A.Lanfranco & Associates Inc.
Environmental Consultants

Prepared for

METRO VANCOUVER

Metrotower III
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WASTE-TO-ENERGY FACILITY

Appendices of Emissions Testing Report
November - December 2024 Survey
Fourth Quarter 2024

Table of Contents

APPENDIX – A

QUALITY ASSURANCE / QUALITY CONTROL RESULTS

Quality assurance / quality control (QA/QC) is divided into four categories: administration, preparation, testing, and analysis. The following sections detail results found for the above four categories.

Administration:

- All field, process, and analytical data was reviewed to ensure data integrity and accuracy.
- Duplicate proof of draft and final report, including data entry, conducted.

Preparation:

- All glassware cleaned
- Blank samples of reagents collected.

Testing:

- Stack diameter and absence of cyclonic flow confirmed
- Calibrated magnehelic used for all velocity measurements
- All trains past pre- and post- leak checks.
- Isokinetics all within 100% $\pm$ 10%.

Analysis:

- Trace Metals and Mercury analysis conducted at Element Labs, Surrey, B.C.
- Fluoride (HF) analysis conducted at Element Labs in Surrey, B.C.
- Nitrous Oxide (N_2O) analysis conducted at Bureau Veritas in Mississauga, ON.
- Volatile Organic Compounds (VOC) analysis conducted at ALS Environmental in Simi Valley, CA.
- Particulate analysis conducted at A. Lanfranco and Associates Inc., Surrey, BC.
- Chain of Custody protocols followed for all samples.
- Acceptable blank values for all sample types. All samples blank corrected.

Sample Type	**Blank Value**		
Fourth Quarter 2024	**Unit 1**	**Unit 2**	**Unit 3**
Filter	0.2 mg	0.0 mg	0 mg
Front Half Washings	-0.1 mg	-1.8 mg	-1.9 mg
Mercury Front	<0.02 ug	<0.02 ug	<0.02 ug
Mercury Back	<0.20 ug	<0.18 ug	<0.17 ug
Trace Metals Front *	<57.9 ug	<85.6 ug	<85.7 ug
Trace Metals Back*	<23.1 ug	<32.1 ug	<28.4 ug
Ammonia	14.0 ug	6 ug	6.7 ug
Fluoride	<7 ug	<7 ug	<7 ug

Sum of all reported elements except Hg*

APPENDIX - B

CALCULATIONS

The following sections show the equations and define the variables that were used for this survey. The equations are organized in three sections. Equations 1-11 were used to calculate particulate concentration at standard conditions on a dry basis. Equations 12-26 were used to sample within the 100 ± 10% isokinetic variation and to confirm that sampling meets this isokinetic variation threshold. Equations 27-29 were used to calculate the volumetric flowrate of the stack flue gas.

App B.1 Contaminant Concentration Calculations

$$c = \frac{m}{V_{std}} \quad \textbf{Equation 1}$$

$$m_{part} = m_{filter} + m_{pw} \quad \textbf{Equation 2}$$

$$m_i = m_{ana,i} - m_{blank} \quad \textbf{Equation 3}$$

$$V_{std} = \frac{V_{std(imp)}}{35.315} \quad \textbf{Equation 4}$$

$$V_{std(imp)} = \frac{V_{samp} \times y \times P_m \times (T_{std} + 459.67)}{P_{std} \times (T_{m(ave)} + 459.67)} \quad \textbf{Equation 5}$$

$$V_{samp} = V_{final} - V_{init} \quad \textbf{Equation 6}$$

$$P_m = P_B + \frac{\Delta H_{ave}}{13.6} \quad \textbf{Equation 7}$$

$$\Delta H_{ave} = \frac{1}{n}\sum_{i=1}^{n} \Delta H_{i(act)}, where\ n = the\ number\ of\ points \quad \textbf{Equation 8}$$

$$OC = \frac{20.9 - \%O_{2c}}{20.9 - \%O_{2m}} \quad \textbf{Equation 9}$$

$$\%O_{2m} = \frac{1}{n}\sum_{i=1}^{n} \%O_{2i}, where\ n = the\ number\ of\ O_2\ measurements \quad \textbf{Equation 10}$$

$$\%CO_{2m} = \frac{1}{n}\sum_{i=1}^{n} \%CO_{2i}, where\ n = the\ number\ of\ CO_2\ measurements \quad \textbf{Equation 11}$$

Where,

c	= Contaminant concentration
m	= Contaminant mass
m_i	= Net analytical mass (mg, ng, or µg)
$m_{ana,i}$	= Analytical mass (mg, ng, or µg)
m_{blank}	= Blank analytical mass (mg, ng, or µg)
m_{part}	= Total particulate mass (mg)
m_{filter}	= Net particulate gain from filter (mg)
m_{pw}	= Net particulate gain from probe wash (mg)
$V_{std(imp)}$	= Sample volume at standard conditions (ft^3)
V_{std}	= Sample volume at standard conditions (m^3)
V_{samp}	= Sample volume at actual conditions (ft^3)
V_{final}	= Final gas meter reading (ft^3)
V_{init}	= Initial gas meter reading (ft^3)
T_{std}	= Standard temperature (68 °F)
T_m	= Gas meter temperature (°F)
$T_{m(ave)}$	= Average gas meter temperature (°F)
P_m	= Absolute meter pressure (inches of Hg)
P_B	= Barometric pressure (inches of Hg)
ΔH_{ave}	= Average of individual point orifice pressures (inches of H_2O)
$\Delta H_{i(act)}$	= Individual recorded point orifice pressures (inches of H_2O)
OC	= Oxygen correction factor (dimensionless)
$\%O_{2c}$	= Oxygen concentration to correct to (% dry basis)
$\%O_{2m}$	= Average measured stack gas oxygen concentration (% dry basis)
$\%CO_{2m}$	= Average measured stack gas oxygen concentration (% dry basis)

Equation 1 is the general concentration calculation used for all contaminants. The contaminant mass, *m*, is the net analytic mass for the given contaminant. For particulate, *m* is the sum of the mass contributed from probe washing and filter particulate.

App B.2 Isokinetic Variation Calculations

$$\Delta H_i = \frac{2.62 \times 10^7 \times c_p \times A_n \times (1 - B_{wo}) \times M_D \times (T_m + 459.67) \times \Delta p_i}{k_o \times M_w \times (T_{Stk} + 459.67)}$$ **Equation 12**

$$R_m = 85.49 \times c_p \times \sqrt{\Delta p_i} \times \sqrt{\frac{(T_{stk_i} + 459.67)}{M_w \times P_B}} \times 60 \times A_n \times \frac{(T_{m_i} + 459.67) \times (1 - B_{wo})}{(T_{stk_i} + 459.67) \times y}$$ **Equation 13**

$$A_n = \pi \left(\frac{d_n}{24}\right)^2$$ **Equation 14**

$$M_w = M_D \times (1 - B_{wo}) + 18 \times B_{wo}$$ **Equation 15**

$$M_D = 0.44 \times \%CO_2 + 0.32 \times \%O_2 + 0.28 \times (100 - \%CO_2 - \%O_2)$$ **Equation 16**

$$T_{Stk} = \frac{1}{n}\sum_{i=1}^{n} T_{Stk_i}, where\ n = the\ number\ of\ points$$ **Equation 17**

$$B_{wo} = \frac{V_{cond}}{V_{cond} + V_{std(imp)}}$$ **Equation 18**

$$V_{cond} = 0.04707 \times V_{gain}$$ **Equation 19**

$$Iso = \frac{1}{n}\sum_{i=1}^{n} Iso_i, where\ n = the\ number\ of\ points$$ **Equation 20**

$$Iso_i = \frac{v_{nzi}}{v_i}$$ **Equation 21**

$$v_i = 85.49 \times c_p \times \sqrt{\Delta p_i} \times \sqrt{\frac{\left(T_{Stk_i} + 459.67\right)}{(P_{Stk} \times M_W)}}$$ **Equation 22**

$$v_{nzi} = \frac{(V_i - V_{i-1}) \times y \times (T_{Stk_i} + 459.67) \times (P_B + \frac{\Delta H_{i(act)}}{13.6})}{A_n \times t_i \times 60 \times (T_{m(i)} + 459.67) \times P_{stk} \times (1 - B_{wo})}$$ **Equation 23**

$$P_{stk} = P_B + \frac{P_g}{13.6}$$ **Equation 24**

Equation 25

$$v_{stk} = \frac{1}{n}\sum_{i=1}^{n} v_i \text{ , where } n = \text{the number of points}$$

Equation 26

$$v_{nz} = \frac{1}{n}\sum_{i=1}^{n} v_{nzi} \text{ , where } n = \text{the number of points}$$

Where,

A_n = *Nozzle area (ft^2)*
d_n = *Diameter of nozzle (inches)*
c_p = *Pitot coefficient (dimensionless)*
Δp_i = *Individual point differential pressures (inches of H_2O)*
T_{Stk} = *Average flue gas temperature (°F), second subscript i, indicates individual point measurements*
$\Delta H_{i(act)}$ = *Calculated individual point orifice pressures (inches of H_2O)*
P_g = *Stack Static pressure (inches of H_2O)*
P_{stk} = *Absolute stack pressure (inches of Hg)*
M_w = *Wet gas molecular weight (g/gmol)*
M_D = *Dry gas molecular weight (g/gmol)*
$\%CO_2$ = *Stack gas carbon dioxide concentration (% dry basis)*
$\%O_2$ = *Stack gas oxygen concentration (% dry basis)*
B_{wo} = *Stack gas water vapour, proportion by volume*
V_{cond} = *Total volume of water vapor collected, corrected to standard conditions (ft^3)*
V_{gain} = *Condensate gain of impinger contents (mL)*
P_{std} = *Standard pressure (29.92 inches of Hg)*
v_{stk} = *Average flue gas velocity (ft/sec)*
v_i = *Individual point flue gas velocity (ft/sec)*
v_{nz} = *Average velocity at nozzle(ft/sec)*
v_{nzi} = *Individual point velocity at nozzle(ft/sec)*
Iso_i = *Individual point isokinetic variation (%)*
Iso = *Average isokinetic variation (%)*
R_m = *Isokinetic sampling rate (ft^3/min)*

App B.3 Volumetric Flowrate Calculations

$$Q_S = Q_A \times \frac{(T_{Std} + 459.67)}{(T_{Stk} + 459.67)} \times \frac{P_{Stk}}{P_{Std}}$$ **Equation 27**

$$Q_A = \frac{v_{stk} \times 60 \times A_{stk}}{35.315}$$ **Equation 28**

$$A_{stk} = \pi \left(\frac{d}{24}\right)^2$$ **Equation 29**

Where,

Q_A = *Actual flowrate (Am³/min)*
Q_S = *Flowrate (m³/min) at standard conditions on a dry basis*
A_{stk} = *Area of stack (ft²)*
d = *Diameter of stack (inches)*

APPENDIX - C

LABORATORY RESULTS

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Report Transmission Cover Page

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784769**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091767
Report Type: Final Report

Contact	Company	Address
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Delivery	Format	Deliverables
Email	PDF	COA / COC
Email	PDF	COC / Test Report

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Delivery	Format	Deliverables
Email	PDF	Invoice

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Analytical Report

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Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784769**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091767
Report Type: Final Report

Reference Number	1784769-1	1784769-2	1784769-3
Sample Date	Dec 12, 2024	Dec 13, 2024	Dec 13, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 1 Run 1 ('MV1-blk' + 4 Bottles) / 17.1 °C	Unit 1 Run 2 ('MV Unit 1 Run 2' + 4 Bottles) / 17.1 °C	Unit 1 Run 3 ('MV Unit 3 Run 2' + 4 Bottles) / 17.1 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	28	36	20	5
Antimony		µg	9	<2	7	2.5
Arsenic		µg	1	2.7	<1	1
Cadmium		µg	<0.3	0.3	<0.3	0.25
Chromium		µg	0.25	0.45	1.8	0.2
Cobalt		µg	0.5	0.5	0.5	0.25
Copper		µg	0.8	1	0.9	0.25
Lead		µg	2.9	6.1	2.6	1.5
Manganese		µg	2	1	2	0.25
Nickel		µg	0.6	1	2	0.5
Phosphorus		µg	49	43	48	2.5
Selenium		µg	<2	<2	<2	1.5
Tellurium		µg	<2	<2	5.4	2
Thallium		µg	<2	<2	<2	1.5
Vanadium		µg	<1	<1	<1	1
Zinc		µg	24	22	22	0.5
Back Half Metals Fraction 2A						
Aluminum		µg	27	20	20	5
Antimony		µg	<2	<2	4	2.5
Arsenic		µg	<0.9	<0.9	3.1	1
Cadmium		µg	<0.2	0.4	<0.2	0.25
Chromium		µg	0.79	3.28	0.52	0.2
Cobalt		µg	<0.2	<0.2	0.7	0.25
Copper		µg	1	<0.2	0.6	0.25
Lead		µg	4.3	<1	2.2	1.5
Manganese		µg	1	2	1	0.25
Nickel		µg	2	2	1	0.5
Phosphorus		µg	20	20	20	2.5
Selenium		µg	<1	<1	<1	1.5
Tellurium		µg	<2	<2	<2	2
Thallium		µg	<1	2.3	<1	1.5
Vanadium		µg	<0.9	<0.9	<0.9	1
Zinc		µg	11	9.1	9.4	0.5
Volume	Sample	mL	648	590	660	
Volume	aliquot volume	mL	598	540	610	
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05

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Analytical Report

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Sample Date	Dec 12, 2024	Dec 13, 2024	Dec 13, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 1 Run 1 ('MV1-blk' + 4 Bottles) / 17.1 °C	Unit 1 Run 2 ('MV Unit 1 Run 2' + 4 Bottles) / 17.1 °C	Unit 1 Run 3 ('MV Unit 3 Run 2' + 4 Bottles) / 17.1 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	250	250	250	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 1B	µg/sample	<0.02	<0.02	<0.02	
Mercury	As Tested	µg/L	0.12	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	648	590	660	
Volume	aliquot volume	mL	5.0	5.0	5.0	
Volume	Final	mL	40	40	40	
Mercury	Fraction 2B	µg/sample	0.65	<0.2	<0.3	
Mercury	As Tested	µg/L	0.40	0.34	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	100	97	98	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3A	µg/sample	0.065	0.053	<0.008	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	500	500	500	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3B	µg/sample	<0.04	<0.04	<0.04	
Mercury	As Tested	µg/L	0.18	0.70	0.12	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	200	200	200	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3C	µg/sample	0.059	0.22	0.038	

Approved by:

Rachel Eden , B. Sc.
Operations Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

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Methodology and Notes

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Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784769**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091767
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 3B	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 08, 2025	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 08, 2025	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

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Report Transmission Cover Page

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Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780836**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085250
Report Type: Final Report

Contact	Company	Address
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Delivery	Format	Deliverables
Email	PDF	COA / COC
Email	PDF	COC / Test Report

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Delivery	Format	Deliverables
Email	PDF	Invoice

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Analytical Report

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780836**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085250
Report Type: Final Report

Reference Number	1780836-1	1780836-2	1780836-3
Sample Date	Nov 19, 2024	Nov 20, 2024	Nov 20, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 2 Run 1 ('Unit 2 R-1' + 4 Bottles) / 20.8 °C	Unit 2 Run 2 ('MV Unit 2 Run 2' + 4 Bottles) / 20.8 °C	Unit 2 Run 3 ('MV Unit 2 Run 3' + 4 Bottles) / 20.8 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	10	33	20	5
Antimony		µg	7	5	4	2.5
Arsenic		µg	2	<1	2	1
Cadmium		µg	<0.3	<0.3	<0.3	0.25
Chromium		µg	3.02	2.5	6.03	0.2
Cobalt		µg	<0.3	<0.3	0.3	0.25
Copper		µg	0.6	0.7	0.6	0.25
Lead		µg	<2	<2	<2	1.5
Manganese		µg	2	1	2	0.25
Nickel		µg	6.4	5.3	8.7	0.5
Phosphorus		µg	60	63	50	2.5
Selenium		µg	5.7	<2	<2	1.5
Tellurium		µg	3.4	<2	<2	2
Thallium		µg	<2	<2	<2	1.5
Vanadium		µg	<1	<1	<1	1
Zinc		µg	12	9.7	10	0.5
Back Half Metals Fraction 2A						
Aluminum		µg	10	9	9	5
Antimony		µg	<2	<2	6	2.5
Arsenic		µg	<0.9	<0.9	1	1
Cadmium		µg	<0.2	<0.2	<0.2	0.25
Chromium		µg	0.26	0.64	1.7	0.2
Cobalt		µg	<0.2	<0.2	<0.2	0.25
Copper		µg	<0.2	<0.2	<0.2	0.25
Lead		µg	<1	<1	<1	1.5
Manganese		µg	2.5	1	0.4	0.25
Nickel		µg	<0.4	<0.4	0.4	0.5
Phosphorus		µg	20	26	20	2.5
Selenium		µg	5.1	<1	<1	1.5
Tellurium		µg	<2	<2	4.7	2
Thallium		µg	5.7	3.0	<1	1.5
Vanadium		µg	<0.9	<0.9	<0.9	1
Zinc		µg	0.9	0.9	5.7	0.5
Volume	Sample	mL	802	765	695	
Volume	aliquot volume	mL	752	715	645	
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05

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Analytical Report

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
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Date Received: Nov 29, 2024
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Report Type: Final Report

Reference Number	1780836-1	1780836-2	1780836-3
Sample Date	Nov 19, 2024	Nov 20, 2024	Nov 20, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 2 Run 1 ('Unit 2 R-1' + 4 Bottles) / 20.8 °C	Unit 2 Run 2 ('MV Unit 2 Run 2' + 4 Bottles) / 20.8 °C	Unit 2 Run 3 ('MV Unit 2 Run 3' + 4 Bottles) / 20.8 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	250	250	250	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 1B	µg/sample	<0.02	<0.02	<0.02	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	802	765	695	
Volume	aliquot volume	mL	5.0	5.0	5.0	
Volume	Final	mL	40	40	40	
Mercury	Fraction 2B	µg/sample	<0.3	<0.3	<0.3	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	133	118	116	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3A	µg/sample	<0.01	<0.009	<0.009	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	500	500	500	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3B	µg/sample	<0.04	<0.04	<0.04	
Mercury	As Tested	µg/L	0.08	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	200	200	200	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3C	µg/sample	0.03	<0.02	<0.02	

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Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780836**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085250
Report Type: Final Report

Reference Number	1780836-4	1780836-5	1780836-6
Sample Date	Nov 18, 2024	Nov 19, 2024	Nov 19, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 3 Run 1 ('Unit 3 R-1' + 4 Bottles) / 20.8 °C	MV Unit 3 Run 2 ('MV U3 Run 2' + 4 Bottles) / 20.8 °C	MV Unit 3 Run 3 ('MV U3 Run 3' + 4 Bottles) / 20.8 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	20	20	20	5
Antimony		µg	<2	<2	<2	2.5
Arsenic		µg	<1	1	1	1
Cadmium		µg	<0.3	<0.3	<0.3	0.25
Chromium		µg	1.8	4.28	1.8	0.2
Cobalt		µg	<0.3	<0.3	<0.3	0.25
Copper		µg	2.9	2.7	2	0.25
Lead		µg	4.7	4.1	8.5	1.5
Manganese		µg	2	2	1	0.25
Nickel		µg	7.9	8.7	5.0	0.5
Phosphorus		µg	72	72	66	2.5
Selenium		µg	<2	<2	<2	1.5
Tellurium		µg	<2	<2	<2	2
Thallium		µg	<2	<2	<2	1.5
Vanadium		µg	<1	<1	<1	1
Zinc		µg	40.7	42.9	44.5	0.5
Back Half Metals Fraction 2A						
Aluminum		µg	23	24	28	5
Antimony		µg	<2	<2	<2	2.5
Arsenic		µg	<0.9	<0.9	<0.9	1
Cadmium		µg	<0.2	<0.2	<0.2	0.25
Chromium		µg	3.19	0.55	5.89	0.2
Cobalt		µg	<0.2	<0.2	<0.2	0.25
Copper		µg	<0.2	0.4	0.9	0.25
Lead		µg	<1	<1	<1	1.5
Manganese		µg	3.2	1.0	2	0.25
Nickel		µg	1	<0.4	0.7	0.5
Phosphorus		µg	25	26	23	2.5
Selenium		µg	<1	<1	<1	1.5
Tellurium		µg	<2	<2	<2	2
Thallium		µg	<1	<1	<1	1.5
Vanadium		µg	<0.9	<0.9	<0.9	1
Zinc		µg	2	1	6.8	0.5
Volume	Sample	mL	670	705	720	
Volume	aliquot volume	mL	620	655	670	
Mercury by CVAA						
Mercury	As Tested	µg/L	0.11	<0.05	<0.05	0.05

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Analytical Report

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V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780836**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085250
Report Type: Final Report

Reference Number	1780836-4	1780836-5	1780836-6
Sample Date	Nov 18, 2024	Nov 19, 2024	Nov 19, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 3 Run 1 ('Unit 3 R-1' + 4 Bottles) / 20.8 °C	MV Unit 3 Run 2 ('MV U3 Run 2' + 4 Bottles) / 20.8 °C	MV Unit 3 Run 3 ('MV U3 Run 3' + 4 Bottles) / 20.8 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	250	250	250	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 1B	µg/sample	0.045	<0.02	<0.02	
Mercury	As Tested	µg/L	0.14	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	670	705	720	
Volume	aliquot volume	mL	5.0	5.0	5.0	
Volume	Final	mL	40	40	40	
Mercury	Fraction 2B	µg/sample	0.74	<0.3	<0.3	
Mercury	As Tested	µg/L	0.12	0.06	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	106	134	130	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3A	µg/sample	0.021	0.01	<0.01	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	500	500	500	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3B	µg/sample	<0.04	<0.04	<0.04	
Mercury	As Tested	µg/L	0.11	0.41	0.16	0.05
Dilution Factor	As Tested		1	1	1	
Volume	Sample	mL	200	200	200	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3C	µg/sample	0.035	0.13	0.052	

Approved by:

Rachel Eden , B. Sc.
Operations Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).
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Methodology and Notes

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780836**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085250
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 3B	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 06, 2024	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 05, 2024	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

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Project ID: Metro Vancouver WTE
Project Name: HF Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780806**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 5, 2024
Report Number: 3085202
Report Type: Final Report

Contact	Company	Address
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Delivery	Format	Deliverables
Email	PDF	COA / COC
Email	PDF	COC / Test Report

Contact	Company	Address
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Delivery	Format	Deliverables
Email	PDF	Invoice

Notes To Clients:

- Reduction of analytical volume was necessary for anion analysis due to matrix effects in lot 1780806. Detection limits are adjusted accordingly.

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Analytical Report

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: HF Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780806**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 5, 2024
Report Number: 3085202
Report Type: Final Report

Reference Number	1780806-1	1780806-2	1780806-3
Sample Date	Nov 20, 2024	Nov 20, 2024	Nov 20, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit #2 HF Run 1 / 19.8 °C	Unit #2 HF Run 2 / 19.8 °C	Unit #2 HF Run 3 / 19.8 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Volume	Sample	mL	351	351	353	
Dilution Factor	fluoride		10.00	10.00	10.00	
Fluoride	As Tested	mg/L	<0.3	<0.3	<0.3	0.03
Fluoride	Water Soluble	µg/sample	<100	<100	<100	

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Analytical Report

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: HF Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780806**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 5, 2024
Report Number: 3085202
Report Type: Final Report

Reference Number	1780806-4	1780806-5	1780806-6
Sample Date	Nov 19, 2024	Nov 19, 2024	Nov 19, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit #3 HF Run 1 / 19.8 °C	Unit #3 HF Run 2 / 19.8 °C	Unit #3 HF Run 3 / 19.8 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Volume	Sample	mL	371	269	335	
Dilution Factor	fluoride		10.00	10.00	10.00	
Fluoride	As Tested	mg/L	<0.3	<0.3	<0.3	0.03
Fluoride	Water Soluble	µg/sample	<100	<80	<100	

Approved by:

Rachel Eden , B. Sc.
Operations Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).
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Methodology and Notes

Bill To:	A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID:	Metro Vancouver WTE	Lot ID:	**1780806**
Attn:	Missy	Project Name:	HF Samples	Control Number:	
Sampled By:		Project Location:		Date Received:	Nov 29, 2024
Company:		LSD:		Date Reported:	Dec 5, 2024
		P.O.:		Report Number:	3085202
		Proj. Acct. code:		Report Type:	Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Anions by IEC in air (VAN)	EMC	*	Determination of Hydrogen Halide & Halogen Emissions from Stationary Sources (Isokinetic), 26A	Dec 03, 2024	Element Vancouver

** Reference Method Modified*

References

EMC	Emission Measurement Center of EPA

Comments:

- Reduction of analytical volume was necessary for anion analysis due to matrix effects in lot 1780806. Detection limits are adjusted accordingly.

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Report Transmission Cover Page

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Filter Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780816**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085219
Report Type: Final Report

Contact	Company	Address
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Delivery	Format	Deliverables
Email	PDF	COA / COC
Email	PDF	COC / Test Report

Contact	Company	Address
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Delivery	Format	Deliverables
Email	PDF	Invoice

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Analytical Report

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Company:

Project ID: Metro Vancouver WTE
Project Name: Filter Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780816**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085219
Report Type: Final Report

Reference Number	1780816-1	1780816-2
Sample Date	Nov 18, 2024	Nov 18, 2024
Sample Time	NA	NA
Sample Location		
Sample Description	Reagent Blank Unit 2 Container 1 (filter) / 19.8 °C	Reagent Blank Unit 3 Container 1 (filter) / 19.8 °C
Matrix	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	6	<5		5
Antimony		µg	<2	6		2.5
Arsenic		µg	<1	2		1
Cadmium		µg	<0.3	<0.3		0.25
Chromium		µg	0.44	<0.2		0.2
Cobalt		µg	<0.3	<0.3		0.25
Copper		µg	<0.3	<0.3		0.25
Lead		µg	<2	2		1.5
Manganese		µg	<0.3	<0.3		0.25
Nickel		µg	0.9	0.6		0.5
Phosphorus		µg	62	47		2.5
Selenium		µg	<2	<2		1.5
Tellurium		µg	<2	<2		2
Thallium		µg	<2	<2		1.5
Vanadium		µg	<1	<1		1
Zinc		µg	0.7	4.2		0.5
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05	<0.05		0.05
Dilution Factor	As Tested		1	1		
Volume	Sample	mL	250	250		
Volume	aliquot volume	mL	25	25		
Volume	Final	mL	40	40		
Mercury	Fraction 1B	µg/sample	<0.02	<0.02		

Approved by:

Rachel Eden , B. Sc.
Operations Manager

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Methodology and Notes

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Filter Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780816**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085219
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 05, 2024	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

Please direct any inquiries regarding this report to our Client Services group.
Results relate only to samples as submitted.

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Report Transmission Cover Page

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Sampled By:
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Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780832**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085235
Report Type: Final Report

Contact	Company	Address
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Delivery	Format	Deliverables
Email	PDF	COA / COC
Email	PDF	COC / Test Report

Contact	Company	Address
Missy	**A. Lanfranco & Associates**	#101, 9488 - 189 Street Surrey, BC V4N 4W7 Phone: (604) 881-2582 Fax: (604) 881-2581 Email: missy@alanfranco.com

Delivery	Format	Deliverables
Email	PDF	Invoice

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Analytical Report

Bill To: A. Lanfranco & Associates
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V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780832**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085235
Report Type: Final Report

Reference Number	1780832-1	1780832-2
Sample Date	Nov 20, 2023	Nov 19, 2024
Sample Time	NA	NA
Sample Location		
Sample Description	Field Blank Unit 2 (Unit 2 BLK + 4 Bottles) / 19.8 °C	Field Blank Unit 3 (Unit 3 Blank + 4 Bottles) / 19.8 °C
Matrix	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	20	20		5
Antimony		µg	<2	<2		2.5
Arsenic		µg	<1	<1		1
Cadmium		µg	<0.3	<0.3		0.25
Chromium		µg	0.38	<0.2		0.2
Cobalt		µg	<0.3	<0.3		0.25
Copper		µg	<0.3	<0.3		0.25
Lead		µg	<2	<2		1.5
Manganese		µg	<0.3	0.3		0.25
Nickel		µg	2	2		0.5
Phosphorus		µg	56	60		2.5
Selenium		µg	<2	<2		1.5
Tellurium		µg	<2	<2		2
Thallium		µg	<2	<2		1.5
Vanadium		µg	<1	<1		1
Zinc		µg	7.2	3.4		0.5
Back Half Metals Fraction 2A						
Aluminum		µg	5	7		5
Antimony		µg	<2	<2		2.5
Arsenic		µg	<0.9	<0.9		1
Cadmium		µg	<0.2	<0.2		0.25
Chromium		µg	0.2	0.41		0.2
Cobalt		µg	0.3	<0.2		0.25
Copper		µg	<0.2	<0.2		0.25
Lead		µg	<1	<1		1.5
Manganese		µg	0.2	<0.2		0.25
Nickel		µg	0.8	<0.5		0.5
Phosphorus		µg	20	20		2.5
Selenium		µg	<1	<1		1.5
Tellurium		µg	<2	<2		2
Thallium		µg	<1	<1		1.5
Vanadium		µg	<0.9	<0.9		1
Zinc		µg	5.6	1.0		0.5
Volume	Sample	mL	434	350		
Volume	aliquot volume	mL	384	300		
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05	<0.05		0.05

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780832**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085235
Report Type: Final Report

Reference Number	1780832-1	1780832-2
Sample Date	Nov 20, 2023	Nov 19, 2024
Sample Time	NA	NA
Sample Location		
Sample Description	Field Blank Unit 2 (Unit 2 BLK + 4 Bottles) / 19.8 °C	Field Blank Unit 3 (Unit 3 Blank + 4 Bottles) / 19.8 °C
Matrix	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Dilution Factor	As Tested		1	1		
Volume	Sample	mL	250	250		
Volume	aliquot volume	mL	25	25		
Volume	Final	mL	40	40		
Mercury	Fraction 1B	µg/sample	<0.02	<0.02		
Mercury	As Tested	µg/L	<0.05	<0.05		0.05
Dilution Factor	As Tested		1	1		
Volume	Sample	mL	434	350		
Volume	aliquot volume	mL	5.0	5.0		
Volume	Final	mL	40	40		
Mercury	Fraction 2B	µg/sample	<0.2	<0.1		
Mercury	As Tested	µg/L	<0.05	<0.05		0.05
Dilution Factor	As Tested		1	1		
Volume	Sample	mL	98	101		
Volume	aliquot volume	mL	25	25		
Volume	Final	mL	40	40		
Mercury	Fraction 3A	µg/sample	<0.008	<0.008		
Mercury	As Tested	µg/L	<0.05	<0.05		0.05
Dilution Factor	As Tested		1	1		
Volume	Sample	mL	500	500		
Volume	aliquot volume	mL	25	25		
Volume	Final	mL	40	40		
Mercury	Fraction 3B	µg/sample	<0.04	<0.04		
Mercury	As Tested	µg/L	<0.05	<0.05		0.05
Dilution Factor	As Tested		1	1		
Volume	Sample	mL	200	200		
Volume	aliquot volume	mL	25	25		
Volume	Final	mL	40	40		
Mercury	Fraction 3C	µg/sample	<0.02	<0.02		

Approved by:

Rachel Eden , B. Sc.
Operations Manager

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Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780832**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085235
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 3B	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 06, 2024	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 05, 2024	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

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Project ID: Metro Vancouver WTE
Project Name: HF Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780800**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 5, 2024
Report Number: 3085195
Report Type: Final Report

Contact	Company	Address
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Email	PDF	COC / Test Report

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Project ID: Metro Vancouver WTE
Project Name: HF Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780800**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 5, 2024
Report Number: 3085195
Report Type: Final Report

Reference Number	1780800-1	1780800-2
Sample Date	Nov 20, 2024	Nov 19, 2024
Sample Time	NA	NA
Sample Location		
Sample Description	Unit #2 HF Blank / 19.8 °C	Unit #3 HF Blank / 19.8 °C
Matrix	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Volume	Sample	mL	231	232		
Dilution Factor	fluoride		1.00	1.00		
Fluoride	As Tested	mg/L	<0.03	<0.03		0.03
Fluoride	Water Soluble	µg/sample	<7	<7		

Approved by:

Rachel Eden , B. Sc.
Operations Manager

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Project Name: HF Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780800**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 5, 2024
Report Number: 3085195
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Anions by IEC in air (VAN)	EMC	*	Determination of Hydrogen Halide & Halogen Emissions from Stationary Sources (Isokinetic), 26A	Dec 03, 2024	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

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Project ID: Metro Vancouver WTE
Project Name: NH3 Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780797**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 6, 2024
Report Number: 3085189
Report Type: Final Report

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Email	PDF	COC / Test Report

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Project ID: Metro Vancouver WTE
Project Name: NH3 Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780797**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 6, 2024
Report Number: 3085189
Report Type: Final Report

Reference Number	1780797-1	1780797-2
Sample Date	Nov 20, 2024	Nov 19, 2024
Sample Time	NA	NA
Sample Location		
Sample Description	Unit # 2 NH3 Blk / 19.8 °C	Unit #3 NH3 Blk / 19.8 °C
Matrix	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Ammonium - N	As Tested	µg/L	29	29		25
Dilution Factor	As Tested		1.00	1.00		
Sample Volume	Sample volume	mL	196	232		
Ammonium - N		µg/sample	5.7	6.7		

Approved by:

Anthony Neumann, MSc
General Manager

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Project ID: Metro Vancouver WTE
Project Name: NH3 Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780797**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 6, 2024
Report Number: 3085189
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Ammonium in Impingers	APHA	*	Automated Phenate Method, 4500-NH3 G	Dec 05, 2024	Element Edmonton - Roper Road

** Reference Method Modified*

References

APHA Standard Methods for the Examination of Water and Wastewater

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Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
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Proj. Acct. code:

Lot ID: **1780818**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085222
Report Type: Final Report

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Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780818**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085222
Report Type: Final Report

Reference Number	1780818-1	1780818-2
Sample Date	Nov 18, 2024	Nov 18, 2024
Sample Time	NA	NA
Sample Location		
Sample Description	Reagent Blank Unit 2 / 19.8 °C	Reagent Blank Unit 3 / 19.8 °C
Matrix	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	5	<5		5
Antimony		µg	<2	3		2.5
Arsenic		µg	<1	<1		1
Cadmium		µg	<0.3	<0.3		0.25
Chromium		µg	0.32	0.63		0.2
Cobalt		µg	<0.3	<0.3		0.25
Copper		µg	<0.3	0.4		0.25
Lead		µg	<2	<2		1.5
Manganese		µg	<0.3	<0.3		0.25
Nickel		µg	1	2		0.5
Phosphorus		µg	5	9		2.5
Selenium		µg	<2	<2		1.5
Tellurium		µg	<2	<2		2
Thallium		µg	<2	<2		1.5
Vanadium		µg	<1	<1		1
Zinc		µg	<0.5	3.7		0.5
Back Half Metals Fraction 2A						
Aluminum		µg	8	7		5
Antimony		µg	<3	<3		2.5
Arsenic		µg	<1	<1		1
Cadmium		µg	<0.3	<0.3		0.25
Chromium		µg	0.37	<0.2		0.2
Cobalt		µg	<0.3	<0.3		0.25
Copper		µg	<0.3	<0.3		0.25
Lead		µg	<2	<2		1.5
Manganese		µg	0.4	0.3		0.25
Nickel		µg	<0.5	<0.5		0.5
Phosphorus		µg	20	20		2.5
Selenium		µg	<2	<2		1.5
Tellurium		µg	<2	<2		2
Thallium		µg	<2	<2		1.5
Vanadium		µg	<1	<1		1
Zinc		µg	5.9	4.9		0.5
Volume	Sample	mL	205	211		
Volume	aliquot volume	mL	155	161		
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05	<0.05		0.05
Dilution Factor	As Tested		1	1		

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Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
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Lot ID: **1780818**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085222
Report Type: Final Report

Reference Number	1780818-1	1780818-2
Sample Date	Nov 18, 2024	Nov 18, 2024
Sample Time	NA	NA
Sample Location		
Sample Description	Reagent Blank Unit 2 / 19.8 °C	Reagent Blank Unit 3 / 19.8 °C
Matrix	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Volume	Sample	mL	250	250		
Volume	aliquot volume	mL	25	25		
Volume	Final	mL	40	40		
Mercury	Fraction 1B	µg/sample	<0.02	<0.02		
Mercury	As Tested	µg/L	<0.05	<0.05		0.05
Dilution Factor	As Tested		1	1		
Volume	Sample	mL	205	211		
Volume	aliquot volume	mL	5.0	5.0		
Volume	Final	mL	40	40		
Mercury	Fraction 2B	µg/sample	<0.08	<0.08		
Mercury	As Tested	µg/L	<0.05	<0.05		0.05
Dilution Factor	As Tested		1	1		
Volume	Sample	mL	98	101		
Volume	aliquot volume	mL	25	25		
Volume	Final	mL	40	40		
Mercury	Fraction 3A	µg/sample	<0.008	<0.008		
Mercury	As Tested	µg/L	<0.05	<0.05		0.05
Dilution Factor	As Tested		1	1		
Volume	Sample	mL	500	500		
Volume	aliquot volume	mL	25	25		
Volume	Final	mL	40	40		
Mercury	Fraction 3B	µg/sample	<0.04	<0.04		
Mercury	As Tested	µg/L	<0.05	<0.05		0.05
Dilution Factor	As Tested		1	1		
Volume	Sample	mL	200	200		
Volume	aliquot volume	mL	25	25		
Volume	Final	mL	40	40		
Mercury	Fraction 3C	µg/sample	<0.02	<0.02		

Approved by:

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Operations Manager

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Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780818**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 16, 2024
Report Number: 3085222
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 3B	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 09, 2024	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 06, 2024	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Dec 05, 2024	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

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Project ID: Metro Vancouver WTE
Project Name: NH3 Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780810**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 6, 2024
Report Number: 3085210
Report Type: Final Report

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Email	PDF	COC / Test Report

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Project ID: Metro Vancouver WTE
Project Name: NH3 Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780810**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 6, 2024
Report Number: 3085210
Report Type: Final Report

Reference Number	1780810-1	1780810-2	1780810-3
Sample Date	Nov 20, 2024	Nov 20, 2024	Nov 20, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 2 Run 1 NH3 / 19.8 °C	Unit 2 Run 2 NH3 / 19.8 °C	Unit 2 Run 3 NH3 / 19.8 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Ammonium - N	As Tested	µg/L	1210	507	175	25
Dilution Factor	As Tested		1.00	1.00	1.00	
Sample Volume	Sample volume	mL	416	434	388	
Ammonium - N		µg/sample	502	220	67.9	

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Sampled By:
Company:

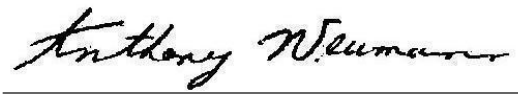
Project ID: Metro Vancouver WTE
Project Name: NH3 Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1780810**
Control Number:
Date Received: Nov 29, 2024
Date Reported: Dec 6, 2024
Report Number: 3085210
Report Type: Final Report

Reference Number	1780810-4	1780810-5	1780810-6
Sample Date	Nov 19, 2024	Nov 19, 2024	Nov 19, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 3 Run 1 NH3 / 19.8 °C	Unit 3 Run 2 NH3 / 19.8 °C	Unit 3 Run 3 NH3 / 19.8 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Ammonium - N	As Tested	µg/L	6490	606	262	25
Dilution Factor	As Tested		1.00	1.00	1.00	
Sample Volume	Sample volume	mL	368	438	422	
Ammonium - N		µg/sample	2390	265	111	

Approved by:



Anthony Neumann, MSc
General Manager

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Methodology and Notes

Bill To:	A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID:	Metro Vancouver WTE	Lot ID:	**1780810**
Attn:	Missy	Project Name:	NH3 Samples	Control Number:	
Sampled By:		Project Location:		Date Received:	Nov 29, 2024
Company:		LSD:		Date Reported:	Dec 6, 2024
		P.O.:		Report Number:	3085210
		Proj. Acct. code:		Report Type:	Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Ammonium in Impingers	APHA	*	Automated Phenate Method, 4500-NH3 G	Dec 05, 2024	Element Edmonton - Roper Road

** Reference Method Modified*

References

APHA	Standard Methods for the Examination of Water and Wastewater

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Report Transmission Cover Page

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784773**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091772
Report Type: Final Report

Contact	Company	Address
Mark Lanfranco	**A. Lanfranco & Associates**	#101, 9488 - 189 Street Surrey, BC V4N 4W7 Phone: (604) 881-2582 Fax: (604) 881-2581 Email: mark.lanfranco@alanfranco.com

Delivery	Format	Deliverables
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Email	PDF	COC / Test Report

Contact	Company	Address
Missy	**A. Lanfranco & Associates**	#101, 9488 - 189 Street Surrey, BC V4N 4W7 Phone: (604) 881-2582 Fax: (604) 881-2581 Email: missy@alanfranco.com

Delivery	Format	Deliverables
Email	PDF	Invoice

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Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
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V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784773**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091772
Report Type: Final Report

Reference Number	1784773-1
Sample Date	Dec 13, 2024
Sample Time	NA
Sample Location	
Sample Description	Field Blank Unit 1 ('MT Blk' + 4 Bottles) / 15.8 °C
Matrix	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	<5			5
Antimony		µg	<2			2.5
Arsenic		µg	1			1
Cadmium		µg	<0.3			0.25
Chromium		µg	<0.2			0.2
Cobalt		µg	0.7			0.25
Copper		µg	<0.3			0.25
Lead		µg	<2			1.5
Manganese		µg	<0.3			0.25
Nickel		µg	1			0.5
Phosphorus		µg	49			2.5
Selenium		µg	<2			1.5
Tellurium		µg	<2			2
Thallium		µg	<2			1.5
Vanadium		µg	<1			1
Zinc		µg	6.2			0.5
Back Half Metals Fraction 2A						
Aluminum		µg	5			5
Antimony		µg	<2			2.5
Arsenic		µg	<1.0			1
Cadmium		µg	<0.2			0.25
Chromium		µg	<0.2			0.2
Cobalt		µg	<0.2			0.25
Copper		µg	<0.2			0.25
Lead		µg	<1			1.5
Manganese		µg	<0.2			0.25
Nickel		µg	2			0.5
Phosphorus		µg	10			2.5
Selenium		µg	<1			1.5
Tellurium		µg	<2			2
Thallium		µg	<1			1.5
Vanadium		µg	<1.0			1
Zinc		µg	6.1			0.5
Volume	Sample	mL	299			
Volume	aliquot volume	mL	249			
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05			0.05

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Analytical Report

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784773**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091772
Report Type: Final Report

Reference Number	1784773-1
Sample Date	Dec 13, 2024
Sample Time	NA
Sample Location	
Sample Description	Field Blank Unit 1 ('MT Blk' + 4 Bottles) / 15.8 °C
Matrix	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Dilution Factor	As Tested		1			
Volume	Sample	mL	250			
Volume	aliquot volume	mL	25			
Volume	Final	mL	40			
Mercury	Fraction 1B	µg/sample	<0.02			
Mercury	As Tested	µg/L	0.08			0.05
Dilution Factor	As Tested		1			
Volume	Sample	mL	299			
Volume	aliquot volume	mL	5.0			
Volume	Final	mL	40			
Mercury	Fraction 2B	µg/sample	0.2			
Mercury	As Tested	µg/L	<0.05			0.05
Dilution Factor	As Tested		1			
Volume	Sample	mL	99			
Volume	aliquot volume	mL	25			
Volume	Final	mL	40			
Mercury	Fraction 3A	µg/sample	<0.008			
Mercury	As Tested	µg/L	<0.05			0.05
Dilution Factor	As Tested		1			
Volume	Sample	mL	500			
Volume	aliquot volume	mL	25			
Volume	Final	mL	40			
Mercury	Fraction 3B	µg/sample	<0.04			
Mercury	As Tested	µg/L	<0.05			0.05
Dilution Factor	As Tested		1			
Volume	Sample	mL	200			
Volume	aliquot volume	mL	25			
Volume	Final	mL	40			
Mercury	Fraction 3C	µg/sample	<0.02			

Approved by:

Rachel Eden , B. Sc.
Operations Manager

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Methodology and Notes

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Attn: Missy
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Company:

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784773**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091772
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 3B	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 08, 2025	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 08, 2025	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

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Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Filter Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784948**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 15, 2025
Report Number: 3092122
Report Type: Final Report

Contact	Company	Address
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Delivery	Format	Deliverables
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Email	PDF	COC / Test Report

Contact	Company	Address
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Delivery	Format	Deliverables
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Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Filter Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784948**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 15, 2025
Report Number: 3092122
Report Type: Final Report

Reference Number	1784948-1
Sample Date	Dec 12, 2024
Sample Time	NA
Sample Location	
Sample Description	Reagent Blank Unit 1 Container 1 (filter) / 14.7 °C
Matrix	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	<5			5
Antimony		µg	<2			2.5
Arsenic		µg	<1			1
Cadmium		µg	<0.3			0.25
Chromium		µg	<0.2			0.2
Cobalt		µg	0.4			0.25
Copper		µg	0.6			0.25
Lead		µg	<2			1.5
Manganese		µg	<0.3			0.25
Nickel		µg	<0.5			0.5
Phosphorus		µg	51			2.5
Selenium		µg	<2			1.5
Tellurium		µg	6.1			2
Thallium		µg	<2			1.5
Vanadium		µg	<1			1
Zinc		µg	6.1			0.5
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05			0.05
Dilution Factor	As Tested		1			
Volume	Sample	mL	250			
Volume	aliquot volume	mL	25			
Volume	Final	mL	40			
Mercury	Fraction 1B	µg/sample	<0.02			

Approved by:

Max Hewitt
Operations Manager

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Methodology and Notes

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Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Filter Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784948**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 15, 2025
Report Number: 3092122
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 08, 2025	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: HF Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784782**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Dec 20, 2024
Report Number: 3091784
Report Type: Final Report

Contact	Company	Address
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Delivery	Format	Deliverables
Email	PDF	COA / COC
Email	PDF	COC / Test Report

Contact	Company	Address
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Delivery	Format	Deliverables
Email	PDF	Invoice

Notes To Clients:

- Reduction of analytical volume was necessary for fluoride analysis due to matrix effects in lot 1784782. Detection limits are adjusted accordingly.

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Analytical Report

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: HF Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784782**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Dec 20, 2024
Report Number: 3091784
Report Type: Final Report

Reference Number	1784782-1	1784782-2	1784782-3
Sample Date	Dec 13, 2024	Dec 13, 2024	Dec 13, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit #1 HF Run 1 / 14.7 °C	Unit #1 HF Run 2 / 14.7 °C	Unit #1 HF Run 3 / 14.7 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Volume	Sample	mL	344	318	330	
Dilution Factor	fluoride		10.00	10.00	10.00	
Fluoride	As Tested	mg/L	<0.3	<0.3	<0.3	0.03
Fluoride	Water Soluble	µg/sample	<100	<100	<100	

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Analytical Report

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: HF Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784782**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Dec 20, 2024
Report Number: 3091784
Report Type: Final Report

Reference Number	1784782-4
Sample Date	Dec 13, 2024
Sample Time	NA
Sample Location	
Sample Description	Unit #1 HF Blank / 14.7 °C
Matrix	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Volume	Sample	mL	231			
Dilution Factor	fluoride		1.00			
Fluoride	As Tested	mg/L	<0.03			0.03
Fluoride	Water Soluble	µg/sample	<7			

Approved by:

Rachel Eden , B. Sc.
Operations Manager

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Methodology and Notes

Bill To:	A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID:	Metro Vancouver WTE	Lot ID:	**1784782**
Attn:	Missy	Project Name:	HF Samples	Control Number:	
Sampled By:		Project Location:		Date Received:	Dec 18, 2024
Company:		LSD:		Date Reported:	Dec 20, 2024
		P.O.:		Report Number:	3091784
		Proj. Acct. code:		Report Type:	Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Anions by IEC in air (VAN)	EMC	*	Determination of Hydrogen Halide & Halogen Emissions from Stationary Sources (Isokinetic), 26A	Dec 20, 2024	Element Vancouver

** Reference Method Modified*

References

EMC	Emission Measurement Center of EPA

Comments:

- Reduction of analytical volume was necessary for fluoride analysis due to matrix effects in lot 1784782. Detection limits are adjusted accordingly.

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: NH3 Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784783**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Dec 30, 2024
Report Number: 3091785
Report Type: Final Report

Contact	Company	Address
Mark Lanfranco	**A. Lanfranco & Associates**	#101, 9488 - 189 Street Surrey, BC V4N 4W7 Phone: (604) 881-2582 Fax: (604) 881-2581 Email: mark.lanfranco@alanfranco.com

Delivery	Format	Deliverables
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Email	PDF	COC / Test Report

Contact	Company	Address
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Analytical Report

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V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: NH3 Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784783**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Dec 30, 2024
Report Number: 3091785
Report Type: Final Report

Reference Number	1784783-1	1784783-2	1784783-3
Sample Date	Dec 13, 2024	Dec 13, 2024	Dec 13, 2024
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Unit 1 Run 1 NH3 / 19.6 °C	Unit 1 Run 2 NH3 / 19.6 °C	Unit 1 Run 3 NH3 / 19.6 °C
Matrix	Stack Samples	Stack Samples	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Ammonium - N	As Tested	µg/L	3040	6190	14600	25
Dilution Factor	As Tested		1.00	1.00	10.0	
Sample Volume	Sample volume	mL	312	316	312	
Ammonium - N		µg/sample	948	1950	4570	

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Analytical Report

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: NH3 Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784783**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Dec 30, 2024
Report Number: 3091785
Report Type: Final Report

Reference Number	1784783-4
Sample Date	Dec 13, 2024
Sample Time	NA
Sample Location	
Sample Description	Unit 1 NH3 Blank / 19.6 °C
Matrix	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Ammonium - N	As Tested	µg/L	62			25
Dilution Factor	As Tested		1.00			
Sample Volume	Sample volume	mL	228			
Ammonium - N		µg/sample	14			

Approved by:

Benjamin Morris, B.Sc
Operations Manager

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Methodology and Notes

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Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: NH3 Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784783**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Dec 30, 2024
Report Number: 3091785
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Ammonium in Impingers	APHA	*	Automated Phenate Method, 4500-NH3 G	Dec 30, 2024	Element Edmonton - Roper Road

** Reference Method Modified*

References

APHA Standard Methods for the Examination of Water and Wastewater

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W: www.element.com

Report Transmission Cover Page

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784775**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091774
Report Type: Final Report

Contact	Company	Address
Mark Lanfranco	**A. Lanfranco & Associates**	#101, 9488 - 189 Street Surrey, BC V4N 4W7 Phone: (604) 881-2582 Fax: (604) 881-2581 Email: mark.lanfranco@alanfranco.com

Delivery	Format	Deliverables
Email	PDF	COA / COC
Email	PDF	COC / Test Report

Contact	Company	Address
Missy	**A. Lanfranco & Associates**	#101, 9488 - 189 Street Surrey, BC V4N 4W7 Phone: (604) 881-2582 Fax: (604) 881-2581 Email: missy@alanfranco.com

Delivery	Format	Deliverables
Email	PDF	Invoice

Element
#104, 19575-55 A Ave.
Surrey, British Columbia
V3S 8P8, Canada

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Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784775**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091774
Report Type: Final Report

Reference Number 1784775-1
Sample Date Dec 13, 2024
Sample Time NA
Sample Location
Sample Description Reagent Blank Unit 1 / 18.9 °C
Matrix Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A						
Aluminum		µg	<5			5
Antimony		µg	5			2.5
Arsenic		µg	2			1
Cadmium		µg	<0.3			0.25
Chromium		µg	<0.2			0.2
Cobalt		µg	0.8			0.25
Copper		µg	<0.3			0.25
Lead		µg	<2			1.5
Manganese		µg	<0.3			0.25
Nickel		µg	<0.5			0.5
Phosphorus		µg	<2			2.5
Selenium		µg	<2			1.5
Tellurium		µg	2.7			2
Thallium		µg	<2			1.5
Vanadium		µg	<1			1
Zinc		µg	2.9			0.5
Back Half Metals Fraction 2A						
Aluminum		µg	6			5
Antimony		µg	<3			2.5
Arsenic		µg	2.8			1
Cadmium		µg	<0.3			0.25
Chromium		µg	<0.2			0.2
Cobalt		µg	0.3			0.25
Copper		µg	<0.3			0.25
Lead		µg	2.9			1.5
Manganese		µg	<0.3			0.25
Nickel		µg	1			0.5
Phosphorus		µg	20			2.5
Selenium		µg	<2			1.5
Tellurium		µg	3.6			2
Thallium		µg	<2			1.5
Vanadium		µg	<1			1
Zinc		µg	4.5			0.5
Volume	Sample	mL	196			
Volume	aliquot volume	mL	146			
Mercury by CVAA						
Mercury	As Tested	µg/L	<0.05			0.05
Dilution Factor	As Tested		1			

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Analytical Report

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784775**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091774
Report Type: Final Report

Reference Number	1784775-1
Sample Date	Dec 13, 2024
Sample Time	NA
Sample Location	
Sample Description	Reagent Blank Unit 1 / 18.9 °C
Matrix	Stack Samples

Analyte		Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued						
Volume	Sample	mL	250			
Volume	aliquot volume	mL	25			
Volume	Final	mL	40			
Mercury	Fraction 1B	µg/sample	<0.02			
Mercury	As Tested	µg/L	0.10			0.05
Dilution Factor	As Tested		1			
Volume	Sample	mL	196			
Volume	aliquot volume	mL	5.0			
Volume	Final	mL	40			
Mercury	Fraction 2B	µg/sample	0.16			
Mercury	As Tested	µg/L	<0.05			0.05
Dilution Factor	As Tested		1			
Volume	Sample	mL	96			
Volume	aliquot volume	mL	25			
Volume	Final	mL	40			
Mercury	Fraction 3A	µg/sample	<0.008			
Mercury	As Tested	µg/L	<0.05			0.05
Dilution Factor	As Tested		1			
Volume	Sample	mL	500			
Volume	aliquot volume	mL	25			
Volume	Final	mL	40			
Mercury	Fraction 3B	µg/sample	<0.04			
Mercury	As Tested	µg/L	<0.05			0.05
Dilution Factor	As Tested		1			
Volume	Sample	mL	200			
Volume	aliquot volume	mL	25			
Volume	Final	mL	40			
Mercury	Fraction 3C	µg/sample	<0.02			

Approved by:

Rachel Eden , B. Sc.
Operations Manager

Data have been validated by Analytical Quality Control and Element's Integrated Data Validation System (IDVS).
Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

Element
#104, 19575-55 A Ave.
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Methodology and Notes

Bill To: A. Lanfranco & Associates
#101, 9488 - 189 Street
Surrey, BC, Canada
V4N 4W7
Attn: Missy
Sampled By:
Company:

Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1784775**
Control Number:
Date Received: Dec 18, 2024
Date Reported: Jan 13, 2025
Report Number: 3091774
Report Type: Final Report

Method of Analysis

Method Name	Reference		Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 3B	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 10, 2025	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 08, 2025	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	*	Metals Emissions from Stationary Sources, 29	Jan 08, 2025	Element Vancouver

** Reference Method Modified*

References

EMC Emission Measurement Center of EPA

ALS Environmental
2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T +1 805 526 7161

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LABORATORY REPORT

January 7, 2025

Mark Lanfranco
A. Lanfranco and Associates Inc.
Unit 101 - 9488 189 St.
Surrey, BC V4N 4W7

RE: MV WTEF

Dear Mark:

Enclosed are the results of the samples submitted to our laboratory on December 18, 2024. For your reference, these analyses have been assigned our service request number P2405118.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

ALS | Environmental

By Sue Anderson at 2:12 pm, Jan 07, 2025

Sue Anderson
Project Manager

ALS Environmental
2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T +1 805 526 7161

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Client: A. Lanfranco and Associates Inc. Service Request No: P2405118
Project: MV WTEF

CASE NARRATIVE

The samples were received intact under chain of custody on December 18, 2024 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

C3 through C6 Hydrocarbon Analysis

The samples were analyzed per modified EPA Method TO-3 for C3 through >C6 hydrocarbons using a gas chromatograph equipped with a flame ionization detector (FID). This procedure is described in laboratory SOP VOA-TO3C1C6. This method is included on the laboratory's DoD-ELAP scope of accreditation, however it is not part of the NELAP accreditation.

Methane, Ethane and Ethylene Analysis

The samples were also analyzed for methane, ethane and ethylene per modified EPA Method TO-3 using a gas chromatograph equipped with a flame ionization detector (FID). This method is not included on the laboratory's NELAP or DoD-ELAP scope of accreditation.

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CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	https://dec.alaska.gov/spar/csp/lab-approval/list-of-approved-labs	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	https://internet.deq.louisiana.gov/portal/divisions/lelap/accredited-laboratories	203013
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtm	CA012627
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	006-999-456
New Jersey DEP (NELAP)	https://dep.nj.gov/dsr/oqa/certified-laboratories/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oklahoma DEQ (NELAP)	labaccreditation.deq.ok.gov/labaccreditation/	2207
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068
Pennsylvania DEP	hhttp://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration only)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413
Utah DOH (NELAP)	https://uphl.utah.gov/certifications/environmental-laboratory-certification/	CA01627
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: A. Lanfranco and Associates Inc. Service Request: P2405118

Project ID: MV WTEF

Date Received: 12/18/2024

Time Received: 09:29

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pfl (psig)	TO-3 Modified - C1C6+ Can	TO-3 Modified - MEEPP Can
MV WTEF Unit 1 Run 1	P2405118-001	Air	12/13/2024	10:15	AC01564	-3.70	3.69	X	X
MV WTEF Unit 1 Run 2	P2405118-002	Air	12/13/2024	11:53	AS01349	-2.56	3.71	X	X
MV WTEF Unit 1 Run 3	P2405118-003	Air	12/13/2024	13:10	AS01417	-2.87	3.75	X	X

ALS Environmental

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161

Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

P2405118

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

ALS Project No.

Company Name & Address (Reporting Information)
A. Lanfranco + Associates Inc.

Project Name: MV WTEF

Project Number:

ALS Contact:

Project Manager: Carter Lanfranco

P.O. # / Billing Information: Bill to account

Phone: 604 882 2582

Fax:

Email Address for Result Reporting: Carter.lanfranco@alanfranco.com

Sampler (Print & Sign):

Analysis Method

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	TO-3 (Liston Air)		Comments e.g. Actual Preservative or specific instructions
MV WTEF Unit 1 Run 1		Dec 13/24	09:15-10:15	AC01564	OA00980	-28	-9		✓		
MV WTEF Unit 1 Run 2		"	10:53-11:53	A501349	OA2261	-29	-7		✓		
MV WTEF Unit 1 Run 3		"	12:10-13:10	A501917	OA00367	-28	-5		✓		

Report Tier Levels - please select

Tier I - Results (Default if not specified) ___
Tier II (Results + QC Summaries) ___
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Data Validation Package) 10% Surcharge _____

EDD required Yes / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	
[signature] FEDEX	Dec 13/24	09:45	FEDEX			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:	Cooler / Blank Temperature ____°C
FEDEX			[signature]	12.18.24	0929	

Signature denotes acceptance of ALS Group USA, Corp. Terms and Conditions - Detailed Terms & Conditions can be reviewed at the link below:
https://www.alsglobal.com/ALSGroupUSACorpTC

ALS Environmental
Sample Acceptance Check Form

Client: A. Lanfranco and Associates Inc. Work order: P2405118

Project: Mv WTEF

Sample(s) received on: 12/18/2024 Date opened: 12/18/2024 by: ANTHONY.VASQUEZ

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☒	
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒
12	Lab Notification: Analyst and PM were alerted of Short HT or RUSH samples?	☐	☐	☒
13	Client Notification: Client has been notified regarding HT exceedances and/or other CoC discrepancies?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2405118-001.01	6.0 L Ambient Can					
P2405118-002.01	6.0 L Silonite Can					
P2405118-003.01	6.0 L Silonite Can					

Explain any discrepancies: (include lab sample ID numbers):

Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **MV WTEF Unit 1 Run 1** ALS Project ID: P2405118
Client Project ID: **MV WTEF** ALS Sample ID: P2405118-001

Test Code: EPA TO-3 Modified Date Collected: 12/13/24
Instrument ID: HP5890 II/GC8/FID Date Received: 12/18/24
Analyst: Stephanie Reynoso Date Analyzed: 12/26/24
Sampling Media: 6.0 L Summa Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:
Container ID: AC01564

Initial Pressure (psig): -3.70 Final Pressure (psig): 3.69

Container Dilution Factor: 1.67

Compound	Result ppmV	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.84	
C_4 as n-Butane	ND	0.84	
C_5 as n-Pentane	ND	0.84	
C_6 as n-Hexane	ND	0.84	
C_6+ as n-Hexane	ND	5.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **MV WTEF Unit 1 Run 2** ALS Project ID: P2405118
Client Project ID: **MV WTEF** ALS Sample ID: P2405118-002

Test Code:	EPA TO-3 Modified	Date Collected:	12/13/24
Instrument ID:	HP5890 II/GC8/FID	Date Received:	12/18/24
Analyst:	Stephanie Reynoso	Date Analyzed:	12/26/24
Sampling Media:	6.0 L Silonite Canister	Volume(s) Analyzed:	1.0 ml(s)
Test Notes:			
Container ID:	AS01349		

Initial Pressure (psig): -2.56 Final Pressure (psig): 3.71

Container Dilution Factor: 1.52

Compound	Result ppmV	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.76	
C_4 as n-Butane	ND	0.76	
C_5 as n-Pentane	ND	0.76	
C_6 as n-Hexane	ND	0.76	
C_6+ as n-Hexane	ND	4.6	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **MV WTEF Unit 1 Run 3** ALS Project ID: P2405118
Client Project ID: **MV WTEF** ALS Sample ID: P2405118-003

Test Code: EPA TO-3 Modified Date Collected: 12/13/24
Instrument ID: HP5890 II/GC8/FID Date Received: 12/18/24
Analyst: Stephanie Reynoso Date Analyzed: 12/26/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:
Container ID: AS01417

Initial Pressure (psig): -2.87 Final Pressure (psig): 3.75

Container Dilution Factor: 1.56

Compound	Result ppmV	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.78	
C_4 as n-Butane	ND	0.78	
C_5 as n-Pentane	ND	0.78	
C_6 as n-Hexane	ND	0.78	
C_6+ as n-Hexane	ND	4.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P2405118
Client Project ID: **MV WTEF** ALS Sample ID: P241226-MB

Test Code: EPA TO-3 Modified Date Collected: NA
Instrument ID: HP5890 II/GC8/FID Date Received: NA
Analyst: Stephanie Reynoso Date Analyzed: 12/26/24
Sampling Media: 6.0 L Summa Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:

Compound	Result ppmV	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.50	
C_4 as n-Butane	ND	0.50	
C_5 as n-Pentane	ND	0.50	
C_6 as n-Hexane	ND	0.50	
C_6+ as n-Hexane	ND	3.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2405118
Client Project ID: **MV WTEF** ALS Sample ID: P241226-DLCS

Test Code: EPA TO-3 Modified Date Collected: NA
Instrument ID: HP5890 II/GC8/FID Date Received: NA
Analyst: Stephanie Reynoso Date Analyzed: 12/26/24
Sampling Media: 6.0 L Summa Canister Volume(s) Analyzed: NA ml(s)
Test Notes:

Compound	Spike Amount LCS / DLCS ppmV	Result LCS ppmV	Result DLCS ppmV	% Recovery LCS	% Recovery DLCS	ALS Acceptance Limits	RPD	RPD Limit	Data Qualifier
Propane	1,000	1,140	1,130	**114**	**113**	92-120	0.9	6	
n-Butane	1,000	1,140	1,130	**114**	**113**	91-121	0.9	6	
n-Pentane	1,000	1,110	1,100	**111**	**110**	89-118	0.9	6	
n-Hexane	1,000	1,170	1,160	**117**	**116**	92-125	0.9	6	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **MV WTEF Unit 1 Run 1** ALS Project ID: P2405118
Client Project ID: **MV WTEF** ALS Sample ID: P2405118-001

Test Code: EPA TO-3 Modified Date Collected: 12/13/24
Instrument ID: HP5890A/GC10/FID/TCD Date Received: 12/18/24
Analyst: Stephanie Reynoso Date Analyzed: 1/3/25
Sampling Media: 6.0 L Summa Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:
Container ID: AC01564

Initial Pressure (psig): -3.70 Final Pressure (psig): 3.69

Container Dilution Factor: 1.67

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	**7.7**	2.2	**12**	3.3	
74-85-1	Ethene	ND	1.1	ND	1.0	
74-84-0	Ethane	ND	1.2	ND	1.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **MV WTEF Unit 1 Run 2** ALS Project ID: P2405118
Client Project ID: **MV WTEF** ALS Sample ID: P2405118-002

Test Code: EPA TO-3 Modified Date Collected: 12/13/24
Instrument ID: HP5890A/GC10/FID/TCD Date Received: 12/18/24
Analyst: Stephanie Reynoso Date Analyzed: 1/3/25
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:
Container ID: AS01349

Initial Pressure (psig): -2.56 Final Pressure (psig): 3.71

Container Dilution Factor: 1.52

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	ND	2.0	ND	3.0	
74-85-1	Ethene	ND	1.0	ND	0.91	
74-84-0	Ethane	ND	1.1	ND	0.91	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **MV WTEF Unit 1 Run 3** ALS Project ID: P2405118
Client Project ID: **MV WTEF** ALS Sample ID: P2405118-003

Test Code: EPA TO-3 Modified Date Collected: 12/13/24
Instrument ID: HP5890A/GC10/FID/TCD Date Received: 12/18/24
Analyst: Stephanie Reynoso Date Analyzed: 1/3/25
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:
Container ID: AS01417

Initial Pressure (psig): -2.87 Final Pressure (psig): 3.75

Container Dilution Factor: 1.56

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	ND	2.0	ND	3.1	
74-85-1	Ethene	ND	1.1	ND	0.94	
74-84-0	Ethane	ND	1.2	ND	0.94	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P2405118
Client Project ID: **MV WTEF** ALS Sample ID: P250103-MB

Test Code: EPA TO-3 Modified Date Collected: NA
Instrument ID: HP5890A/GC10/FID/TCD Date Received: NA
Analyst: Stephanie Reynoso Date Analyzed: 1/03/25
Sampling Media: 6.0 L Summa Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	ND	1.3	ND	2.0	
74-85-1	Ethene	ND	0.69	ND	0.60	
74-84-0	Ethane	ND	0.74	ND	0.60	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2405118
Client Project ID: **MV WTEF** ALS Sample ID: P250103-DLCS

Test Code: EPA TO-3 Modified Date Collected: NA
Instrument ID: HP5890A/GC10/FID/TCD Date Received: NA
Analyst: Stephanie Reynoso Date Analyzed: 1/03/25
Sampling Media: 6.0 L Summa Canister Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ppmV	Result LCS ppmV	Result DLCS ppmV	% Recovery LCS	% Recovery DLCS	ALS Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	7.60	7.87	7.71	**104**	**101**	70-130	3	15	
74-85-1	Ethene	7.53	7.66	7.48	**102**	**99**	70-130	3	15	
74-84-0	Ethane	7.49	7.81	7.66	**104**	**102**	70-130	2	15	

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LABORATORY REPORT

December 12, 2024

Mark Lanfranco
A. Lanfranco and Associates Inc.
Unit 101 - 9488 189 St.
Surrey, BC V4N 4W7

RE: Metro Van WTE

Dear Mark:

Enclosed are the results of the samples submitted to our laboratory on November 26, 2024. For your reference, these analyses have been assigned our service request number P2404828.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

ALS | Environmental

shaarazetta.robinson 12/12/24 5:54 pm

for Sue Anderson
Project Manager

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Client: A. Lanfranco and Associates Inc. Service Request No: P2404828
Project: Metro Van WTE

CASE NARRATIVE

The samples were received intact under chain of custody on November 26, 2024 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

C3 through C6 Hydrocarbons, Methane, Ethene and Ethane Analysis

The samples were analyzed per modified EPA Method TO-3 for C3 through >C6 hydrocarbons and methane, ethene and ethane using a gas chromatograph equipped with a flame ionization detector (FID). This procedure is described in laboratory SOP VOA-TO3C1C6. This method is included on the laboratory's DoD-ELAP scope of accreditation, however it is not part of the NELAP or AIHA-LAP, LLC accreditation.

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CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	https://dec.alaska.gov/spar/csp/lab-approval/list-of-approved-labs	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	https://internet.deq.louisiana.gov/portal/divisions/lelap/accredited-laboratories	203013
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtm	CA01627
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	006-999-456
New Jersey DEP (NELAP)	https://dep.nj.gov/dsr/oqa/certified-laboratories/	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oklahoma DEQ (NELAP)	labaccreditation.deq.ok.gov/labaccreditation/	2207
Oregon PHD (NELAP)	https://orelap.state.or.us/searchLabs	4068-012
Pennsylvania DEP	hhttp://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413
Utah DOH (NELAP)	https://uphl.utah.gov/certifications/environmental-laboratory-certification/	CA016272024-16
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: A. Lanfranco and Associates Inc. Service Request: P2404828

Project ID: Metro Van WTE

Date Received: 11/26/2024

Time Received: 09:48

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pfl (psig)	TO-3 Modified - C1C6+ Can	TO-3 Modified - MEEPP Can
Unit 2 Run 1	P2404828-001	Air	11/20/2024	00:00	AS01381	-2.63	3.73	X	X
Unit 2 Run 2	P2404828-002	Air	11/20/2024	11:55	AC02114	-4.99	3.64	X	X
Unit 2 Run 3	P2404828-003	Air	11/20/2024	13:10	AS01627	-0.59	3.80	X	X
Unit 3 Run 1	P2404828-004	Air	11/19/2024	11:11	AC01860	-0.32	3.80	X	X
Unit 3 Run 2	P2404828-005	Air	11/19/2024	12:51	AS00356	-2.80	3.80	X	X
Unit 3 Run 3	P2404828-006	Air	11/19/2024	14:16	AS00880	-2.76	3.85	X	X

Air - Chain of Custody Record & Analytical Service Request

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Phone (805) 526-7161

Page _____ of _____

P2404828

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

ALS Project No.

Company Name & Address (Reporting Information)
A. Lanfranco & Associates Inc

Project Name
Metro Van WTE

Project Number

Project Manager
Mark Lanfranco

P.O. # / Billing Information

Phone
604 888 2582

Fax

Email Address for Result Reporting
mark.lanfranco@alanfranco.com

Sampler (Print & Sign)

ALS Contact:

Analysis Method

EPA TO-15

Comments
e.g. Actual Preservative or specific instructions

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	EPA TO-15		
Unit 2 Run 1		20Nov24		AS01881		-28	-6		✓		
Unit 2 Run 2		20Nov24	1055 - 1155	AC02114		-27.5	-11		✓		
Unit 2 Run 3		20Nov24	1210 - 1310	AS01627		-13	-2		✓		
Unit 3 Run 1		19Nov24	1011 - 1111	AC01860		-15	-3		✓		
Unit 3 Run 2		19Nov24	1151 - 1251	AS00356		-29	-5		✓		
Unit 3 Run 3		19Nov24	1319 - 1416	AS00880		-29	-7		✓		

Report Tier Levels - please select

Tier I - Results (Default if not specified) _____
Tier II (Results + QC Summaries) _____
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Data Validation Package) 10% Surcharge _____

EDD required Yes / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
			FEDEX		
Relinquished by: (Signature) FEDEX	Date:	Time:	Received by: (Signature)	Date: 11.26.24	Time: 0948

Cooler / Blank Temperature ____ °C

ALS Environmental
Sample Acceptance Check Form

Client: A. Lanfranco and Associates Inc. Work order: P2404828

Project: Metro Van WTE

Sample(s) received on: 11/26/24 Date opened: 11/26/24 by: ANTHONY.VASQUEZ

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☒	
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒
12	Lab Notification: Analyst and PM were alerted of Short HT or RUSH samples?	☐	☐	☒
13	Client Notification: Client has been notified regarding HT exceedances and/or other CoC discrepancies?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2404828-001.01	6.0 L Silonite Can					
P2404828-002.01	6.0 L Ambient Can					
P2404828-003.01	6.0 L Silonite Can					
P2404828-004.01	6.0 L Ambient Can					
P2404828-005.01	6.0 L Silonite Can					
P2404828-006.01	6.0 L Silonite Can					

Explain any discrepancies: (include lab sample ID numbers):

Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 2 Run 1** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-001

Test Code: EPA TO-3 Modified Date Collected: 11/20/24
Instrument ID: HP5890 II/GC8/FID Date Received: 11/26/24
Analyst: Braden Kalous Date Analyzed: 12/4/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:
Container ID: AS01381

Initial Pressure (psig): -2.63 Final Pressure (psig): 3.73

Container Dilution Factor: 1.53

Compound	Result ppmV	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.77	
C_4 as n-Butane	ND	0.77	
C_5 as n-Pentane	ND	0.77	
C_6 as n-Hexane	ND	0.77	
C_6+ as n-Hexane	ND	4.6	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 2 Run 2** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-002

Test Code: EPA TO-3 Modified Date Collected: 11/20/24
Instrument ID: HP5890 II/GC8/FID Date Received: 11/26/24
Analyst: Braden Kalous Date Analyzed: 12/4/24
Sampling Media: 6.0 L Summa Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:
Container ID: AC02114

Initial Pressure (psig): -4.99 Final Pressure (psig): 3.64

Container Dilution Factor: 1.89

Compound	Result ppmV	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.95	
C_4 as n-Butane	ND	0.95	
C_5 as n-Pentane	ND	0.95	
C_6 as n-Hexane	ND	0.95	
C_6+ as n-Hexane	ND	5.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 2 Run 3** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-003

Test Code: EPA TO-3 Modified Date Collected: 11/20/24
Instrument ID: HP5890 II/GC8/FID Date Received: 11/26/24
Analyst: Braden Kalous Date Analyzed: 12/4/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:
Container ID: AS01627

Initial Pressure (psig): -0.59 Final Pressure (psig): 3.80

Container Dilution Factor: 1.31

Compound	Result ppmV	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.66	
C_4 as n-Butane	ND	0.66	
C_5 as n-Pentane	ND	0.66	
C_6 as n-Hexane	ND	0.66	
C_6+ as n-Hexane	ND	3.9	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 3 Run 1** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-004

Test Code: EPA TO-3 Modified Date Collected: 11/19/24
Instrument ID: HP5890 II/GC8/FID Date Received: 11/26/24
Analyst: Stephanie Reynoso Date Analyzed: 12/6/24
Sampling Media: 6.0 L Summa Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:
Container ID: AC01860

Initial Pressure (psig): -0.32 Final Pressure (psig): 3.80

Container Dilution Factor: 1.29

Compound	**Result ppmV**	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.65	
C_4 as n-Butane	ND	0.65	
C_5 as n-Pentane	ND	0.65	
C_6 as n-Hexane	ND	0.65	
C_6+ as n-Hexane	ND	3.9	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 3 Run 2** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-005

Test Code: EPA TO-3 Modified Date Collected: 11/19/24
Instrument ID: HP5890 II/GC8/FID Date Received: 11/26/24
Analyst: Stephanie Reynoso Date Analyzed: 12/6/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:
Container ID: AS00356

Initial Pressure (psig): -2.80 Final Pressure (psig): 3.80

Container Dilution Factor: 1.55

Compound	Result ppmV	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.78	
C_4 as n-Butane	ND	0.78	
C_5 as n-Pentane	ND	0.78	
C_6 as n-Hexane	ND	0.78	
C_6+ as n-Hexane	ND	4.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 3 Run 3** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-006

Test Code: EPA TO-3 Modified Date Collected: 11/19/24
Instrument ID: HP5890 II/GC8/FID Date Received: 11/26/24
Analyst: Stephanie Reynoso Date Analyzed: 12/6/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:
Container ID: AS00880

Initial Pressure (psig): -2.76 Final Pressure (psig): 3.85

Container Dilution Factor: 1.55

Compound	Result ppmV	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.78	
C_4 as n-Butane	ND	0.78	
C_5 as n-Pentane	ND	0.78	
C_6 as n-Hexane	ND	0.78	
C_6+ as n-Hexane	ND	4.7	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P241204-MB

Test Code: EPA TO-3 Modified Date Collected: NA
Instrument ID: HP5890 II/GC8/FID Date Received: NA
Analyst: Braden Kalous Date Analyzed: 12/04/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:

Compound	Result ppmV	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.50	
C_4 as n-Butane	ND	0.50	
C_5 as n-Pentane	ND	0.50	
C_6 as n-Hexane	ND	0.50	
C_6+ as n-Hexane	ND	3.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P241206-MB

Test Code: EPA TO-3 Modified Date Collected: NA
Instrument ID: HP5890 II/GC8/FID Date Received: NA
Analyst: Stephanie Reynoso Date Analyzed: 12/06/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 1.0 ml(s)
Test Notes:

Compound	**Result ppmV**	MRL ppmV	Data Qualifier
C_3 as Propane	ND	0.50	
C_4 as n-Butane	ND	0.50	
C_5 as n-Pentane	ND	0.50	
C_6 as n-Hexane	ND	0.50	
C_6+ as n-Hexane	ND	3.0	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P241204-DLCS

Test Code: EPA TO-3 Modified Date Collected: NA
Instrument ID: HP5890 II/GC8/FID Date Received: NA
Analyst: Braden Kalous Date Analyzed: 12/04/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: NA ml(s)
Test Notes:

Compound	Spike Amount LCS / DLCS ppmV	Result LCS ppmV	Result DLCS ppmV	% Recovery LCS	% Recovery DLCS	ALS Acceptance Limits	RPD	RPD Limit	Data Qualifier
Propane	1,000	1,080	1,090	**108**	**109**	92-120	0.9	6	
n-Butane	1,000	1,090	1,090	**109**	**109**	91-121	0	6	
n-Pentane	1,000	1,060	1,060	**106**	**106**	89-118	0	6	
n-Hexane	1,000	1,110	1,110	**111**	**111**	92-125	0	6	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P241206-DLCS

Test Code: EPA TO-3 Modified Date Collected: NA
Instrument ID: HP5890 II/GC8/FID Date Received: NA
Analyst: Stephanie Reynoso Date Analyzed: 12/06/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: NA ml(s)
Test Notes:

Compound	Spike Amount LCS / DLCS ppmV	Result LCS ppmV	Result DLCS ppmV	% Recovery LCS	% Recovery DLCS	ALS Acceptance Limits	RPD	RPD Limit	Data Qualifier
Propane	1,000	1,140	1,120	**114**	**112**	92-120	2	6	
n-Butane	1,000	1,150	1,130	**115**	**113**	91-121	2	6	
n-Pentane	1,000	1,120	1,100	**112**	**110**	89-118	2	6	
n-Hexane	1,000	1,170	1,150	**117**	**115**	92-125	2	6	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 2 Run 1** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-001

Test Code: EPA TO-3 Modified Date Collected: 11/20/24
Instrument ID: HP5890A/GC10/FID/TCD Date Received: 11/26/24
Analyst: Stephanie Reynoso Date Analyzed: 12/5/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:
Container ID: AS01381

Initial Pressure (psig): -2.63 Final Pressure (psig): 3.73

Container Dilution Factor: 1.53

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	ND	2.0	ND	3.1	
74-85-1	Ethene	ND	1.1	ND	0.92	
74-84-0	Ethane	ND	1.1	ND	0.92	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 2 Run 2** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-002

Test Code: EPA TO-3 Modified Date Collected: 11/20/24
Instrument ID: HP5890A/GC10/FID/TCD Date Received: 11/26/24
Analyst: Stephanie Reynoso Date Analyzed: 12/5/24
Sampling Media: 6.0 L Summa Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:
Container ID: AC02114

Initial Pressure (psig): -4.99 Final Pressure (psig): 3.64

Container Dilution Factor: 1.89

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	ND	2.5	ND	3.8	
74-85-1	Ethene	ND	1.3	ND	1.1	
74-84-0	Ethane	ND	1.4	ND	1.1	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 2 Run 3** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-003

Test Code: EPA TO-3 Modified Date Collected: 11/20/24
Instrument ID: HP5890A/GC10/FID/TCD Date Received: 11/26/24
Analyst: Stephanie Reynoso Date Analyzed: 12/5/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:
Container ID: AS01627

Initial Pressure (psig): -0.59 Final Pressure (psig): 3.80

Container Dilution Factor: 1.31

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	**1.8**	1.7	**2.7**	2.6	
74-85-1	Ethene	ND	0.90	ND	0.79	
74-84-0	Ethane	ND	0.97	ND	0.79	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 3 Run 1** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-004

Test Code: EPA TO-3 Modified Date Collected: 11/19/24
Instrument ID: HP5890A/GC10/FID/TCD Date Received: 11/26/24
Analyst: Stephanie Reynoso Date Analyzed: 12/5/24
Sampling Media: 6.0 L Summa Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:
Container ID: AC01860

Initial Pressure (psig): -0.32 Final Pressure (psig): 3.80

Container Dilution Factor: 1.29

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	**2.2**	1.7	**3.4**	2.6	
74-85-1	Ethene	ND	0.89	ND	0.77	
74-84-0	Ethane	ND	0.95	ND	0.77	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 3 Run 2** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-005

Test Code: EPA TO-3 Modified Date Collected: 11/19/24
Instrument ID: HP5890A/GC10/FID/TCD Date Received: 11/26/24
Analyst: Stephanie Reynoso Date Analyzed: 12/5/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:
Container ID: AS00356

Initial Pressure (psig): -2.80 Final Pressure (psig): 3.80

Container Dilution Factor: 1.55

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	ND	2.0	ND	3.1	
74-85-1	Ethene	ND	1.1	ND	0.93	
74-84-0	Ethane	ND	1.1	ND	0.93	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Unit 3 Run 3** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P2404828-006

Test Code: EPA TO-3 Modified Date Collected: 11/19/24
Instrument ID: HP5890A/GC10/FID/TCD Date Received: 11/26/24
Analyst: Stephanie Reynoso Date Analyzed: 12/5/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:
Container ID: AS00880

Initial Pressure (psig): -2.76 Final Pressure (psig): 3.85

Container Dilution Factor: 1.55

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	ND	2.0	ND	3.1	
74-85-1	Ethene	ND	1.1	ND	0.93	
74-84-0	Ethane	ND	1.1	ND	0.93	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P241205-MB

Test Code: EPA TO-3 Modified Date Collected: NA
Instrument ID: HP5890A/GC10/FID/TCD Date Received: NA
Analyst: Stephanie Reynoso Date Analyzed: 12/05/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: 0.50 ml(s)
Test Notes:

CAS #	Compound	Result mg/m³	MRL mg/m³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	ND	1.3	ND	2.0	
74-85-1	Ethene	ND	0.69	ND	0.60	
74-84-0	Ethane	ND	0.74	ND	0.60	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Client: **A. Lanfranco and Associates Inc.**
Client Sample ID: **Duplicate Lab Control Sample** ALS Project ID: P2404828
Client Project ID: **Metro Van WTE** ALS Sample ID: P241205-DLCS

Test Code: EPA TO-3 Modified Date Collected: NA
Instrument ID: HP5890A/GC10/FID/TCD Date Received: NA
Analyst: Stephanie Reynoso Date Analyzed: 12/05/24
Sampling Media: 6.0 L Silonite Canister Volume(s) Analyzed: NA ml(s)
Test Notes:

CAS #	Compound	Spike Amount LCS / DLCS ppmV	Result LCS ppmV	Result DLCS ppmV	% Recovery LCS	% Recovery DLCS	ALS Acceptance Limits	RPD	RPD Limit	Data Qualifier
74-82-8	Methane	7.60	7.50	6.87	**99**	**90**	70-130	10	15	
74-85-1	Ethene	7.53	7.61	7.04	**101**	**93**	70-130	8	15	
74-84-0	Ethane	7.49	7.77	7.13	**104**	**95**	70-130	9	15	

Appendix B - Particulate Analysis

Client:	Metro Vancouver	**Sample Date:**	Nov 18-20 & Dec 13, 2024
Source:	Units 1, 2, and 3	**Location:**	WTE (Burnaby, B.C)

A. Lanfranco & Associates Standard Operating Procedure:

SOP 1.2.1 Gravimetric determination of total particulate matter

Filter Collection:

Test #	Initial (grams)	Final (grams)	Net Diference (grams)	Blank Adjusted (grams)
Unit 1 Blank	0.4448	0.4450	0.0002	
Unit 1 Run 1	0.4461	0.4463	0.0002	ND
Unit 1 Run 2	0.4487	0.4489	0.0002	ND
Unit 1 Run 3	0.4468	0.4470	0.0002	ND
Unit 2 Blank	0.4710	0.4710	0.0000	
Unit 2 Run 1	0.4730	0.4726	-0.0004	ND
Unit 2 Run 2	0.4492	0.4487	-0.0005	ND
Unit 2 Run 3	0.4462	0.4458	-0.0004	ND
Unit 3 Blank	0.4758	0.4758	0.0000	
Unit 3 Run 1	0.4758	0.4776	0.0018	0.0018
Unit 3 Run 2	0.4675	0.4690	0.0015	0.0015
Unit 3 Run 3	0.4725	0.4740	0.0015	0.0015

Front Half Washings:

Test #	Initial (grams)	Final (grams)	Net Diference (grams)	Blank Adjusted (grams)
Unit 1 Blank	125.7449	125.7448	-0.0001	
Unit 1 Run 1	118.9304	118.9297	-0.0007	ND
Unit 1 Run 2	122.2442	122.2441	-0.0001	ND
Unit 1 Run 3	104.4505	104.4500	-0.0005	ND
Unit 2 Blank	96.0553	96.0535	-0.0018	
Unit 2 Run 1	118.5703	118.5688	-0.0015	0.0003
Unit 2 Run 2	110.9592	110.9585	-0.0007	0.0011
Unit 2 Run 3	86.4778	86.4771	-0.0007	0.0011
Unit 3 Blank	119.3318	119.3299	-0.0019	
Unit 3 Run 1	123.7585	123.7570	-0.0015	0.0004
Unit 3 Run 2	125.0864	125.0857	-0.0007	0.0012
Unit 3 Run 3	117.3477	117.3460	-0.0017	0.0002

Task	**Unit**	**Personnel**	**Date**	**Quality Control**	**Y/N**
Fiter Recovery:	Unit 1	J. Ching	12-13-Dec-24	Adequate PW volume:	Y
	Unit 2	J. Ching	19-20-Nov-24	No sample leakage:	Y
	Unit 3	J. Ching	18-19-Nov-24	Filter not compromised:	Y
PW Initial Analysis:	Unit 1	C. De La O	16-Dec-24		
	Unit 2	J. Ching	22-Nov-24		
	Unit 3	J. Ching	22-Nov-24		
PW, FilterFinal Analysis:	Unit 1	J. Ching	18-Dec-24		
	Unit 2	J. Ching	29-Nov-24		
	Unit 3	J. Ching	29-Nov-24		
Data entered to computer:	All	C. Lanfranco	6-Jan-24		

Comments:

No problems encountered in sample analysis.

Your Project #: MVWTE
Site#: C4A1686
Site Location: BURNABY,BC
Your C.O.C. #: C4A1686-ONTV-01-01

Attention: Shanaz Akbar

Bureau Veritas
4606 Canada Way
Burnaby, BC
CANADA V5G 1K5

Report Date: 2025/01/03
Report #: R8465817
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4BJ246
Received: 2024/12/17, 09:12

Sample Matrix: Tedlar Bag
Samples Received: 3

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Nitrous Oxide	3	N/A	2024/12/17	CAM SOP-00203	GC/ECD

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: MVWTE
Site#: C4A1686
Site Location: BURNABY,BC
Your C.O.C. #: C4A1686-ONTV-01-01

Attention: Shanaz Akbar

Bureau Veritas
4606 Canada Way
Burnaby, BC
CANADA V5G 1K5

Report Date: 2025/01/03
Report #: R8465817
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C4BJ246
Received: 2024/12/17, 09:12

Encryption Key

Julian Tong
Project Manager Assistant
03 Jan 2025 16:48:59

Please direct all questions regarding this Certificate of Analysis to:
Julian Tong, Project Manager Assistant
Email: Julian.Tong@bureauveritas.com
Phone# (905) 817-5700

==========

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

COMPRESSED GAS PARAMETERS (TEDLAR BAG)

Bureau Veritas ID		ALXF44	ALXF44	ALXF45	ALXF46		
Sampling Date		2024/12/13 09:15	2024/12/13 09:15	2024/12/13 10:53	2024/12/13 12:10		
COC Number		C4A1686-ONTV-01-01	C4A1686-ONTV-01-01	C4A1686-ONTV-01-01	C4A1686-ONTV-01-01		
	UNITS	DCC147-UNIT 1 BAG 1	DCC147-UNIT 1 BAG 1 Lab-Dup	DCC148-UNIT 1 BAG 2	DCC149-UNIT 1 BAG 3	RDL	QC Batch
Gas							
Nitrous Oxide	ppmv	5.5	5.3	6.2	5.3	0.1	9854213

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

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Bureau Veritas Job #: C4BJ246
Report Date: 2025/01/03

Bureau Veritas
Client Project #: MVWTE
Site Location: BURNABY,BC

TEST SUMMARY

Bureau Veritas ID: ALXF44
Sample ID: DCC147-UNIT 1 BAG 1
Matrix: Tedlar Bag

Collected: 2024/12/13
Shipped:
Received: 2024/12/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9854213	N/A	2024/12/17	Cathy Li

Bureau Veritas ID: ALXF44 Dup
Sample ID: DCC147-UNIT 1 BAG 1
Matrix: Tedlar Bag

Collected: 2024/12/13
Shipped:
Received: 2024/12/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9854213	N/A	2024/12/17	Cathy Li

Bureau Veritas ID: ALXF45
Sample ID: DCC148-UNIT 1 BAG 2
Matrix: Tedlar Bag

Collected: 2024/12/13
Shipped:
Received: 2024/12/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9854213	N/A	2024/12/17	Cathy Li

Bureau Veritas ID: ALXF46
Sample ID: DCC149-UNIT 1 BAG 3
Matrix: Tedlar Bag

Collected: 2024/12/13
Shipped:
Received: 2024/12/17

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9854213	N/A	2024/12/17	Cathy Li

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GENERAL COMMENTS

Sample were analysed 4 days after the date of sampling. The recommended holding time is 2 days.

Results relate only to the items tested.

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Bureau Veritas Job #: C4BJ246
Report Date: 2025/01/03

QUALITY ASSURANCE REPORT

Bureau Veritas
Client Project #: MVWTE
Site Location: BURNABY,BC

			Method Blank		RPD	
QC Batch	Parameter	Date	Value	UNITS	Value (%)	QC Limits
9854213	Nitrous Oxide	2024/12/17	<0.1	ppmv	NC	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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Bureau Veritas Job #: C4BJ246
Report Date: 2025/01/03

Bureau Veritas
Client Project #: MVWTE
Site Location: BURNABY,BC

VALIDATION SIGNATURE PAGE

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

Tom Mitchell, B.Sc, Supervisor, Compressed Gases

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Your Project #: MVWTE
Site#: BURNABY, BC
Site Location: C494906
Your C.O.C. #: C494906-ONTV-01-01

Attention: Shanaz Akbar

Bureau Veritas
4606 Canada Way
Burnaby, BC
CANADA V5G 1K5

Report Date: 2024/11/27
Report #: R8422098
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C4AH840
Received: 2024/11/22, 09:11

Sample Matrix: Tedlar Bag
Samples Received: 6

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Nitrous Oxide	6	N/A	2024/11/22	CAM SOP-00203	GC/ECD

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, EPA, APHA or the Quebec Ministry of Environment.

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Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Your Project #: MVWTE
Site#: BURNABY, BC
Site Location: C494906
Your C.O.C. #: C494906-ONTV-01-01

Attention: Shanaz Akbar

Bureau Veritas
4606 Canada Way
Burnaby, BC
CANADA V5G 1K5

Report Date: 2024/11/27
Report #: R8422098
Version: 2 - Revision

CERTIFICATE OF ANALYSIS – REVISED REPORT

BUREAU VERITAS JOB #: C4AH840
Received: 2024/11/22, 09:11

Encryption Key

Julian Tong
Project Manager Assistant
27 Nov 2024 13:45:49

Please direct all questions regarding this Certificate of Analysis to:
Julian Tong, Project Manager Assistant
Email: Julian.Tong@bureauveritas.com
Phone# (905) 817-5700

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Bureau Veritas Job #: C4AH840
Report Date: 2024/11/27

Bureau Veritas
Client Project #: MVWTE
Site Location: C494906

COMPRESSED GAS PARAMETERS (TEDLAR BAG)

Bureau Veritas ID		AJPT15	AJPT15		AJPT18		
Sampling Date		2024/11/19 11:05	2024/11/19 11:05		2024/11/19 12:51		
COC Number		C494906-ONTV-01-01	C494906-ONTV-01-01		C494906-ONTV-01-01		
	UNITS	DAU611-UNIT 3 BAG 1	DAU611-UNIT 3 BAG 1 Lab-Dup	RDL	DAU612-UNIT 3 BAG 2	RDL	QC Batch
Gas							
Nitrous Oxide	ppmv	4.3	4.2	0.25	3.7	0.1	9783693

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas ID		AJPT19	AJPT20	AJPT22	AJPT24		
Sampling Date		2024/11/19 14:11	2024/11/20 10:39	2024/11/20 11:55	2024/11/20 13:10		
COC Number		C494906-ONTV-01-01	C494906-ONTV-01-01	C494906-ONTV-01-01	C494906-ONTV-01-01		
	UNITS	DAU613-UNIT 3 BAG 3	DAU614-UNIT 2 BAG 1	DAU615-UNIT 2 BAG 2	DAU616-UNIT 2 BAG 3	RDL	QC Batch
Gas							
Nitrous Oxide	ppmv	4.1	4.8	3.3	3.3	0.1	9783693

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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TEST SUMMARY

Bureau Veritas ID: AJPT15
Sample ID: DAU611-UNIT 3 BAG 1
Matrix: Tedlar Bag

Collected: 2024/11/19
Shipped:
Received: 2024/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9783693	N/A	2024/11/22	Marina Tsoy

Bureau Veritas ID: AJPT15 Dup
Sample ID: DAU611-UNIT 3 BAG 1
Matrix: Tedlar Bag

Collected: 2024/11/19
Shipped:
Received: 2024/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9783693	N/A	2024/11/22	Marina Tsoy

Bureau Veritas ID: AJPT18
Sample ID: DAU612-UNIT 3 BAG 2
Matrix: Tedlar Bag

Collected: 2024/11/19
Shipped:
Received: 2024/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9783693	N/A	2024/11/22	Marina Tsoy

Bureau Veritas ID: AJPT19
Sample ID: DAU613-UNIT 3 BAG 3
Matrix: Tedlar Bag

Collected: 2024/11/19
Shipped:
Received: 2024/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9783693	N/A	2024/11/22	Marina Tsoy

Bureau Veritas ID: AJPT20
Sample ID: DAU614-UNIT 2 BAG 1
Matrix: Tedlar Bag

Collected: 2024/11/20
Shipped:
Received: 2024/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9783693	N/A	2024/11/22	Marina Tsoy

Bureau Veritas ID: AJPT22
Sample ID: DAU615-UNIT 2 BAG 2
Matrix: Tedlar Bag

Collected: 2024/11/20
Shipped:
Received: 2024/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9783693	N/A	2024/11/22	Marina Tsoy

Bureau Veritas ID: AJPT24
Sample ID: DAU616-UNIT 2 BAG 3
Matrix: Tedlar Bag

Collected: 2024/11/20
Shipped:
Received: 2024/11/22

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrous Oxide	GC/ECD	9783693	N/A	2024/11/22	Marina Tsoy

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

GENERAL COMMENTS

Revised report - corrected job number

Sample AJPT15 [DAU611-UNIT 3 BAG 1] : The sample was analysed 3 days after the date of sampling. The recommended holding time is 2 days.

Sample AJPT18 [DAU612-UNIT 3 BAG 2] : The sample was analysed 3 days after the date of sampling. The recommended holding time is 2 days.

Sample AJPT19 [DAU613-UNIT 3 BAG 3] : The sample was analysed 3 days after the date of sampling. The recommended holding time is 2 days.

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

			Method Blank		RPD	
QC Batch	Parameter	Date	Value	UNITS	Value (%)	QC Limits
9783693	Nitrous Oxide	2024/11/22	<0.1	ppmv	NC	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

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

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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Bureau Veritas Job #: C4AH840
Report Date: 2024/11/27

Bureau Veritas
Client Project #: MVWTE
Site Location: C494906

VALIDATION SIGNATURE PAGE

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

Tom Mitchell, B.Sc, Supervisor, Compressed Gases

Bureau Veritas has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation, please refer to the Validation Signatures page if included, otherwise available by request. For Department specific Analyst/Supervisor validation names, please refer to the Test Summary section if included, otherwise available by request. This report is authorized by Rodney Major, General Manager responsible for Ontario Environmental laboratory operations.

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Sent to: Bureau Veritas Campobello
6740 Campobello Road
Mississauga, ON, L5N 2L8
Tel: (905) 817-5700

BUREAU VERITAS INTERLAB CHAIN OF CUSTODY RECORD

COC # C494906-ONTV-01-01

REPORT INFORMATION	
Company:	Bureau Veritas
Address:	4606 Canada Way, Burnaby, British Columbia, V5G 1K5
Contact Name:	Shanaz Akbar
Email:	Shanaz.Akbar@bureauveritas.com, Customersolutionswest@bureauveritas.com
Phone:	
BV Project #:	C494906
Client Invoice To:	A. LANFRANCO & ASSOCIATES INC. (1301)
Client Report To:	A. LANFRANCO & ASSOCIATES INC. (1301)

#	SAMPLE ID	MATRIX	DATE SAMPLED (YYYY/MM/DD)	TIME SAMPLED (HH:MM)	SAMPLER INITIALS	# CONT.	ANALYSIS REQUESTED: N2O Gas CSA Z2396.1-09 Subcontract	ADDITIONAL SAMPLE INFORMATION
1	DAU611-UNIT 3 BAG 1	AIR	2024/11/19	11:05		1	X	(P: 01)
2	DAU612-UNIT 3 BAG 2	AIR	2024/11/19	12:51		1	X	(P: 01)
3	DAU613-UNIT 3 BAG 3	AIR	2024/11/19	14:11		1	X	(P: 01)
4	DAU614-UNIT 2 BAG 1	AIR	2024/11/20	10:39		1	X	(P: 01)
5	DAU615-UNIT 2 BAG 2	AIR	2024/11/20	11:55		1	X	(P: 01)
6	DAU616-UNIT 2 BAG 3	AIR	2024/11/20	13:10		1	X	(P: 01)
7								
8								
9								
10								

Job Barcode Label

22-Nov-24 09:11
Colby Coutu
C4AH840
J_L AIR-001

Incl. on Report? Yes / No

SITE LOCATION:	REGULATORY CRITERIA	SPECIAL INSTRUCTIONS	REQUIRED EDDs	TURNAROUND TIME
BURNABY, BC		Please inform Bureau Veritas immediately if you are not accredited for the requested test(s) or the hold time is approaching. **Please return a copy of this form with the report.**	National Excel (N001)	☐ Rush Required 2024/12/05 Date Required *Please inform us if rush charges will be incurred.*
SITE #:				
PROJECT #:				
MVWTE				
PO/AFE, TASK ORDER/SERVICE ORDER, LINE ITEM:				

COOLER ID:	YES	NO	Temp: (°C)
Custody Seal Present	✓		
Custody Seal Intact	✓		
Cooling Media Present			

COOLER ID:	YES	NO	Temp: (°C)
Custody Seal Present	✓		
Custody Seal Intact	✓		
Cooling Media Present			

COOLER ID:	YES	NO	Temp: (°C)
Custody Seal Present			
Custody Seal Intact			
Cooling Media Present			

RECEIVING LAB USE ONLY
Bureau Veritas Job #

RELINQUISHED BY: (SIGN & PRINT)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (SIGN & PRINT)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	Samples Labelled By:	Labels Verified By:
1. ALFRED NGAI	2024/11/21	14:35	1.	2024/11/22	09:11		
2.			2.				

APPENDIX - D

COMPUTER GENERATED RESULTS

Client:	Metro Vancouver	**Date:**	12-Dec-24
Jobsite:	WTE (Burnaby, BC)	**Run:**	1 - Particulate / Metals
Source:	Unit 1	**Run Time:**	11:20 - 13:22

Concentrations:

Particulate	0.04	mg/dscm	0.00002	gr/dscf
	0.02	mg/Acm	0.00001	gr/Acf
	0.04	mg/dscm (@ 11% O2)	0.00002	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.003	Kg/hr	0.007	lb/hr

Flue Gas Characteristics:

Flow	1196	dscm/min	42222	dscf/min
	19.93	dscm/sec	704	dscf/sec
	2101	Acm/min	74199	Acf/min
Velocity	13.748	m/sec	45.10	f/sec
Temperature	153.1	oC	307.7	oF
Moisture	13.3	%		
Gas Analysis	9.7	% O2		
	10.6	% CO2		
	30.080	Mol. Wt (g/gmole) Dry		
	28.470	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.2872	dscm	80.771	dscf
Sample Time	120.0	minutes		
Isokineticity	101.1	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	12-Dec-24
Jobsite:	WTE (Burnaby, BC)	**Run:**	1 - Particulate / Metals
Source:	Unit 1	**Run Time:**	11:10 - 13:15

Control Unit (Y)	0.9812
Nozzle Diameter (in.)	0.2815
Pitot Factor	0.8493
Baro. Press. (in. Hg)	29.78
Static Press. (in. H20)	-16.50
Stack Height (ft)	30
Stack Diameter (in.)	70.90
Stack Area (sq.ft.)	27.417
Minutes Per Reading	5.0
Minutes Per Point	5.0

Collection:

Filter (grams)	0.00005
Washings (grams)	0.00005
Total (grams)	**0.00010**

Gas Analysis (Vol. %):

	CO2	O2
Traverse 1	10.73	9.53
Traverse 2	10.40	9.93
	10.57	**9.73**

Condensate Collection:

Impinger 1	159.0
Impinger 2	76.0
Impinger 3	9.0
Impinger 4	2.0
Impinger 5	3.0
Impinger 6	2.0
Gel	13.0
Gain (grams)	**264.0**

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	732.135								
1	5.0	734.980	0.29	1.06	60	60	2.5	303	1.5	100.6
2	10.0	737.670	0.26	0.94	60	60	2.5	308	4.7	100.8
3	15.0	740.660	0.32	1.16	61	61	3	309	8.4	100.9
4	20.0	743.750	0.34	1.24	62	62	3	310	12.5	101.1
5	25.0	746.780	0.33	1.20	63	63	3	310	17.7	100.4
6	30.0	749.950	0.35	1.28	64	64	3	311	25.2	101.9
7	35.0	753.700	0.50	1.82	64	64	3	311	45.6	101.0
8	40.0	757.690	0.56	2.05	66	66	3	310	53.2	101.1
9	45.0	761.550	0.52	1.91	66	66	3.5	310	58.3	101.5
10	50.0	765.350	0.50	1.84	67	67	3.5	310	62.5	101.7
11	55.0	768.980	0.46	1.69	67	67	3	309	66.1	101.1
12	60.0	772.530	0.44	1.62	67	67	3	308	69.4	101.1
Traverse 2	0.0	772.530								
1	5.0	775.490	0.30	1.11	68	68	3	305	1.5	101.5
2	10.0	778.570	0.33	1.22	67	67	3	307	4.7	101.1
3	15.0	781.700	0.34	1.25	67	67	3	308	8.4	101.3
4	20.0	784.860	0.35	1.29	68	68	3	308	12.5	100.6
5	25.0	788.260	0.40	1.48	68	68	3	306	17.7	101.2
6	30.0	791.740	0.42	1.56	68	68	3	305	25.2	101.0
7	35.0	795.580	0.51	1.89	68	68	3	306	45.6	101.3
8	40.0	799.530	0.54	2.00	69	69	3	306	53.2	101.1
9	45.0	803.330	0.50	1.85	69	69	3	307	58.3	101.1
10	50.0	807.050	0.48	1.78	70	70	3	306	62.5	100.7
11	55.0	810.670	0.45	1.67	70	70	3	306	66.1	101.2
12	60.0	814.251	0.44	1.64	70	70	3	305	69.4	101.2
Average:			0.414	1.523	66.2	66.2	3.0	307.7		101.1

Client:	Metro Vancouver	**Date:**	13-Dec-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 1	**Run Time:**	8:21 - 10:24

Concentrations:

Particulate	0.04	mg/dscm	0.00002	gr/dscf
	0.02	mg/Acm	0.00001	gr/Acf
	0.04	mg/dscm (@ 11% O2)	0.00002	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.003	Kg/hr	0.007	lb/hr

Flue Gas Characteristics:

Flow	1185	dscm/min	41832	dscf/min
	19.74	dscm/sec	697	dscf/sec
	2103	Acm/min	74252	Acf/min
Velocity	13.758	m/sec	45.14	f/sec
Temperature	154.2	oC	309.5	oF
Moisture	13.5	%		
Gas Analysis	9.8	% O2		
	10.0	% CO2		
	29.987	Mol. Wt (g/gmole) Dry		
	28.368	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.2656	dscm	80.010	dscf
Sample Time	120.0	minutes		
Isokineticity	101.1	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	13-Dec-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 1	**Run Time:**	8:21 - 10:24

Control Unit (Y)	0.9812	**Collection:**			**Gas Analysis (Vol. %):**		**Condensate Collection:**	
Nozzle Diameter (in.)	0.2815	Filter (grams)	0.00005		CO2	O2	Impinger 1	169.0
Pitot Factor	0.8493	Washings (grams)	0.00005	Traverse 1	9.73	9.90	Impinger 2	77.0
Baro. Press. (in. Hg)	29.66			Traverse 2	10.20	9.73	Impinger 3	3.0
Static Press. (in. H20)	-17.00	**Total (grams)**	**0.00010**				Impinger 4	0.0
Stack Height (ft)	30						Impinger 5	0.0
Stack Diameter (in.)	70.90						Impinger 6	1.0
Stack Area (sq.ft.)	27.417						Gel	15.5
Minutes Per Reading	5.0				**9.97**	**9.82**	**Gain (grams)**	**265.5**
Minutes Per Point	5.0							

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	815.000								
1	5.0	818.340	0.41	1.47	51	51	5	303	1.5	101.1
2	10.0	821.860	0.46	1.64	51	51	5	309	4.7	101.0
3	15.0	825.450	0.48	1.70	51	51	6	312	8.4	101.1
4	20.0	828.960	0.46	1.63	51	51	6	312	12.5	100.9
5	25.0	832.400	0.44	1.56	51	51	6	313	17.7	101.2
6	30.0	835.890	0.45	1.61	53	53	6	311	25.2	101.0
7	35.0	839.500	0.48	1.72	55	55	5	310	45.6	100.7
8	40.0	842.920	0.43	1.54	55	55	5	310	53.2	100.8
9	45.0	846.320	0.42	1.51	56	56	5	310	58.3	101.2
10	50.0	849.850	0.45	1.62	57	57	5	309	62.5	101.3
11	55.0	853.090	0.38	1.37	58	58	5	309	66.1	100.9
12	60.0	856.200	0.35	1.27	58	58	5	309	69.4	100.9
Traverse 2	0.0	856.200								
1	5.0	858.980	0.28	1.02	58	58	5	305	1.5	100.5
2	10.0	861.700	0.27	0.98	59	59	5	308	4.7	100.1
3	15.0	864.600	0.30	1.09	59	59	5	310	8.4	101.4
4	20.0	867.250	0.25	0.91	60	60	5	310	12.5	101.3
5	25.0	870.200	0.31	1.12	60	60	5	310	17.7	101.3
6	30.0	873.000	0.28	1.01	60	60	5	311	25.2	101.2
7	35.0	876.900	0.54	1.96	61	61	6	310	45.6	101.5
8	40.0	880.640	0.50	1.82	61	61	6	310	53.2	101.1
9	45.0	884.450	0.52	1.89	61	61	6	310	58.3	101.0
10	50.0	888.100	0.48	1.75	62	62	6	310	62.5	100.5
11	55.0	891.700	0.46	1.68	62	62	6	309	66.1	101.2
12	60.0	895.275	0.43	1.57	62	62	6	309	69.4	103.9
								.		
Average:			0.410	1.477	57.2	57.2	5.4	309.5		101.1

Client:	Metro Vancouver	**Date:**	13-Dec-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 1	**Run Time:**	10:46 - 12:48

Concentrations:

Particulate	0.0	mg/dscm	0.0000	gr/dscf
	0.0	mg/Acm	0.0000	gr/Acf
	0.0	mg/dscm (@ 11% O2)	0.0000	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.003	Kg/hr	0.006	lb/hr

Flue Gas Characteristics:

Flow	1182	dscm/min	41751	dscf/min
	19.70	dscm/sec	696	dscf/sec
	2114	Acm/min	74644	Acf/min
Velocity	13.831	m/sec	45.38	f/sec
Temperature	152.5	oC	306.4	oF
Moisture	14.5	%		
Gas Analysis	10.1	% O2		
	9.4	% CO2		
	29.903	Mol. Wt (g/gmole) Dry		
	28.177	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.7015	dscm	95.403	dscf
Sample Time	120.0	minutes		
Isokineticity	102.4	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	13-Dec-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 1	**Run Time:**	10:46 - 12:48

Control Unit (Y)	0.9812	**Collection:**			**Gas Analysis (Vol. %):**			**Condensate Collection:**	
Nozzle Diameter (in.)	0.3058	Filter (grams)	0.00005		CO2	O2		Impinger 1	244.0
Pitot Factor	0.8436	Washings (grams)	0.00005	Traverse 1	9.47	10.07		Impinger 2	51.0
Baro. Press. (in. Hg)	29.67			Traverse 2	9.30	10.03		Impinger 3	12.0
Static Press. (in. H20)	-17.00	**Total (grams)**	**0.00010**					Impinger 4	0.0
Stack Height (ft)	30							Impinger 5	20.0
Stack Diameter (in.)	70.90							Impinger 6	0.0
Stack Area (sq.ft.)	27.417							Gel	17.0
Minutes Per Reading	5.0				**9.38**	**10.05**		**Gain (grams)**	**344.0**
Minutes Per Point	5.0								

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	896.200								
1	5.0	899.690	0.31	1.56	60	60	3	301	1.5	102.6
2	10.0	903.330	0.34	1.71	60	60	3	300	4.7	102.2
3	15.0	906.750	0.30	1.50	60	60	3	304	8.4	102.4
4	20.0	910.100	0.29	1.45	60	60	3	309	12.5	102.3
5	25.0	913.500	0.30	1.49	60	60	3	309	17.7	102.1
6	30.0	917.060	0.33	1.64	60	60	3	310	25.2	102.1
7	35.0	921.400	0.49	2.44	60	60	4	309	45.6	102.2
8	40.0	925.880	0.52	2.60	61	61	4	309	53.2	102.3
9	45.0	930.540	0.56	2.80	61	61	5	307	58.3	102.5
10	50.0	935.100	0.53	2.67	62	62	5	303	62.5	102.6
11	55.0	939.500	0.49	2.48	62	62	5	301	66.1	102.7
12	60.0	943.780	0.46	2.33	63	63	5	300	69.4	102.8
Traverse 2	0.0	943.780								
1	5.0	947.700	0.39	1.97	63	63	4	302	1.5	102.3
2	10.0	951.750	0.42	2.11	63	63	4	308	4.7	102.3
3	15.0	955.690	0.40	2.00	63	63	4	310	8.4	102.1
4	20.0	960.010	0.48	2.40	63	63	4	310	12.5	102.3
5	25.0	964.250	0.46	2.30	63	63	4	310	17.7	102.5
6	30.0	968.430	0.45	2.25	63	63	4	311	25.2	102.3
7	35.0	972.700	0.47	2.35	63	63	4	310	45.6	102.2
8	40.0	976.990	0.47	2.36	64	64	4	310	53.2	102.5
9	45.0	981.150	0.44	2.21	64	64	4	308	58.3	102.5
10	50.0	985.110	0.40	2.02	64	64	4	305	62.5	102.1
11	55.0	988.920	0.37	1.87	64	64	4	305	66.1	102.1
12	60.0	992.650	0.35	1.77	64	64	4	303	69.4	102.6
Average:			0.418	2.095	62.1	62.1	3.9	306.4		102.4

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)
Source: Unit 1

Sample Type: HF

Parameter		Test 1	Test 2	Test 3
Test Date		13-Dec-24	13-Dec-24	13-Dec-24
Test Time		09:15 - 10:15	10:53 - 11:53	12:10 - 13:10
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	29.66	29.66	29.66
DGM Factor	(Y)	1.0207	1.0207	1.0207
Initial Reading	(m^3)	207.262	207.821	208.445
Final Reading	(m^3)	207.816	208.439	209.041
Temp. Outlet	(Avg. oF)	52.7	51.0	55.3
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm^3)	0.58	0.65	0.62
HF	(mg)	0.053	0.053	0.053
Oxygen	(Vol. %)	9.7	9.8	10.1
HF	**(mg/Sm^3)**	**0.091**	**0.081**	**0.085**
HF	**(mg/Sm^3 @ 11% O2)**	**0.081**	**0.073**	**0.078**
Moisture	**(Vol. %)**	13.5	13.5	14.5

Tstd. (oF) 68 Pstd. (in. Hg) 29.92

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)
Source: Unit 1

Sample Type: NH_3

Parameter		Test 1	Test 2	Test 3
Test Date		13-Dec-24	13-Dec-24	13-Dec-24
Test Time		09:15 - 10:15	10:53 - 11:53	12:10 - 13:10
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	29.66	29.66	29.66
DGM Factor	(Y)	0.9950	0.9950	0.9950
Initial Reading	(m^3)	632.516	633.126	633.652
Final Reading	(m^3)	633.119	633.646	634.378
Temp. Outlet	(Avg. oF)	50.3	50.7	52.3
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm^3)	0.62	0.53	0.74
NH_3	(mg)	1.1	2.4	5.5
Oxygen	(Vol. %)	9.7	9.8	10.1
NH_3	**(mg/Sm^3)**	**1.8**	**4.4**	**7.5**
NH_3	**(mg/Sm^3 @ 11% O2)**	**1.6**	**4.0**	**6.8**
Moisture	**(Vol. %)**	13.5	13.5	14.5

Tstd. (oF) 68 Pstd. (in. Hg) 29.92

Client:	Metro Vancouver	**Date:**	19-Nov-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	1 - Particulate / Metals
Source:	Unit 2	**Run Time:**	10:38 - 12:42

Concentrations:

Particulate	0.1	mg/dscm	0.0001	gr/dscf
	0.1	mg/Acm	0.0000	gr/Acf
	0.1	mg/dscm (@ 11% O2)	0.0001	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.009	Kg/hr	0.020	lb/hr

Flue Gas Characteristics:

Flow	1192	dscm/min	42102	dscf/min
	19.87	dscm/sec	702	dscf/sec
	2138	Acm/min	75511	Acf/min
Velocity	13.991	m/sec	45.90	f/sec
Temperature	148.1	oC	298.5	oF
Moisture	15.8	%		
Gas Analysis	10.8	% O2		
	9.8	% CO2		
	29.990	Mol. Wt (g/gmole) Dry		
	28.098	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.7392	dscm	96.735	dscf
Sample Time	120.0	minutes		
Isokineticity	104.1	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	19-Nov-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	1 - Particulate / Metals
Source:	Unit 2	**Run Time:**	10:38 - 12:42

Control Unit (Y)	0.9899	**Collection:**			**Gas Analysis (Vol. %):**		**Condensate Collection:**	
Nozzle Diameter (in.)	0.3040	Filter (grams)	0.00005		CO2	O2	Impinger 1	244.0
Pitot Factor	0.8483	Washings (grams)	0.00030	Traverse 1	9.50	11.00	Impinger 2	102.0
Baro. Press. (in. Hg)	29.86			Traverse 2	10.00	10.50	Impinger 3	13.0
Static Press. (in. H20)	-19.00	**Total (grams)**	**0.00035**				Impinger 4	2.0
Stack Height (ft)	30						Impinger 5	4.0
Stack Diameter (in.)	70.90						Impinger 6	0.0
Stack Area (sq.ft.)	27.417						Gel	20.2
Minutes Per Reading	5.0				**9.75**	**10.75**	**Gain (grams)**	**385.2**
Minutes Per Point	5.0							

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	934.800								
1	5.0	938.570	0.38	1.90	49	49	3	292	1.5	105.3
2	10.0	942.440	0.40	2.00	52	52	3	295	4.7	105.0
3	15.0	946.170	0.37	1.85	52	52	4	302	8.4	105.7
4	20.0	949.740	0.34	1.70	53	53	4	305	12.5	105.5
5	25.0	953.250	0.33	1.65	54	54	4	306	17.7	105.1
6	30.0	956.920	0.36	1.80	56	56	4	308	25.2	105.0
7	35.0	961.570	0.58	2.91	56	56	4	304	45.6	104.8
8	40.0	966.420	0.63	3.16	56	56	4	304	53.2	104.9
9	45.0	971.390	0.66	3.31	58	58	5	300	58.3	104.4
10	50.0	976.280	0.64	3.21	58	58	5	295	62.5	104.0
11	55.0	981.090	0.62	3.11	57	57	5	292	66.1	103.9
12	60.0	985.920	0.62	3.11	57	57	5	290	69.4	104.2
Traverse 2	0.0	985.920								
1	5.0	990.330	0.52	2.61	57	57	5	290	1.5	103.7
2	10.0	994.650	0.50	2.51	58	58	5	292	4.7	103.5
3	15.0	998.970	0.50	2.51	58	58	5	296	8.4	103.8
4	20.0	1003.200	0.48	2.40	59	59	5	300	12.5	103.8
5	25.0	1007.430	0.48	2.40	60	60	5	301	17.7	103.6
6	30.0	1011.620	0.47	2.35	60	60	5	302	25.2	103.8
7	35.0	1015.130	0.33	1.65	60	60	5	300	45.6	103.5
8	40.0	1018.490	0.30	1.50	61	61	5	297	53.2	103.4
9	45.0	1021.550	0.25	1.25	60	60	4	300	58.3	103.5
10	50.0	1024.480	0.23	1.15	60	60	4	302	62.5	103.5
11	55.0	1027.350	0.22	1.10	62	62	3	298	66.1	102.9
12	60.0	1030.220	0.22	1.10	62	62	3	294	69.4	102.7
Average:			0.435	2.177	57.3	57.3	4.3	298.5		104.1

Client:	Metro Vancouver	**Date:**	20-Nov-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 2	**Run Time:**	09:07 - 11:11

Concentrations:

Particulate	0.50	mg/dscm	0.00022	gr/dscf
	0.27	mg/Acm	0.00012	gr/Acf
	0.44	mg/dscm (@ 11% O2)	0.00019	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.036	Kg/hr	0.080	lb/hr

Flue Gas Characteristics:

Flow	1207	dscm/min	42619	dscf/min
	20.11	dscm/sec	710	dscf/sec
	2195	Acm/min	77510	Acf/min
Velocity	14.362	m/sec	47.12	f/sec
Temperature	145.2	oC	293.3	oF
Moisture	16.7	%		
Gas Analysis	9.7	% O2		
	10.5	% CO2		
	30.069	Mol. Wt (g/gmole) Dry		
	28.054	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.3010	dscm	81.261	dscf
Sample Time	120.0	minutes		
Isokineticity	105.9	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	20-Nov-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 2	**Run Time:**	09:07 - 11:11

Control Unit (Y)	0.9899	**Collection:**			**Gas Analysis (Vol. %):**			**Condensate Collection:**	
Nozzle Diameter (in.)	0.2818	Filter (grams)	0.00005		CO2	O2		Impinger 1	225.0
Pitot Factor	0.8483	Washings (grams)	0.00110	Traverse 1	10.00	10.45		Impinger 2	91.0
Baro. Press. (in. Hg)	29.58			Traverse 2	11.00	9.00		Impinger 3	11.0
Static Press. (in. H20)	-19.0	**Total (grams)**	**0.00115**					Impinger 4	0.0
Stack Height (ft)	30							Impinger 5	3.0
Stack Diameter (in.)	70.90							Impinger 6	0.0
Stack Area (sq.ft.)	27.417							Gel	16.1
Minutes Per Reading	5.0				**10.50**	**9.73**		**Gain (grams)**	**346.1**
Minutes Per Point	5.0								

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	30.599								
1	5.0	33.975	0.40	1.54	54	54	5	285	1.5	105.9
2	10.0	37.378	0.41	1.56	54	54	5	293	4.7	106.0
3	15.0	40.325	0.31	1.17	54	54	5	298	8.4	105.9
4	20.0	43.166	0.29	1.09	54	54	5	300	12.5	105.6
5	25.0	46.100	0.31	1.17	54	54	5	299	17.7	105.5
6	30.0	49.244	0.35	1.33	55	55	5	294	25.2	105.8
7	35.0	53.425	0.62	2.36	56	56	5	298	45.6	106.1
8	40.0	57.860	0.70	2.67	57	57	5	298	53.2	105.8
9	45.0	62.828	0.87	3.32	58	58	5	297	58.3	106.2
10	50.0	67.777	0.85	3.29	59	59	5	289	62.5	106.3
11	55.0	72.570	0.80	3.09	59	59	5	290	66.1	106.1
12	60.0	76.720	0.60	2.32	59	59	5	290	69.4	105.9
Traverse 2	0.0	76.720								
1	5.0	80.905	0.61	2.32	60	60	5	293	1.5	105.9
2	10.0	84.878	0.55	2.11	61	61	5	298	4.7	106.0
3	15.0	89.025	0.60	2.30	62	62	5	300	8.4	105.9
4	20.0	92.966	0.54	2.07	63	63	5	303	12.5	106.0
5	25.0	96.855	0.52	2.01	64	64	5	296	17.7	105.9
6	30.0	100.444	0.44	1.71	65	65	5	294	25.2	105.8
7	35.0	103.375	0.29	1.14	65	65	4	288	45.6	105.9
8	40.0	106.048	0.24	0.95	65	65	4	282	53.2	105.7
9	45.0	108.666	0.23	0.91	65	65	4	283	58.3	105.8
10	50.0	111.155	0.21	0.82	65	65	4	290	62.5	105.7
11	55.0	113.759	0.23	0.90	65	65	4	292	66.1	105.8
12	60.0	116.190	0.20	0.78	66	66	4	290	69.4	105.6
Average:			0.465	1.789	60.0	60.0	4.8	293.3		105.9

Client:	Metro Vancouver	**Date:**	20-Nov-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 2	**Run Time:**	11:27 - 13:30

Concentrations:

Particulate	0.5	mg/dscm	0.0002	gr/dscf
	0.3	mg/Acm	0.0001	gr/Acf
	0.4	mg/dscm (@ 11% O2)	0.0002	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.03	Kg/hr	0.076	lb/hr

Flue Gas Characteristics:

Flow	1123	dscm/min	39670	dscf/min
	18.72	dscm/sec	661	dscf/sec
	2053	Acm/min	72485	Acf/min
Velocity	13.431	m/sec	44.06	f/sec
Temperature	149.1	oC	300.3	oF
Moisture	16.2	%		
Gas Analysis	9.5	% O2		
	11.0	% CO2		
	30.140	Mol. Wt (g/gmole) Dry		
	28.172	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.2432	dscm	79.218	dscf
Sample Time	120.0	minutes		
Isokineticity	105.3	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	20-Nov-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 2	**Run Time:**	11:27 - 13:30

Control Unit (Y)	0.9899	**Collection:**			**Gas Analysis (Vol. %):**			**Condensate Collection:**	
Nozzle Diameter (in.)	0.2818	Filter (grams)	0.00005		CO2	O2		Impinger 1	241.0
Pitot Factor	0.8493	Washings (grams)	0.00110	Traverse 1	11.00	9.50		Impinger 2	57.0
Baro. Press. (in. Hg)	29.58			Traverse 2	11.00	9.50		Impinger 3	11.0
Static Press. (in. H20)	-19.50	**Total (grams)**	**0.0011**					Impinger 4	0.0
Stack Height (ft)	30							Impinger 5	1.0
Stack Diameter (in.)	70.90							Impinger 6	1.0
Stack Area (sq.ft.)	27.417							Gel	14.7
Minutes Per Reading	5.0				**11.00**	**9.50**		**Gain (grams)**	**325.7**
Minutes Per Point	5.0								

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	116.500								
1	5.0	119.909	0.40	1.54	65	65	4.5	301	1.5	105.4
2	10.0	123.394	0.42	1.62	65	65	4.5	303	4.7	105.3
3	15.0	126.992	0.45	1.73	65	65	4.5	304	8.4	105.1
4	20.0	130.515	0.43	1.65	65	65	4.5	304	12.5	105.3
5	25.0	133.658	0.34	1.31	65	65	4.5	301	17.7	105.3
6	30.0	136.653	0.31	1.20	65	65	4.5	300	25.2	105.0
7	35.0	139.294	0.24	0.93	65	65	4.5	300	45.6	105.2
8	40.0	141.936	0.24	0.93	65	65	4.5	301	53.2	105.3
9	45.0	144.688	0.26	1.01	65	65	4.5	300	58.3	105.3
10	50.0	147.545	0.28	1.09	65	65	4.5	298	62.5	105.3
11	55.0	150.248	0.25	0.97	65	65	4.5	299	66.1	105.4
12	60.0	153.000	0.26	1.01	66	66	4.5	300	69.4	105.1
Traverse 2	0.0	153.000								
1	5.0	156.055	0.32	1.24	66	66	4	299	1.5	105.2
2	10.0	159.016	0.30	1.16	66	66	4	300	4.7	105.3
3	15.0	161.770	0.26	1.01	66	66	4	301	8.4	105.3
4	20.0	164.477	0.25	0.97	66	66	4	298	12.5	105.3
5	25.0	167.235	0.26	1.01	66	66	4	300	17.7	105.4
6	30.0	170.338	0.33	1.28	66	66	4	300	25.2	105.3
7	35.0	174.865	0.70	2.72	67	67	5.5	299	45.6	105.6
8	40.0	179.560	0.75	2.93	67	67	5.5	294	53.2	105.5
9	45.0	184.310	0.77	2.98	67	67	5.5	301	58.3	105.8
10	50.0	188.825	0.70	2.70	67	67	5.5	304	62.5	105.6
11	55.0	193.175	0.65	2.52	68	68	5.5	302	66.1	105.2
12	60.0	196.810	0.45	1.75	68	68	5.5	298	69.4	105.2
		.								
Average:			0.401	1.553	65.9	65.9	3.0	300.3		105.3

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)
Source: Unit 2

Sample Type: HF

Parameter		Test 1	Test 2	Test 3
Test Date		20-Nov-24	20-Nov-24	20-Nov-24
Test Time		09:39 - 10:39	10:55 - 11:55	12:10 - 13:10
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	29.60	29.60	29.60
DGM Factor	(Y)	1.0207	1.0207	1.0207
Initial Reading	(m^3)	203.427	204.037	204.662
Final Reading	(m^3)	204.032	204.659	205.254
Temp. Outlet	(Avg. oF)	52.2	59.0	60.5
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm^3)	0.63039	0.64009	0.60716
HF	(mg)	0.053	0.053	0.053
Oxygen	(Vol. %)	10.8	9.7	9.5
HF	**(mg/Sm^3)**	**0.084**	**0.082**	**0.087**
HF	**(mg/Sm^3 @ 11% O2)**	**0.081**	**0.073**	**0.075**
Moisture (isokinetic)	**(Vol. %)**	15.8	16.7	16.2

*Wet Basis Calculated on moisture from isokinetic tests
Tstd. (oF) 68 Pstd. (in. Hg) 29.92

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)
Source: Unit 2

Sample Type: NH_3

Parameter		Test 1	Test 2	Test 3
Test Date		20-Nov-24	20-Nov-24	20-Nov-24
Test Time		09:39 - 10:39	10:55 - 11:55	12:10 - 13:10
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	29.60	29.60	29.60
DGM Factor	(Y)	1.0355	1.0355	1.0355
Initial Reading	(m^3)	315.205	315.749	316.247
Final Reading	(m^3)	315.744	316.243	316.786
Temp. Outlet	(Avg. oF)	52.4	57.7	61.0
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm^3)	0.56969	0.51619	0.56028
NH_3	(mg)	0.6	0.3	0.1
Oxygen	(Vol. %)	10.8	9.7	9.5
NH_3	**(mg/Sm^3)**	**1.1**	**0.5**	**0.1**
NH_3	**(mg/Sm^3 @ 11% O2)**	**1.0**	**0.4**	**0.1**
Moisture (isokinetic)	**(Vol. %)**	15.8	16.7	16.2

*Wet Basis Calculated on moisture from isokinetic tests
Tstd. (oF) 68 Pstd. (in. Hg) 29.92

Client:	Metro Vancouver	**Date:**	18-Nov-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	1 - Particulate / Metals
Source:	Unit 3	**Run Time:**	12:17 - 14:22

Concentrations:

Particulate	1.02	mg/dscm	0.00045	gr/dscf
	0.57	mg/Acm	0.00025	gr/Acf
	0.93	mg/dscm (@ 11% O2)	0.00041	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.069	Kg/hr	0.153	lb/hr

Flue Gas Characteristics:

Flow	1132	dscm/min	39991	dscf/min
	18.87	dscm/sec	667	dscf/sec
	2022	Acm/min	71391	Acf/min
Velocity	13.228	m/sec	43.40	f/sec
Temperature	154.9	oC	310.8	oF
Moisture	13.8	%		
Gas Analysis	10.1	% O2		
	10.0	% CO2		
	30.003	Mol. Wt (g/gmole) Dry		
	28.350	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.1572	dscm	76.181	dscf
Sample Time	120.0	minutes		
Isokineticity	100.5	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	18-Nov-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	1 - Particulate / Metals
Source:	Unit 3	**Run Time:**	12:17 - 14:22

Control Unit (Y)	0.9792
Nozzle Diameter (in.)	0.2818
Pitot Factor	0.8493
Baro. Press. (in. Hg)	29.78
Static Press. (in. H20)	-19.00
Stack Height (ft)	30
Stack Diameter (in.)	70.90
Stack Area (sq.ft.)	27.417
Minutes Per Reading	5.0
Minutes Per Point	5.0

Collection:	
Filter (grams)	0.00180
Washings (grams)	0.00040
Total (grams)	**0.00220**

Gas Analysis (Vol. %):		
	CO2	O2
Traverse 1	10.00	10.25
Traverse 2	10.00	9.90
	10.00	**10.08**

Condensate Collection:	
Impinger 1	144.0
Impinger 2	82.0
Impinger 3	17.0
Impinger 4	1.0
Impinger 5	1.0
Impinger 6	0.0
Gel	13.6
Gain (grams)	**258.6**

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	532.049								
1	5.0	535.688	0.49	1.79	57	57	5	313	1.5	100.6
2	10.0	539.535	0.55	2.01	56	56	5	312	4.7	100.6
3	15.0	543.280	0.52	1.90	56	56	5	312	8.4	100.7
4	20.0	546.810	0.46	1.68	56	56	5	311	12.5	100.8
5	25.0	550.400	0.48	1.76	56	56	5	312	17.7	100.4
6	30.0	553.939	0.46	1.69	57	57	5	311	25.2	100.9
7	35.0	556.924	0.33	1.21	57	57	5	312	45.6	100.4
8	40.0	559.820	0.31	1.14	58	58	5	312	53.2	100.3
9	45.0	562.682	0.30	1.10	59	59	5	313	58.3	100.6
10	50.0	565.410	0.28	1.03	60	60	5	313	62.5	99.0
11	55.0	568.170	0.28	1.03	60	60	5	313	66.1	100.2
12	60.0	570.794	0.25	0.92	61	61	5	311	69.4	100.5
Traverse 2	0.0	570.794								
1	5.0	573.625	0.29	1.07	62	62	5	311	1.5	100.5
2	10.0	576.505	0.30	1.11	62	62	5	309	4.7	100.4
3	15.0	579.188	0.26	0.96	62	62	5	310	8.4	100.5
4	20.0	581.980	0.28	1.04	63	63	5	308	12.5	100.5
5	25.0	584.965	0.32	1.19	63	63	5	310	17.7	100.6
6	30.0	587.690	0.27	1.00	63	63	5	310	25.2	100.0
7	35.0	591.070	0.41	1.52	63	63	5.5	310	45.6	100.8
8	40.0	594.616	0.45	1.68	64	64	5.5	310	53.2	100.7
9	45.0	598.344	0.50	1.86	64	64	5.5	310	58.3	100.5
10	50.0	601.940	0.46	1.72	65	65	5.5	310	62.5	100.9
11	55.0	605.500	0.45	1.68	65	65	5.5	309	66.1	100.9
12	60.0	608.850	0.40	1.50	65	65	5.5	308	69.4	100.6
Average:			0.379	1.400	60.6	60.6	5.1	310.8		100.5

Client:	Metro Vancouver	**Date:**	19-Nov-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 3	**Run Time:**	09:13 - 11:17

Concentrations:

Particulate	1.21	mg/dscm	0.00053	gr/dscf
	0.66	mg/Acm	0.00029	gr/Acf
	1.09	mg/dscm (@ 11% O2)	0.00048	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.083	Kg/hr	0.183	lb/hr

Flue Gas Characteristics:

Flow	1145	dscm/min	40443	dscf/min
	19.09	dscm/sec	674	dscf/sec
	2101	Acm/min	74193	Acf/min
Velocity	13.747	m/sec	45.10	f/sec
Temperature	156.1	oC	313.0	oF
Moisture	16.1	%		
Gas Analysis	10.0	% O2		
	10.3	% CO2		
	30.038	Mol. Wt (g/gmole) Dry		
	28.100	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.2397	dscm	79.095	dscf
Sample Time	120.0	minutes		
Isokineticity	103.0	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	19-Nov-24
Jobsite:	WTE (Burnaby, B.C)	**Run:**	2 - Particulate / Metals
Source:	Unit 3	**Run Time:**	09:13 - 11:17

Control Unit (Y)	0.9792	**Collection:**			**Gas Analysis (Vol. %):**			**Condensate Collection:**	
Nozzle Diameter (in.)	0.2818	Filter (grams)	0.00150		CO2	O2		Impinger 1	157.0
Pitot Factor	0.8493	Washings (grams)	0.00120	Traverse 1	10.50	9.80		Impinger 2	122.0
Baro. Press. (in. Hg)	29.86			Traverse 2	10.00	10.10		Impinger 3	17.0
Static Press. (in. H20)	-19.00	**Total (grams)**	**0.00270**					Impinger 4	10.0
Stack Height (ft)	30							Impinger 5	3.0
Stack Diameter (in.)	70.90							Impinger 6	1.0
Stack Area (sq.ft.)	27.417							Gel	12.5
Minutes Per Reading	5.0				**10.25**	**9.95**		**Gain (grams)**	**322.5**
Minutes Per Point	5.0								

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	609.129								
1	5.0	611.894	0.28	1.01	49	49	4	310	1.5	104.9
2	10.0	614.779	0.33	1.19	48	48	4	313	4.7	101.2
3	15.0	617.525	0.29	1.04	48	48	4	313	8.4	102.7
4	20.0	620.128	0.26	0.94	48	48	4	312	12.5	102.8
5	25.0	622.780	0.27	0.97	48	48	4	313	17.7	102.8
6	30.0	625.588	0.30	1.08	49	49	4	313	25.2	103.1
7	35.0	629.277	0.52	1.87	49	49	6.5	313	45.6	103.1
8	40.0	633.279	0.61	2.20	50	50	6.5	314	53.2	103.2
9	45.0	637.255	0.60	2.17	51	51	6.5	313	58.3	103.1
10	50.0	641.139	0.57	2.06	51	51	6.5	312	62.5	103.2
11	55.0	644.989	0.56	2.03	52	52	6.5	314	66.1	103.2
12	60.0	648.240	0.40	1.45	53	53	6.5	313	69.4	102.7
					0					
Traverse 2	0.0	648.240								
1	5.0	651.965	0.52	1.90	55	55	6.5	313	1.5	102.9
2	10.0	655.769	0.54	1.96	55	55	6.5	315	4.7	103.2
3	15.0	659.710	0.58	2.12	56	56	6.5	314	8.4	103.0
4	20.0	663.455	0.52	1.90	56	56	6.5	314	12.5	103.3
5	25.0	667.129	0.50	1.83	57	57	6.5	314	17.7	103.1
6	30.0	670.766	0.49	1.79	57	57	6.5	313	25.2	103.0
7	35.0	673.835	0.35	1.28	57	57	5	313	45.6	102.8
8	40.0	676.780	0.32	1.17	57	57	5	312	53.2	103.0
9	45.0	679.728	0.32	1.18	58	58	5	312	58.3	102.9
10	50.0	682.435	0.27	0.99	58	58	5	311	62.5	102.8
11	55.0	685.030	0.25	0.92	58	58	5	313	66.1	102.5
12	60.0	687.360	0.20	0.73	59	59	5	314	69.4	102.7
Average:			0.410	1.491	51.2	53.3	5.5	313.0		103.0

Client:	Metro Vancouver	**Date:**	19-Nov-24
Jobsite:	WTE(Burnaby,B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 3	**Run Time:**	11:51 - 13:55

Concentrations:

Particulate	0.76	mg/dscm	0.00033	gr/dscf
	0.42	mg/Acm	0.00018	gr/Acf
	0.70	mg/dscm (@ 11% O2)	0.00031	gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.053	Kg/hr	0.117	lb/hr

Flue Gas Characteristics:

Flow	1159	dscm/min	40927	dscf/min
	19.32	dscm/sec	682	dscf/sec
	2090	Acm/min	73804	Acf/min
Velocity	13.675	m/sec	44.86	f/sec
Temperature	155.6	oC	312.2	oF
Moisture	14.7	%		
Gas Analysis	10.2	% O2		
	10.0	% CO2		
	30.007	Mol. Wt (g/gmole) Dry		
	28.238	Mol. Wt (g/gmole) Wet		

Sample Parameters:

Sample Volume	2.2301	dscm	78.757	dscf
Sample Time	120.0	minutes		
Isokineticity	101.5	%		

*** Standard Conditions:** Metric: 20 deg C, 101.325 kPa
Imperial: 68 deg F, 29.92 in.Hg

Client:	Metro Vancouver	**Date:**	19-Nov-24
Jobsite:	WTE(Burnaby,B.C)	**Run:**	3 - Particulate / Metals
Source:	Unit 3	**Run Time:**	11:51 - 13:55

Control Unit (Y)	0.9792	**Collection:**			**Gas Analysis (Vol. %):**			**Condensate Collection:**	
Nozzle Diameter (in.)	0.2818	Filter (grams)	0.00150		CO2	O2		Impinger 1	215.0
Pitot Factor	0.8495	Washings (grams)	0.00020	Traverse 1	10.00	9.80		Impinger 2	64.0
Baro. Press. (in. Hg)	29.86			Traverse 2	10.00	10.55		Impinger 3	-3.0
Static Press. (in. H20)	-19.00	**Total (grams)**	**0.00170**					Impinger 4	0.0
Stack Height (ft)	30							Impinger 5	1.0
Stack Diameter (in.)	70.90							Impinger 6	0.0
Stack Area (sq.ft.)	27.417							Gel	12.2
Minutes Per Reading	5.0				**10.00**	**10.18**		**Gain (grams)**	**289.2**
Minutes Per Point	5.0								

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Temperature Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	687.700								
1	5.0	691.285	0.48	1.75	54	54	3.5	311	1.5	101.7
2	10.0	694.902	0.49	1.79	54	54	3.5	312	4.7	101.6
3	15.0	698.600	0.51	1.09	55	55	3.5	313	8.4	101.5
4	20.0	702.185	0.48	1.75	55	55	3.5	312	12.5	101.5
5	25.0	705.740	0.47	1.72	55	55	3.5	312	17.7	101.7
6	30.0	709.148	0.43	1.57	56	56	3.5	312	25.2	101.7
7	35.0	712.129	0.33	1.21	56	56	3.5	312	45.6	101.5
8	40.0	715.065	0.32	1.17	56	56	3.5	310	53.2	101.4
9	45.0	717.765	0.27	0.99	57	57	3.5	312	58.3	101.4
10	50.0	720.420	0.26	0.95	57	57	3.5	314	62.5	101.7
11	55.0	722.740	0.20	0.73	58	58	3.5	314	66.1	101.1
12	60.0	725.060	0.20	0.73	58	58	3.5	313	69.4	101.0
Traverse 2	0.0	725.060								
1	5.0	728.280	0.38	1.40	59	59	4	310	1.5	101.5
2	10.0	731.410	0.36	1.32	59	59	4	313	4.7	101.5
3	15.0	734.572	0.37	1.36	59	59	4	314	8.4	101.2
4	20.0	737.615	0.34	1.25	59	59	4	312	12.5	101.5
5	25.0	740.475	0.30	1.10	60	60	4	313	17.7	101.4
6	30.0	743.475	0.33	1.21	60	60	4	313	25.2	101.4
7	35.0	747.128	0.49	1.81	60	60	4.5	312	45.6	101.4
8	40.0	751.350	0.65	2.40	61	61	4.5	313	53.2	101.8
9	45.0	755.610	0.66	2.44	61	61	4.5	311	58.3	101.8
10	50.0	759.666	0.60	2.22	61	61	4.5	311	62.5	101.6
11	55.0	763.255	0.47	1.74	61	61	4.5	312	66.1	101.5
12	60.0	766.480	0.38	1.41	61	61	4.5	311	69.4	101.3
Average:			0.407	1.463	58.0	58.0	3.9	312.2		101.5

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)
Source: Unit 3

Sample Type: HF

Parameter		Test 1	Test 2	Test 3
Test Date		19-Nov-24	19-Nov-24	19-Nov-24
Test Time		10:05 - 11:05	11:51 - 12:51	13:11 - 14:11
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	29.86	29.86	29.86
DGM Factor	(Y)	1.0207	1.0207	1.0207
Initial Reading	(m^3)	201.428	202.117	202.726
Final Reading	(m^3)	202.108	202.718	203.407
Temp. Outlet	(Avg. oF)	49.2	49.3	54.0
Orifice Press.	(ΔH in.H2O)	0.30	0.30	0.30
Gas Volume	(Sm^3)	0.71876	0.63492	0.71335
HF	(mg)	0.051	0.041	0.051
Oxygen	(Vol. %)	10.1	10.0	10.2
HF	**(mg/Sm^3)**	**0.072**	**0.065**	**0.072**
HF	**(mg/Sm^3 @ 11% O2)**	**0.065**	**0.059**	**0.067**
Moisture (isokinetic)	**(Vol. %)**	13.8	16.1	14.7

*Wet Basis Calculated on moisture from isokinetic tests

Tstd. (oF) 68 Pstd. (in. Hg) 29.92

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)
Source: Unit 3

Sample Type: NH_3

Parameter		Test 1	Test 2	Test 3
Test Date		19-Nov-24	19-Nov-24	19-Nov-24
Test Time		10:05 - 11:05	11:51 - 12:51	13:11 - 14:11
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	29.86	29.86	29.86
DGM Factor	(Y)	1.0355	1.0355	1.0355
Initial Reading	(m^3)	313.585	314.078	314.632
Final Reading	(m^3)	314.078	314.629	315.199
Temp. Outlet	(Avg. oF)	45.7	52.3	55.5
Orifice Press.	(ΔH in.H2O)	0.30	0.30	0.30
Gas Volume	(Sm^3)	0.53196	0.58749	0.60040
NH_3	(mg)	2.9	0.3	0.1
Oxygen	(Vol. %)	10.1	10.0	10.2
NH_3	**(mg/Sm^3)**	**5.4**	**0.5**	**0.2**
NH_3	**(mg/Sm^3 @ 11% O2)**	**5.0**	**0.5**	**0.2**
Moisture (isokinetic)	**(Vol. %)**	13.8	16.1	14.7

*Wet Basis Calculated on moisture from isokinetic tests

Tstd. (oF) 68 Pstd. (in. Hg) 29.92

Client: Metro Vancouver
Jobsite: WTE (Burnaby,B.C)

Parameter: N_2O

Molecular Weight: 44.00 grams/mol **Reportable Detection Limit:** 0.18 mg/Sm^3
Lab Detection Limit: 0.1 ppm

Sample ID	Date	Time	N_2O ppm	N_2O mg/Sm^3	N_2O mg/Sm^3 @ 11% O_2
Unit 1 - Run 1	December 13, 2024	09:15 - 10:15	5.50	10.07	8.93
Unit 1 - Run 2	December 13, 2024	10:53 - 11:53	6.20	11.35	10.15
Unit 1 - Run 3	December 13, 2024	12:10 - 13:10	5.30	9.70	8.86
Average					**9.31**
Unit 2 - Run 1	November 20, 2024	09:39 - 10:39	4.80	8.79	8.58
Unit 2 - Run 2	November 20, 2024	10:55 - 11:55	3.30	6.04	5.36
Unit 2 - Run 3	November 20, 2024	12:10 - 13:10	3.30	6.04	5.25
Average					**6.39**
Unit 3 - Run 1	November 19, 2024	10:11 - 11:11	4.30	7.87	7.20
Unit 3 - Run 2	November 19, 2024	11:51 - 12:51	3.70	6.77	6.13
Unit 3 - Run 3	November 19, 2024	13:16 - 14:16	4.10	7.50	6.93
Average					**6.76**

Date:	**13-Dec-24**			**20-Nov-24**			**19-Nov-24**		
	Unit 1			**Unit 2**			**Unit 3**		
	Run 1	Run 2	Run 3	Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
Test Times:	09:15 - 10:15	10:53 - 11:53	12:10 - 13:10	09:39 - 10:39	10:55 - 11:55	12:10 - 13:10	10:11 - 11:11	11:51 - 12:51	13:16 - 14:16
Methane (ppmv)	12	ND	ND	ND	ND	2.7	3.4	ND	ND
Ethane (ppmv)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Ethene (ppmv)	ND	ND	ND	ND	ND	ND	ND	ND	ND
C3 as Propane (ppmv)	ND	ND	ND	ND	ND	ND	ND	ND	ND
C4 as n-Butane (ppmv)	ND	ND	ND	ND	ND	ND	ND	ND	ND
C5 as n-Pentane (ppmv)	ND	ND	ND	ND	ND	ND	ND	ND	ND
C6 as n-Hexane (ppmv)	ND	ND	ND	ND	ND	ND	ND	ND	ND
C6+ as n-Hexane (ppmv)	ND	ND	ND	ND	ND	ND	ND	ND	ND
Detection Limits:									
Methane	3.1	3.4	3.1	3.6	3.1	3.1	3.5	2.4	4.1
Ethane	0.92	1	0.92	1.1	0.9	0.94	1.00	0.73	1.20
Ethene	0.92	1	0.92	1.1	0.9	0.94	1.00	0.73	1.20
C3 as Propane	0.77	0.85	0.9	0.82	0.78	0.79	0.87	0.61	1
C4 as n-Butane	0.77	0.85	0.9	0.82	0.78	0.79	0.87	0.61	1
C5 as n-Pentane	0.77	0.85	0.9	0.82	0.78	0.79	0.87	0.61	1
C6 as n-Hexane	0.77	0.85	0.9	0.82	0.78	0.79	0.87	0.61	1
C6+	1.5	1.7	1.8	1.6	1.6	1.6	1.7	1.2	2.1

Using 1/2 DL Convention

Sample Date:	**13-Dec-24**			**20-Nov-24**			**19-Nov-24**		
	Unit 1			**Unit 2**			**Unit 3**		
	Run 1	Run 2	Run 3	Run 1	Run 2	Run 3	Run 1	Run 2	Run 3
Test Times:	09:15 - 10:15	10:53 - 11:53	12:10 - 13:10	09:39 - 10:39	10:55 - 11:55	12:10 - 13:10	10:11 - 11:11	11:51 - 12:51	13:16 - 14:16
Methane (ppm)	12.00	1.70	1.55	1.80	1.55	2.70	3.40	1.20	2.05
Ethane (ppm)	0.46	0.50	0.46	0.55	0.47	0.47	0.50	0.37	0.60
Ethene (ppm)	0.46	0.50	0.46	0.55	0.47	0.47	0.50	0.37	0.60
C3 as Propane (ppm)	0.39	0.43	0.45	0.41	0.39	0.40	0.44	0.31	0.50
C4 as n-Butane (ppm)	0.39	0.43	0.45	0.41	0.39	0.40	0.44	0.31	0.50
C5 as n-Pentane (ppm)	0.39	0.43	0.45	0.41	0.39	0.40	0.44	0.31	0.50
C6 as n-Hexane (ppm)	0.39	0.43	0.45	0.41	0.39	0.40	0.44	0.31	0.50
C6+ as n-Hexane (ppm)	0.75	0.85	0.90	0.80	0.80	0.80	0.85	0.60	1.05
Methane (mg/m^3 as CH_4)	8.01	1.13	1.03	1.20	1.03	1.80	2.27	0.80	1.37
Ethane (mg/m^3 as CH_4)	0.31	0.33	0.31	0.37	0.31	0.31	0.33	0.24	0.40
Ethene (mg/m^3 as CH_4)	0.31	0.33	0.31	0.37	0.31	0.31	0.33	0.24	0.40
C3 as Propane (mg/m^3 as CH_4)	0.26	0.28	0.30	0.27	0.26	0.26	0.29	0.20	0.33
C4 as n-Butane (mg/m^3 as CH_4)	0.26	0.28	0.30	0.27	0.26	0.26	0.29	0.20	0.33
C5 as n-Pentane (mg/m^3 as CH_4)	0.26	0.28	0.30	0.27	0.26	0.26	0.29	0.20	0.33
C6 as n-Hexane (mg/m^3 as CH_4)	0.26	0.28	0.30	0.27	0.26	0.26	0.29	0.20	0.33
C6+ as n-Hexane (mg/m^3 as CH_4)	0.50	0.57	0.60	0.53	0.53	0.53	0.57	0.40	0.70
Total mg/Sm^3 @11% O_2 as CH_4	7.64	2.56	2.52	2.44	2.44	3.09	3.06	1.85	3.04

All data is corrected to standard conditions (S) of 20 °C, 101.325 kPa (dry) unless otherwise noted.

APPENDIX - E

FIELD DATA SHEETS

A. Lanfranco and Associates Inc.

LF

METRO VANCOUVER WTE - BURNABY B.C.			NOZZLE G-282 DIAMETER, IN. 0.2815	IMPINGER	INITIAL	FINAL	TOTAL GAIN
			PROBE 7C Cp 0.8493	VOLUMES	(mL)	(mL)	(mL)
SOURCE Unit #1				Imp. #1	0	159	159
PARAMETER / RUN No Metals/Partic Run#1			PORT LENGTH	Imp. #2	100	176	76
DATE 12 Dec 2024			STATIC PRESSURE, IN. H2O -16.5"	Imp. #3	100	109	9
OPERATOR: LF			STACK DIAMETER 70.90"	Imp. #4	0	2	2
CONTROL UNIT CAE AL1	Y 0.9812		STACK HEIGHT 30'	Imp. #5	100	103	3
	ΔH@ 1.820			Imp. #6	100	102	2
BAROMETRIC PRESSURE, IN. Hg 29.78			INITIAL LEAK TEST 0.000 @15"	Imp. #7			
ASSUMED MOISTURE, Bw 15%			FINAL LEAK TEST 0.001 @15"	Imp. #8			
						Testo-1	

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F					Pump Vac. IN. Hg	Fyrites			
					Dry Gas Outlet	Stack	Probe	Box	Impinger Exit		CO_2 Vol. %	O_2 Vol. %		
	1120	732.135												
1		734.98	0.29	1.06	60	303	250	250	52	2.5				
2	10	737.67	0.26	0.94	60	308					10.7	9.9		
3		740.66	0.32	1.16	61	309	250	250	48	3				
4	20	743.75	0.34	1.24	62	310								
5		746.78	0.33	1.20	63	310	250	250	48	3				
6	30	749.95	0.35	1.28	64	311					10.5	9.6		
7		753.70	0.50	1.82	64	311	250	250	49	3				
8	40	757.69	0.56	2.05	66	310								
9		761.55	0.52	1.91	66	310	250	250	51	3.5				
10	50	765.35	0.50	1.84	67	310					11.0	9.1		
11		768.98	0.46	1.69	67	309	250	250	51	3				
12	60	772.53	0.44	1.62	67	308								
1		775.49	0.30	1.11	68	305	250	250	50	3				
2	10	778.57	0.33	1.22	67	307					10.6	9.8		
3		781.70	0.34	1.25	67	308	250	250	48	3				
4	20	784.86	0.35	1.29	68	308								
5		788.26	0.40	1.48	68	306	250	250	45	3				
6	30	791.74	0.42	1.56	68	305					10.2	10.1		
7		795.58	0.51	1.89	68	306	250	250	45	3				
8	40	799.53	0.54	2.00	69	306								
9		803.33	0.50	1.85	69	307	250	250	46	3				
10	50	807.05	0.48	1.78	70	306					10.4	9.9		
11		810.67	0.45	1.67	70	306	250	250	46	3				
12		814.251	0.44	1.64	70	305								
End	1322													

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LF

METRO VANCOUVER WTE - BURNABY B.C.			
SOURCE Unit #1			
PARAMETER / RUN No Metals / Partic Run #2			
DATE 13 Dec 2024			
OPERATOR: LF			
CONTROL UNIT CAE AL1	Y 0.9812		
	ΔH@ 1.820		
BAROMETRIC PRESSURE, IN. Hg 29.66			
ASSUMED MOISTURE, Bw 15%			

NOZZLE G-282	DIAMETER, IN. 0.2815		
PROBE 7C	Cp 0.8493		
PORT LENGTH			
STATIC PRESSURE, IN. H2O -17"			
STACK DIAMETER 70.90"			
STACK HEIGHT 30'			
INITIAL LEAK TEST 0.000 @15"			
FINAL LEAK TEST 0.000 @15"			

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	0	169	169
Imp. #2	100	177	77
Imp. #3	100	103	3
Imp. #4	0	0	0
Imp. #5	100	100	0
Imp. #6	100	101	1
Imp. #7	Gel		
Imp. #8			

Testo-1

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F					Pump Vac. IN. Hg	Fyrites			
					Dry Gas Outlet	Stack	Probe	Box	Impinger Exit		CO_2 Vol. %	O_2 Vol. %		
	8:21	815.000												
1		818.34	0.41	1.47	51	303	250	250	58	5				
2	10	821.86	0.46	1.64	51	309					9.7	9.8		
3		825.45	0.48	1.70	51	312	250	250	54	6				
4	20	828.96	0.46	1.63	51	312								
5		832.40	0.44	1.56	51	313	250	250	51	6				
6	30	835.89	0.45	1.61	53	311					10.0	9.7		
7		839.50	0.48	1.72	55	310	250	250	49	5				
8	40	842.92	0.43	1.54	55	310								
9		846.32	0.42	1.51	56	310	250	250	49	5				
10	50	849.85	0.45	1.62	57	309					9.5	10.2		
11		853.09	0.38	1.37	58	309	250	250	49	5				
12	60	856.20	0.35	1.27	58	309								
1		858.98	0.28	1.02	58	305	250	250	51	5				
2	10	861.70	0.27	0.98	59	308					10.2	9.4		
3		864.60	0.30	1.09	59	310	250	250	49	5				
4	20	867.25	0.25	0.91	60	310								
5		870.20	0.31	1.12	60	310	250	250	49	5				
6	30	873.00	0.28	1.01	60	311					9.9	10.2		
7		876.90	0.54	1.96	61	310	250	250	50	6				
8	40	880.64	0.50	1.82	61	310								
9		884.45	0.52	1.89	61	310	250	250	51	6				
10	50	888.10	0.48	1.75	62	310					10.5	9.6		
11		891.70	0.46	1.68	62	309	250	250	51	6				
12	60	895.295	0.43	1.57	62	309								
End	1024													

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LF

METRO VANCOUVER WTE - BURNABY B.C.

SOURCE Unit #1
PARAMETER / RUN No Metals / Partic Run #3
DATE 13 Dec 2024
OPERATOR: LF
CONTROL UNIT CAE AL1 Y 0.9812
ΔH@ 1.820
BAROMETRIC PRESSURE, IN. Hg 29.67
ASSUMED MOISTURE, Bw 15%

NOZZLE G-309 DIAMETER, IN. 0.3058
PROBE TA-1 Cp 0.8436
PORT LENGTH
STATIC PRESSURE, IN. H2O -17"
STACK DIAMETER 70.90"
STACK HEIGHT 30'
INITIAL LEAK TEST 0.001@15"
FINAL LEAK TEST 0.000@15"

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	0	244	244
Imp. #2	100	151	51
Imp. #3	100	112	12
Imp. #4	0	0	0
Imp. #5	100	102	2
Imp. #6	100	100	0
Imp. #7	Gel		
Imp. #8			

Testo-1

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites: CO_2 Vol. %	Fyrites: O_2 Vol. %
	1046	896.200										
1		899.69	0.31	1.56	60	301	250	250	47	3		
2	10	903.33	0.34	1.71	60	300					9.5	10.1
3		906.75	0.30	1.50	60	304	250	250	47	3		
4	20	910.10	0.29	1.45	60	309						
5		913.50	0.30	1.49	60	309	250	250	48	3		
6	30	917.06	0.33	1.64	60	310					9.7	9.9
7		921.40	0.44	2.44	60	309	250	250	48	4		
8	40	925.88	0.52	2.60	61	309						
9		930.54	0.56	2.80	61	307	250	250	49	5		
10	50	935.10	0.53	2.67	62	303					9.2	10.2
11		939.50	0.49	2.48	62	301	250	250	50	5		
12	60	943.78	0.46	2.33	63	300						
1		947.70	0.39	1.97	63	302	250	250	49	4		
2	10	951.75	0.42	2.11	63	308					9.5	10.2
3		955.69	0.40	2.00	63	310	250	250	49	4		
4	20	960.01	0.48	2.40	63	310						
5		964.25	0.46	2.30	63	310	250	250	50	4		
6	30	968.43	0.45	2.25	63	311					9.0	10.1
7		972.70	0.47	2.35	63	310	250	250	50	4		
8	40	976.99	0.47	2.36	64	310						
9		981.15	0.44	2.21	64	308	250	250	48	4		
10	50	985.11	0.40	2.02	64	305					9.4	9.8
11		988.92	0.37	1.87	64	305	250	250	48	4		
12	60	992.650	0.35	1.77	64	303						
End	1248											

LF

Client	WWTIE	Y	LMV-D1,0207
Source	Unit 1	Cp	
Parameter	~~HCL~~ HF	Pbar	29.86 Static
Date	DEC, 13, 24	Operator	BL/CL
Stack Dia		Down	Up

Leak Check	Run 1	Run 2	Run 3
Initial	0.0001	0.0001	0.0001
Final	0.0001	0.0001	0.0001

Test No.	Time (hhmm)	DGM Volume (cu ft) / (m^3)	Temperature (°F) DGM Outlet	Temperature (°F) Stack	Imp. Vol. (mL)	ΔP IN. H_2O R1	ΔP IN. H_2O R2	ΔP IN. H_2O R3
1	9:15	207.2618	48					
	9:45	207.5532	55					
	10:15	207.8158	55					
2	10:53	207.8214	48					
	11:20	208.0870	51					
	11:53	208.4392	54					
3	12:10	208.4450	60					
	12:40	208.6630	50					
	13:10	209.0414	56					

Client	WWTIE	Y	LMV-A0.9950
Source	Unit 1	Cp	
Parameter	NH3	Pbar	29.66 Static
Date	DEC, 13, 24	Operator	BL/CL
Stack Dia		Down	Up

Leak Check	Run 1	Run 2	Run 3
Initial	0.0001	0.0001	0.0001
Final	0.0001	0.0001	0.0001

Test No.	Time (hhmm)	DGM Volume (cu ft) / (m^3)	Temperature (°F) DGM Outlet	Temperature (°F) Stack	Imp. Vol. (mL)	ΔP IN. H_2O R1	ΔP IN. H_2O R2	ΔP IN. H_2O R3
1	9:15	632.5156	50					
	9:45	632.9000	50					
	10:15	633.1192	51					
2	10:53	633.1258	48					
	11:20	633.3550	53					
	11:53	633.6456	51					
3	12:10	633.6518	52					
	12:40	633.9290	51					
	13:10	634.3776	54					

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Client MVWTE

Source Unit 1 Date Dec, 13, 24

		Run 1	Run 2	Run 3	Run 4	Run 5
Pbar (in. Hg)		29.66				
Canister Number		A201564				
Controller Number		0A00920				
Gauge Number						
Initial:	Start Time	9:15				
	Flask Vac. (in. Hg)	-28				
Final:	End Time	10:15				
	Flask Vac. (in. Hg)	-9				

Source Unit 1 Date Dec, 13, 24

		Run 1	Run 2	Run 3	Run 4	Run 5
Pbar (in. Hg)		29.66				
Canister Number		A501349				
Controller Number		0A2261				
Gauge Number						
Initial:	Start Time	10:53				
	Flask Vac. (in. Hg)	-29				
Final:	End Time	10:53				
	Flask Vac. (in. Hg)	-7				

Source Unit 1 Date Dec, 13, 24

		Run 1	Run 2	Run 3	Run 4	Run 5
Pbar (in. Hg)		29.66				
Canister Number		A501467				
Controller Number		0A00367				
Gauge Number						
Initial:	Start Time	12:10				
	Flask Vac. (in. Hg)	-28				
Final:	End Time	13:10				
	Flask Vac. (in. Hg)	-5				

Source _____ Date _____

		Run 1	Run 2	Run 3	Run 4	Run 5
Pbar (in. Hg)						
Canister Number						
Controller Number						
Gauge Number						
Initial:	Start Time					
	Flask Vac. (in. Hg)					
Final:	End Time					
	Flask Vac. (in. Hg)					

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√6.11 5.01ΔH DSV

CLIENT: MVRD	NOZZLE G3-24 DIAMETER, IN. .3040	IMPINGER VOLUMES	INITIAL (mL) / FINAL (mL) / TOTAL GAIN (mL)
SOURCE: Unit #2	PROBE AL OVRD Cp .8483	Imp. #1	0 / 244 / 244
PARAMETER / RUN No 1 METAL / PART.	PORT LENGTH	Imp. #2	100 / 202 / 102
DATE NOV. 19/24	STATIC PRESSURE, IN. H2O − 19.00	Imp. #3	100 / 113 / 13
OPERATOR: GL / FL / A	STACK DIAMETER 70.90	Imp. #4	0 / 2 / 2
CONTROL UNIT FK 18 Y .9899	STACK HEIGHT 25'	Imp. #5	100 / 104 / 4
ΔH@		Imp. #6	100 / 100 / 0
BAROMETRIC PRESSURE, IN. Hg 29.86	INITIAL LEAK TEST 0.005 @ 15"	Upstream Diameters	
ASSUMED MOISTURE, Bw 16%	FINAL LEAK TEST 0.002 @ 15"	Downstream Diameters	

5 min Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites CO_2 Vol. %	O_2 Vol. %
	10:38	934.800										
1		938.57	.38	1.40	49	292	250	250	50	3		
2		942.44	.40	2.00	52	295					9.5	11.0
3		946.17	.37	1.85	52	302	250	250	48	4		
4		949.74	.34	1.70	53	305						
5		953.25	.33	1.65	54	306	250	250	50	4		
6		956.92	.36	1.80	56	308					9.5	11.0
7		961.57	.58	2.91	56	304	250	250	52	4		
8		966.42	.63	3.16	56	304						
9		971.39	.66	3.31	58	300	250	250	48	5		
10		976.28	.64	3.21	58	295					9.5	11.0
11		981.09	.62	3.11	57	292	250	250	50	5		
12		985.92	.62	3.11	57	290						
1		990.33	.52	2.61	57	290	250	250	48	5		
2		994.65	.50	2.51	58	292					10.0	10.5
3		998.97	.50	2.51	58	296	250	250	50	5		
4		1003.20	.48	2.40	59	300						
5		1007.43	.48	2.40	60	301	250	250	48	5		
6		1011.62	.47	2.35	60	302						
7		1015.13	.33	1.65	60	300	250	250	48	5		
8		1018.49	.30	1.50	61	297					10.0	10.5
9		1021.58	.25	1.25	60	300	250	250	48	4		
10		1024.48	.23	1.15	60	302						
11		1027.35	.22	1.10	62	298	250	250	50	3		
12	12:42	1030.22	.22	1.10	62	297						

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DSV

CLIENT	MV WTE Reworld	NOZZLE P-281 DIAMETER, IN. .2818	IMPINGER VOLUMES / INITIAL (mL) / FINAL (mL) / TOTAL GAIN (mL)
SOURCE	Unit 2	PROBE 7 AL-GARD Cp .8483	Imp. #1: 200 / 225 / 225
PARAMETER / RUN No	Metals Particulate Run #2	PORT LENGTH	Imp. #2: 100 / 191 / 91
DATE	20-Nov-24	STATIC PRESSURE, IN. H2O -19.00	Imp. #3: 100 / 111 / 11
OPERATOR:	FE18 BV + BL + LF	STACK DIAMETER 75.40"	Imp. #4: 100 / 100 / 0
CONTROL UNIT	FE18 Y .9899	STACK HEIGHT 350'	Imp. #5: 100 / 103 / 3
	ΔH@ 1.854		Imp. #6: 100 / 100 / 0
BAROMETRIC PRESSURE, IN. Hg	29.58	INITIAL LEAK TEST 0.000 @ 15"	Upstream Diameters
ASSUMED MOISTURE, Bw	.14	FINAL LEAK TEST 0.000 @ 15"	Downstream Diameters

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites: CO_2 Vol. %	Fyrites: O_2 Vol. %		
1	9:07	030.599												
1	5	33.975	.40	1.54	54	285	250	250	51	5	10	10.3		
2	10	37.377	.41	1.56	54	293								
3	15	40.375	.31	1.19	54	298								
4	20	43.166	.29	1.09	54	300								
5	25	46.100	.31	1.17	54	299								
6	30	49.744	.35	1.33	55	294								
7	35	53.425	.62	2.36	56	298								
8	40	57.860	.70	2.67	57	298								
9	45	62.828	.87	3.32	58	297	250	252	50	5	10	10.6		
10	50	67.777	.76	3.29	59	289								
11	55	72.570	.80	3.09	59	290								
12	60	76.720	.60	2.32	59	290								
1	65	80.905	.61	2.32	60	293								
2	70	84.870	.55	2.11	61	298								
3	75	89.025	.60	2.30	62	300	250	252	51	5	17	9.0		
4	80	92.966	.54	2.07	63	303								
5	85	96.855	.52	2.01	64	296								
6	90	100.444	.44	1.71	65	294								
7	95	103.375	.29	1.14	65	288								
8	100	106.048	.24	.95	65	282								
9	105	108.666	.23	.91	65	283								
10	110	111.153	.21	.87	65	290	252	252	51	4	11	9.0		
11	115	113.759	.23	.90	65	292								
12	120	116.190	.20	.78	66	290								
END	11:11													

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D3

CLIENT	MWTE Reworld	NOZZLE P-281 DIAMETER, IN. .2818	IMPINGER VOLUMES / INITIAL (mL) / FINAL (mL) / TOTAL GAIN (mL)
SOURCE	UNIT #2	PROBE 7C Cp .8493	Imp. #1 100 / 241 / 241
PARAMETER / RUN No	Metals Run #3	PORT LENGTH	Imp. #2 100 / 157 / 57
DATE	20-Nov-24	STATIC PRESSURE, IN. H2O -1.50	Imp. #3 100 / 111 / 11
OPERATOR:	SV + BC + LF	STACK DIAMETER 40.90"	Imp. #4 100 / 0 / 0
CONTROL UNIT	Y .9899	STACK HEIGHT 30'	Imp. #5 100 / 101 / 1
	ΔH@ 1.854		Imp. #6 (DRY) 100 / 101 / 1
BAROMETRIC PRESSURE, IN. Hg	29.58	INITIAL LEAK TEST 0.00001 @15"	Upstream Diameters
ASSUMED MOISTURE, Bw	.14	FINAL LEAK TEST 0.00001 @15"	Downstream Diameters

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites: CO_2 Vol. %	Fyrites: O_2 Vol. %		
	11:27	116.500												
1	5	119.909	.40	1.54	66	301	252	248	51	4.5	11	9.4		
2	10	123.394	.42	1.62	65	303								
3	15	126.997	.45	1.73	65	304								
4	20	130.515	.43	1.65	65	304								
5	25	133.658	.34	1.31	65	301								
6	30	136.653	.31	1.20	65	300								
7	35	139.294	.24	.93	65	300								
8	40	141.936	.24	.93	65	301								
9	45	144.680	.26	1.01	65	300								
10	50	147.545	.28	1.09	65	298	252	252	48	4.5	11	9.6		
11	55	150.248	.25	.97	65	299								
12	60	153.000	.26	1.01	66	300								
1	65	156.055	.32	1.24	66	299								
2	70	159.016	.30	1.16	66	300								
3	75	161.770	.26	1.01	66	301		8						
4	80	164.477	.25	.97	66	298	252	252	49	4.0	11	9.5		
5	85	167.235	.26	1.01	66	300								
6	90	170.338	.33	1.28	66	300								
7	95	174.065	.70	2.72	67	299								
8	100	179.560	.75	2.90	67	294								
9	105	184.310	.77	2.98	67	301								
10	110	188.825	.70	2.70	67	304								
11	115	193.175	.65	2.57	68	302	252	252	52	5.5	11	9.5		
12	120	196.810	.45	1.75	68	298								
END	15:30													

Client	MWTE	Y	LMV-01.0207		
Source	Unit 2	Cp	~~29.00~~		
Parameter	HF	Pbar	29.60	Static	
Date	NOV, 20, 24	Operator	BL		
Stack Dia		Down		Up	

Leak Check	Run 1	Run 2	Run 3
Initial	0.0001	0.0001	0.0001
Final	0.0001	0.0001	0.0001

Run No.	Time (hhmm)	DGM Volume (cu ft) / (m^3)	Temp (°F) DGM Outlet	Temp (°F) Stack	Imp. Vol. (mL)	ΔP IN. H_2O R1	ΔP IN. H_2O R2	ΔP IN. H_2O R3
1	9:39	203.1270	46					
	10:09	203.7490	53.5					
	10:39	204.0318	57					
2	10:55	204.0674	58					
	11:25	204.4230	60					
	11:55	204.6590	58					
3	12:10	204.6620	59					
	13:00	205.2540	62					

	Run 1	Run 2	Run 3
O_2			
CO_2			

Client	MWTE	Y	LMV-B 1.0355		
Source	Unit 2	Cp			
Parameter	NH_3	Pbar	29.60	Static	
Date	NOV, 20, 24	Operator	BM		
Stack Dia		Down		Up	

Leak Check	Run 1	Run 2	Run 3
Initial	0.0001	0.0001	0.0001
Final	0.0001	0.0001	0.0001

Run No.	Time (hhmm)	DGM Volume (cu ft) / (m^3)	Temperature (°F) DGM Outlet	Temperature (°F) Stack	Imp. Vol. (mL)	ΔP IN. H_2O R1	ΔP IN. H_2O R2	ΔP IN. H_2O R3
1	9:39	315.2052	47					
	10:09	315.4540	54.2					
	10:39	315.7442	56					
2	10:55	315.7492	57					
	11:25	315.9990	57					
	11:55	316.2426	59					
3	12:10	316.2474	59					
	13:10	316.7864	63					

	Run 1	Run 2	Run 3
O_2			
CO_2			

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CLIENT	MV WTE Rework	NOZZLE P-281 DIAMETER, IN. .2818	IMPINGER VOLUMES / INITIAL (mL) / FINAL (mL) / TOTAL GAIN (mL)
SOURCE	Unit 3	PROBE TC Cp .8493	Imp. #1 100 / 144 / 144
PARAMETER / RUN No	Metals Run #1	PORT LENGTH	Imp. #2 100 / 182 / 82
DATE	18 Nov 24	STATIC PRESSURE, IN. H2O -19.00"	Imp. #3 100 / 117 / 17
OPERATOR:	SV BL	STACK DIAMETER 79.90"	Imp. #4 0 / 1 / 1
CONTROL UNIT 5	Y .9797	STACK HEIGHT 30'	Imp. #5 100 / 101 / 1
	ΔH@ 1.884		Imp. #6 100 / 101 / 0
BAROMETRIC PRESSURE, IN. Hg	29.78	INITIAL LEAK TEST 0.0001 @ 15"	Upstream Diameters
ASSUMED MOISTURE, Bw	.16	FINAL LEAK TEST 0.0001 @ 15"	Downstream Diameters

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites: CO_2 Vol. %	Fyrites: O_2 Vol. %		
	12:17	532.049												
1	5	535.688	.49	1.79	57	313	250	252	49	5	10	10.5		
2	10	539.535	.55	2.01	56	312								
3	15	543.280	.52	1.9	56	312								
4	20	546.810	.46	1.68	56	311								
5	25	550.400	.48	1.76	56	312								
6	30	553.939	.46	1.69	57	311								
7	35	556.924	.33	1.2	57	312								
8	40	559.820	.31	1.14	58	312	252	252	51	5	10	10		
9	45	562.682	.28	1.10	59	313								
10	50	565.410	.28	1.03	60	313								
11	55	568.170	.28	1.03	60	313								
12	60	570.794	.25	.92	61	311								
1	65	573.675	.29	1.07	62	311								
2	70	576.505	.30	1.11	62	309								
3	75	579.188	.26	.96	62	310								
4	80	581.980	.28	1.04	63	308	252	250	47	5	10	10.1		
5	85	584.965	.32	1.19	63	310								
6	90	587.690	.27	1.00	63	310								
7	95	591.070	.41	1.52	63	310								
8	100	594.616	.45	1.68	64	310								
9	105	598.344	.50	1.86	64	310								
10	110	601.940	.46	1.72	65	310	252	252	46	5.5	10	9.7		
11	115	605.500	.45	1.68	65	309								
12	120	608.85	.40	1.50	65	308								
END	14:22													

A. Lanfranco and Associates Inc.

CLIENT	MV WTE ReWorld	NOZZLE P-281	DIAMETER, IN. .2818
SOURCE	Unit 3	PROBE 7 C	Cp .8493
PARAMETER / RUN No	Metals Run #2	PORT LENGTH	
DATE	19-Nov-24	STATIC PRESSURE, IN. H2O	-19.00
OPERATOR:	SU + BL + LF	STACK DIAMETER	20.90"
CONTROL UNIT	Y .9797	STACK HEIGHT	30'
	ΔH@ 1.884		
BAROMETRIC PRESSURE, IN. Hg	29.86	INITIAL LEAK TEST	0.0001 @ 15"
ASSUMED MOISTURE, Bw	.16	FINAL LEAK TEST	0.0001 @ 15"

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	0	157	157
Imp. #2	100	222	122
Imp. #3	100	117	17
Imp. #4	0	10	10
Imp. #5	100	103	3
Imp. #6	100	101	1
Upstream Diameters			
Downstream Diameters			

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites CO_2 Vol. %	O_2 Vol. %
	9:13	609.129										
1	5	611.844	.28	1.01	49	310	250	250	48	4	11	9.6
2	10	614.779	.33	1.19	48	313						
3	15	617.525	.29	1.04	48	313						
4	20	620.128	.26	.94	48	313						
5	25	622.780	.27	.97	48	313						
6	30	625.588	.30	1.08	49	313						
7	35	629.277	.52	1.87	49	313						
8	40	633.279	.61	2.20	50	314						
9	45	637.255	.60	2.17	51	313	252	252	49	6.5	10	10
10	50	641.139	.57	2.06	51	312						
11	55	644.989	.56	2.03	52	314						
12	60	648.240	.40	1.45	53	313						
1	65	651.965	.52	1.90	55	313						
2	70	655.769	.54	1.96	55	313						
3	75	659.710	.58	2.12	56	314	252	250	49	6.5	10	9.9
4	80	663.455	.52	1.90	56	314						
5	85	667.129	.50	1.83	57	314						
6	90	670.766	.49	1.79	57	313						
7	95	673.835	.35	1.28	57	313						
8	100	676.780	.32	1.17	57	312						
9	105	679.728	.32	1.18	58	312						
10	110	682.435	.27	.99	58	311	252	252	49	5	10	10.3
11	115	685.030	.25	.92	58	313						
12	120	687.360	.20	.73	59	314						
END	11:17											

DSV

A. Lanfranco and Associates Inc.

CLIENT	MV WTE Reward	NOZZLE DIAMETER, IN.	.2818	IMPINGER VOLUMES	INITIAL (mL) / FINAL (mL) / TOTAL GAIN (mL)
SOURCE	Unit 3	PROBE Cp	.8495	Imp. #1	100 / 215 / 215
PARAMETER / RUN No	Metals Run #3	PORT LENGTH		Imp. #2	100 / 164 / 64
DATE	19-Nov-24	STATIC PRESSURE, IN. H2O	-19.00	Imp. #3	100 / 97 / -3
OPERATOR:	SV + BL + LF	STACK DIAMETER	49.90"	Imp. #4	100 / 0 / 0
CONTROL UNIT	.9797	STACK HEIGHT	30	Imp. #5	100 / 161 / 1
	ΔH@ 1.884			Imp. #6	SILICA GEL / 100 / 0
BAROMETRIC PRESSURE, IN. Hg	29.86	INITIAL LEAK TEST	0.001 @ 15"	Upstream Diameters	
ASSUMED MOISTURE, Bw	.16	FINAL LEAK TEST	0.0001 @ 15"	Downstream Diameters	

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F: Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites CO_2 Vol. %	Fyrites O_2 Vol. %		
	11:51	687.700												
1	5	691.285	.48	1.75	54	311	252	250	49	3.5	10	9.9		
2	10	694.909	.49	1.79	54	312								
3	15	698.600	.51	1.86	55	313								
4	20	702.185	.48	1.75	55	312								
5	25	705.780	.47	1.72	55	312								
6	30	709.148	.43	1.57	56	312								
7	35	712.129	.33	1.21	56	312								
8	40	715.065	.32	1.17	56	310								
9	45	717.765	.27	.99	57	312	250	250	49	3.5	10	9.7		
10	50	720.420	.26	.95	57	314								
11	55	722.740	.20	.73	58	314								
12	60	725.060	.20	.73	58	313								
1	65	728.280	.38	1.4	59	310								
2	70	731.410	.36	1.32	59	313								
3	75	734.572	.37	1.36	59	314								
4	80	737.615	.34	1.25	59	312	250	252	49	4	10	10.7		
5	85	740.475	.30	1.10	60	313								
6	90	743.475	.33	1.21	60	313								
7	95	747.138	.49	1.81	60	312								
8	100	751.350	.65	2.40	61	313								
9	105	755.610	.66	2.44	61	311								
10	110	759.666	.60	2.22	61	311	252	252	49	4.5	10	10.4		
11	115	763.255	.47	1.74	61	312								
12	120	766.480	.38	1.41	61	311								
END	13:55													

Client	MVWtE	Y	LMU-D 1.0207		
Source	Unit 3	Cp			
Parameter	HF	Pbar	29.86	Static	
Date	Nov, 19, 24	Operator	BM		
Stack Dia		Down		Up	

Leak Check	Run 1	Run 2	Run 3
Initial 0.0001	~~201.4276~~ 0.0001	0.0001	0.0001
Final	0.0001	0.0000	0.0001

Run No.	Time (hhmm)	DGM Volume (cu ft) / (m^3)	Temp (°F) DGM Outlet	Temp (°F) Stack	Imp. Vol. (mL)	ΔP IN. H_2O R1	ΔP IN. H_2O R2	ΔP IN. H_2O R3
1	10:05	201.4276	47.7	313	195			
					110			
	10:35	201.7730	48					
	11:05	202.1076	52					
2	11:51	202.1172	47		175			
	12:21	202.4760	49					
	12:51	202.7180	52					
3	13:11	202.7260	54					
	14:11	203.4072	54					

	Run 1	Run 2	Run 3
O_2			
CO_2			

Client	MVWTE	Y	LMU-B 1.0355		
Source	Unit 3	Cp	~~LMU-B~~		
Parameter	NH_3	Pbar	29.86	Static	
Date	Nov, 19, 24	Operator	BM		
Stack Dia		Down		Up	

Leak Check	Run 1	Run 2	Run 3
Initial	0.0001	0.0001	0.0001
Final	0.0001	0.0001	0.0001

Run No.	Time (hhmm)	DGM Volume (cu ft) / (m^3)	Temperature (°F) DGM Outlet	Temperature (°F) Stack	Imp. Vol. (mL)	ΔP IN. H_2O R1	ΔP IN. H_2O R2	ΔP IN. H_2O R3
1	10:05	313.5852	44	313				
	10:35	313.8050	46					
	11:05	314.0720	47					
2	11:51	314.0778	46					
	12:21	314.3750	55					
	12:51	314.6290	56					
3	13:11	314.6322	55					
	14:11	315.1990	56					

	Run 1	Run 2	Run 3
O_2			
CO_2			

A. Lanfranco and Associates Inc.

Client MVWTE

Source Unit 3 Date Nov. 19, 24

		Run 1	Run 2	Run 3	Run 4	Run 5
Pbar (in. Hg)		29.85	29.85	29.85		
Canister Number		AC01860	A500356	A500880		
Controller Number		OA00367	OA02261	OA00920		
Gauge Number						
Initial:	Start Time	10:11	11:51	13:16		
	Flask Vac. (in. Hg)	-15	-29	-29		
Final:	End Time	11:11	12:51	14:16		
	Flask Vac. (in. Hg)	-3	-5	-7		

Source Unit 2 Date 20-Nov-24

		Run 1	Run 2	Run 3	Run 4	Run 5
Pbar (in. Hg)		29.60	29.60	29.60		
Canister Number		A501381	AC02114	A501627		
Controller Number		OA00367	OA02261	OA00920		
Gauge Number						
Initial:	Start Time	9:39	10:55	12:10		
	Flask Vac. (in. Hg)	-28	-27.5	-13		
Final:	End Time	-6	11:56	13:10		
	Flask Vac. (in. Hg)	10:39	-11	-2		

Source _____ Date _____

		Run 1	Run 2	Run 3	Run 4	Run 5
Pbar (in. Hg)						
Canister Number						
Controller Number						
Gauge Number						
Initial:	Start Time					
	Flask Vac. (in. Hg)					
Final:	End Time					
	Flask Vac. (in. Hg)					

Source _____ Date _____

		Run 1	Run 2	Run 3	Run 4	Run 5
Pbar (in. Hg)						
Canister Number						
Controller Number						
Gauge Number						
Initial:	Start Time					
	Flask Vac. (in. Hg)					
Final:	End Time					
	Flask Vac. (in. Hg)					

APPENDIX – F

CALIBRATION SHEETS and

TECHNICIAN CERTIFICATES

A.Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: CAE AL1

Serial #: 0028-070611-1

Date: 27-Jun-24

Barometric Pressure: 29.85 (in. Hg)

Theoretical Critical Vacuum: 14.08 (in. Hg)

!!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!!

---------- DRY GAS METER READINGS ----------									-CRITICAL ORIFICE READINGS-					
		Volume	Volume	Volume	Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual	-- Ambient Temperature --		
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
3.75	16.00	152.452	169.870	17.418	64.0	64.0	65.0	65.0	73	0.8185	17.0	63.0	69.0	66.0
1.95	33.00	169.870	195.805	25.935	66.0	66.0	70.0	69.0	63	0.5956	20.5	67.0	69.0	68.0
1.15	18.00	195.805	206.821	11.016	69.0	69.0	70.0	70.0	55	0.4606	22.0	70.0	71.0	70.5
0.67	21.00	206.821	216.604	9.783	70.0	70.0	72.0	72.0	48	0.3560	23.5	70.0	73.0	71.5
0.32	16.00	216.604	221.712	5.108	71.0	71.0	72.0	72.0	40	0.2408	24.5	72.0	73.0	72.5

********** RESULTS **********

--- DRY GAS METER ---		--------- ORIFICE ---------			-- DRY GAS METER --		--------- ORIFICE ---------			
					CALIBRATION FACTOR Y		CALIBRATION FACTOR dH@			
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	Value (number)	Variation (number)	Value (in H2O)	Value (mm H2O)	Variation (in H2O)	Ko (value)
17.648	499.8	17.045	482.7	17.027	0.966	-0.015	1.867	47.41	0.047	0.711
26.001	736.3	25.533	723.1	25.603	0.982	0.001	1.830	46.47	0.010	0.709
10.986	311.1	10.745	304.3	10.825	0.978	-0.003	1.806	45.87	-0.014	0.716
9.717	275.2	9.680	274.1	9.771	0.996	0.015	1.760	44.70	-0.060	0.713
5.064	143.4	4.984	141.1	5.040	0.984	0.003	1.839	46.70	0.019	0.706
				Average Y---------->	**0.9812**		**Average dH@----->**	**1.820**	**46.2**	**Average Ko----->**	**0.711**

TEMPERATURE CALIBRATION

Calibration Standard -------> Omega Model CL23A S/N:T-218768

Reference	Temperature Device Reading									
Set-Point	Stack		Hot Box		Probe		Imp Out		Aux	
(deg F)	(deg F)	(% diff)	(deg F)	(% diff)	(deg F)	(% diff)	(deg F)	(% diff)	(deg F)	(% diff)
32	32	0.00%	35	0.61%	35	0.61%	32	0.00%	32	0.00%
100	100	0.00%	102	0.36%	103	0.54%	100	0.00%	100	0.00%
300	300	0.00%	301	0.13%	304	0.53%	299	-0.13%	300	0.00%
500	499	-0.10%	501	0.10%	504	0.42%	499	-0.10%	499	-0.10%
1000	998	-0.14%	1001	0.07%	1004	0.27%	999	-0.07%	999	-0.07%

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.
For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.
For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Liam Forrer Signature: _____ Date: June 27, 2024

A.Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: FE 18

Serial #: 0028-020118-1

Date: 05-Jul-24

Barometric Pressure: 30.05 (in. Hg)

Theoretical Critical Vacuum: 14.17 (in. Hg)

!!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!!

---------- DRY GAS METER READINGS ----------									-CRITICAL ORIFICE READINGS-					
		Volume	Volume	Volume	Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual	-- Ambient Temperature --		
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
3.50	17.00	495.355	514.226	18.871	79.0	79.0	79.0	79.0	73	0.8185	14.0	80.0	80.0	80.0
2.00	15.00	516.055	528.580	12.525	80.0	80.0	80.0	80.0	63	0.5956	17.0	80.0	80.0	80.0
1.20	17.00	528.580	538.799	10.219	81.0	81.0	82.0	82.0	55	0.4606	18.5	80.0	80.0	80.0
0.70	15.00	538.799	545.714	6.915	81.0	81.0	82.0	82.0	48	0.3560	19.5	81.0	81.0	81.0
0.35	15.00	545.714	550.356	4.642	82.0	82.0	82.0	82.0	40	0.2408	21.0	81.0	82.0	81.5

********** RESULTS **********

--- DRY GAS METER ---		--------- ORIFICE ---------			-- DRY GAS METER --		--------- ORIFICE ---------			
					CALIBRATION FACTOR Y		CALIBRATION FACTOR dH@			
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	Value (number)	Variation (number)	Value (in H2O)	Value (mm H2O)	Variation (in H2O)	Ko (value)
18.718	530.1	17.993	509.6	18.330	0.961	-0.029	1.729	43.91	-0.125	0.749
12.355	349.9	11.553	327.2	11.769	0.935	-0.055	1.862	47.30	0.008	0.744
10.033	284.1	10.126	286.8	10.315	1.009	0.019	1.863	47.33	0.009	0.690
6.781	192.0	6.899	195.4	7.041	1.017	0.028	1.823	46.30	-0.031	0.692
4.544	128.7	4.664	132.1	4.765	1.027	0.037	1.992	50.60	0.138	0.656
				Average Y---------->	**0.9899**		**Average dH@-----> 1.854**	**47.1**		**Average Ko----> 0.706**

TEMPERATURE CALIBRATION

Calibration Standard -------> Omega Model CL23A S/N:T-218768

Reference Set-Point	Temperature Device Reading: Stack		Hot Box		Probe		Imp Out		Aux	
(deg F)	(deg F)	(% diff)	(deg F)	(% diff)	(deg F)	(% diff)	(deg F)	(% diff)	(deg F)	(% diff)
32	32	0.00%	31	-0.20%	35	0.61%	31	-0.20%	32	0.00%
100	99	-0.18%	99	-0.18%	100	0.00%	99	-0.18%	99	-0.18%
300	299	-0.13%	299	-0.13%	301	0.13%	299	-0.13%	299	-0.13%
500	498	-0.21%	499	-0.10%	500	0.00%	499	-0.10%	499	-0.10%
1000	998	-0.14%	1000	0.00%	1008	0.55%	1000	0.00%	998	-0.14%

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.
For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.
For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Ben Lester Signature:  Date: July 5, 2024

A.Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: ST CAE2
Serial #: 0028-072911-1

Date: 02-Jul-24
Barometric Pressure: 29.92 (in. Hg)
Theoretical Critical Vacuum: 14.11 (in. Hg)

!!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!!

---------- DRY GAS METER READINGS ----------									-CRITICAL ORIFICE READINGS-					
		Volume	Volume	Volume	Initial Temps.		Final Temps.		Orifice	K' Orifice	Actual	-- Ambient Temperature --		
dH (in H2O)	Time (min)	Initial (cu ft)	Final (cu ft)	Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Serial# (number)	Coefficient (see above)	Vacuum (in Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
3.85	17.00	318.200	336.620	18.420	67.0	67.0	68.0	68.0	73	0.8185	16.0	70.0	75.0	72.5
2.00	15.00	336.620	348.420	11.800	68.0	68.0	68.0	68.0	63	0.5956	18.5	76.0	78.0	77.0
1.20	15.00	348.420	357.575	9.155	70.0	70.0	70.0	70.0	55	0.4606	20.0	83.0	72.0	77.5
0.70	15.00	361.855	368.815	6.960	70.0	70.0	70.0	70.0	48	0.3560	21.0	67.0	67.0	67.0
0.33	15.00	368.815	373.670	4.855	70.0	70.0	71.0	71.0	40	0.2408	22.0	66.0	64.0	65.0

********** RESULTS **********

--- DRY GAS METER ---		--------- ORIFICE ---------			-- DRY GAS METER --		--------- ORIFICE ---------			
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	CALIBRATION FACTOR Y Value (number)	Variation (number)	CALIBRATION FACTOR dH@ Value (in H2O)	Value (mm H2O)	Variation (in H2O)	Ko (value)
18.604	526.9	18.041	510.9	18.202	0.970	-0.009	1.925	48.89	0.040	0.696
11.853	335.7	11.535	326.7	11.736	0.973	-0.006	1.902	48.32	0.018	0.699
9.144	258.9	8.916	252.5	9.080	0.975	-0.004	1.903	48.34	0.019	0.699
6.943	196.6	6.960	197.1	6.949	1.002	0.023	1.822	46.28	-0.062	0.695
4.834	136.9	4.717	133.6	4.692	0.976	-0.004	1.869	47.46	-0.016	0.705
				Average Y---------->	**0.9792**		**Average dH@----->**	**1.884**	**47.9**	**Average Ko----->**	**0.699**

TEMPERATURE CALIBRATION

Calibration Standard -------> Omega Model CL23A S/N:T-218768

Reference	Temperature Device Reading									
Set-Point	Stack		Hot Box		Probe		Imp Out		Aux	
(deg F)	(deg F)	(% diff)	(deg F)	(% diff)	(deg F)	(% diff)	(deg F)	(% diff)	(deg F)	(% diff)
32	33	0.20%	33	0.20%	31	-0.20%	33	0.20%	33	0.20%
100	101	0.18%	101	0.18%	100	0.00%	101	0.18%	101	0.18%
300	301	0.13%	302	0.26%	300	0.00%	301	0.13%	301	0.13%
500	500	0.00%	500	0.00%	500	0.00%	501	0.10%	501	0.10%
1000	1000	0.00%	1000	0.00%	1000	0.00%	1000	0.00%	1000	0.00%

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.
For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.
For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Ben Lester Signature: _____ Date: July 2, 2024

A. Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: LMU A

Serial #: Kimmon 186

Date: 24-Jun-24

Barometric Pressure: 29.98 (in. Hg)

Theoretical Critical Vacuum: 14.14 (in. Hg)

!!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!!

---------- DRY GAS METER READINGS ----------

dH (in H2O)	Time (min)	Volume Initial (m^3)	Volume Final (m^3)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)
0.00	21.00	613.095	613.373	9.810	67.0	67.0	69.0	69.0
0.00	15.00	613.373	613.571	6.992	68.0	68.0	70.0	70.0
0.00	16.00	613.571	613.782	7.458	69.0	69.0	73.0	73.0

-CRITICAL ORIFICE READINGS-

Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	-- Ambient Temperature -- Initial (deg F)	Final (deg F)	Average (deg F)
48	0.3560	20.0	65.0	70.0	67.5
48	0.3560	20.0	71.0	70.0	70.5
48	0.3560	20.0	70.0	72.0	71.0

********** **RESULTS** **********

--- DRY GAS METER ---

VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)
9.826	278.3
6.990	198.0
7.428	210.4

--------- ORIFICE ---------

VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)
9.759	276.4	9.734
6.951	196.8	6.972
7.411	209.9	7.441

-- DRY GAS METER --

CALIBRATION FACTOR Y Value (number)	Variation (number)
0.993	-0.002
0.994	-0.001
0.998	0.003

--------- ORIFICE ---------

CALIBRATION FACTOR dH@ Value (in H2O)	Value (mm H2O)	Variation (in H2O)
0.000	0.00	0.000
0.000	0.00	0.000
0.000	0.00	0.000

Average Y---------> 0.9950 **Average dH@-----> 0.0000 0.00**

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.
For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.
For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Liam Forrer Signature: Justin Ching Date: June 24, 2024

A. Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: **LMU-B**

Serial #: **Wizit 6276**

Date: 21-Jun-24

Barometric Pressure: 29.85 (in. Hg)

Theoretical Critical Vacuum: 14.08 (in. Hg)

!!!!!!!!!

IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.

IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).

!!!!!!!!!

---------- DRY GAS METER READINGS ----------

dH (in H2O)	Time (min)	Volume Initial (m^3)	Volume Final (m^3)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)
0.00	19.00	308.8520	309.0950	8.581	77.0	77.0	85.0	85.0
0.00	19.00	309.0950	309.3400	8.652	84.0	84.0	88.0	88.0
0.00	19.00	309.3400	309.5850	8.652	87.0	87.0	87.0	87.0

-CRITICAL ORIFICE READINGS-

Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	-- Ambient Temperature -- Initial (deg F)	Final (deg F)	Average (deg F)
48	0.3560	20.0	86.0	86.0	86.0
48	0.3560	20.0	86.0	85.0	85.5
48	0.3560	20.0	85.0	90.0	87.5

********** **RESULTS** **********

--- DRY GAS METER ---

VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)
8.352	236.5
8.344	236.3
8.329	235.9

--------- ORIFICE ---------

VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)
8.641	244.7	8.960
8.645	244.8	8.956
8.629	244.4	8.972

-- DRY GAS METER --

CALIBRATION FACTOR Y Value (number)	CALIBRATION FACTOR Y Variation (number)
1.035	-0.001
1.036	0.001
1.036	0.001

--------- ORIFICE ---------

CALIBRATION FACTOR dH@ Value (in H2O)	Value (mm H2O)	Variation (in H2O)
0.000	0.00	0.000
0.000	0.00	0.000
0.000	0.00	0.000

Average Y---------> 1.0355 **Average dH@-----> 0.0000** **0.00**

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.

For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.

For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Liam Forrer Signature:  Date: June 21, 2024

A. Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: **LMU-D**

Serial #: **Wizit 4618**

Date: 24-Jun-24

Barometric Pressure: 29.98 (in. Hg)

Theoretical Critical Vacuum: 14.14 (in. Hg)

!!!!!!!!!
IMPORTANT For valid test results, the Actual Vacuum should be 1 to 2 in. Hg greater than the Theoretical Critical Vacuum shown above.
IMPORTANT The Critical Orifice Coefficient, K', must be entered in English units, (ft)^3*(deg R)^0.5/((in.Hg)*(min)).
!!!!!!!!!

---------- DRY GAS METER READINGS ----------

dH (in H2O)	Time (min)	Volume Initial (m^3)	Volume Final (m^3)	Volume Total (cu ft)	Initial Temps. Inlet (deg F)	Initial Temps. Outlet (deg F)	Final Temps. Inlet (deg F)	Final Temps. Outlet (deg F)
0.00	18.00	180.418	180.649	8.158	71.0	71.0	72.0	72.0
0.00	16.00	180.649	180.856	7.310	71.0	71.0	74.0	74.0
0.00	15.00	180.856	181.050	6.851	72.0	72.0	72.0	72.0

-CRITICAL ORIFICE READINGS-

Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	-- Ambient Temperature -- Initial (deg F)	Final (deg F)	Average (deg F)
48	0.3560	20.0	72.0	72.0	72.0
48	0.3560	20.0	72.0	75.0	73.5
48	0.3560	20.0	73.0	74.0	73.5

********** **RESULTS** **********

--- DRY GAS METER --- VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	--------- ORIFICE --------- VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	-- DRY GAS METER -- CALIBRATION FACTOR Y Value (number)	Variation (number)	--------- ORIFICE --------- CALIBRATION FACTOR dH@ Value (in H2O)	Value (mm H2O)	Variation (in H2O)
8.117	229.9	8.329	235.9	8.379	1.026	0.005	0.000	0.00	0.000
7.260	205.6	7.393	209.4	7.458	1.018	-0.002	0.000	0.00	0.000
6.810	192.9	6.931	196.3	6.992	1.018	-0.003	0.000	0.00	0.000

Average Y---------> **1.0207** **Average dH@----->** **0.0000** **0.00**

Note: For Calibration Factor Y, the ratio of the reading of the calibration meter to the dry gas meter, acceptable tolerance of individual values from the average is +-0.02.
For Orifice Calibration Factor dH@, the orifice differential pressure in inches of H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.
For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Liam Forrer Signature: Date: June 24, 2024

A. LANFRANCO and ASSOCIATES INC.

ENVIRONMENTAL CONSULTANTS

GLASS NOZZLE DIAMETER CALIBRATION FORM

Calibrated by: Christian De La O
Date: 25-Nov-24

Signature: 

Nozzle I.D.	d1	d2	d3	difference	average dia.	average area
	(inch)	(inch)	(inch)	(inch)	(inch)	(ft^2)
A	0.1270	0.1270	0.1255	0.0015	0.1265	0.0000873
G-165	0.1650	0.1660	0.1645	0.0015	0.1652	0.0001488
G-170	0.1700	0.1710	0.1695	0.0015	0.1702	0.0001579
G-178	0.1760	0.1770	0.1790	0.0030	0.1773	0.0001715
J	0.1890	0.1889	0.1891	0.0002	0.1890	0.0001948
E	0.1950	0.1930	0.1960	0.0030	0.1947	0.0002067
Q	0.2030	0.2040	0.2050	0.0020	0.2040	0.0002270
L	0.2100	0.2070	0.2090	0.0030	0.2087	0.0002375
P-2240	0.2160	0.2155	0.2170	0.0015	0.2162	0.0002549
P-224	0.2160	0.2170	0.2150	0.0020	0.2160	0.0002545
G-221	0.2160	0.2185	0.2190	0.0030	0.2178	0.0002588
G-225	0.2190	0.2175	0.2180	0.0015	0.2182	0.0002596
G-218	0.2180	0.2200	0.2210	0.0030	0.2197	0.0002632
G-2232	0.2210	0.2200	0.2215	0.0015	0.2208	0.0002660
P-223	0.2297	0.2296	0.2298	0.0002	0.2297	0.0002878
P-250	0.2500	0.2495	0.2505	0.0010	0.2500	0.0003409
C-250	0.2500	0.2500	0.2500	0.0000	0.2500	0.0003409
P-251	0.2545	0.2530	0.2540	0.0015	0.2538	0.0003514
P-254	0.2484	0.2489	0.2482	0.0007	0.2485	0.0003368
P-256	0.2540	0.2550	0.2560	0.0020	0.2550	0.0003547
P-280	0.2810	0.2805	0.2815	0.0010	0.2810	0.0004307
C-280	0.2800	0.2800	0.2800	0.0000	0.2800	0.0004276
G-282	0.2820	0.2800	0.2825	0.0025	0.2815	0.0004322
P-281	0.2820	0.2820	0.2815	0.0005	0.2818	0.0004332
G-304	0.3030	0.3040	0.3050	0.0020	0.3040	0.0005041
G-3121	0.3055	0.3063	0.3070	0.0015	0.3063	0.0005116
G-3085	0.3085	0.3080	0.3090	0.0010	0.3085	0.0005191
G-309	0.3045	0.3065	0.3065	0.0020	0.3058	0.0005101
G-3092	0.3100	0.3085	0.3090	0.0015	0.3092	0.0005213
P-311	0.3115	0.3120	0.3120	0.0005	0.3118	0.0005304
P-312	0.3120	0.3110	0.3105	0.0015	0.3112	0.0005281
P-343	0.3420	0.3430	0.3440	0.0020	0.3430	0.0006417
P-313	0.3140	0.3130	0.3130	0.0010	0.3133	0.0005355
P-314	0.3135	0.3135	0.3140	0.0005	0.3137	0.0005366
P-315	0.3145	0.3145	0.3145	0.0000	0.3145	0.0005395
V-06	0.3220	0.3215	0.3200	0.0020	0.3212	0.0005626
G-345	0.3470	0.3475	0.3475	0.0005	0.3473	0.0006580
P-346	0.3457	0.3456	0.3458	0.0002	0.3457	0.0006518
G-349	0.3490	0.3490	0.3490	0.0000	0.3490	0.0006643
P27	0.3490	0.3480	0.3500	0.0020	0.3490	0.0006643
G-367	0.3680	0.3660	0.3658	0.0022	0.3666	0.0007330
G-372	0.3669	0.3700	0.3668	0.0032	0.3679	0.0007382
P-374	0.3740	0.3720	0.3730	0.0020	0.3730	0.0007588
C-375	0.3730	0.3750	0.3745	0.0020	0.3742	0.0007636
P-375	0.3705	0.3710	0.3709	0.0005	0.3708	0.0007499
P-401	0.3980	0.3990	0.4000	0.0020	0.3990	0.0008683
P-405	0.4047	0.4055	0.4056	0.0009	0.4053	0.0008958
P-407	0.4065	0.4070	0.4072	0.0007	0.4069	0.0009030
G-433	0.4360	0.4360	0.4355	0.0005	0.4358	0.0010360
P-29	0.4681	0.4683	0.4685	0.0004	0.4683	0.0011961
G-437	0.4690	0.4690	0.4700	0.0010	0.4693	0.0012014
G-468	0.4700	0.4685	0.4720	0.0035	0.4702	0.0012057
P-7	0.4965	0.4945	0.4975	0.0030	0.4962	0.0013427
B	0.4981	0.4984	0.4989	0.0008	0.4985	0.0013552
G-540	0.5400	0.5410	0.5400	0.0010	0.5403	0.0015924

Where:

(a) D1, D2, D3 = three different nozzle diameters; each diameter must be measured to within (0.025mm) 0.001 in.

(b) Difference = maximum difference between any two diameters; must be less than or equal to (0.1mm) 0.004 in.

(c) Average = average of D1, D2 and D3

Pitot Tube Calibration

Date: 02-Jul-24 Temp (R): 539
Pbar (in.Hg): 29.88 Dn (in.): 0.25

Pitot ID: **7A-1**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.240	0.330	32.7	0.8443	0.0007
0.360	0.495	40.1	0.8443	0.0007
0.440	0.610	44.3	0.8408	0.0028
0.560	0.770	50.0	0.8443	0.0007
0.640	0.880	53.4	0.8443	0.0007
		Average :	0.8436	0.0011

Pitot ID: **ST 8A**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.220	0.300	31.3	0.8478	0.0020
0.335	0.455	38.7	0.8495	0.0003
0.420	0.570	43.3	0.8498	0.0001
0.530	0.720	48.6	0.8494	0.0004
0.630	0.850	53.0	0.8523	0.0026
		Average :	0.8498	0.0010

Pitot ID: **7B**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.230	0.320	32.0	0.8393	0.0045
0.370	0.510	40.6	0.8432	0.0006
0.450	0.620	44.8	0.8434	0.0004
0.540	0.740	49.1	0.8457	0.0019
0.630	0.860	53.0	0.8473	0.0035
		Average :	0.8438	0.0022

Pitot ID: **ST 8B**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.230	0.310	32.0	0.8527	0.0013
0.340	0.460	39.0	0.8511	0.0003
0.440	0.600	44.3	0.8478	0.0036
0.525	0.710	48.4	0.8513	0.0001
0.640	0.860	53.4	0.8540	0.0026
		Average :	0.8514	0.0016

Pitot ID: **7 AL GVRD-1**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.220	0.300	16.3	0.8478	0.0006
0.340	0.460	19.9	0.8511	0.0028
0.430	0.590	25.3	0.8452	0.0032
0.560	0.760	35.8	0.8498	0.0015
0.660	0.900	48.4	0.8478	0.0006
		Average :	0.8483	0.0017

Pitot ID: **ST 8C**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.210	0.290	14.9	0.8425	0.0061
0.350	0.490	19.4	0.8367	0.0004
0.475	0.660	29.0	0.8399	0.0036
0.590	0.835	43.1	0.8322	0.0041
0.700	0.995	52.8	0.8304	0.0059
		Average :	0.8363	0.0040

Pitot ID: **7C**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.240	0.330	32.7	0.8443	0.0050
0.340	0.460	16.3	0.8511	0.0019
0.430	0.590	43.8	0.8452	0.0041
0.550	0.740	30.5	0.8535	0.0042
0.630	0.850	47.0	0.8523	0.0030
		Average :	0.8493	0.0036

Pitot ID:

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
		Average :		

* Average absolute deviation must not exceed 0.01.

Calibrated by: Christian De La C Signature: _____ Date: July 2, 2024

BAROMETER CALIBRATION FORM						
		Pbar Env Canada		Device (inches of Hg)		Difference
Device	Cal Date	(kPa)	(inches of Hg)	Reading	Elevation Corrected	(Env Can - Elv Corr)
LA	15-Jul-24	99.8	29.46	29.37	29.44	0.02
DS	15-Jul-24	99.8	29.46	29.36	29.43	0.03
CL	15-Jul-24	99.8	29.46	29.37	29.44	0.02
JC	15-Jul-24	99.8	29.46	29.34	29.41	0.05
LF	15-Jul-24	99.8	29.46	29.36	29.43	0.03
SH	15-Jul-24	99.8	29.46	29.35	29.42	0.04
CDO	15-Jul-24	99.8	29.46	29.34	29.41	0.05
JG	15-Jul-24	99.8	29.46	29.32	29.39	0.07
ML	15-Jul-24	99.8	29.46	29.34	29.41	0.05
BL	15-Jul-24	99.8	29.46	29.36	29.43	0.03

Calibrated by: Louis Agassiz Signature:  Date: 15-Jul-24

Performance Specification is

Device Corrected for Elevation must be +/- 0.1 " Hg of ENV CANADA SEA-LEVEL Pbar

Enter Environment canada Pressure from their website for Vancouver (link below)
and the reading from your barometer on the ground floor of the office.

https://weather.gc.ca/city/pages/bc-74_metric_e.html

Calibration Certificate

Date: 04-Sep-24
Calibrated by: Sean Verby
Authorizing Signature:

Insrtument Calibrated: Testo 1 (330-2LL)
Serial #: 03101345
Customer: ALA

Ambient Conditions: Temperature: 20 °C Barometric Pressure: 102 kPa Relative Humidity: 76%

A. Lanfranco and Associates Inc. certifies that the described instrument has been inspected and tested following calibration procedures in the Environment Canada Report EPS 1/PG/7 (Revised 2005). Below are the observed readings after calibrations are complete. Calibration checks should be completed at least every 6 months.

O_2	Initial Evaluation				After Calibration				
Gas	Instrument Reading (vol %)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (vol %)	% Calibration Error	Pass/Fail	Notes	Certified Value (vol %)
Zero	0.2	0.20	Pass		0.2	0.20	Pass		0
O_2	11.3	0.30	Pass		11.3	0.30	Pass		11.00
Ambient	20.9	0.05	Pass		20.9	0.05	Pass		20.95

Performance Specification: +/- 1% O_2 (absolute diff)

CO	Initial Evaluation				After Calibration				
Gas	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Certified Value (ppm)
Zero	0	0.0%	Pass		0	0.0%	Pass		0
1 Gas	243	4.2%	Pass		243	4.2%	Pass		254
2 Gas	496	1.7%	Pass		496	1.7%	Pass		504
3 Gas	918	3.7%	Pass		918	3.7%	Pass		953

Performance Specification: +/- 5% of Certified Gas Value

NO	Initial Evaluation				After Calibration				
Gas	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Certified Value (ppm)
Zero	0	0.0%	Pass		0	0.0%	Pass		0
1 Gas	43	4.1%	Pass		43	4.1%	Pass		45
2 Gas	87	4.6%	Pass		87	4.6%	Pass		91
3 Gas	243	2.6%	Pass		243	2.6%	Pass		250

Performance Specification: +/- 5% of Certified Gas Value

NIST Traceable Calibration Gases:

Cylinder	Cylinder ID Number	Certification Date	Expiration Date	Cylinder Pressure (PSI)	NO (ppm)	O_2 (Vol. %)	CO (ppm)
Zero Gas (N_2)	075			1100	0	0	0
1 Gas	030	2023-12-19	2031-12-20	1500	44.84	0	253.6
2 Gas	5AE	2024-04-15	2032-04-15	1800	91.24	0	504.4
3 Gas	K2H	2024-05-22	2032-05-22	1900	249.6	0	952.9
O_2/CO_2	742	2023-05-07	2031-06-07	650	0	11.00	0

Note: National Institute of Standards and Technology traceable certificates are available upon request.

A. LANFRANCO and ASSOCIATES INC.

ENVIRONMENTAL CONSULTANTS

TEMPERATURE CALIBRATION FORM

Calibrated by: Louis Agassiz

Date: 12-Jul-24

Signature: 

TEMPERATURE DEVICE CALIBRATIONS

Reference Device			Temperature Settings (degrees F)													
Model CL23A Calibrator			32		100		200		300		500		800		1700	
Device	**ALA #**	**Serial #**	**Reading**	**Variation**	**Reading**	**Variation**	**Reading**	**Variation**	**Reading**	**Variation**	**Reading**	**Variation**	**Reading**	**Variation**	**Reading**	**Variation**
Omega HH11A	3	300132	32	0.00%	99	-0.18%	201	0.15%	301	0.13%	500	0.00%	800	0.00%	1699	-0.05%
Omega HH11A	4	200167	32	0.00%	99	-0.18%	200	0.00%	303	0.39%	499	-0.10%	799	-0.08%	1697	-0.14%
Omega HH11A	6	600059	33	0.20%	100	0.00%	201	0.15%	300	0.00%	499.2	-0.08%	798	-0.16%	1696	-0.19%
TPI 341K	7	2.0315E+10	31	-0.20%	99.6	-0.07%	199	-0.15%	301	0.13%	499.1	-0.09%	799.1	-0.07%	1695	-0.23%
TPI 341K	8	2.0313E+10	32	0.00%	99.7	-0.05%	200.4	0.06%	301	0.13%	498.5	-0.16%	799.2	-0.06%	1696	-0.19%
Cont Cmpny	10	102008464	31	-0.20%	99.2	-0.14%	199.5	-0.08%	299	-0.13%	499	-0.10%	799.1	-0.07%	1699	-0.05%
Omega HH11	14	409426	32.5	0.10%	99.1	-0.16%	199	-0.15%	298	-0.26%	501	0.10%	799.1	-0.07%	1698	-0.09%
TPI 341K	16	400120029	31	-0.20%	100	0.00%	199.2	-0.12%	299.3	-0.09%	501	0.10%	799.1	-0.07%	1700	0.00%
TPI 341K	18	2.0329E+10	31	-0.20%	99.8	-0.04%	199.2	-0.12%	299.8	-0.03%	500	0.00%	799.5	-0.04%	1701	0.05%
TPI 341K	20	2.0329E+10	31	-0.20%	99.2	-0.14%	199.1	-0.14%	299	-0.13%	499.2	-0.08%	799.2	-0.06%	1699	-0.05%
TPI 341K	22	2.0329E+10	32	0.00%	99.6	-0.07%	199.2	-0.12%	298.4	-0.21%	499.1	-0.09%	798.5	-0.12%	1698	-0.09%
Reference device is a NIST certified digital thermocouple calibrator																
Variation expressed as a percentage of the absolute temperature must be within 1.5 %																

MOUNT ROYAL COLLEGE

Faculty of Continuing Education and Extension

Carter Lanfranco

has successfully completed

Stack Sampling

May 2009

Date

Norma D MacDonald

Dean
Faculty of Continuing Education and Extension

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Conflict of Interest Disclosure Statement

A qualified professional [1] providing services to either the Ministry of Environment and Climate Change Strategy ("ministry"), or to a regulated person for the purpose of obtaining an authorization from the ministry, or pursuant to a requirement imposed under the *Environmental Management Act,* the *Integrated Pest Management Act* or the *Park Act* has a real or perceived conflict of interest when the qualified professional, or their relatives, close associates or personal friends have a financial or other interest in the outcome of the work being performed.

A real or perceived conflict of interest occurs when a qualified professional has

a) an ownership interest in the regulated person's business;

b) an opportunity to influence a decision that leads to financial benefits from the regulated person or their business other than a standard fee for service (e.g. bonuses, stock options, other profit sharing arrangements);

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e) a spouse or other family member who will benefit from a specific outcome; or

f) any other interest that could be perceived as a threat to the independence or objectivity of the qualified professional in performing a duty or function.

Qualified professionals who work under ministry legislation must take care in the conduct of their work that potential conflicts of interest within their control are avoided or mitigated. Precise rules in conflict of interest are not possible and professionals must rely on guidance of their professional associations, their common sense, conscience and sense of personal integrity.

Declaration

I Carter Lanfranco, as a member of Air and Waste Management Association declare

Select one of the following:

☒ Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this project. I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to Mr. Sajid Barlas, erring on the side of caution.

☐ Real or perceived conflict of interest

Description and nature of conflict(s):

_____

_____

_____

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

_____

_____

_____

Further, I acknowledge that this disclosure may be interpreted as a threat to my independence and will be considered by the statutory decision maker accordingly.

This conflict of interest disclosure statement is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Signature:

X _____

Print name: Carter Lanfranco

Witnessed by:

X _____

Print name: Mark Lanfranco

Date: Dec. 16, 2020

[1]*Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and

b) through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Declaration of Competency

The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals[1], under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

1. Name of Qualified Professional Carter LanFranco

   Title Chief operations officer / owner

2. Are you a registered member of a professional association in B.C.? ☐ Yes ☒ No

   Name of Association: _____ Registration # _____

3. Brief description of professional services:

   _____

   _____

This declaration of competency is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature:

X _____

Print Name: Carter LanFranco

Date signed: Dec. 7/2020

Witnessed by:

X Shawn Harrington

Print Name: Shawn Harrington

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MOUNT ROYAL UNIVERSITY
Faculty of Continuing Education

MOUNT ROYAL
UNIVERSITY
1910
CALGARY, ALBERTA

Justin Ching

has successfully completed

Stack Sampling

The Faculty of Continuing Education
Mount Royal University

30 hours | May 26, 2023

Dimitra Fotopoulos, Vice Dean
Professional and Continuing Education

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Conflict of Interest Disclosure Statement

A qualified professional [1] providing services to either the Ministry of Environment and Climate Change Strategy ("ministry"), or to a regulated person for the purpose of obtaining an authorization from the ministry, or pursuant to a requirement imposed under the *Environmental Management Act,* the *Integrated Pest Management Act* or the *Park Act* has a real or perceived conflict of interest when the qualified professional, or their relatives, close associates or personal friends have a financial or other interest in the outcome of the work being performed.

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c) a personal or professional interest in a specific outcome;

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e) a spouse or other family member who will benefit from a specific outcome; or

f) any other interest that could be perceived as a threat to the independence or objectivity of the qualified professional in performing a duty or function.

Qualified professionals who work under ministry legislation must take care in the conduct of their work that potential conflicts of interest within their control are avoided or mitigated. Precise rules in conflict of interest are not possible and professionals must rely on guidance of their professional associations, their common sense, conscience and sense of personal integrity.

Declaration

I Justin Ching, as a member of **Air and Waste Management Association** declare

Select one of the following:

☒ Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this **project**. I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to **Mr. Sajid Barlas**, erring on the side of caution.

☐ Real or perceived conflict of interest

Description and nature of conflict(s):

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

Further, I acknowledge that this disclosure may be interpreted as a threat to my independence and will be considered by the statutory decision maker accordingly.

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Signature:

X Justin Ching

Print name: Justin Ching

Witnessed by:

X

Print name: Mark Lanfranco

Date: June 28, 2023

[1]*Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and

b) *through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.*

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Declaration of Competency

The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals[1], under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

1. Name of Qualified Professional Justin Ching

Title Environmental Technician

2. Are you a registered member of a professional association in B.C.? ☐ Yes ☑ No

Name of Association: _____ Registration # _____

3. Brief description of professional services:

Environmental Technician - specialising in air and atmospheric sciences

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Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature: Witnessed by:

X Justin Ching **X** Daryl Sampson

Print Name: Justin Ching Print Name: Daryl Sampson

Date signed: June 28, 2023

[1] *Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

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MOUNT ROYAL UNIVERSITY
Faculty of Continuing Education

MOUNT ROYAL
UNIVERSITY
1910
CALGARY, ALBERTA

Liam Forrer

has successfully completed

Stack Sampling

The Faculty of Continuing Education
Mount Royal University

30 hours | May 26, 2023

Dimitra Fotopoulos, Vice Dean
Professional and Continuing Education

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Conflict of Interest Disclosure Statement

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A real or perceived conflict of interest occurs when a qualified professional has

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Declaration

I Liam Forrer, as a member of **Air and Waste Management Association** declare

Select one of the following:

☒ Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this **project**. I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to **Mr. Sajid Barlas**, erring on the side of caution.

☐ Real or perceived conflict of interest

Description and nature of conflict(s):

_____

_____

_____

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

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Signature:

X Liam Forrer

Print name: Liam Forrer

Date: July 12, 2023

Witnessed by:

X _____

Print name: Mark Lanfranco

[1]*Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and

b) *through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.*

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Declaration of Competency

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1. Name of Qualified Professional Liam Forrer

Title Environmental Technician

2. Are you a registered member of a professional association in B.C.? ☐ Yes ☒ No

Name of Association: _____ Registration # _____

3. Brief description of professional services:

Environmental consulting, specializing in air and atmospheric sciences

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Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature:

x Liam Forrer

Print Name: Liam Forrer

Witnessed by:

x Daryl Sampson

Print Name: Daryl Sampson

Date signed: July 12, 2023

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Walter Smith & Associates, Inc.

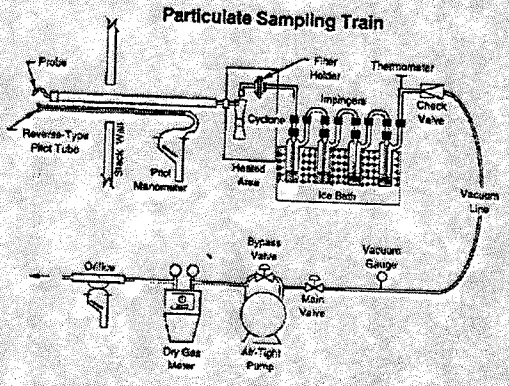
is hereby granted to:

Louis Agassiz

to certify that they have completed to satisfaction

Source Sampling & CEMS Workshop

Granted: March 11, 2011



Walter S, Smith, PE, DEE

3.5 CEU

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Conflict of Interest Disclosure Statement

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Declaration

I Louis Agassiz, as a member of ECO Canada declare

Select one of the following:

☒ Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this **project**. I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to **Mr. Sajid Barlas**, erring on the side of caution.

Ministry of Environment and Climate Change Strategy

☐ Real or perceived conflict of interest

Description and nature of conflict(s):

_____

_____

_____

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

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Signature:

X _____

Print name: Louis Agassiz

Witnessed by:

X _____

Print name: Mark Lanfranco

Date: Jan. 4, 2021

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BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Declaration of Competency

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1. Name of Qualified Professional Louis Agassiz

   Title Senior Environmental Technician/Project Manager

2. Are you a registered member of a professional association in B.C.? ☐ Yes ☑ No

   Name of Association: _____ Registration # _____

3. Brief description of professional services:

   Environmental consulting, specializing in air and atmospheric sciences

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Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature: Witnessed by:

X _____ **X** Daryl Sampson

Print Name: Louis Agassiz Print Name: Daryl Sampson

Date signed: November 23, 2020

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MOUNT ROYAL UNIVERSITY
Faculty of Continuing Education

MOUNT ROYAL
UNIVERSITY
1910
CALGARY, ALBERTA

Sean Verby

has successfully completed

Stack Sampling

The Faculty of Continuing Education
Mount Royal University

30 hours | May 1, 2024

Dimitra Fotopoulos, Vice Dean
Professional and Continuing Education

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Conflict of Interest Disclosure Statement

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Declaration

I Sean Verby, as a member of **Air and Waste Management Association** declare

Select one of the following:

☒ Absence from conflict of interest

Other than the standard fee I will receive for my professional services, I have no financial or other interest in the outcome of this **project**. I further declare that should a conflict of interest arise in the future during the course of this work, I will fully disclose the circumstances in writing and without delay to **Mr. Sajid Barlas**, erring on the side of caution.

☐ Real or perceived conflict of interest

Description and nature of conflict(s):

_____

_____

_____

I will maintain my objectivity, conducting my work in accordance with my Code of Ethics and standards of practice.

In addition, I will take the following steps to mitigate the real or perceived conflict(s) I have disclosed, to ensure the public interest remains paramount:

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Signature:

X _____

Print name: Sean Verby

Witnessed by:

X _____

Print name: Mark Lanfranco

Date: Sept, 4, 2024

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BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Declaration of Competency

The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals[1], under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

1. Name of Qualified Professional Sean Verby

Title Environmental Technician

2. Are you a registered member of a professional association in B.C.? ☐ Yes ☒ No

Name of Association: _____ Registration # _____

3. Brief description of professional services:

Environmental consulting, specializing in air and atmospheric sciences

This declaration of competency is collected under section 26(c) of the *Freedom of Information and Protection of Privacy Act* for the purposes of increasing government transparency and ensuring professional ethics and accountability. By signing and submitting this statement you consent to its publication and its disclosure outside of Canada. This consent is valid from the date submitted and cannot be revoked. If you have any questions about the collection, use or disclosure of your personal information please contact the Ministry of Environment and Climate Change Strategy Headquarters Office at 1-800-663-7867.

Declaration

I am a qualified professional with the knowledge, skills and experience to provide expert information, advice and/or recommendations in relation to the specific work described above.

Signature: Witnessed by:

X _____ **X** _____

Print Name: Sean Verby Print Name: Daryl Sampson

Date signed: Sept, 4, 2024

[1] *Qualified Professional, in relation to a duty or function under ministry legislation, means an individual who*

a) is registered in British Columbia with a professional association, is acting under that organization's code of ethics, and is subject to disciplinary action by that association, and

b) *through suitable education, experience, accreditation and knowledge, may reasonably be relied on to provide advice within his or her area of expertise, which area of expertise is applicable to the duty or function.*

Canadian Association for Laboratory Accreditation Inc.

Certificate of Accreditation

A. Lanfranco and Associates Inc.
101 - 9488 - 189th Street
Surrey, British Columbia

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

Accreditation No.: 1004232
Issued On: 4/11/2023
Accreditation Date: 2/5/2021
Expiry Date: 10/11/2025

President and CEO

For the specific tests to which this accreditation applies, please refer to the laboratory's scope of accreditation at www.cala.ca.