Volatile Organic Compound Analysis Results for Samples Collected in Nuiqsut, Alaska

Sample Location: Nuiqsut Ambient Air Quality Monitoring Station

Date Sample Collected: 4/1/2022

Analysis Conducted by: Atmospheric Analysis & Consulting, Inc.

Analysis Method: EPA Method TO-15

Laboratory Analysis Report

CLIENT : SLR International
PROJECT NO : 220714
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 04/05/2022
DATE REPORTED : 04/06/2022
ANALYST : MB

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	NUI			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	220714-29830				
Date Sampled	04/01/2022				
Date Analyzed	04/05/2022				
Can Dilution Factor	1.61				
Compound	Result	Qualifier	Analysis DF		
Chlorodifluoromethane	<SRL	U	1	0.81	0.50
Propene	<SRL	U	1	1.61	1.00
Dichlorodifluoromethane	<SRL	U	1	0.81	0.50
Chloromethane	<SRL	U	1	0.81	0.50
Dichlorotetrafluoroethane	<SRL	U	1	0.81	0.50
Vinyl Chloride	<SRL	U	1	0.81	0.50
Methanol	<SRL	U	1	8.06	5.00
1,3-Butadiene	<SRL	U	1	0.81	0.50
Bromomethane	<SRL	U	1	0.81	0.50
Chloroethane	<SRL	U	1	0.81	0.50
Dichlorofluoromethane	<SRL	U	1	0.81	0.50
Ethanol	<SRL	U	1	3.22	2.00
Vinyl Bromide	<SRL	U	1	0.81	0.50
Acetone	<SRL	U	1	3.22	2.00
Trichlorofluoromethane	<SRL	U	1	0.81	0.50
2-Propanol (IPA)	<SRL	U	1	3.22	2.00
Acrylonitrile	<SRL	U	1	3.22	2.00
1,1-Dichloroethene	<SRL	U	1	0.81	0.50
Methylene Chloride (DCM)	<SRL	U	1	1.61	1.00
Allyl Chloride	<SRL	U	1	1.61	1.00
Carbon Disulfide	<SRL	U	1	3.22	2.00
Trichlorotrifluoroethane	<SRL	U	1	0.81	0.50
trans-1,2-Dichloroethene	<SRL	U	1	0.81	0.50
1,1-Dichloroethane	<SRL	U	1	0.81	0.50
Methyl Tert Butyl Ether (MTBE)	<SRL	U	1	0.81	0.50
Vinyl Acetate	<SRL	U	1	1.61	1.00
2-Butanone (MEK)	<SRL	U	1	1.61	1.00
cis-1,2-Dichloroethene	<SRL	U	1	0.81	0.50
Hexane	<SRL	U	1	0.81	0.50
Chloroform	<SRL	U	1	0.81	0.50
Ethyl Acetate	<SRL	U	1	0.81	0.50
Tetrahydrofuran	<SRL	U	1	0.81	0.50
1,2-Dichloroethane	<SRL	U	1	0.81	0.50
1,1,1-Trichloroethane	<SRL	U	1	0.81	0.50
Benzene	<SRL	U	1	0.81	0.50

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Laboratory Analysis Report

CLIENT : SLR International
PROJECT NO : 220714
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 04/05/2022
DATE REPORTED : 04/06/2022
ANALYST : MB

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	NUI			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	220714-29830				
Date Sampled	04/01/2022				
Date Analyzed	04/05/2022				
Can Dilution Factor	1.61				
Compound	Result	Qualifier	Analysis DF		
Carbon Tetrachloride	<SRL	U	1	0.81	0.50
Cyclohexane	<SRL	U	1	0.81	0.50
1,2-Dichloropropane	<SRL	U	1	0.81	0.50
Bromodichloromethane	<SRL	U	1	0.81	0.50
1,4-Dioxane	<SRL	U	1	1.61	1.00
Trichloroethene (TCE)	<SRL	U	1	0.81	0.50
2,2,4-Trimethylpentane	<SRL	U	1	0.81	0.50
Heptane	<SRL	U	1	0.81	0.50
cis-1,3-Dichloropropene	<SRL	U	1	0.81	0.50
4-Methyl-2-pentanone (MiBK)	<SRL	U	1	0.81	0.50
trans-1,3-Dichloropropene	<SRL	U	1	0.81	0.50
1,1,2-Trichloroethane	<SRL	U	1	0.81	0.50
Toluene	<SRL	U	1	0.81	0.50
2-Hexanone (MBK)	<SRL	U	1	1.61	1.00
Dibromochloromethane	<SRL	U	1	0.81	0.50
1,2-Dibromoethane	<SRL	U	1	0.81	0.50
Tetrachloroethene (PCE)	<SRL	U	1	0.81	0.50
Chlorobenzene	<SRL	U	1	0.81	0.50
Ethylbenzene	<SRL	U	1	0.81	0.50
m & p-Xylene	<SRL	U	1	1.61	1.00
Bromoform	<SRL	U	1	0.81	0.50
Styrene	<SRL	U	1	0.81	0.50
1,1,2,2-Tetrachloroethane	<SRL	U	1	0.81	0.50
o-Xylene	<SRL	U	1	0.81	0.50
4-Ethyltoluene	<SRL	U	1	0.81	0.50
1,3,5-Trimethylbenzene	<SRL	U	1	0.81	0.50
1,2,4-Trimethylbenzene	<SRL	U	1	0.81	0.50
Benzyl Chloride (a-Chlorotoluene)	<SRL	U	1	0.81	0.50
1,3-Dichlorobenzene	<SRL	U	1	0.81	0.50
1,4-Dichlorobenzene	<SRL	U	1	0.81	0.50
1,2-Dichlorobenzene	<SRL	U	1	0.81	0.50
1,2,4-Trichlorobenzene	<SRL	U	1	3.22	2.00
Hexachlorobutadiene	<SRL	U	1	0.81	0.50
BFB-Surrogate Std. % Recovery		94%			70-130%

U - Compound was not detected at or above the SRL.

QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 04/05/2022
MATRIX : High Purity N_2
UNITS : PPB (v/v)

INSTRUMENT ID : GC/MS-02
CALIBRATION STD ID : MS1-030722-01
ANALYST : MB

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Continuing Calibration Verification of the 03/21/2022 Calibration

Analyte Compounds	*Source*[1]	*CCV*[2]	*% Recovery*[3]
4-BFB (surrogate standard)	10.00	10.51	105
Chlorodifluoromethane	10.50	9.33	89
Propene	10.60	9.29	88
Dichlorodifluoromethane	10.40	10.40	100
Dimethyl Ether	10.80	9.92	92
Chloromethane	10.40	9.48	91
Dichlorotetrafluoroethane	10.30	11.38	110
Vinyl Chloride	10.50	10.11	96
Acetaldehyde	22.50	21.81	97
Methanol	20.10	17.79	89
1,3-Butadiene	10.60	10.14	96
Bromomethane	10.40	10.41	100
Chloroethane	10.30	9.87	96
Dichlorofluoromethane	10.50	9.84	94
Ethanol	11.20	10.72	96
Vinyl Bromide	10.50	11.04	105
Acrolein	11.10	10.30	93
Acetone	10.60	10.04	95
Trichlorofluoromethane	10.50	10.56	101
2-Propanol (IPA)	11.00	10.10	92
Acrylonitrile	11.40	10.32	91
1,1-Dichloroethene	10.40	10.60	102
Methylene Chloride (DCM)	10.50	10.59	101
TertButanol (TBA)	11.30	10.60	94
Allyl Chloride	10.40	8.44	81
Carbon Disulfide	10.50	10.42	99
Trichlorotrifluoroethane	10.40	10.73	103
trans-1,2-Dichloroethene	10.60	10.23	97
1,1-Dichloroethane	10.50	9.52	91
Methyl Tert Butyl Ether (MTBE)	10.50	9.16	87
Vinyl Acetate	11.00	9.73	88
2-Butanone (MEK)	10.60	9.21	87
cis-1,2-Dichloroethene	10.50	10.26	98
Hexane	10.70	9.56	89
Chloroform	10.60	9.56	90
Ethyl Acetate	10.60	9.55	90
Tetrahydrofuran	10.20	8.82	86
1,2-Dichloroethane	10.50	9.16	87
1,1,1-Trichloroethane	10.40	9.75	94
Benzene	10.60	9.95	94
Carbon Tetrachloride	10.20	8.68	85
Cyclohexane	10.50	10.06	96

Analyte Compounds (Continued)	*Source*[1]	*CCV*[2]	*% Recovery*[3]
1,2-Dichloropropane	10.50	9.75	93
Bromodichloromethane	10.40	9.06	87
1,4-Dioxane	10.40	10.60	102
Trichloroethene (TCE)	10.40	11.11	107
2,2,4-Trimethylpentane	10.40	9.26	89
Methyl Methacrylate	11.00	9.63	88
Heptane	10.50	9.51	91
cis-1,3-Dichloropropene	10.40	8.86	85
4-Methyl-2-pentanone (MiBK)	10.40	8.87	85
trans-1,3-Dichloropropene	10.50	9.09	87
1,1,2-Trichloroethane	10.50	10.12	96
Toluene	10.60	9.62	91
2-Hexanone (MBK)	10.50	8.77	84
Dibromochloromethane	10.30	10.52	102
1,2-Dibromoethane	10.60	10.46	99
Tetrachloroethene (PCE)	10.40	10.38	100
Chlorobenzene	10.60	10.50	99
Ethylbenzene	10.50	10.39	99
m & p-Xylene	21.00	22.01	105
Bromoform	10.50	11.72	112
Styrene	10.50	11.21	107
1,1,2,2-Tetrachloroethane	10.50	10.47	100
o-Xylene	10.50	10.88	104
1,2,3-Trichloropropane	10.40	11.18	108
Isopropylbenzene (Cumene)	10.40	11.15	107
α-Pinene	11.40	9.89	87
2-Chlorotoluene	10.40	11.37	109
n-Propylbenzene	10.50	11.19	107
4-Ethyltoluene	10.30	12.00	117
1,3,5-Trimethylbenzene	10.30	11.63	113
β-Pinene LR	11.30	7.23	64
1,2,4-Trimethylbenzene	10.30	11.46	111
Benzyl Chloride (a-Chlorotoluene)	10.40	11.85	114
1,3-Dichlorobenzene	10.40	12.30	118
1,4-Dichlorobenzene	10.30	11.88	115
Sec-ButylBenzene	10.40	11.97	115
1,2-Dichlorobenzene	10.60	12.06	114
n-ButylBenzene	10.40	11.48	110
1,2-Dibromo-3-Chloropropane	10.40	11.39	110
1,2,4-Trichlorobenzene	11.00	10.35	94
Naphthalene	11.50	10.87	95
Hexachlorobutadiene	11.00	11.44	104

[1] Concentration of analyte compound in certified source standard.

[2] Measured result from daily Continuing Calibration Verification (CCV).

[3] The acceptable range for analyte recovery is 100±30%.

LR - Recovery for this compound was low. Results should be considered estimated.

QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 04/05/2022
MATRIX : High Purity N_2
UNITS : PPB (v/v)

INSTRUMENT ID : GC/MS-02
CALIBRATION STD ID : MS1-030722-01
ANALYST : MB

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Laboratory Control Spike Analysis

System Monitoring Compounds	*Sample Concentration*	*Spike Added*	*LCS[1] Recovery*	*LCSD[1] Recovery*	*LCS[1] % Recovery[2]*	*LCSD[1] % Recovery[2]*	*RPD[3]*
4-BFB (surrogate standard)	0.0	10.00	10.51	10.51	105.1	105.1	0.0
1,1-Dichloroethene	0.0	10.40	10.60	10.56	102	102	0.4
Methylene Chloride (DCM)	0.0	10.50	10.59	10.68	101	102	0.8
Benzene	0.0	10.60	9.95	9.90	94	93	0.5
Trichloroethene (TCE)	0.0	10.40	11.11	10.87	107	105	2.2
Toluene	0.0	10.60	9.62	9.62	91	91	0.0
Tetrachloroethene (PCE)	0.0	10.40	10.38	10.93	100	105	5.2
Chlorobenzene	0.0	10.60	10.50	10.70	99	101	1.9
Ethylbenzene	0.0	10.50	10.39	10.54	99	100	1.4
m & p-Xylene	0.0	21.00	22.01	22.20	105	106	0.9
o-Xylene	0.0	10.50	10.88	11.11	104	106	2.1

[1] Laboratory Control Spike (LCS) / Laboratory Control Spike Duplicate (LCSD)

[2] The acceptable range for analyte recovery is 100±30%.

[3] Relative Percent Difference (RPD) between LCS recovery and LCSD recovery (acceptable range is <25%).

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QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 04/05/2022 | **INSTRUMENT ID : GC/MS-02**
MATRIX : High Purity He or N_2 | **ANALYST : MB**
UNITS : PPB (v/v)

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Method Blank Analysis

Analyte Compounds	*MB 040522*	*Reporting Limit (RL)*
4-BFB (surrogate standard)	94%	100±30%
Chlorodifluoromethane	<RL	0.5
Propene	<RL	1.0
Dichlorodifluoromethane	<RL	0.5
Dimethyl Ether	<RL	0.5
Chloromethane	<RL	0.5
Dichlorotetrafluoroethane	<RL	0.5
Vinyl Chloride	<RL	0.5
Acetaldehyde	<RL	5.0
Methanol	<RL	5.0
1,3-Butadiene	<RL	0.5
Bromomethane	<RL	0.5
Chloroethane	<RL	0.5
Dichlorofluoromethane	<RL	0.5
Ethanol	<RL	2.0
Vinyl Bromide	<RL	0.5
Acrolein	<RL	1.0
Acetone	<RL	2.0
Trichlorofluoromethane	<RL	0.5
2-Propanol (IPA)	<RL	2.0
Acrylonitrile	<RL	2.0
1,1-Dichloroethene	<RL	0.5
Methylene Chloride (DCM)	<RL	1.0
TertButanol (TBA)	<RL	0.5
Allyl Chloride	<RL	1.0
Carbon Disulfide	<RL	2.0
Trichlorotrifluoroethane	<RL	0.5
trans-1,2-Dichloroethene	<RL	0.5
1,1-Dichloroethane	<RL	0.5
Methyl Tert Butyl Ether (MTBE)	<RL	0.5
Vinyl Acetate	<RL	1.0
2-Butanone (MEK)	<RL	1.0
cis-1,2-Dichloroethene	<RL	0.5
Hexane	<RL	0.5
Chloroform	<RL	0.5
Ethyl Acetate	<RL	0.5
Tetrahydrofuran	<RL	0.5
1,2-Dichloroethane	<RL	0.5
1,1,1-Trichloroethane	<RL	0.5
Benzene	<RL	0.5
Carbon Tetrachloride	<RL	0.5
Cyclohexane	<RL	0.5

Analyte Compounds (Continued)	*MB 040522*	*Reporting Limit (RL)*
1,2-Dichloropropane	<RL	0.5
Bromodichloromethane	<RL	0.5
1,4-Dioxane	<RL	1.0
Trichloroethene (TCE)	<RL	0.5
2,2,4-Trimethylpentane	<RL	0.5
Methyl Methacrylate	<RL	0.5
Heptane	<RL	0.5
cis-1,3-Dichloropropene	<RL	0.5
4-Methyl-2-pentanone (MiBK)	<RL	0.5
trans-1,3-Dichloropropene	<RL	0.5
1,1,2-Trichloroethane	<RL	0.5
Toluene	<RL	0.5
2-Hexanone (MBK)	<RL	1.0
Dibromochloromethane	<RL	0.5
1,2-Dibromoethane	<RL	0.5
Tetrachloroethene (PCE)	<RL	0.5
Chlorobenzene	<RL	0.5
Ethylbenzene	<RL	0.5
m & p-Xylene	<RL	1.0
Bromoform	<RL	0.5
Styrene	<RL	0.5
1,1,2,2-Tetrachloroethane	<RL	0.5
o-Xylene	<RL	0.5
1,2,3-Trichloropropane	<RL	0.5
Isopropylbenzene (Cumene)	<RL	0.5
α-Pinene	<RL	0.5
2-Chlorotoluene	<RL	0.5
n-Propylbenzene	<RL	0.5
4-Ethyltoluene	<RL	0.5
1,3,5-Trimethylbenzene	<RL	0.5
β-Pinene	<RL	0.5
1,2,4-Trimethylbenzene	<RL	0.5
Benzyl Chloride (a-Chlorotoluene)	<RL	0.5
1,3-Dichlorobenzene	<RL	0.5
1,4-Dichlorobenzene	<RL	0.5
Sec-ButylBenzene	<RL	0.5
1,2-Dichlorobenzene	<RL	0.5
n-ButylBenzene	<RL	0.5
1,2-Dibromo-3-Chloropropane	<RL	0.5
1,2,4-Trichlorobenzene	<RL	2.0
Naphthalene	<RL	2.0
Hexachlorobutadiene	<RL	0.5

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QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 04/05/2022
MATRIX : Air
UNITS : PPB (v/v)

INSTRUMENT ID : GC/MS-02
ANALYST : MB
DILUTION FACTOR[1] : x1755.64

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Duplicate Analysis of AAC Sample ID: 220645-29542

Analyte Compounds	*Sample*	*Duplicate*	*RPD[2]*
4-BFB (surrogate standard)	10.4	10.4	0.4
Chlorodifluoromethane	<SRL	<SRL	*NA*
Propene	21400	22300	4.0
Dichlorodifluoromethane	<SRL	<SRL	*NA*
Dimethyl Ether	4560	5160	12.3
Chloromethane	<SRL	<SRL	*NA*
Dichlorotetrafluoroethane	<SRL	<SRL	*NA*
Vinyl Chloride	<SRL	<SRL	*NA*
Acetaldehyde	<SRL	<SRL	*NA*
Methanol E	398000	453000	12.9
1,3-Butadiene	<SRL	<SRL	*NA*
Bromomethane	<SRL	<SRL	*NA*
Chloroethane	<SRL	<SRL	*NA*
Dichlorofluoromethane	<SRL	<SRL	*NA*
Ethanol E	616000	622000	0.9
Vinyl Bromide	<SRL	<SRL	*NA*
Acrolein	<SRL	<SRL	*NA*
Acetone	58400	65500	11.6
Trichlorofluoromethane	<SRL	<SRL	*NA*
2-Propanol (IPA)	102000	110000	7.0
Acrylonitrile	<SRL	<SRL	*NA*
1,1-Dichloroethene	<SRL	<SRL	*NA*
Methylene Chloride (DCM)	<SRL	<SRL	*NA*
TertButanol (TBA)	<SRL	<SRL	*NA*
Allyl Chloride	<SRL	<SRL	*NA*
Carbon Disulfide	<SRL	<SRL	*NA*
Trichlorotrifluoroethane	<SRL	<SRL	*NA*
trans-1,2-Dichloroethene	<SRL	<SRL	*NA*
1,1-Dichloroethane	<SRL	<SRL	*NA*
Methyl Tert Butyl Ether (MTBE)	<SRL	<SRL	*NA*
Vinyl Acetate	<SRL	<SRL	*NA*
2-Butanone (MEK)	83400	83500	0.0
cis-1,2-Dichloroethene	<SRL	<SRL	*NA*
Hexane	1280	1320	2.7
Chloroform	<SRL	<SRL	*NA*
Ethyl Acetate	55400	56600	2.2
Tetrahydrofuran	13900	14700	5.4
1,2-Dichloroethane	1160	1160	0.0
1,1,1-Trichloroethane	<SRL	<SRL	*NA*
Benzene	5340	5230	2.0
Carbon Tetrachloride	<SRL	<SRL	*NA*
Cyclohexane	2580	3020	15.7

Analyte Compounds (Continued)	*Sample*	*Duplicate*	*RPD[2]*
1,2-Dichloropropane	<SRL	<SRL	*NA*
Bromodichloromethane	<SRL	<SRL	*NA*
1,4-Dioxane	<SRL	<SRL	*NA*
Trichloroethene (TCE)	<SRL	<SRL	*NA*
2,2,4-Trimethylpentane	<SRL	<SRL	*NA*
Methyl Methacrylate	<SRL	<SRL	*NA*
Heptane	3930	3860	1.8
cis-1,3-Dichloropropene	<SRL	<SRL	*NA*
4-Methyl-2-pentanone (MiBK)	3160	3070	2.8
trans-1,3-Dichloropropene	<SRL	<SRL	*NA*
1,1,2-Trichloroethane	<SRL	<SRL	*NA*
Toluene	33200	32700	1.5
2-Hexanone (MBK)	<SRL	<SRL	*NA*
Dibromochloromethane	<SRL	<SRL	*NA*
1,2-Dibromoethane	<SRL	<SRL	*NA*
Tetrachloroethene (PCE)	1190	1120	6.1
Chlorobenzene	<SRL	<SRL	*NA*
Ethylbenzene	5790	5760	0.6
m & p-Xylene	13000	12900	1.0
Bromoform	<SRL	<SRL	*NA*
Styrene	<SRL	<SRL	*NA*
1,1,2,2-Tetrachloroethane	<SRL	<SRL	*NA*
o-Xylene	3550	3600	1.5
1,2,3-Trichloropropane	<SRL	<SRL	*NA*
Isopropylbenzene (Cumene)	<SRL	<SRL	*NA*
α-Pinene	59300	60300	1.6
2-Chlorotoluene	<SRL	<SRL	*NA*
n-Propylbenzene	<SRL	<SRL	*NA*
4-Ethyltoluene	1140	1110	3.1
1,3,5-Trimethylbenzene	<SRL	<SRL	*NA*
β-Pinene	1700	1690	1.0
1,2,4-Trimethylbenzene	1250	1260	1.4
Benzyl Chloride (a-Chlorotoluene)	<SRL	<SRL	*NA*
1,3-Dichlorobenzene	<SRL	<SRL	*NA*
1,4-Dichlorobenzene	<SRL	<SRL	*NA*
Sec-ButylBenzene	<SRL	<SRL	*NA*
1,2-Dichlorobenzene	<SRL	<SRL	*NA*
n-ButylBenzene	<SRL	<SRL	*NA*
1,2-Dibromo-3-Chloropropane	<SRL	<SRL	*NA*
1,2,4-Trichlorobenzene	<SRL	<SRL	*NA*
Naphthalene	<SRL	<SRL	*NA*
Hexachlorobutadiene	<SRL	<SRL	*NA*

[1] Dilution factor is the product of the Canister Dilution Factor and the Analysis Dilution Factor.

[2] Relative Percent Difference (RPD) between Sample analysis and Duplicate analysis (acceptable range is <25%).

SRL - Sample Reporting Limit (minimum)

E - Estimated value above the maximum reporting limit, shown for duplication purposes only.