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

Sample Location: Nuiqsut Ambient Air Quality Monitoring Station

Date Sample Collected: 3/4/2022

Analysis Conducted by: Atmospheric Analysis & Consulting, Inc.

Analysis Method: EPA Method TO-15

Laboratory Analysis Report

CLIENT : SLR International Corporation
PROJECT NO : 220468
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 03/08/2022
DATE REPORTED : 03/09/2022
ANALYST : MB/RC

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	NUI AQMS			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	220468-28597				
Date Sampled	03/04/2022				
Date Analyzed	03/08/2022				
Can Dilution Factor	1.71				
Compound	Result	Qualifier	Analysis DF		
Chlorodifluoromethane	<SRL	U	1	0.86	0.50
Propene	<SRL	U	1	1.71	1.00
Dichlorodifluoromethane	<SRL	U	1	0.86	0.50
Chloromethane	<SRL	U	1	0.86	0.50
Dichlorotetrafluoroethane	<SRL	U	1	0.86	0.50
Vinyl Chloride	<SRL	U	1	0.86	0.50
Methanol	<SRL	U	1	8.57	5.00
1,3-Butadiene	<SRL	U	1	0.86	0.50
Bromomethane	<SRL	U	1	0.86	0.50
Chloroethane	<SRL	U	1	0.86	0.50
Dichlorofluoromethane	<SRL	U	1	0.86	0.50
Ethanol	3.70		1	3.43	2.00
Vinyl Bromide	<SRL	U	1	0.86	0.50
Acetone	<SRL	U	1	3.43	2.00
Trichlorofluoromethane	<SRL	U	1	0.86	0.50
2-Propanol (IPA)	<SRL	U	1	3.43	2.00
Acrylonitrile	<SRL	U	1	3.43	2.00
1,1-Dichloroethene	<SRL	U	1	0.86	0.50
Methylene Chloride (DCM)	<SRL	U	1	1.71	1.00
Allyl Chloride	<SRL	U	1	1.71	1.00
Carbon Disulfide	<SRL	U	1	3.43	2.00
Trichlorotrifluoroethane	<SRL	U	1	0.86	0.50
trans-1,2-Dichloroethene	<SRL	U	1	0.86	0.50
1,1-Dichloroethane	<SRL	U	1	0.86	0.50
Methyl Tert Butyl Ether (MTBE)	<SRL	U	1	0.86	0.50
Vinyl Acetate	<SRL	U	1	1.71	1.00
2-Butanone (MEK)	<SRL	U	1	1.71	1.00
cis-1,2-Dichloroethene	<SRL	U	1	0.86	0.50
Hexane	<SRL	U	1	0.86	0.50
Chloroform	<SRL	U	1	0.86	0.50
Ethyl Acetate	<SRL	U	1	0.86	0.50
Tetrahydrofuran	<SRL	U	1	0.86	0.50
1,2-Dichloroethane	<SRL	U	1	0.86	0.50
1,1,1-Trichloroethane	<SRL	U	1	0.86	0.50
Benzene	<SRL	U	1	0.86	0.50

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Laboratory Analysis Report

CLIENT : SLR International Corporation
PROJECT NO : 220468
MATRIX : AIR
UNITS : PPB (v/v)

DATE RECEIVED : 03/08/2022
DATE REPORTED : 03/09/2022
ANALYST : MB/RC

VOLATILE ORGANIC COMPOUNDS BY EPA TO-15

Client ID	NUI AQMS			Sample Reporting Limit (SRL) (MRLxDF's)	Method Reporting Limit (MRL)
AAC ID	220468-28597				
Date Sampled	03/04/2022				
Date Analyzed	03/08/2022				
Can Dilution Factor	1.71				
Compound	Result	Qualifier	Analysis DF		
Carbon Tetrachloride	<SRL	U	1	0.86	0.50
Cyclohexane	<SRL	U	1	0.86	0.50
1,2-Dichloropropane	<SRL	U	1	0.86	0.50
Bromodichloromethane	<SRL	U	1	0.86	0.50
1,4-Dioxane	<SRL	U	1	1.71	1.00
Trichloroethene (TCE)	<SRL	U	1	0.86	0.50
2,2,4-Trimethylpentane	<SRL	U	1	0.86	0.50
Heptane	<SRL	U	1	0.86	0.50
cis-1,3-Dichloropropene	<SRL	U	1	0.86	0.50
4-Methyl-2-pentanone (MiBK)	<SRL	U	1	0.86	0.50
trans-1,3-Dichloropropene	<SRL	U	1	0.86	0.50
1,1,2-Trichloroethane	<SRL	U	1	0.86	0.50
Toluene	<SRL	U	1	0.86	0.50
2-Hexanone (MBK)	<SRL	U	1	1.71	1.00
Dibromochloromethane	<SRL	U	1	0.86	0.50
1,2-Dibromoethane	<SRL	U	1	0.86	0.50
Tetrachloroethene (PCE)	<SRL	U	1	0.86	0.50
Chlorobenzene	<SRL	U	1	0.86	0.50
Ethylbenzene	<SRL	U	1	0.86	0.50
m & p-Xylene	<SRL	U	1	1.71	1.00
Bromoform	<SRL	U	1	0.86	0.50
Styrene	<SRL	U	1	0.86	0.50
1,1,2,2-Tetrachloroethane	<SRL	U	1	0.86	0.50
o-Xylene	<SRL	U	1	0.86	0.50
4-Ethyltoluene	<SRL	U	1	0.86	0.50
1,3,5-Trimethylbenzene	<SRL	U	1	0.86	0.50
1,2,4-Trimethylbenzene	<SRL	U	1	0.86	0.50
Benzyl Chloride (a-Chlorotoluene)	<SRL	U	1	0.86	0.50
1,3-Dichlorobenzene	<SRL	U	1	0.86	0.50
1,4-Dichlorobenzene	<SRL	U	1	0.86	0.50
1,2-Dichlorobenzene	<SRL	U	1	0.86	0.50
1,2,4-Trichlorobenzene	<SRL	U	1	0.86	0.50
Hexachlorobutadiene	<SRL	U	1	0.86	0.50
BFB-Surrogate Std. % Recovery		83%			70-130%

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

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QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 03/08/2022
MATRIX : High Purity N_2
UNITS : PPB (v/v)

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

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Continuing Calibration Verification of the 03/01/2022 Calibration

Analyte Compounds	*Source*[1]	*CCV*[2]	*% Recovery*[3]
4-BFB (surrogate standard)	10.00	8.79	88
Chlorodifluoromethane	10.50	10.90	104
Propene	10.60	10.50	99
Dichlorodifluoromethane	10.40	10.86	104
Dimethyl Ether	10.80	8.33	77
Chloromethane	10.40	9.74	94
Dichlorotetrafluoroethane	10.30	11.48	111
Vinyl Chloride	10.50	9.90	94
Acetaldehyde	22.50	27.38	122
Methanol HR	20.10	68.39	340
1,3-Butadiene	10.60	10.40	98
Bromomethane	10.40	9.56	92
Chloroethane	10.30	9.27	90
Dichlorofluoromethane	10.50	10.49	100
Ethanol	11.20	8.71	78
Vinyl Bromide	10.50	10.37	99
Acrolein	11.10	10.10	91
Acetone	10.60	9.20	87
Trichlorofluoromethane	10.50	10.68	102
2-Propanol (IPA)	11.00	9.91	90
Acrylonitrile	11.40	11.34	99
1,1-Dichloroethene	10.40	9.32	90
Methylene Chloride (DCM)	10.50	9.79	93
TertButanol (TBA)	11.30	11.49	102
Allyl Chloride	10.40	9.93	95
Carbon Disulfide	10.50	9.68	92
Trichlorotrifluoroethane	10.40	9.95	96
trans-1,2-Dichloroethene	10.60	10.28	97
1,1-Dichloroethane	10.50	10.07	96
Methyl Tert Butyl Ether (MTBE)	10.50	8.67	83
Vinyl Acetate	11.00	10.20	93
2-Butanone (MEK)	10.60	9.76	92
cis-1,2-Dichloroethene	10.50	10.12	96
Hexane	10.70	9.20	86
Chloroform	10.60	10.16	96
Ethyl Acetate	10.60	9.47	89
Tetrahydrofuran	10.20	9.11	89
1,2-Dichloroethane	10.50	9.12	87
1,1,1-Trichloroethane	10.40	10.19	98
Benzene	10.60	9.85	93
Carbon Tetrachloride	10.20	10.39	102
Cyclohexane	10.50	9.89	94

Analyte Compounds (Continued)	*Source*[1]	*CCV*[2]	*% Recovery*[3]
1,2-Dichloropropane	10.50	9.60	91
Bromodichloromethane	10.40	9.67	93
1,4-Dioxane	10.40	9.88	95
Trichloroethene (TCE)	10.40	9.83	95
2,2,4-Trimethylpentane	10.40	10.20	98
Methyl Methacrylate	11.00	9.88	90
Heptane	10.50	9.40	90
cis-1,3-Dichloropropene	10.40	9.54	92
4-Methyl-2-pentanone (MiBK)	10.40	9.70	93
trans-1,3-Dichloropropene	10.50	9.41	90
1,1,2-Trichloroethane	10.50	9.95	95
Toluene	10.60	10.13	96
2-Hexanone (MBK)	10.50	10.26	98
Dibromochloromethane	10.30	10.82	105
1,2-Dibromoethane	10.60	10.33	97
Tetrachloroethene (PCE)	10.40	9.33	90
Chlorobenzene	10.60	9.95	94
Ethylbenzene	10.50	10.58	101
m & p-Xylene	21.00	20.91	100
Bromoform	10.50	10.82	103
Styrene	10.50	10.58	101
1,1,2,2-Tetrachloroethane	10.50	11.46	109
o-Xylene	10.50	10.79	103
1,2,3-Trichloropropane	10.40	11.83	114
Isopropylbenzene (Cumene)	10.40	11.03	106
α-Pinene	11.40	10.52	92
2-Chlorotoluene	10.40	10.48	101
n-Propylbenzene	10.50	11.49	109
4-Ethyltoluene	10.30	11.03	107
1,3,5-Trimethylbenzene	10.30	10.82	105
β-Pinene	11.30	10.41	92
1,2,4-Trimethylbenzene	10.30	10.72	104
Benzyl Chloride (a-Chlorotoluene)	10.40	11.18	108
1,3-Dichlorobenzene	10.40	10.64	102
1,4-Dichlorobenzene	10.30	10.26	100
Sec-ButylBenzene	10.40	11.12	107
1,2-Dichlorobenzene	10.60	10.84	102
n-ButylBenzene	10.40	11.74	113
1,2-Dibromo-3-Chloropropane	10.40	10.76	103
1,2,4-Trichlorobenzene	11.00	10.44	95
Naphthalene	11.50	11.23	98
Hexachlorobutadiene	11.00	11.27	102

[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%.

HR - Recovery for this compound was high. Results should be considered biased high.

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QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 03/08/2022
MATRIX : High Purity N_2
UNITS : PPB (v/v)

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

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	8.79	8.75	87.9	87.5	0.5
1,1-Dichloroethene	0.0	10.40	9.32	9.39	90	90	0.7
Methylene Chloride (DCM)	0.0	10.50	9.79	9.64	93	92	1.5
Benzene	0.0	10.60	9.85	9.88	93	93	0.3
Trichloroethene (TCE)	0.0	10.40	9.83	9.76	95	94	0.7
Toluene	0.0	10.60	10.13	10.24	96	97	1.1
Tetrachloroethene (PCE)	0.0	10.40	9.33	9.42	90	91	1.0
Chlorobenzene	0.0	10.60	9.95	9.64	94	91	3.2
Ethylbenzene	0.0	10.50	10.58	10.54	101	100	0.4
m & p-Xylene	0.0	21.00	20.91	20.62	100	98	1.4
o-Xylene	0.0	10.50	10.79	10.70	103	102	0.8

[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 : 03/08/2022
MATRIX : High Purity He or N_2
UNITS : PPB (v/v)

INSTRUMENT ID : GC/MS-02
ANALYST : RC

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Method Blank Analysis

Analyte Compounds	*MB 030822*	*Reporting Limit (RL)*
4-BFB (surrogate standard)	83%	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 030822*	*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	0.5
Naphthalene	<RL	1.0
Hexachlorobutadiene	<RL	0.5

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Atmospheric Analysis & Consulting, Inc.

QUALITY CONTROL / QUALITY ASSURANCE REPORT

ANALYSIS DATE : 03/08/2022
MATRIX : Air
UNITS : PPB (v/v)

INSTRUMENT ID : GC/MS-02
ANALYST : RC
DILUTION FACTOR[1] : x66.16

VOLATILE ORGANIC COMPOUNDS BY EPA METHOD TO-15

Duplicate Analysis of AAC Sample ID: 220461-28566

Analyte Compounds	*Sample*	*Duplicate*	*RPD[2]*
4-BFB (surrogate standard)	8.61	8.75	1.6
Chlorodifluoromethane	<SRL	<SRL	*NA*
Propene	<SRL	<SRL	*NA*
Dichlorodifluoromethane	<SRL	<SRL	*NA*
Dimethyl Ether	<SRL	<SRL	*NA*
Chloromethane	<SRL	<SRL	*NA*
Dichlorotetrafluoroethane	<SRL	<SRL	*NA*
Vinyl Chloride	<SRL	<SRL	*NA*
Acetaldehyde	<SRL	<SRL	*NA*
Methanol	<SRL	<SRL	*NA*
1,3-Butadiene	<SRL	<SRL	*NA*
Bromomethane	<SRL	<SRL	*NA*
Chloroethane	<SRL	<SRL	*NA*
Dichlorofluoromethane	<SRL	<SRL	*NA*
Ethanol	<SRL	<SRL	*NA*
Vinyl Bromide	<SRL	<SRL	*NA*
Acrolein	<SRL	<SRL	*NA*
Acetone	<SRL	<SRL	*NA*
Trichlorofluoromethane	<SRL	<SRL	*NA*
2-Propanol (IPA)	<SRL	<SRL	*NA*
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)	<SRL	<SRL	*NA*
cis-1,2-Dichloroethene	<SRL	<SRL	*NA*
Hexane	<SRL	<SRL	*NA*
Chloroform	<SRL	<SRL	*NA*
Ethyl Acetate	<SRL	<SRL	*NA*
Tetrahydrofuran	<SRL	<SRL	*NA*
1,2-Dichloroethane	<SRL	<SRL	*NA*
1,1,1-Trichloroethane	<SRL	<SRL	*NA*
Benzene	<SRL	<SRL	*NA*
Carbon Tetrachloride	<SRL	<SRL	*NA*
Cyclohexane	<SRL	<SRL	*NA*

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	38.4	39.7	3.4
cis-1,3-Dichloropropene	<SRL	<SRL	*NA*
4-Methyl-2-pentanone (MiBK)	<SRL	<SRL	*NA*
trans-1,3-Dichloropropene	<SRL	<SRL	*NA*
1,1,2-Trichloroethane	<SRL	<SRL	*NA*
Toluene E	6750	7550	11.1
2-Hexanone (MBK)	<SRL	<SRL	*NA*
Dibromochloromethane	<SRL	<SRL	*NA*
1,2-Dibromoethane	<SRL	<SRL	*NA*
Tetrachloroethene (PCE)	<SRL	<SRL	*NA*
Chlorobenzene	<SRL	<SRL	*NA*
Ethylbenzene	<SRL	<SRL	*NA*
m & p-Xylene	<SRL	<SRL	*NA*
Bromoform	<SRL	<SRL	*NA*
Styrene	<SRL	<SRL	*NA*
1,1,2,2-Tetrachloroethane	<SRL	<SRL	*NA*
o-Xylene	<SRL	<SRL	*NA*
1,2,3-Trichloropropane	<SRL	<SRL	*NA*
Isopropylbenzene (Cumene)	<SRL	<SRL	*NA*
α-Pinene	<SRL	<SRL	*NA*
2-Chlorotoluene	<SRL	<SRL	*NA*
n-Propylbenzene	<SRL	<SRL	*NA*
4-Ethyltoluene	<SRL	<SRL	*NA*
1,3,5-Trimethylbenzene	<SRL	<SRL	*NA*
β-Pinene	<SRL	<SRL	*NA*
1,2,4-Trimethylbenzene	<SRL	<SRL	*NA*
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.

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