99-9	< 0.1	< 0.03	0.1	604	
Toluene	108-88-3	< 0.1	< 0.03	0.1	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	< 0.1	< 0.01	0.1	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.1	< 0.01	0.1	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.1	< 0.01	0.1	1052	
1,1,2-Trichloroethane	79-00-5	< 0.1	< 0.02	0.1	739	
1,1,1-Trichloroethane	71-55-6	< 0.1	< 0.02	0.1	616	
Trichloroethene	79-01-6	< 0.1	< 0.02	0.1	660	
1,2,3-Trichloropropane	96-18-4	< 0.1	< 0.02	0.1	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.1	< 0.02	0.1	881	
1,2,4-Trimethylbenzene	95-63-6	< 0.1	< 0.02	0.1	903	
m,p-Xylene	108-38-3; 106-42-3	< 0.2	< 0.05	0.2	802	

Client Sample ID: Room 31
Laboratory ID: 100195-7

Compound	CAS	Sample Concentration		Reporting Limit	RI	Additional Information
		ng/L	ppb	ng/L		
o-Xylene	95-47-6	< 0.1	< 0.02	0.1	825	

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	**CAS**	**ng/L**	**ppb**	**ng/L**	**RI**	**Additional Information**
C8-C10 Hydrocarbon	N/A	3	N/A	2	1073	Contains oxygen; appears to be dimethyl isosorbide (CAS 5306-85-4)
Decanal	112-31-2	2	0.4	2	1032	
Diethylene glycol	111-46-6	2	0.5	2	924	
Hexyl cellosolve	112-25-4	8	1	2	985	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Ethanol	64-17-5	5.9	3.1	90 - 40,334,000	vinous, alcohol

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

No EPA Hazardous Air Pollutants are present in this sample.

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of the quality indicators. It allows comparison of multiple samples with each other or with target l
The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{[\frac{(A_s - A_b) \times W_s}{A_i}]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ lerived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as the reference point allows the resulting retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, car $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ ormula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x
RTn – retention time of n-alkane eluting before target compound x

RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Jericho, NY 11753	**COC:** **Laboratory ID:**	**100195** **100195-5**
Sampled By:	J. Harvey		
Project:	Marshall Public H.S.21111804		
Location:	805 South Miami Ave Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	05/04/2022 05/04/2022 05/04/2022 05/09/2022
Client Sample ID:	Room 14		
Volume:	48 L		
Date Sampled:	05/02/2022		
Sample Type:	TDT AF231		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. **Sample Summary:** listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. **Top 5:** listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. **TO17 Compounds:** listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. **Semiquantitative Compounds:** listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. **Supplemental Information: Odorants:** listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. **Supplemental Information: EPA Hazardous Air Pollutants (HAPs):** listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. **Additional Information:** definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	3300	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	7	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	190	32	2	911	DPGME
Texanol-B	74367-34-3	190	21	2	1127	
Texanol-A	74367-33-2	160	17	2	1121	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	630	330	1.0	480	J*
Isopropanol	67-63-0	55	22	0.5	517	J*

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**34**	**14**	0.5	509	
Acetonitrile	75-05-8	< 0.2	< 0.1	0.2	522	
Acrylonitrile	107-13-1	< 0.1	< 0.05	0.1	543	
Benzene	71-43-2	**0.3**	**0.08**	0.1	631	
Bromobenzene	108-86-1	< 0.1	< 0.02	0.1	866	
Bromochloromethane	74-97-5	< 0.1	< 0.02	0.1	603	
Bromodichloromethane	75-27-4	< 0.1	< 0.02	0.1	682	
Bromoform	75-25-2	< 0.1	< 0.01	0.1	837	
1,3-Butadiene	106-99-0	< 0.1	< 0.05	0.1	389	
tert-Butylbenzene	98-06-6	< 0.1	< 0.02	0.1	900	
sec-Butylbenzene	135-98-8	< 0.1	< 0.02	0.1	914	
n-Butylbenzene	104-51-8	< 0.1	< 0.02	0.1	949	
Carbon Disulfide	75-15-0	< 0.1	< 0.03	0.1	520	
Carbon Tetrachloride	56-23-5	**0.6**	**0.09**	0.1	623	
Chlorobenzene	108-90-7	< 0.1	< 0.02	0.1	791	
Chlorodibromomethane	124-48-1	< 0.1	< 0.01	0.1	759	
2-Chloroethanol	107-07-3	**0.6**	**0.2**	0.1	675	
Chloroform	67-66-3	**0.2**	**0.04**	0.1	608	
Chloroprene	126-99-8	< 0.1	< 0.03	0.1	571	
3-Chloropropene	107-05-1	< 0.1	< 0.03	0.1	527	
4-Chlorotoluene	106-43-4	< 0.1	< 0.02	0.1	883	
2-Chlorotoluene	95-49-8	< 0.1	< 0.02	0.1	877	
Cyclohexane	110-82-7	**0.2**	**0.05**	0.1	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.2	< 0.02	0.2	991	

Client Sample ID: Room 14
Laboratory ID: 100195-5

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.1	< 0.01	0.1	766	
Dibromomethane	74-95-3	< 0.1	< 0.01	0.1	674	
trans 1,4-Dichloro-2-butene	110-57-6	**0.4**	**0.08**	0.1	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.1	< 0.02	0.1	848	
1,2-Dichlorobenzene	95-50-1	< 0.1	< 0.02	0.1	951	
1,3-Dichlorobenzene	541-73-1	< 0.1	< 0.02	0.1	923	
1,4-Dichlorobenzene	106-46-7	**1**	**0.2**	0.1	930	
1,1-Dichloroethane	75-34-3	< 0.1	< 0.03	0.1	567	
1,2-Dichloroethane	107-06-2	< 0.1	< 0.03	0.1	633	
cis 1,2-Dichloroethene	156-59-2	< 0.1	< 0.03	0.1	593	
trans 1,2-Dichloroethene	156-60-5	< 0.1	< 0.03	0.1	548	
1,1-Dichloroethene	75-35-4	< 0.1	< 0.03	0.1	508	
2,2-Dichloropropane	594-20-7	< 0.1	< 0.02	0.1	593	
1,2-Dichloropropane	78-87-5	< 0.1	< 0.02	0.1	670	
1,3-Dichloropropane	142-28-9	< 0.1	< 0.02	0.1	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.1	< 0.02	0.1	729	
1,1-Dichloropropene	563-58-6	< 0.1	< 0.02	0.1	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.1	< 0.02	0.1	701	
Diethyl ether	60-29-7	< 0.1	< 0.03	0.1	493	
1,4-Dioxane	123-91-1	< 0.2	< 0.06	0.2	673	
Ethanol	64-17-5	**630**	**330**	1.0	480	J*
Ethylacetate	141-78-6	**3.9**	**1.1**	0.1	594	
Ethylbenzene	100-41-4	**0.3**	**0.06**	0.1	795	
Ethylmethacrylate	97-63-2	< 0.1	< 0.02	0.1	731	
4-Ethyltoluene	622-96-8	< 0.1	< 0.02	0.1	878	
Hexachlorobutadiene	87-68-3	< 0.1	< 0.01	0.1	1036	
Hexane (C 6)	110-54-3	**0.6**	**0.2**	0.1	562	
Isooctane	540-84-1	**0.2**	**0.03**	0.1	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**55**	**22**	0.5	517	J*
Isopropylbenzene	98-82-8	< 0.1	< 0.02	0.1	846	

Client Sample ID: Room 14
Laboratory ID: 100195-5

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	**0.3**	**0.05**	0.1	924	
Methacrylonitrile	126-98-7	< 0.1	< 0.04	0.1	600	
Methyl methacrylate	80-62-6	< 0.1	< 0.03	0.1	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.1	< 0.03	0.1	547	MTBE
2-Methyl-1-propanol	78-83-1	**0.7**	**0.2**	0.1	625	Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.0**	**0.2**	0.1	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.1	< 0.03	0.1	595	
Methylene Chloride	75-09-2	**0.4**	**0.1**	0.1	533	
2-Methylnaphthalene	91-57-6	< 0.2	< 0.04	0.2	1095	
Naphthalene	91-20-3	**0.3**	**0.05**	0.2	1042	
Nitrobenzene	98-95-3	< 0.4	< 0.08	0.4	999	
Pentachloroethane	76-01-7	< 0.1	< 0.01	0.1	902	
Propionitrile	107-12-0	< 0.1	< 0.05	0.1	593	
n-Propylbenzene	103-65-1	< 0.1	< 0.02	0.1	871	
Styrene	100-42-5	**0.5**	**0.1**	0.1	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.1	< 0.02	0.1	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.1	< 0.02	0.1	794	
Tetrachloroethene	127-18-4	**0.1**	**0.02**	0.1	746	
Tetrahydrofuran	109-99-9	< 0.1	< 0.03	0.1	604	
Toluene	108-88-3	**3.3**	**0.9**	0.1	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.5**	**0.06**	0.1	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.1	< 0.01	0.1	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.1	< 0.01	0.1	1052	
1,1,2-Trichloroethane	79-00-5	< 0.1	< 0.02	0.1	739	
1,1,1-Trichloroethane	71-55-6	< 0.1	< 0.02	0.1	616	
Trichloroethene	79-01-6	< 0.1	< 0.02	0.1	660	
1,2,3-Trichloropropane	96-18-4	< 0.1	< 0.02	0.1	867	
1,3,5-Trimethylbenzene	108-67-8	< 0.1	< 0.02	0.1	881	
1,2,4-Trimethylbenzene	95-63-6	**2.0**	**0.4**	0.1	903	
m,p-Xylene	108-38-3; 106-42-3	**0.7**	**0.2**	0.2	802	

Client Sample ID: Room 14
Laboratory ID: 100195-5

Compound	CAS	Sample Concentration		Reporting Limit	RI	Additional Information
		ng/L	ppb	ng/L		
o-Xylene	95-47-6	**0.3**	**0.06**	0.1	825	

Compound Notes

J* The accuracy of this determination may be degraded because the reported value exceeded the calibrated range by more than a factor of 10.

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
2,6-Dimethyl-7-octen-2-ol	18479-58-8	4	0.6	2	962	
Acetaldehyde	75-07-0	15	8	2	398	
Acetic Acid	64-19-7	4	1	2	629	L*
Acetophenone	98-86-2	2	0.5	2	979	
Benzaldehyde	100-52-7	5	1	2	902	
Butane (C 4)	106-97-8	10	4	2	382	
1-Butanol	71-36-3	14	5	2	653	
1-Butoxy-2-propanol	5131-66-8	3	0.6	2	863	
2-Butoxyethanol	111-76-2	23	5	2	842	
Butoxyethoxyethanol	112-34-5	30	5	2	1028	
4-tert-Butylcyclohexyl acetate	32210-23-4	3	0.3	2	1078	
C11-C13 Hydrocarbon	N/A	2	N/A	2	1014	
C12-C14 Hydrocarbon	N/A	2	N/A	2	1036	Cyclic; contains oxygen
C5-C7 Hydrocarbon	N/A	2	N/A	2	744	Contains nitrogen and oxygen; appears to be 4,4-dimethyloxazolidine (CAS 51200-87-4)
C7-C9 Hydrocarbon	N/A	8	N/A	2	754	Sum of two overlapping hydrocarbons; one is n-butyl acetate (CAS 123-86-4); one is hexanal (CAS 66-25-1)
Diethylene glycol ethyl ether	111-90-0	18	3	2	921	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	190	32	2	911	DPGME
Dodecamethylcyclohexasiloxane (D6)	540-97-6	3	0.2	2	1050	
Dodecane (C 12)	112-40-3	6	0.8	2	1008	
2-Ethyl-1-hexanol	104-76-7	17	3	2	935	
Ethylene Glycol	107-21-1	41	16	2	714	

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Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Isobutane	75-28-5	3	1	2	357	
Isohexadecane	4390-04-9	2	0.2	2	1077	
Isoprene	78-79-5	4	1	2	496	
Limonene	138-86-3 or 5989-27-5	23	4	2	921	Limonene (CAS 138-86-3) or d-Limonene (CAS 5989-27-5)
Menthol	89-78-1 or 1490-04-6	2	0.3	2	1028	
Methoxy-2-propanol	107-98-2	2	0.6	2	653	PGME
2-Methylbutane	78-78-4	4	1	2	446	
Nonanal	124-19-6	7	1	2	982	
Pentane (C 5)	109-66-0	18	6	2	473	
1-Propanol	71-23-8	3	1	2	568	
n-Propylacetate	109-60-4	6	1	2	674	
Propylene glycol	57-55-6	10	3	2	746	
Tetradecane (C 14)	629-59-4	4	0.5	2	1096	
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	126-86-3	18	2	2	1134	
Texanol-A	74367-33-2	160	17	2	1121	
Texanol-B	74367-34-3	190	21	2	1127	
Tridecane (C 13)	629-50-5	4	0.6	2	1053	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

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Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetaldehyde	75-07-0	15	8	2 - 1,000,000	pungent, fruity, suffocating, fresh, green
Acetic Acid	64-19-7	4	1	0 - 204,000	pungent, vinegar,
Acetone	67-64-1	34	14	400 - 11,745,000	sweet, fruity, etherous
Acetophenone	98-86-2	2	0.5	0 - 590	sweet, almond, pungent, oranges, river water
Benzaldehyde	100-52-7	5	1	2 - 783,000	bitter almond, fruit, vanilla
Benzene	71-43-2	0.3	0.08	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	10	4	421 - 5,048,000	natural gas
1-Butanol	71-36-3	14	5	3 - 990,000	sweet, malty, alcohol, medicinal
2-Butoxyethanol	111-76-2	23	5	43 - 390	sweet, ester, musty
Carbon Tetrachloride	56-23-5	0.6	0.09	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
2-Chloroethanol	107-07-3	0.6	0.2	360 -	ethereal
Chloroform	67-66-3	0.2	0.04	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.2	0.05	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	1	0.2	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	18	3	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	630	330	90 - 40,334,000	vinous, alcohol
2-Ethyl-1-hexanol	104-76-7	17	3	75 - 150	citrus, fatty, floral, fresh, fruity, green, musty, oily, sweet
Ethylacetate	141-78-6	3.9	1.1	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.3	0.06	2 - 18,000	oily, solvent
Ethylene Glycol	107-21-1	41	16	5,120 -	-
Hexane (C 6)	110-54-3	0.6	0.2	1,500 - 248,000	gasoline
Isoprene	78-79-5	4	1	47 - 3,590	aromatic
Isopropanol	67-63-0	55	22	1,000 - 2,197,000	sharp, rubbing alcohol
Limonene	138-86-3 or 5989-27-5	23	4	2 - 310	lemon, plastic, citrus, rubber, terpeny

Client Sample ID: Room 14
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Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Menthol	89-78-1 or 1490-04-6	2	0.3	0 - 10,640	caraway, cool, minty, menthol, peppermint, sweet, woody
Methoxy-2-propanol	107-98-2	2	0.6	8,390 - 33,000	etherish, ammonia
2-Methyl-1-propanol	78-83-1	0.7	0.2	10 - 165,000	sweet, fusel, musty, alcohol, rubber, latex
4-Methyl-2-pentanone	108-10-1	1.0	0.2	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.4	0.1	1,200 - 440,000	sweet
Naphthalene	91-20-3	0.3	0.05	2 - 1,012	tar, creosote, mothballs, empyreumatic
Pentane (C 5)	109-66-0	18	6	1,290 - 1,147,000	sweet
1-Propanol	71-23-8	3	1	31 - 10,172,000	sweet, alcohol
n-Propylacetate	109-60-4	6	1	48 - 87,000	sweet, ester
Propylene glycol	57-55-6	10	3	5,140 -	-
Styrene	100-42-5	0.5	0.1	3 - 61,000	sharp, sweet
Tetrachloroethene	127-18-4	0.1	0.02	767 - 71,000	etherish
Toluene	108-88-3	3.3	0.9	21 - 157,000	sour, burnt
1,2,4-Trimethylbenzene	95-63-6	2.0	0.4	6 - 2,400	aromatic
m,p-Xylene	108-38-3; 106-42-3	0.7	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.06	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.3	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.6	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.2	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	1	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.4	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Naphthalene	91-20-3	0.3	50,000 ng/L (10,000 ppb)	Gasoline; diesel; Moth balls/crystals; insecticide
Styrene	100-42-5	0.5	215,000 ng/L (50,000 ppb)	Polystyrene foam; synthetic rubber; flavoring agent
Tetrachloroethene	127-18-4	0.1	Carcinogen	Dry cleaning; adhesives, automotive cleaners, polishes
Toluene	108-88-3	3.3	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	0.7	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of the quality indicators. It allows comparison of multiple samples with each other or with target l
The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ lerived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as the reference point allows the resulting retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, car $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ ormula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x
RTn – retention time of n-alkane eluting before target compound x

RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

ENTHALPY ANALYTICAL
formerly *Prism Analytical Technologies*

Analytical Report

Client:	JS Held, LLC 50 Jericho Quadrangle Jericho, NY 11753	**COC:** **Laboratory ID:**	**100195** **100195-9**
Sampled By:	J. Harvey		
Project:	Marshall Public H.S.21111804		
Location:	805 South Miami Ave Marshall, MO 65340	Received Date: Approved Date: Scanned Date: Report Date:	05/04/2022 05/04/2022 05/04/2022 05/09/2022
Client Sample ID:	Hall o/s Little Theatre		
Volume:	48 L		
Date Sampled:	05/02/2022		
Sample Type:	TDT AI522		

Comp-Air Survey Analysis

Applicable methods for this analytical technique include (with relevant modifications) US EPA TO-17 and ISO 16000-6. A scan was made for all compounds contained in the Air Survey Analysis List (TB503 Quantitative and Semiquantitative List). All compounds detected are listed below.

Comp-Air Survey Analysis Report Description

The Comp-Air (Comprehensive-Air) Survey Analysis is designed to provide additional information beyond the high quality chemical data from the air sample. This additional information may aid in interpretation of results.

Your Report is divided into several sections describing different aspects of the chemical composition of your sample.

1. **Sample Summary:** listing of some of the aggregate values from this air sample (e.g., Total VOCs).

2. **Top 5:** listing of the five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds (see below for a description of TO17 and Semiquantitative Compounds).

3. **TO17 Compounds:** listing of the chemical compounds characterized by EPA method TO17. Some of these are Hazardous Air Pollutants (HAPs) and others are typical of industrial/manufacturing sources. Accuracy for TO17 compounds is within ±15%.

4. **Semiquantitative Compounds:** listing of chemical compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence of identification. Also listed in this section are compounds that are not specificially identified but for which some information is available (e.g., C10-C12 Hydrocarbons; probably an alcohol). Instrument and media response have not been confirmed for most chemical compounds reported semiquantitatively, conferring an accuracy on the order of ±50% based on an instrument and media response of unity. Semiquantitative results should be interpreted relative to other chemical compounds.

5. **Supplemental Information: Odorants:** listing of the odor characteristics of chemical compounds present in this air sample. Almost all chemical compounds have an odor and a mixture of various chemical compounds could alter the odor characteristics. Some chemical compounds have a strong odor at relatively low concentrations so the individual chemical compound concentrations may be of secondary importance relative to the odor characteristics for odor concerns.

6. **Supplemental Information: EPA Hazardous Air Pollutants (HAPs):** listing of the chemical compounds detected in this air sample that are known or suspected to have serious health or environmental effects (also known as air toxics). HAPs include VOCs, metals, some pesticides/insecticides that are primarily semi-volatile, inorganic compounds, and very volatile organic compounds. Of the 187 compounds or groups defined as HAPs, approximately 65 are VOCs that can be detected with this analysis.

7. **Additional Information:** definitions, calculations, and other useful information.

Sample Summary

General information regarding the sample and aggregate concentrations, e.g., Total VOCs, are listed below. The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are also listed. The full list of compounds and their concentrations in this air sample are listed later in the report and may be displayed more than once depending on the categorization of specific compounds.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total VOCs	470	200	Total volatile organic compounds calculated based on internal standard ratio; does not include C1, C2, or methanol.

Compound	Sample Concentration ng/L	Reporting Limit ng/L	Additional Information
Total Mold VOCs (TMVOC)	6	3	TMVOC is an assessment of the quantity of actively growing mold in the sample location.

Top 5

The top five highest concentration compounds in the air sample from both the quantitative TO17 and Semiquantitative Compounds are listed below.

Semiquantitative Compounds

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Pentane (C 5)	109-66-0	10	3	2	473	
Butane (C 4)	106-97-8	9	4	2	382	
2-Methylbutane	78-78-4	6	2	2	446	

EPA Method TO-17

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
Ethanol	64-17-5	30	16	1.0	480	
Acetone	67-64-1	10	4.3	0.5	509	

TO17 Compounds

EPA Method TO17 focuses on chemical compounds that are typical of industrial/manufacturing sources, many of these compounds are also found in commercial and residential environments. Accuracy for these chemical compounds is within ±15%.

This section lists all the TO17 compounds in alphabetical order (compounds not present or with concentrations below the reporting limit are listed with '<'; compounds above the reporting limit have bold text for the Sample Concentration). The concentrations are reported in two different units for easy comparison to exposure limits or other information. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of reporting units and RI can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Acetone	67-64-1	**10**	**4.3**	0.5	509	
Acetonitrile	75-05-8	< 0.2	< 0.1	0.2	522	
Acrylonitrile	107-13-1	< 0.1	< 0.05	0.1	543	
Benzene	71-43-2	**0.3**	**0.09**	0.1	631	
Bromobenzene	108-86-1	< 0.1	< 0.02	0.1	866	
Bromochloromethane	74-97-5	< 0.1	< 0.02	0.1	603	
Bromodichloromethane	75-27-4	< 0.1	< 0.02	0.1	682	
Bromoform	75-25-2	< 0.1	< 0.01	0.1	837	
1,3-Butadiene	106-99-0	< 0.1	< 0.05	0.1	389	
tert-Butylbenzene	98-06-6	< 0.1	< 0.02	0.1	900	
sec-Butylbenzene	135-98-8	< 0.1	< 0.02	0.1	914	
n-Butylbenzene	104-51-8	< 0.1	< 0.02	0.1	949	
Carbon Disulfide	75-15-0	< 0.1	< 0.03	0.1	520	
Carbon Tetrachloride	56-23-5	**0.5**	**0.08**	0.1	623	
Chlorobenzene	108-90-7	< 0.1	< 0.02	0.1	791	
Chlorodibromomethane	124-48-1	< 0.1	< 0.01	0.1	759	
2-Chloroethanol	107-07-3	**0.2**	**0.06**	0.1	675	
Chloroform	67-66-3	**0.1**	**0.02**	0.1	608	
Chloroprene	126-99-8	< 0.1	< 0.03	0.1	571	
3-Chloropropene	107-05-1	< 0.1	< 0.03	0.1	527	
4-Chlorotoluene	106-43-4	< 0.1	< 0.02	0.1	883	
2-Chlorotoluene	95-49-8	< 0.1	< 0.02	0.1	877	
Cyclohexane	110-82-7	**0.3**	**0.09**	0.1	620	
1,2-Dibromo-3-chloropropane	96-12-8	< 0.2	< 0.02	0.2	991	

Client Sample ID: Hall o/s Little Theatre
Laboratory ID: 100195-9

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
1,2-Dibromoethane	106-93-4	< 0.1	< 0.01	0.1	766	
Dibromomethane	74-95-3	< 0.1	< 0.01	0.1	674	
trans 1,4-Dichloro-2-butene	110-57-6	**0.1**	**0.02**	0.1	865	
cis 1,4-Dichloro-2-butene	1476-11-5	< 0.1	< 0.02	0.1	848	
1,2-Dichlorobenzene	95-50-1	< 0.1	< 0.02	0.1	951	
1,3-Dichlorobenzene	541-73-1	< 0.1	< 0.02	0.1	923	
1,4-Dichlorobenzene	106-46-7	**0.1**	**0.02**	0.1	930	
1,1-Dichloroethane	75-34-3	< 0.1	< 0.03	0.1	567	
1,2-Dichloroethane	107-06-2	< 0.1	< 0.03	0.1	633	
cis 1,2-Dichloroethene	156-59-2	< 0.1	< 0.03	0.1	593	
trans 1,2-Dichloroethene	156-60-5	< 0.1	< 0.03	0.1	548	
1,1-Dichloroethene	75-35-4	< 0.1	< 0.03	0.1	508	
2,2-Dichloropropane	594-20-7	< 0.1	< 0.02	0.1	593	
1,2-Dichloropropane	78-87-5	< 0.1	< 0.02	0.1	670	
1,3-Dichloropropane	142-28-9	< 0.1	< 0.02	0.1	748	
trans 1,3-Dichloropropene	10061-02-6	< 0.1	< 0.02	0.1	729	
1,1-Dichloropropene	563-58-6	< 0.1	< 0.02	0.1	623	
cis 1,3-Dichloropropene	10061-01-5	< 0.1	< 0.02	0.1	701	
Diethyl ether	60-29-7	< 0.1	< 0.03	0.1	493	
1,4-Dioxane	123-91-1	< 0.2	< 0.06	0.2	673	
Ethanol	64-17-5	**30**	**16**	1.0	480	
Ethylacetate	141-78-6	**0.2**	**0.05**	0.1	594	
Ethylbenzene	100-41-4	**0.3**	**0.07**	0.1	795	
Ethylmethacrylate	97-63-2	< 0.1	< 0.02	0.1	731	
4-Ethyltoluene	622-96-8	**0.1**	**0.03**	0.1	878	
Hexachlorobutadiene	87-68-3	< 0.1	< 0.01	0.1	1036	
Hexane (C 6)	110-54-3	**0.6**	**0.2**	0.1	562	
Isooctane	540-84-1	**0.2**	**0.04**	0.1	638	2,2,4-Trimethylpentane
Isopropanol	67-63-0	**5.0**	**2.0**	0.5	517	
Isopropylbenzene	98-82-8	< 0.1	< 0.02	0.1	846	

Client Sample ID: Hall o/s Little Theatre
Laboratory ID: 100195-9

Compound	CAS	Sample Concentration ng/L	Sample Concentration ppb	Reporting Limit ng/L	RI	Additional Information
p-Isopropyltoluene	99-87-6	< 0.1	< 0.02	0.1	924	
Methacrylonitrile	126-98-7	< 0.1	< 0.04	0.1	600	
Methyl methacrylate	80-62-6	< 0.1	< 0.03	0.1	672	
Methyl Tertiary Butyl Ether	1634-04-4	< 0.1	< 0.03	0.1	547	MTBE
2-Methyl-1-propanol	78-83-1	< 0.1	< 0.03	0.1		Isobutyl alcohol
4-Methyl-2-pentanone	108-10-1	**1.0**	**0.2**	0.1	707	Methyl isobutyl ketone (MIBK)
Methylacrylate	96-33-3	< 0.1	< 0.03	0.1	595	
Methylene Chloride	75-09-2	**0.3**	**0.08**	0.1	533	
2-Methylnaphthalene	91-57-6	< 0.2	< 0.04	0.2	1095	
Naphthalene	91-20-3	< 0.2	< 0.04	0.2	1042	
Nitrobenzene	98-95-3	< 0.4	< 0.08	0.4	999	
Pentachloroethane	76-01-7	< 0.1	< 0.01	0.1	902	
Propionitrile	107-12-0	< 0.1	< 0.05	0.1	593	
n-Propylbenzene	103-65-1	< 0.1	< 0.02	0.1	871	
Styrene	100-42-5	< 0.1	< 0.02	0.1	825	
1,1,2,2-Tetrachloroethane	79-34-5	< 0.1	< 0.02	0.1	863	
1,1,1,2-Tetrachloroethane	630-20-6	< 0.1	< 0.02	0.1	794	
Tetrachloroethene	127-18-4	< 0.1	< 0.02	0.1	746	
Tetrahydrofuran	109-99-9	**0.1**	**0.05**	0.1	604	
Toluene	108-88-3	**1.2**	**0.3**	0.1	719	
1,1,2-Trichloro-1,2,2-trifluoroethane	76-13-1	**0.6**	**0.07**	0.1	510	
1,2,4-Trichlorobenzene	120-82-1	< 0.1	< 0.01	0.1	1030	
1,2,3-Trichlorobenzene	87-61-6	< 0.1	< 0.01	0.1	1052	
1,1,2-Trichloroethane	79-00-5	< 0.1	< 0.02	0.1	739	
1,1,1-Trichloroethane	71-55-6	< 0.1	< 0.02	0.1	616	
Trichloroethene	79-01-6	< 0.1	< 0.02	0.1	660	
1,2,3-Trichloropropane	96-18-4	< 0.1	< 0.02	0.1	867	
1,3,5-Trimethylbenzene	108-67-8	**0.1**	**0.03**	0.1	881	
1,2,4-Trimethylbenzene	95-63-6	**0.7**	**0.1**	0.1	903	
m,p-Xylene	108-38-3; 106-42-3	**0.9**	**0.2**	0.2	802	

Client Sample ID: Hall o/s Little Theatre
Laboratory ID: 100195-9

Compound	CAS	Sample Concentration		Reporting Limit	RI	Additional Information
		ng/L	ppb	ng/L		
o-Xylene	95-47-6	**0.3**	**0.08**	0.1	825	

Semiquantitative Compounds

Semiquantitative data includes compounds that have not been calibrated but have some reference information indicating the validity of the compound identification, an acceptable reference library match, or some other supporting evidence as part of the extensive Prism compound database.

This section lists the Semiquantitative compounds detected in this air sample above the reporting limit in alphabetical order. The concentrations are reported in two different units for easy comparison to exposure limits or other information. Note that the conversion to ppb requires the molecular weight of the chemical compound so those compounds that are non-specific (e.g., C10-C12 Hydrocarbon) do not have a concentration in ppb listed. The Retention Index (RI) indicates volatility relative to adjacent n-alkanes. A more detailed description of these terms can be found at the end of the report.

		Sample Concentration		Reporting Limit		
Compound	CAS	ng/L	ppb	ng/L	RI	Additional Information
Butane (C 4)	106-97-8	9	4	2	382	
Diethylene glycol ethyl ether	111-90-0	4	0.6	2	921	DEGMEE; Carbitol
Dipropylene glycol methyl ether	13588-28-8; 34590-94-8	6	1	2	911	DPGME
Methyl ethyl ketone	78-93-3	3	1	2	590	
2-Methylbutane	78-78-4	6	2	2	446	
Pentane (C 5)	109-66-0	10	3	2	473	
2-Pentanone	107-87-9	3	0.9	2	664	
Propylene glycol	57-55-6	2	0.7	2	746	
Texanol-B	74367-34-3	3	0.4	2	1127	

These results pertain only to this sample as it was collected and to the items reported.
These results have been reviewed and approved by the Laboratory Director or authorized representative.

Alice E. Delia, Ph.D., Laboratory Director

Enthalpy Analytical, LLC (MTP)
2625 Denison Dr.
Mt. Pleasant, MI 48858
989-772-5088

Supplemental Information: Odorants

Many chemical compounds have odors associated with them, some pleasant and some unpleasant. These odors can combine to create different odors, making odor identification more difficult. The odor descriptions for the compounds reported in this air sample are listed below as well as some of the more common sources.

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
Acetone	67-64-1	10	4.3	400 - 11,745,000	sweet, fruity, etherous
Benzene	71-43-2	0.3	0.09	470 - 313,000	aromatic, sweet, solvent, empyreumatic
Butane (C 4)	106-97-8	9	4	421 - 5,048,000	natural gas
Carbon Tetrachloride	56-23-5	0.5	0.08	1,680 - 720,000	sweet, ethereal, dry cleaner, aromatic
2-Chloroethanol	107-07-3	0.2	0.06	360 -	ethereal
Chloroform	67-66-3	0.1	0.02	102 - 1,413,000	sweet, etherous, suffocating
Cyclohexane	110-82-7	0.3	0.09	520 - 784,000	aromatic, chloroform, pungent, sweet
1,4-Dichlorobenzene	106-46-7	0.1	0.02	121 - 15,000	camphor, mothballs
Diethylene glycol ethyl ether	111-90-0	4	0.6	200 - 1,090	ethereal, mild, pleasant
Ethanol	64-17-5	30	16	90 - 40,334,000	vinous, alcohol
Ethylacetate	141-78-6	0.2	0.05	90 - 190,000	fruity, sweet, fingernail polish, etherous
Ethylbenzene	100-41-4	0.3	0.07	2 - 18,000	oily, solvent
Hexane (C 6)	110-54-3	0.6	0.2	1,500 - 248,000	gasoline
Isopropanol	67-63-0	5.0	2.0	1,000 - 2,197,000	sharp, rubbing alcohol
Methyl ethyl ketone	78-93-3	3	1	70 - 339,000	sweet, sharp
4-Methyl-2-pentanone	108-10-1	1.0	0.2	30 - 16,000	camphor, dairy, fruity, green, herbal, pleasant, sharp, solvent, spicy, sweet
Methylene Chloride	75-09-2	0.3	0.08	1,200 - 440,000	sweet
Pentane (C 5)	109-66-0	10	3	1,290 - 1,147,000	sweet
2-Pentanone	107-87-9	3	0.9	28 - 65,000	fingernail polish
Propylene glycol	57-55-6	2	0.7	5,140 -	-
Tetrahydrofuran	109-99-9	0.1	0.05	92 - 61,000	ether
Toluene	108-88-3	1.2	0.3	21 - 157,000	sour, burnt
1,3,5-Trimethylbenzene	108-67-8	0.1	0.03	6 - 2,400	aromatic
1,2,4-Trimethylbenzene	95-63-6	0.7	0.1	6 - 2,400	aromatic

Client Sample ID: Hall o/s Little Theatre
Laboratory ID: 100195-9

Compound	CAS	Conc. (ng/L)	Conc. (ppb)	Odor Range (ppb)	Odor Description
m,p-Xylene	108-38-3; 106-42-3	0.9	0.2	12 - 316,000	sweet, empyreumatic
o-Xylene	95-47-6	0.3	0.08	12 - 316,000	sweet, empyreumatic

Supplemental Information: EPA Hazardous Air Pollutants (HAPs)

Hazardous air pollutants, also known as toxic air pollutants or air toxics, are those pollutants that are known or suspected to cause cancer or other serious health effects, such as reproductive effects or birth defects, or adverse environmental effects. Of the 187 compounds or groups defined as HAPs, approximately 65 can be detected with this analysis. Listed below are those HAPs that were detected in this air sample. For more information about HAPs visit the EPA Air Toxics website. The exposure limits listed below can also be found in the NIOSH Guide to Chemical Hazards.

Compound	CAS	Conc. (ng/L)	NIOSH TWA REL	Potential Health Effects
Benzene	71-43-2	0.3	320 ng/L (100 ppb)	Gasoline. Less common sources include some discontinued solvents; printing and lithography; paints and coatings; rubber; dry cleaning; adhesives; detergents
Carbon Tetrachloride	56-23-5	0.5	Carcinogen	Solvent; metal degreasing; refrigerant; agricultural fumigant; fire retardant (former use)
Chloroform	67-66-3	0.1	Carcinogen	Formed during the chlorination of drinking water, wastewater and swimming pools. Also pulp and paper mills, hazardous waste sites, and sanitary landfills
1,4-Dichlorobenzene	106-46-7	0.1	Carcinogen	Moth balls/crystals; room deodorant
Ethylbenzene	100-41-4	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; solvent; pesticide
Methylene Chloride	75-09-2	0.3	Carcinogen	Automotive products; degreasing solvent; paint stripper; adhesive remover; aerosol propellant; insecticide
Toluene	108-88-3	1.2	375,000 ng/L (100,000 ppb)	Gasoline; adhesives (building and arts/crafts); contact cement; solvent; heavy duty cleaner
m,p-Xylene	108-38-3; 106-42-3	0.9	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges
o-Xylene	95-47-6	0.3	435,000 ng/L (100,000 ppb)	Gasoline; paints and coatings; adhesives and cements; solvent; print cartridges

Additional Information

Glossary of Terms

Total VOCs (TVOC): TVOC is one of the quality indicators. It allows comparison of multiple samples with each other or with target l
The following formula depicts the calcul $TVOC\ (\frac{ng}{L}) = \frac{\left[\frac{(A_s - A_b) \times W_s}{A_i}\right]}{L_s}$ Typically, TVOC includes compounds that contain between 3 and 15 carbon atoms (along with the associated hydrogen, as well as oxygen, nitrogen, sulfur, silicon, etc.), although certain compounds outside this range of carbon atoms may be included depending on the type of compound.

Where:
As – C3-C15 TIC (Total Ion Chromatogram from GC-MS) area of the sample
Ab – C3-C15 TIC area of the media blank
Ws – Weight of the internal standard added in ng
Ai – average TIC area of the internal standard peak(s)
Ls – Volume of the sample in L

CAS: The Chemical Abstract Service (CAS) assigns a unique number to chemical compounds, commonly referred to as the CAS number. This number is usually the best way to search for additional information about the compound since some compounds may have many names but only one CAS number.

Reporting Units - ng/L: Most concentrations for air samples will be reported in units of ng/L, which translates to ng of that specific chemical compound present per liter of air sampled. Concentration in ng/L is equivalent to μg/m³.

Reporting Units - ppb: Some sections o h compound concentrations displayed in units of ppb (parts per billion), which are or reference limits. The concentration in ng/L (or μg/m³ can be converted easily $Conc\ (ppb) = \frac{Conc\ (\frac{ng}{L}) \times 24.04(\frac{L}{mol})}{MW\ (\frac{g}{mol})}$ lerived from the Ideal Gas Law.

Where:
Vm = Molar Volume as 24.04 L/mol at 1 atm pressure and 20 °C (68 °F)
MW = Molecular Weight in g/mol

Reporting Limit: The Reporting Limit column displays the lowest possible concentration that could be reported for that compound for that sample and analysis. Typically the reporting limit is displayed in units of ng/L but other units may be used as appropriate.

Retention Index (RI): The retention index is a means of converting a compound GC-MS retention time, which is dependent on the type of system and specific operating parameters, into an independent and universal value based on the elution of the adjacent n-alkanes. Each n-alkane is assigned a retention index based on its carbon number, e.g., pentane (C5) has a retention index of 500 and hexane (C6) has a retention index of 600, etc. For example, a hydrocarbon with a retention index of 550 would be expected to elute at the midpoint between pentane and hexane. Using the elution of the n-alkanes as the reference point allows the resulting retention index of organic compounds to be applicable across almost any GC-MS ion index, which is most applicable to the GC-MS instruments used by Prism, car $RI_x = 100n + 100 \times \frac{(RT_x - RT_n)}{(RT_{n+1} - RT_n)}$ ormula derived from the Kovats isothermal retention index.

Where:
RIx – retention index of target compound x
n – Carbon number of n-alkane eluting before the target compound x
RTx – retention time of target compound x
RTn – retention time of n-alkane eluting before target compound x

RTn+1 – retention time of n-alkane eluting after target compound x

Odor Description: Description of the odor (e.g., fruity)

HAPs: Hazardous Air Pollutants

NIOSH: National Institute for Occupational Safety and Health

TWA: Time Weighted Average

REL: Recommended Exposure Limit

Ca: Potential carcinogen

Sources for Additional Compound Information:
The compound information displayed in this report (e.g., odor description, exposure limits, etc.) is gathered from a variety of sources, including but not limited to, the NIST Chemistry Webbook, the NIOSH Pocket Guide to Chemical Hazards, the Household Products Database, the University of Akron Chemical Database, the WISER (for Emergency Responders), IRIS, ToxNet, ATSDR. Prism does not guarantee the accuracy of this information or endorse any of the views or opinions expressed.

APPENDIX D

DATA TABLES

TABLE 1.

COMPARISON OF TOP FIVE VOC SAMPLING RESULTS MARCH 30, 2022 vs. MAY 2, 2022

Table 1. Comparison of Top Five VOC Sampling Results March 30, 2022 vs. May 2, 2022

Compound	Room 7		Room 10		Room 3		Room 4		Room 26		SE Hallway between Rooms 36 & 37		Room 31		Room 14		Hall Outside of Little Theater	
	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2
TO-17 Compounds																		
Acetone	61.00	29.00	62.00	33.00	49.00	26.00	48.00	24.00	49.00	44.00	46.00	36.00	45.00	< 0.5	60.00	34.00	19.00	10.00
Ethanol	1,500.00	510.00	1,400.00	770.00	790.00	400.00	1,100.00	440.00	720.00	860.00	820.00	370.00	670.00	5.90	970.00	630.00	260.00	30.00
Ethylacetate	4.60	3.00	3.40	4.10	2.30	2.80	4.80	2.80	2.00	18.00	2.30	4.80	1.90	< 0.1	2.30	3.90	0.80	0.20
Isopropanol	150.00	53.00	120.00	68.00	130.00	36.00	110.00	35.00	44.00	72.00	45.00	46.00	49.00	< 0.1	100.00	55.00	11.00	5.00
SEMI QUANTITATIVE COMPOUNDS																		
Acetaldehyde	60.00	19.00	60.00	23.00	22.00	13.00	33.00	21.00	20.00	25.00	26.00	13.00	52.00	< 2.0	22.00	15.00	< 4.0	< 2.0
Butane (C 4)	10.00	9.00	10.00	11.00	10.00	9.00	13.00	8.00	5.00	15.00	5.00	10.00	7.00	< 2.0	7.00	10.00	29.00	9.00
C8-C10 Hydrocarbon	< 4.0	3.00	< 4.0	4.00	< 4.0	3.00	< 4.0	2.00	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	3.00	< 4.0	< 2.0	< 4.0	< 2.0
Dipropylene glycol methyl ether	420.00	210.00	450.00	290.00	240.00	120.00	320.00	130.00	270.00	320.00	190.00	140.00	330.00	< 2.0	300.00	190.00	15.00	6.00
Ethylene Glycol	57.00	41.00	53.00	36.00	73.00	51.00	58.00	36.00	43.00	39.00	91.00	78.00	41.00	< 2.0	56.00	41.00	< 4.0	< 2.0
Hexyl Cellosolve	< 4.0	7.00	< 4.0	11.00	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	6.00	< 4.0	< 2.0	< 4.0	8.00	< 4.0	< 2.0	< 4.0	< 2.0
2-Methylbutane	6.00	4.00	5.00	2.00	5.00	3.00	6.00	3.00	< 4.0	8.00	< 4.0	3.00	< 4.0	< 2.0	5.00	4.00	4.00	6.00
Pentane (C 5)	23.00	19.00	25.00	22.00	18.00	16.00	17.00	14.00	27.00	21.00	22.00	12.00	22.00	< 2.0	29.00	18.00	8.00	10.00
Texanol-A	200.00	97.00	240.00	130.00	220.00	130.00	260.00	130.00	170.00	110.00	130.00	77.00	220.00	< 2.0	300.00	160.00	9.00	< 2.0
Texanol-B	250.00	120.00	300.00	160.00	280.00	160.00	330.00	160.00	230.00	130.00	170.00	93.00	270.00	< 2.0	390.00	190.00	19.00	3.00

TABLE 2.

COMPARISON OF SAMPLING RESULTS FROM MARCH 30, 2022 vs. MAY 2, 2022

Table 2. Comparison of Sampling Results from March 30, 2022 vs. May 2, 2022 (ng/L)

Compound	Room 7		Room 10		Room 3		Room 4		Room 26		SE Hallway between Rooms 36 & 37		Room 31		Room 14		Hall Outside of Little Theater	
	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2	3/30	5/2	3/30	3/30
TO-17 Compounds																		
Acetone	61.0	29.0	62.0	33.0	49.0	26.0	48.0	24.0	49.0	44.0	46.0	36.0	45.0	< 0.5	60.0	34.0	19.0	10.0
Acetonitrile	0.5	< 0.2	0.6	< 0.2	< 0.4	< 0.2	0.6	0.2	< 0.4	0.4	< 0.4	< 0.2	< 0.4	< 0.2	< 0.4	< 0.2	< 0.4	< 0.2
Benzene	0.4	0.2	0.4	0.2	0.4	0.3	0.4	0.3	0.4	0.3	0.4	0.2	0.3	< 0.1	0.4	0.3	0.4	0.3
Carbon Disulfide	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.2	< 0.2	0.1	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1
Carbon Tetrachloride	0.7	0.5	0.7	0.6	0.7	0.6	0.7	0.5	0.9	0.8	1.4	1.2	0.8	< 0.1	0.8	0.6	0.5	0.5
2-Chloroethanol	< 0.2	0.4	< 0.2	0.6	< 0.2	0.3	< 0.2	0.3	< 0.2	0.7	< 0.2	0.4	< 0.2	< 0.1	< 0.2	0.6	< 0.2	0.2
Chloroform	0.3	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.2	0.3	0.2	0.2	< 0.2	< 0.1	0.3	0.2	< 0.2	0.1
Cyclohexane	0.3	0.1	0.3	0.2	0.3	0.2	0.3	0.1	0.2	0.6	0.3	0.3	0.2	< 0.1	0.3	0.3	0.2	0.3
trans 1,4-Dichloro-2-butene	< 0.2	0.3	< 0.2	0.4	< 0.2	0.3	< 0.2	0.3	< 0.2	0.4	< 0.2	0.3	< 0.2	< 0.1	< 0.2	0.4	< 0.2	0.1
cis 1,4-Dichloro-2-butene	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1
1,4-Dichlorobenzene	2.9	0.8	3.1	1.0	2.5	0.7	2.3	0.6	3.5	1.7	4.4	1.5	4.3	< 0.1	3.1	1.0	0.5	0.1
1,2-Dichloroethane	< 0.2	0.1	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1	< 0.2	0.2	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1
1,2-Dichloropropane	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.3	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1
1,4-Dioxane	< 0.4	< 0.2	< 0.4	< 0.2	< 0.4	< 0.2	< 0.4	0.2	< 0.4	< 0.2	< 0.4	< 0.2	< 0.4	< 0.2	< 0.4	< 0.2	< 0.4	< 0.2
Ethanol	1500.0	510.0	1400.0	770.0	790.0	400.0	1100.0	440.0	720.0	860.0	820.0	370.0	670.0	5.9	970.0	630.0	260.0	30.0
Ethylacetate	4.6	3.0	3.4	4.1	2.3	2.8	4.8	2.8	2.0	18	2.3	4.8	1.9	< 0.1	2.3	3.9	0.8	0.2
Ethylbenzene	0.4	0.2	0.4	0.3	0.4	0.3	0.4	0.2	0.3	0.4	0.3	0.3	0.3	< 0.1	0.4	0.3	0.3	0.3
4-Ethyltoluene	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1
Hexane (C 6)	0.8	0.5	0.8	0.6	0.8	0.5	0.8	0.4	0.8	1.1	1.5	1.4	1.1	< 0.1	0.8	0.6	0.5	0.6
Isooctane	< 0.2	0.1	< 0.2	0.2	< 0.2	0.2	< 0.2	0.1	< 0.2	0.6	< 0.2	0.2	< 0.2	< 0.1	< 0.2	0.2	< 0.2	0.2
Isopropanol	150.0	53.0	120.0	68.0	130.0	36.0	110.0	35.0	44.0	72.0	45.0	46.0	49.0	< 0.1	100.0	55.0	11.0	5.0
Isopropylbenzene	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1
p-Isopropyltoluene	0.5	0.3	0.6	0.4	0.4	0.2	0.4	0.2	0.5	0.4	0.3	0.2	0.4	< 0.1	0.5	0.3	0.3	< 0.1
2-Methyl-1-propanol	< 0.2	0.7	< 0.2	0.7	0.9	0.6	0.8	0.5	< 0.2	0.8	< 0.2	0.8	1.0	< 0.1	0.8	0.7	0.8	< 0.1
4-Methyl-2-pentanone	1.6	1.0	2.2	1.1	1.3	0.8	1.3	0.7	2.9	1.9	1.1	1.2	1.3	< 0.1	1.9	1.0	1.0	1.0
Methylene Chloride	0.5	0.3	0.4	0.4	0.5	0.4	0.5	0.3	0.6	0.6	0.9	1.1	0.6	< 0.1	0.5	0.4	0.3	0.3
Naphthalene	< 0.4	0.3	< 0.4	0.3	< 0.4	0.2	< 0.4	0.2	0.4	0.4	0.7	0.8	0.5	< 0.2	< 0.4	0.3	< 0.4	< 0.2
n-Propylbenzene	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1
Styrene	0.5	0.4	0.5	0.5	0.5	0.5	0.6	0.4	0.4	0.7	0.4	0.4	0.4	< 0.1	0.5	0.5	< 0.2	< 0.1
Tetrachloroethene	< 0.2	0.2	< 0.2	0.2	< 0.2	0.1	< 0.2	0.2	< 0.2	0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1
Tetrahydrofuran	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1
Toluene	3.4	3.1	3.3	3.5	3.1	4.3	3.6	3.6	3.1	6.6	3.6	3.2	3.3	< 0.1	3.3	3.3	1.3	1.2
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5	0.5	0.5	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	< 0.1	0.6	0.5	0.6	0.6
1,1,2-Trichloroethane	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1
Trichloroethene	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1
1,3,5-Trimethylbenzene	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	< 0.1	< 0.2	0.1
1,2,4-Trimethylbenzene	< 0.2	1.7	< 0.2	2.2	< 0.2	1.7	< 0.2	1.7	< 0.2	2.6	< 0.2	1.7	< 0.2	< 0.1	< 0.2	2.0	0.2	0.7
m,p-Xylene	1.1	0.7	1.1	0.7	0.9	0.8	1.1	0.7	0.9	1.3	1.0	1.0	1.0	< 0.2	1.0	0.7	0.8	0.9
o-Xylene	0.4	0.2	0.4	0.3	0.3	0.3	0.4	0.2	0.3	0.5	0.3	0.3	0.3	< 0.1	0.3	0.3	0.3	0.3
SEMI QUANTITATIVE COMPOUNDS																		
2,6-Dimethyl-7-octen-2-ol	7.0	3.0	8.0	3.0	5.0	2.0	4.0	< 2.0	6.0	5.0	4.0	3.0	6.0	< 2.0	7.0	4.0	< 4.0	< 2.0
Acetaldehyde	60.0	19.0	60.0	23.0	22.0	13.0	33.0	21.0	20.0	25.0	26.0	13.0	52.0	< 2.0	22.0	15.0	< 4.0	< 2.0
Acetic Acid	< 4.0	3.0	< 4.0	4.0	< 4.0	4.0	< 4.0	4.0	< 4.0	4.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	4.0	< 4.0	< 2.0
Acetophenone	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	3.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0
Benzaldehyde	7.0	4.0	7.0	6.0	5.0	4.0	6.0	4.0	5.0	7.0	5.0	4.0	7.0	< 2.0	6.0	5.0	< 4.0	< 2.0
Butane (C 4)	10.0	9.0	10.0	11.0	10.0	9.0	13.0	8.0	5.0	15.0	5.0	10.0	7.0	< 2.0	7.0	10.0	29.0	9.0
1-Butanol	30.0	12.0	30.0	16.0	23.0	12.0	36.0	12.0	22.0	20.0	17.0	16.0	15.0	< 2.0	26.0	14.0	< 4.0	< 2.0
1-Butoxy-2-propanol	4.0	3.0	< 4.0	3.0	< 4.0	2.0	5.0	2.0	< 4.0	4.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0
2-Butoxyethanol	22.0	14.0	24.0	19.0	17.0	13.0	26.0	13.0	16.0	26.0	13.0	17.0	23.0	< 2.0	24.0	23.0	< 4.0	< 2.0
Butoxyethoxyethanol	45.0	27.0	42.0	35.0	17.0	12.0	18.0	11.0	29.0	42.0	16.0	14.0	40.0	< 2.0	34.0	30.0	< 4.0	< 2.0
4-tert-Butylcyclohexyl acetate	5.0	3.0	6.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	5.0	4.0	< 4.0	< 2.0	< 4.0	< 2.0	5.0	3.0	< 4.0	< 2.0
C5-C7 Hydrocarbon	< 4.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0
C8-C10 Hydrocarbon	< 4.0	3.0	< 4.0	4.0	< 4.0	3.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0	< 4.0	< 2.0
C11-C13 - Hydrocarbon	< 4.0	< 2.0	< 4.0	< 4.0	< 2.0	< 4.0	< 4.0	< 4.0	< 4.0	3.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0
C12-C14 Hydrocarbon[1]	8.0	< 2.0	10.0	3.0	7.0	< 2.0	5.0	< 2.0	7.0	< 2.0	6.0	< 2.0	6.0	< 2.0	9.0	< 2.0	< 4.0	< 2.0
C12-C14 Hydrocarbon[2]	< 4.0	< 2.0	5.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0
C13-C15 Hydrocarbon	< 4.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0
C14-C16 Hydrocarbon	< 4.0	2.0	< 4.0	2.0	4.0	3.0	< 4.0	2.0	< 4.0	< 2.0	10.0	10.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0
C7-C9 Hydrocarbon	10.0	7.0	10.0	9.0	9.0	7.0	11.0	8.0	7.0	15.0	6.0	9.0	8.0	< 2.0	8.0	8.0	< 4.0	< 2.0
Decanal	< 4.0	6.0	6.0	7.0	5.0	< 2.0	< 4.0	< 2.0	7.0	6.0	9.0	4.0	14.0	< 2.0	7.0	< 2.0	< 4.0	< 2.0
Diethylene glycol	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	< 2.0
Diethylene glycol ethyl ether	29.0	11.0	15.0	16.0	11.0	9.0	8.0	8.0	9.0	23.0	9.0	12.0	23.0	< 2.0	21.0	18.0	< 4.0	4.0
Dipropylene glycol methyl ether	420.0	210.0	450.0	290.0	240.0	120.0	320.0	130.0	270.0	320.0	190.0	140.0	330.0	< 2.0	300.0	190.0	15.0	6.0
Dodecamethylcyclohexasiloxane (D6)	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	4.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0
Dodecane (C 12)	8.0	5.0	8.0	7.0	6.0	4.0	7.0	4.0	6.0	7.0	5.0	5.0	8.0	< 2.0	7.0	6.0	< 4.0	< 2.0
2-Ethyl-1-hexanol	18.0	14.0	18.0	16.0	19.0	15.0	18.0	13.0	15.0	19.0	15.0	17.0	18.0	< 2.0	18.0	17.0	< 4.0	< 2.0
Ethylene Glycol	57.0	41.0	53.0	36.0	73.0	51.0	58.0	36.0	43.0	39.0	91.0	78.0	41.0	< 2.0	56.0	41.0	< 4.0	< 2.0
2-Ethylhexylacetate	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0
4-Hydroxyl-4-methyl-2-pentanone	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0
Hexamethylcyclotrisiloxane (D3)	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0
Hexyl Cellosolve	< 4.0	7.0	< 4.0	11.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	6.0	< 4.0	< 2.0	< 4.0	8.0	< 4.0	< 2.0	< 4.0	< 2.0
Isobutane	10.0	3.0	9.0	3.0	10.0	2.0	9.0	2.0	4.0	5.0	5.0	3.0	5.0	< 2.0	6.0	3.0	9.0	< 2.0
Isohexadecane	7.0	< 2.0	7.0	2.0	6.0	< 2.0	5.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0	< 4.0	< 2.0	7.0	2.0	< 4.0	< 2.0
Isoprene	7.0	3.0	8.0	3.0	6.0	2.0	4.0	< 2.0	7.0	6.0	6.0	3.0	< 4.0	< 2.0	9.0	4.0	< 4.0	< 2.0
Limonene	50.0	17.0	70.0	23.0	23.0	9.0	22.0	9.0	25.0	19.0	17.0	12.0	21.0	< 2.0	42.0	23.0	8.0	< 2.0
Menthol	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	4.0	5.0	2.0	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0
Methoxy-2-propanol	7.0	< 2.0	7.0	2.0	6.0	< 2.0	6.0	< 2.0	7.0	4.0	6.0	2.0	5.0	< 2.0	10.0	2.0	< 4.0	< 2.0
Methyl ethyl ketone	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	3.0
2-Methylbutane	6.0	4.0	5.0	2.0	5.0	3.0	6.0	3.0	< 4.0	8.0	< 4.0	3.0	< 4.0	< 2.0	5.0	4.0	4.0	6.0
Nonanal	5.0	7.0	5.0	9.0	< 4.0	7.0	6.0	6.0	< 4.0	8.0	5.0	6.0	13.0	< 2.0	< 4.0	7.0	< 4.0	< 2.0
Octamethylcyclotetrasiloxane (D4)	5.0	< 2.0	6.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	5.0	< 2.0	< 4.0	< 2.0
Pentane (C 5)	23.0	19.0	25.0	22.0	18.0	16.0	17.0	14.0	27.0	21.0	22.0	12.0	22.0	< 2.0	29.0	18.0	8.0	10.0
1-Propoxy-2-Proponal	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0
1-Propanol	7.0	2.0	6.0	2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	4.0	< 4.0	6.0	< 4.0	< 2.0	< 4.0	3.0	< 4.0	< 2.0
2-Pentanone	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	3.0
n-Propylacetate	7.0	5.0	9.0	6.0	5.0	4.0	< 4.0	3.0	< 4.0	9.0	< 4.0	5.0	< 4.0	< 2.0	15.0	6.0	< 4.0	< 2.0
Propylene glycol	14.0	9.0	14.0	10.0	13.0	11.0	8.0	7.0	14.0	12.0	16.0	12.0	12.0	< 2.0	14.0	10.0	< 4.0	2.0
Tetradecane (C 14)	6.0	3.0	5.0	4.0	< 4.0	3.0	< 4.0	3.0	4.0	4.0	4.0	3.0	5.0	< 2.0	5.0	4.0	< 4.0	< 2.0
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	34.0	37.0	47.0	42.0	12.0	10.0	9.0	10.0	30.0	27.0	17.0	14.0	8.0	< 2.0	20.0	18.0	< 4.0	< 2.0
Texanol-A	200.0	97.0	240.0	130.0	220.0	130.0	260.0	130.0	170.0	110.0	130.0	77.0	220.0	< 2.0	300.0	160.0	9.0	< 2.0
Texanol-B	250.0	120.0	300.0	160.0	280.0	160.0	330.0	160.0	230.0	130.0	170.0	93.0	270.0	< 2.0	390.0	190.0	19.0	3.0
Tridecane (C 13)	6.0	4.0	6.0	5.0	< 4.0	3.0	5.0	3.0	5.0	5.0	4.0	4.0	6.0	< 2.0	5.0	4.0	< 4.0	< 2.0
Urea	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0	4.0	< 2.0	8.0	< 2.0	< 4.0	< 2.0	< 4.0	< 2.0

[1] *Contains silicon and oxygen; appears to be a siloxane*

[2] *Cyclic; may be a terpene*

TABLE 3.

MAY 2, 2022 SAMPLING RESULTS COMPARED TO NEW YORK STATE DEPARTMENT OF HEALTH SURVEY UPPER FENCE LIMITS, OSHA PERMISSIBLE EXPOSURE LIMITS (PELs), AND ACGIH THRESHOLD LIMIT VALUES (TLVs)

Table 3. May 2, 2022 Sampling Results Compared to NYS DOH Upper Fence Limits, OSHA PELs, and ACGIH TLVs (ng/L)												
Compound	**Room 7**	**Room 10**	**Room 3**	**Room 4**	**Room 26**	**SE Hallway between Rooms 36 & 37**	**Room 31**	**Room 14**	**Hall Outside of Little Theater**	**NYS DOH Upper Fence Limit**	**ACGIH Threshold Limit Value**	**OSHA PEL**
TO-17 Compounds												
Acetone	29.0	33.0	26.0	24.0	44.0	36.0	< 0.5	34.0	10.0	115.0	590,000	2,400,000
Acetonitrile	< 0.2	< 0.2	< 0.2	0.2	0.4	< 0.2	< 0.2	< 0.2	< 0.2	NE	34,000	70,000
Benzene	0.2	0.2	0.3	0.3	0.3	0.2	< 0.1	0.3	0.3	13	1,600	3,190
Carbon Disulfide	< 0.1	< 0.1	< 0.1	< 0.1	0.2	0.1	< 0.1	0.1	< 0.1	NE	3110.0	62270.0
Carbon Tetrachloride	0.5	0.6	0.6	0.5	0.8	1.2	< 0.1	0.6	0.5	1.3	31,500	63,000
2-Chloroethanol	0.4	0.6	0.3	0.3	0.7	0.4	< 0.1	0.6	0.2	NE	NE	16,460
Chloroform	0.2	0.2	0.2	0.1	0.3	0.2	< 0.1	0.2	0.1	1.2	48,900	NE
Cyclohexane	0.1	0.2	0.2	0.1	0.6	0.3	< 0.1	0.3	0.3	6.3	345,000	1,050,000
trans 1,4-Dichloro-2-butene	0.3	0.4	0.3	0.3	0.4	0.3	< 0.1	0.4	0.1	NE	NE	NE
cis 1,4-Dichloro-2-butene	< 0.1	0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	NE	NE	NE
1,4-Dichlorobenzene	0.8	1.0	0.7	0.6	1.7	1.5	< 0.1	1.0	0.1	1.2	60,000	450,000
1,2-Dichloroethane	0.1	< 0.1	0.1	< 0.1	0.2	< 0.1	< 0.1	< 0.1	< 0.1	0.37	40,500	202,500
1,2-Dichloropropane	< 0.1	< 0.1	< 0.1	< 0.1	0.3	< 0.1	< 0.1	< 0.1	< 0.1	0.39	46,210	346,600
1,4-Dioxane	< 0.2	< 0.2	< 0.2	0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	NE	72000.0	360,330
Ethanol	510.0	770.0	400.0	440.0	860.0	370.0	5.9	630.0	30.0	1300	NE	1,900,000
Ethylacetate	3.0	4.1	2.8	2.8	18.0	4.8	< 0.1	3.9	0.2	NE	1,400,000	1,400,000
Ethylbenzene	0.2	0.3	0.3	0.2	0.4	0.3	< 0.1	0.3	0.3	6.4	90,000	435,000
4-Ethyltoluene	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	0.1	NE	NE	NE
Hexane (C 6)	0.5	0.6	0.5	0.4	1.1	1.4	< 0.1	0.6	0.6	NE	180,000	1,800,000
Isooctane	0.1	0.2	0.2	0.1	0.6	0.2	< 0.1	0.2	0.2	5.0	NE	NE
Isopropanol	53.0	68.0	36.0	35.0	72.0	46.0	< 0.1	55.0	5.0	NE	492,000	980,000
Isopropylbenzene	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.82	24,580	245,800
p-Isopropyltoluene	0.3	0.4	0.2	0.2	0.4	0.2	< 0.1	0.3	< 0.1	NE	NE	NE
2-Methyl-1-propanol	0.7	0.7	0.6	0.5	0.8	0.8	< 0.1	0.7	< 0.1	NE	150,000	300,000
4-Methyl-2-pentanone	1.0	1.1	0.8	0.7	1.9	1.2	< 0.1	1.0	1.0	1.9	82,000	410,000
Methylene Chloride	0.3	0.4	0.4	0.3	0.6	1.1	< 0.1	0.4	0.3	16.0	174,000	87,000
Naphthalene	0.3	0.3	0.2	0.2	0.4	0.8	< 0.2	0.3	< 0.2	NE	52,000	50,000
n-Propylbenzene	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	1.5	NE	NE
Styrene	0.4	0.5	0.5	0.4	0.7	0.4	< 0.1	0.5	< 0.1	1.4	86,000	425,000
1,1,2,2-Tetrachloroethane	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.38	6,870	35,000
Tetrachloroethene	0.2	0.2	0.1	0.2	0.1	< 0.1	< 0.1	0.1	< 0.1	2.5	170,000	678,000
Tetrahydrofuran	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.1	0.78	147,500	NE
Toluene	3.1	3.5	4.3	3.6	6.6	3.2	< 0.1	3.3	1.2	57.0	753,000	754,000
1,1,2-Trichloro-1,2,2-trifluoroethane	0.5	0.5	0.6	0.5	0.5	0.5	< 0.1	0.5	0.6	NE	7,600,000	7,600,000
1,1,2-Trichloroethane	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.38	54,500	54,500
Trichloroethene	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.46	53,750	537,500
1,3,5-Trimethylbenzene	< 0.1	< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1	< 0.1	0.1	3.9	NE	NE
1,2,4-Trimethylbenzene	1.7	2.2	1.7	1.7	2.6	1.7	< 0.1	2.0	0.7	9.8	NE	NE
m,p-Xylene	0.7	0.7	0.8	0.7	1.3	1.0	< 0.2	0.7	0.9	11.0	435,000	435,000
o-Xylene	0.2	0.3	0.3	0.2	0.5	0.3	< 0.1	0.3	0.3	7.1	435,000	435,000
SEMI QUANTITATIVE COMPOUNDS												
2,6-Dimethyl-7-octen-2-ol	3.0	3.0	2.0	< 2.0	5.0	3.0	< 2.0	4.0	< 2.0	NE	NE	NE
Acetaldehyde	19.0	23.0	13.0	21.0	25.0	13.0	< 2.0	15.0	< 2.0	NE	NE	360,000
Acetic Acid	3.0	4.0	4.0	4.0	4.0	2.0	< 2.0	4.0	< 2.0	NE	24,500	24,500
Acetophenone	< 2.0	2.0	< 2.0	< 2.0	3.0	2.0	< 2.0	2.0	< 2.0	NE	49,000	NE
Benzaldehyde	4.0	6.0	4.0	4.0	7.0	4.0	< 2.0	5.0	< 2.0	NE	NE	NE
Butane (C 4)	9.0	11.0	9.0	8.0	15.0	10.0	< 2.0	10.0	9.0	NE	NE	NE
1-Butanol	12.0	16.0	12.0	12.0	20.0	16.0	< 2.0	14.0	< 2.0	NE	60,000	300,000
1-Butoxy-2-propanol	3.0	3.0	2.0	2.0	4.0	2.0	< 2.0	3.0	< 2.0	NE	NE	NE
2-Butoxyethanol	14.0	19.0	13.0	13.0	26.0	17.0	< 2.0	23.0	< 2.0	NE	97,000	240,000
Butoxyethoxyethanol	27.0	35.0	12.0	11.0	42.0	14.0	< 2.0	30.0	< 2.0	NE	67,000	NE
4-tert-Butylcyclohexyl acetate	3.0	< 2.0	< 2.0	< 2.0	4.0	< 2.0	< 2.0	3.0	< 2.0	NE	NE	NE
C5-C7 Hydrocarbon	< 2.0	3.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.0	< 2.0	NE	NE	NE
C8-C10 Hydrocarbon	3.0	4.0	3.0	2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	NE	NE	NE
C11-C13 - Hydrocarbon	< 2.0	3.0	< 2.0	< 2.0	3.0	2.0	< 2.0	2.0	< 2.0	NE	NE	NE
C12-C14 Hydrocarbon[1]	< 2.0	3.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NE	NE	NE
C12-C14 Hydrocarbon[2]	< 2.0	< 2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	2.0	< 2.0	NE	NE	NE
C13-C15 Hydrocarbon	< 2.0	3.0	< 2.0	< 2.0	2.0	< 2.0	< 2.0	< 2.0	< 2.0	NE	NE	NE
C14-C16 Hydrocarbon	2.0	2.0	3.0	2.0	< 2.0	10.0	< 2.0	< 2.0	< 2.0	NE	NE	NE
C7-C9 Hydrocarbon	7.0	9.0	7.0	8.0	15.0	9.0	< 2.0	8.0	< 2.0	NE	NE	NE
Decanal	6.0	7.0	< 2.0	< 2.0	6.0	4.0	< 2.0	< 2.0	< 2.0	NE	NE	NE
Diethylene glycol	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.0	< 2.0	< 2.0	NE	NE	NE
Diethylene glycol ethyl ether	11.0	16.0	9.0	8.0	23.0	12.0	< 2.0	18.0	4.0	NE	NE	NE
Dipropylene glycol methyl ether	210.0	290.0	120.0	130.0	320.0	140.0	< 2.0	190.0	6.0	NE	NE	NE
Dodecamethylcyclohexasiloxane (D6)	< 2.0	2.0	< 2.0	< 2.0	4.0	< 2.0	< 2.0	3.0	< 2.0	NE	NE	NE
Dodecane (C 12)	5.0	7.0	4.0	4.0	7.0	5.0	< 2.0	6.0	< 2.0	NE	NE	NE
2-Ethyl-1-hexanol	14.0	16.0	15.0	13.0	19.0	17.0	< 2.0	17.0	< 2.0	NE	NE	NE
Ethylene Glycol	41.0	36.0	51.0	36.0	39.0	78.0	< 2.0	41.0	< 2.0	NE	NE	NE
2-Ethylhexylacetate	< 2.0	2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	< 2.0	< 2.0	NE	NE	NE
4-Hydroxyl-4-methyl-2-pentanone	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	2.0	< 2.0	< 2.0	< 2.0	NE	237,630	237,630
Hexamethylcyclotrisiloxane (D3)	< 2.0	< 2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	< 2.0	< 2.0	NE	NE	NE
Hexyl Cellosolve	7.0	11.0	< 2.0	< 2.0	6.0	< 2.0	8.0	< 2.0	< 2.0	NE	NE	NE
Isobutane	3.0	3.0	2.0	2.0	5.0	3.0	< 2.0	3.0	< 2.0	NE	NE	NE
Isohexadecane	< 2.0	2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	2.0	< 2.0	NE	NE	NE
Isoprene	3.0	3.0	2.0	< 2.0	6.0	3.0	< 2.0	4.0	< 2.0	9.5	NE	NE
Limonene	17.0	23.0	9.0	9.0	19.0	12.0	< 2.0	23.0	< 2.0	20.0	NE	NE
Menthol	< 2.0	< 2.0	< 2.0	< 2.0	4.0	2.0	< 2.0	2.0	< 2.0	NE	NE	NE
Methoxy-2-propanol	< 2.0	2.0	< 2.0	< 2.0	4.0	2.0	< 2.0	2.0	< 2.0	NE	NE	NE
Methyl ethyl ketone	< 2.0	< 2.0	< 2.0	< 2.0	3.0	< 2.0	< 2.0	< 2.0	3.0	16.0	590,000	590,000
2-Methylbutane	4.0	2.0	3.0	3.0	8.0	3.0	< 2.0	4.0	6.0	NE	2,950,000	2,950,000
Nonanal	7.0	9.0	7.0	6.0	8.0	6.0	< 2.0	7.0	< 2.0	NE	NE	NE
Octamethylcyclotetrasiloxane (D4)	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	NE	NE	NE
Pentane (C 5)	19.0	22.0	16.0	14.0	21.0	12.0	< 2.0	18.0	10.0	NE	2,950,000	295,000
1-Propoxy-2-Proponal	< 2.0	< 2.0	< 2.0	< 2.0	2.0	< 2.0	< 2.0	< 2.0	< 2.0	NE	NE	NE
1-Propanol	2.0	2.0	< 2.0	< 2.0	4.0	6.0	< 2.0	3.0	< 2.0	NE	250,000	500,000
2-Pentanone	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	< 2.0	3.0	NE	NE	700,000
n-Propylacetate	5.0	6.0	4.0	3.0	9.0	5.0	< 2.0	6.0	< 2.0	NE	420,000	840,000
Propylene glycol	9.0	10.0	11.0	7.0	12.0	12.0	< 2.0	10.0	2.0	NE	NE	NE
Tetradecane (C 14)	3.0	4.0	3.0	3.0	4.0	3.0	< 2.0	4.0	< 2.0	NE	NE	NE
2,4,7,9-Tetramethyl-5-decyne-4,7-diol	37.0	42.0	10.0	10.0	27.0	14.0	< 2.0	18.0	< 2.0	NE	NE	NE
Texanol-A	97.0	130.0	130.0	130.0	110.0	77.0	< 2.0	160.0	< 2.0	NE	NE	NE
Texanol-B	120.0	160.0	160.0	160.0	130.0	93.0	< 2.0	190.0	3.0	NE	NE	NE
Tridecane (C 13)	4.0	5.0	3.0	3.0	5.0	4.0	< 2.0	4.0	< 2.0	NE	NE	NE

[1] *Contains silicon and oxygen; appears to be a siloxane*

[2] *Cyclic; may be a terpene*