



**A. Lanfranco
& Associates Inc.**

Environmental Consultants

**Prepared for
METRO VANCOUVER**

**Metrotower III, 4515 Central Boulevard
Burnaby, BC
V5H 0C6**

Waste-to-Energy Facility
Appendices of Compliance Emissions Testing Report
November 2021 Survey

Table of Contents

Appendix

- A Quality Assurance / Quality Control Results
- B Laboratory Results
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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 ALS Environmental in Burnaby, B.C.
- Nitrous Oxide (N₂O) analysis conducted with portable analyzer by A. Lanfranco and Associates.
- Particulate analysis conducted at A. Lanfranco and Associates Inc., Surrey, BC.
- Ammonium (for ammonia NH₃) conducted at Exova Labs, Surrey, B.C.
- THC/VOC analysis conducted at ALS Environmental in Simi Valley, California
- Chain of Custody protocols followed for all samples.
- Excellent blank values for all sample types. All samples blank corrected.

Sample Type	Blank Value		
Fourth Survey 2021	Unit 1	Unit 2	Unit 3
Filter	0.2 mg	0.2 mg	-0.1 mg
Front Half Washings	-0.7 mg	0.1 mg	-0.9 mg
Mercury Front	<0.02 ug	<0.02 ug	<0.02 ug
Mercury Back	<0.22 ug	<0.209 ug	<0.238 ug
Trace Metals Front *	<50.4 ug	<38.0 ug	<42.0 ug
Trace Metals Back*	<32.5 ug	<22.1 ug	<22.4 ug
Fluoride	342 ug	494 ug	42.1 ug

Sum of all reported elements except Hg*

APPENDIX - B

LABORATORY RESULTS

Report Transmission Cover Page

Bill To: A. Lanfranco & Associates	Project ID: Metro Vancouver WTE	Lot ID: 1538875
#101, 9488 - 189 Street	Project Name: Filter Reagent Blanks	Control Number:
Surrey, BC, Canada	Project Location:	Date Received: Nov 25, 2021
V4N 4W7	LSD:	Date Reported: Dec 17, 2021
Attn: Missy	P.O.:	Report Number: 2697513
Sampled By:	Proj. Acct. code:	
Company:		

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 - Merge Reports	PDF	COC / Test Report
Email - Multiple Reports By Agreement	PDF	COA
Email - Single Report	PDF	COR

Notes To Clients:

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: Filter Reagent Blanks
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1538875**
Control Number:
Date Received: Nov 25, 2021
Date Reported: Dec 17, 2021
Report Number: 2697513

		Reference Number	1538875-1	1538875-2	1538875-3
		Sample Date	Nov 15, 2021	Nov 15, 2021	Nov 15, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Reagent Blank Unit 1 Container 1 (filter)	Reagent Blank Unit 2 Container 1 (filter)	Reagent Blank Unit 3 Container 1 (filter)
		Matrix	Stack Samples	Stack Samples	Stack Samples
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A					
Aluminum	µg	10	6	10	5
Antimony	µg	<2	<2	3	2.5
Arsenic	µg	<1	<1	<1	1
Cadmium	µg	<0.3	<0.3	<0.3	0.25
Chromium	µg	<0.2	0.65	0.72	0.2
Cobalt	µg	<0.3	<0.3	<0.3	0.25
Copper	µg	<0.3	<0.3	1	0.25
Lead	µg	2	<2	2.7	1.5
Manganese	µg	0.3	0.4	<0.3	0.25
Nickel	µg	<0.5	<0.5	<0.5	0.5
Phosphorus	µg	45	43	53	2.5
Selenium	µg	3.3	<2	<2	1.5
Tellurium	µg	2.6	2	2	2
Thallium	µg	<2	3.8	2.6	1.5
Vanadium	µg	<1	<1	<1	1
Zinc	µg	2	1	2	0.5
Mercury by CVAA					
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05
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

Approved by:



Max Hewitt
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.

Methodology and Notes

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: Filter Reagent Blanks Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538875 Control Number: Date Received: Nov 25, 2021 Date Reported: Dec 17, 2021 Report Number: 2697513
Attn: Missy Sampled By: Company:		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	* Metals Emissions from Stationary Sources, 29	Dec 3, 2021	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	* Metals Emissions from Stationary Sources, 29	Nov 30, 2021	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.

The test report shall not be reproduced except in full, without the written approval of the laboratory.



www.Element.com

Project Information

Project ID: Metro Vancouver WTE
Project Name: Filter Reagent Blanks
Project Location:
Legal Location:
PO/AFE#:
Proj. Acct. Code:
Quote #:

Invoice To

Company: A. Lanfranco & Associates Inc.
Address: 101-9488 189 Street
Surrey BC, V4N 4W7
Attention:
Phone: 604-881-2582
Cell:
Fax:
E-mail: mark.lanfranco@alanfranco.com
Agreement ID:
Copy of Report: YES / NO

Report To

Company:
Address:
Attention:
Phone:
Cell:
Fax:
E-mail 1:
E-mail 2:
Copy of Invoice: YES / NO

Additional Reports to

1) Name:
E-mail:
2) Name:
E-mail:
Sample Custody
Sampled by:
Company:
I authorize Element to proceed with the work indicated on this form:
Signature:
Date/Time:

Report Results

Requirements

- ☐ Same Day (200%)
☐ Next Day/Two Day (100%)
☐ Three or Four Days (50%)
☒ 5 to 7 Days (Regular TAT)

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

- ☒ Email ☐ QA/QC
☐ Online ☒ PDF
☐ Fax ☐ Excel

- ☐ HCDWORG ☐ SPIGEC
☐ AB Tier 1 ☐ BCCSR
Other (list below)

Date Required

Special Instructions/Comments (please include contact information including phone number if different from above).

* Please report µg/sample

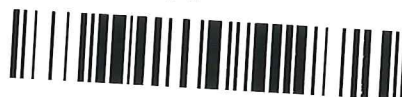
Site I.D.	Sample Description	Depth start end in cm m	Date/Time sampled	Matrix	Sampling method	Number of Containers	ICAP	Hg	Enter tests above (✓ relevant samples below)
1	Reagent Blank Unit 1 Container 1(filter)		15-Nov-21			1	✓	✓	
2									
3	Reagent Blank Unit 2 Container 1 (filter)		15-Nov-21			1	✓	✓	
4									
5	Reagent Blank Unit 3 Container 1 (filter)		15-Nov-21			1	✓	✓	
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									

Please indicate any potentially hazardous samples

Submission of this form acknowledges acceptance of Element's Standard of terms and conditions (<https://www.element.com/terms/terms-and-conditions>)

Page ____ of ____ Control #
ED 120-005

Lot: 1538875 COC



Temp. received: 18.4 °C
Delivery Method: HD
Waybill:
Received by: LC
Date/Time stamp: NOV 25 21 15:44

Report Transmission Cover Page

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: Reagent Blanks Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538884 Control Number: Date Received: Nov 25, 2021 Date Reported: Dec 17, 2021 Report Number: 2697521
Attn: Missy Sampled By: Company:		

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 - Merge Reports	PDF	COC / Test Report
Email - Multiple Reports By Agreement	PDF	COA
Email - Single Report	PDF	COR

Notes To Clients:

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: **1538884**
Control Number:
Date Received: Nov 25, 2021
Date Reported: Dec 17, 2021
Report Number: 2697521

		Reference Number	1538884-1	1538884-2	1538884-3
		Sample Date	Nov 15, 2021	Nov 15, 2021	Nov 15, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Reagent Blank Unit 1	Reagent Blank Unit 2	Reagent Blank Unit 3
		Matrix	Stack Samples	Stack Samples	Stack Samples
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A					
Aluminum	µg	<5	<5	<5	5
Antimony	µg	<2	<2	3	2.5
Arsenic	µg	<1	1	1	1
Cadmium	µg	<0.3	<0.3	<0.3	0.25
Chromium	µg	<0.2	<0.2	0.88	0.2
Cobalt	µg	<0.3	<0.3	<0.3	0.25
Copper	µg	0.4	<0.3	0.9	0.25
Lead	µg	<2	<2	2	1.5
Manganese	µg	<0.3	1	<0.3	0.25
Nickel	µg	<0.5	0.8	<0.5	0.5
Phosphorus	µg	<2	7	3	2.5
Selenium	µg	2	2.9	<2	1.5
Tellurium	µg	2.8	<2	<2	2
Thallium	µg	2	2	<2	1.5
Vanadium	µg	<1	<1	1	1
Zinc	µg	<0.5	0.6	<0.5	0.5
Back Half Metals Fraction 2A					
Aluminum	µg	<5	8	<5	5
Antimony	µg	<3	<3	<3	2.5
Arsenic	µg	2	3.1	3	1
Cadmium	µg	<0.3	<0.3	<0.3	0.25
Chromium	µg	0.52	0.64	<0.2	0.2
Cobalt	µg	0.5	0.4	0.3	0.25
Copper	µg	<0.3	<0.3	<0.3	0.25
Lead	µg	<2	<2	<2	1.5
Manganese	µg	<0.3	0.3	<0.3	0.25
Nickel	µg	<0.5	<0.5	<0.5	0.5
Phosphorus	µg	20	20	20	2.5
Selenium	µg	<2	6.8	<2	1.5
Tellurium	µg	<2	<2	<2	2
Thallium	µg	<2	<2	<2	1.5
Vanadium	µg	<1	<1	<1	1
Zinc	µg	1	<0.5	<0.5	0.5
Volume	Sample	mL	205	205	205
Volume	aliquot volume	mL	155	155	155
Mercury by CVAA					
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05
Dilution Factor	As Tested		1	1	1
Volume	Sample	mL	250	250	250

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: **1538884**
Control Number:
Date Received: Nov 25, 2021
Date Reported: Dec 17, 2021
Report Number: 2697521

		Reference Number	1538884-1	1538884-2	1538884-3
		Sample Date	Nov 15, 2021	Nov 15, 2021	Nov 15, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Reagent Blank Unit 1	Reagent Blank Unit 2	Reagent Blank Unit 3
		Matrix	Stack Samples	Stack Samples	Stack Samples
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Mercury by CVAA - Continued					
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
Dilution Factor	As Tested		1	1	1
Volume	Sample	mL	205	205	205
Volume	aliquot volume	mL	5.0	5.0	5.0
Volume	Final	mL	40	45	45
Mercury	Fraction 2B	µg/sample	<0.08	<0.09	<0.09
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05
Dilution Factor	As Tested		1	1	1
Volume	Sample	mL	100	100	105
Volume	aliquot volume	mL	25	25	25
Volume	Final	mL	40	40	40
Mercury	Fraction 3A	µg/sample	<0.008	<0.008	<0.008
Mercury	As Tested	µg/L	<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	<0.02	<0.02	<0.02

Approved by:



Max Hewitt
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 Project Name: Reagent Blanks Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538884 Control Number: Date Received: Nov 25, 2021 Date Reported: Dec 17, 2021 Report Number: 2697521
Attn: Missy Sampled By: Company:		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	* Metals Emissions from Stationary Sources, 29	Dec 3, 2021	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	* Metals Emissions from Stationary Sources, 29	Nov 29, 2021	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	* Metals Emissions from Stationary Sources, 29	Dec 15, 2021	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	* Metals Emissions from Stationary Sources, 29	Dec 15, 2021	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	* Metals Emissions from Stationary Sources, 29	Dec 16, 2021	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	* Metals Emissions from Stationary Sources, 29	Nov 30, 2021	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.

The test report shall not be reproduced except in full, without the written approval of the laboratory.



www.Element.com

Project Information

Project ID: Metro Vancouver WTE
Project Name: Reagent Blanks
Project Location:
Legal Location:
PO/AFE#:
Proj. Acct. Code:
Quote #:

Invoice To
Company: A. Lanfranco & Associates Inc.
Address: 101-9488 189 Street
Surrey BC, V4N 4W7
Attention:
Phone: 604-881-2582
Cell:
Fax:
E-mail: mark.lanfranco@alanfranco.com
Agreement ID:
Copy of Report: YES / NO

Report To
Company:
Address:
Attention:
Phone:
Cell:
Fax:
E-mail 1:
E-mail 2:
Copy of Invoice: YES / NO

Additional Reports to
1) Name:
E-mail:
2) Name:
E-mail:
Sample Custody
Sampled by:
Company:
I authorize Element to proceed with the work indicated on this form:
Signature:
Date/Time:

Report Results

Requirements

- ☐ Same Day (200%)
☐ Next Day/Two Day (100%)
☐ Three or Four Days (50%)
☒ 5 to 7 Days (Regular TAT)

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

- ☒ Email ☐ QA/QC
☐ Online ☒ PDF
☐ Fax ☐ Excel

- ☐ HCDWORG ☐ SPIGEC
☐ AB Tier 1 ☐ BCCSR
Other (list below)

Date Required

Special Instructions/Comments (please include contact information including phone number if different from above).

*Front and Back ICAP as per EPA Method 29. *Hg analysis as per EPA Method 29. *Please report µg/sample.

Site I.D.	Sample Description	Depth start end in cm m	Date/Time sampled	Matrix	Sampling method	Number of Containers	Front ICAP	Back ICAP	Front Hg	Back Hg	5A Hg	5B Hg								
1	Reagent Blank Unit 1		15-Nov-21			5	✓	✓	✓	✓	✓	✓								
2																				
3	Reagent Blank Unit 2		15-Nov-21			5	✓	✓	✓	✓	✓	✓								
4																				
5	Reagent Blank Unit 3		15-Nov-21			5	✓	✓	✓	✓	✓	✓								
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13																				
14																				
15																				

Please indicate any potentially hazardous samples

Submission of this form acknowledges acceptance of Element's Standard of terms and conditions (<https://www.element.com/terms/terms-and-conditions>)

Page ____ of ____ Control #
ED 120-005

Lot: 1538884 COC



Temp. received: 18.4 °C
Date/Time stamp: NOV 25 21 15:44
Delivery Method: FID
Waybill:
Received by: LC

Report Transmission Cover Page

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: Field Blanks Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538851 Control Number: Date Received: Nov 25, 2021 Date Reported: Dec 17, 2021 Report Number: 2697486
Attn: Missy Sampled By: Company:		

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 - Merge Reports	PDF	COC / Test Report
Email - Multiple Reports By Agreement	PDF	COA
Email - Single Report	PDF	COR

Notes To Clients:

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

Lot ID: **1538851**
Control Number:
Date Received: Nov 25, 2021
Date Reported: Dec 17, 2021
Report Number: 2697486

	Reference Number	1538851-1	1538851-2	1538851-3	
	Sample Date	Nov 19, 2021	Nov 22, 2021	Nov 23, 2021	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	Field Blank Unit 1 (MV unit 1 BLK + 4 Bottles)	Field Blank Unit 2 (Unit 2 BLK + 4 Bottles)	Field Blank Unit 3 (MV unit 3 BLK + 4 Bottles)	
	Matrix	Stack Samples	Stack Samples	Stack Samples	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A					
Aluminum	µg	20	9	10	5
Antimony	µg	4	<2	4	2.5
Arsenic	µg	<1	<1	<1	1
Cadmium	µg	<0.3	<0.3	<0.3	0.25
Chromium	µg	<0.2	0.2	0.2	0.2
Cobalt	µg	<0.3	<0.3	<0.3	0.25
Copper	µg	0.5	0.6	<0.3	0.25
Lead	µg	2	<2	2	1.5
Manganese	µg	0.3	2.7	0.4	0.25
Nickel	µg	<0.5	<0.5	0.6	0.5
Phosphorus	µg	20	20	46	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	2.6	2.5	2	0.5
Back Half Metals Fraction 2A					
Aluminum	µg	6	6	6	5
Antimony	µg	<2	<2	<2	2.5
Arsenic	µg	2	2	3.2	1
Cadmium	µg	<0.2	<0.2	<0.2	0.25
Chromium	µg	0.25	<0.2	<0.2	0.2
Cobalt	µg	0.7	0.5	<0.2	0.25
Copper	µg	0.5	<0.2	<0.2	0.25
Lead	µg	<1	<1	<1	1.5
Manganese	µg	0.4	0.3	0.4	0.25
Nickel	µg	<0.5	<0.5	<0.5	0.5
Phosphorus	µg	20	10	20	2.5
Selenium	µg	2	<1	3.5	1.5
Tellurium	µg	<2	<2	<2	2
Thallium	µg	<1	<1	<1	1.5
Vanadium	µg	<0.9	<1.0	<1.0	1
Zinc	µg	0.6	3.3	2	0.5
Volume	Sample	mL	320	290	310
Volume	aliquot volume	mL	270	240	260
Mercury by CVAA					
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05

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

Lot ID: **1538851**
Control Number:
Date Received: Nov 25, 2021
Date Reported: Dec 17, 2021
Report Number: 2697486

		Reference Number	1538851-1	1538851-2	1538851-3	Nominal Detection Limit
		Sample Date	Nov 19, 2021	Nov 22, 2021	Nov 23, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	Field Blank Unit 1 (MV unit 1 BLK + 4 Bottles)	Field Blank Unit 2 (Unit 2 BLK + 4 Bottles)	Field Blank Unit 3 (MV unit 3 BLK + 4 Bottles)	
		Matrix	Stack Samples	Stack Samples	Stack Samples	
Analyte	Units	Results	Results	Results		
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	320	290	310	
Volume	aliquot volume	mL	5.0	5.0	5.0	
Volume	Final	mL	40	40	40	
Mercury	Fraction 2B	µg/sample	<0.1	<0.1	<0.1	
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05	0.05
Dilution Factor	As Tested	1	1	1		
Volume	Sample	mL	140	115	165	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3A	µg/sample	<0.01	<0.009	<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	1000	1000	1000	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3B	µg/sample	<0.08	<0.08	<0.08	
Mercury	As Tested	µg/L	0.09	0.07	0.15	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	0.048	

Approved by:



Max Hewitt
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.

Methodology and Notes

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: Field Blanks Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538851 Control Number: Date Received: Nov 25, 2021 Date Reported: Dec 17, 2021 Report Number: 2697486
Attn: Missy Sampled By: Company:		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	* Metals Emissions from Stationary Sources, 29	Dec 3, 2021	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	* Metals Emissions from Stationary Sources, 29	Nov 29, 2021	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	* Metals Emissions from Stationary Sources, 29	Dec 15, 2021	Element Vancouver
Mercury in Air (VAN) - 3B	EMC	* Metals Emissions from Stationary Sources, 29	Dec 15, 2021	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	* Metals Emissions from Stationary Sources, 29	Dec 15, 2021	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	* Metals Emissions from Stationary Sources, 29	Dec 16, 2021	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	* Metals Emissions from Stationary Sources, 29	Nov 30, 2021	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.

The test report shall not be reproduced except in full, without the written approval of the laboratory.



www.Element.com

Project Information

Project ID: Metro Vancouver WTE
Project Name: Field Blanks
Project Location:
Legal Location:
PO/AFE#:
Proj. Acct. Code:
Quote #:

Invoice To
Company: A. Lanfranco & Associates Inc.
Address: 101-9488 189 Street
Surrey BC, V4N 4W7
Attention:
Phone: 604-881-2582
Cell:
Fax:
E-mail: mark.lanfranco@alanfranco.com
Agreement ID:
Copy of Report: YES / NO

Report To
Company:
Address:
Attention:
Phone:
Cell:
Fax:
E-mail 1:
E-mail 2:
Copy of Invoice: YES / NO

Additional Reports to
1) Name:
E-mail:
2) Name:
E-mail:
Sample Custody
Sampled by:
Company:
I authorize Element to proceed with the work indicated on this form:
Signature:
Date/Time:

Report Results

Requirements

- ☐ Same Day (200%)
☐ Next Day/Two Day (100%)
☐ Three or Four Days (50%)
☒ 5 to 7 Days (Regular TAT)

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

- ☒ Email ☐ QA/QC
☐ Online ☒ PDF
☐ Fax ☐ Excel

- ☐ HCDWORG ☐ SPIGEC
☐ AB Tier 1 ☐ BCCSR
Other (list below)

Date Required

Special Instructions/Comments (please include contact information including phone number if different from above).

*Front and Back ICAP as per EPA Method 29. *Hg analysis as per EPA Method 29. *Please report µg/sample.

Site I.D.	Sample Description	Depth start end in cm m	Date/Time sampled	Matrix	Sampling method	Number of Containers	Front ICAP	Back ICAP	Front Hg	Back Hg	5A Hg	5B Hg								
1	Field Blank Unit 1 (MV unit 1 BLK + 4 Bottles)		19-Nov-21			5	✓	✓	✓	✓	✓	✓								
2																				
3	Field Blank Unit 2 (Unit 2 BLK + 4 Bottles)		22-Nov-21			5	✓	✓	✓	✓	✓	✓								
4																				
5	Field Blank Unit 3 (MV unit 3 BLK + 4 Bottles)		23-Nov-21			5	✓	✓	✓	✓	✓	✓								
6																				
7																				
8																				
9																				
10																				
11																				
12																				
13																				
14																				
15																				

Please indicate any potentially hazardous samples

Submission of this form acknowledges acceptance of Element's Standard of terms and conditions (<https://www.element.com/terms/terms-and-conditions>)

Page of Control #
ED 120-005

Lot: 1538851 COC



Temp. received: 18.4 °C
Date/Time stamp: NOV 25 '21 15:26
Delivery Method: HD
Waybill:
Received by: KC

Report Transmission Cover Page

Bill To: A. Lanfranco & Associates	Project ID: Metro Vancouver WTE	Lot ID: 1538904
#101, 9488 - 189 Street	Project Name: Metals and Hg Samples	Control Number:
Surrey, BC, Canada	Project Location:	Date Received: Nov 26, 2021
V4N 4W7	LSD:	Date Reported: Dec 17, 2021
Attn: Missy	P.O.:	Report Number: 2697550
Sampled By:	Proj. Acct. code:	
Company:		

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 - Merge Reports	PDF	COC / Test Report
Email - Multiple Reports By Agreement	PDF	COA
Email - Single Report	PDF	COR

Notes To Clients:

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: **1538904**
Control Number:
Date Received: Nov 26, 2021
Date Reported: Dec 17, 2021
Report Number: 2697550

		Reference Number	1538904-1	1538904-2	1538904-3
		Sample Date	Nov 18, 2021	Nov 19, 2021	Nov 19, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Unit 1 Run 1 (Unit 1 R-1 + 4 Bottles)	Unit 1 Run 2 (MV Unit 1 Run-2 + 4 Bottles)	Unit 1 Run 3 (Unit 1 Run-3 + 4 Bottles)
		Matrix	Stack Samples	Stack Samples	Stack Samples
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A					
Aluminum	µg	56	32	20	5
Antimony	µg	9	<2	4	2.5
Arsenic	µg	<1	<1	<1	1
Cadmium	µg	0.8	0.3	0.4	0.25
Chromium	µg	6.32	2.0	1.8	0.2
Cobalt	µg	<0.3	<0.3	<0.3	0.25
Copper	µg	5.3	2.9	3.0	0.25
Lead	µg	14	8.8	7.7	1.5
Manganese	µg	3.2	2	2	0.25
Nickel	µg	7.9	8.8	5.6	0.5
Phosphorus	µg	31	28	51	2.5
Selenium	µg	3.3	2.9	<2	1.5
Tellurium	µg	<2	<2	<2	2
Thallium	µg	<2	<2	<2	1.5
Vanadium	µg	1	1	<1	1
Zinc	µg	64.1	44.4	55.4	0.5
Back Half Metals Fraction 2A					
Aluminum	µg	20	42	10	5
Antimony	µg	<2	<2	<2	2.5
Arsenic	µg	1	2.3	<0.9	1
Cadmium	µg	0.2	<0.2	<0.2	0.25
Chromium	µg	0.41	0.67	0.45	0.2
Cobalt	µg	<0.2	0.3	0.3	0.25
Copper	µg	0.8	0.8	<0.2	0.25
Lead	µg	2.6	<1	<1	1.5
Manganese	µg	0.7	0.8	0.9	0.25
Nickel	µg	<0.4	<0.4	<0.4	0.5
Phosphorus	µg	10	10	10	2.5
Selenium	µg	<1	<1	<1	1.5
Tellurium	µg	<2	<2	2	2
Thallium	µg	<1	<1	<1	1.5
Vanadium	µg	<0.8	<0.9	<0.9	1
Zinc	µg	6.1	5.9	2	0.5
Volume	Sample	mL	950	825	825
Volume	aliquot volume	mL	900	775	775
Mercury by CVAA					
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05

Analytical Report

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: Metals and Hg Samples Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538904 Control Number: Date Received: Nov 26, 2021 Date Reported: Dec 17, 2021 Report Number: 2697550
Attn: Missy		
Sampled By:		
Company:		

		Reference Number	1538904-1	1538904-2	1538904-3
		Sample Date	Nov 18, 2021	Nov 19, 2021	Nov 19, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Unit 1 Run 1 (Unit 1 R-1 + 4 Bottles)	Unit 1 Run 2 (MV Unit 1 Run-2 + 4 Bottles)	Unit 1 Run 3 (Unit 1 Run-3 + 4 Bottles)
		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
Dilution Factor	As Tested	1	1	1	
Volume	Sample	mL	950	825	825
Volume	aliquot volume	mL	5.0	5.0	5.0
Volume	Final	mL	40	40	40
Mercury	Fraction 2B	µg/sample	<0.4	<0.3	<0.3
Mercury	As Tested	µg/L	<0.05	0.81	<0.05
Dilution Factor	As Tested	1	1	1	
Volume	Sample	mL	180	165	155
Volume	aliquot volume	mL	25	25	25
Volume	Final	mL	40	40	40
Mercury	Fraction 3A	µg/sample	<0.01	0.21	<0.01
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05
Dilution Factor	As Tested	1	1	1	
Volume	Sample	mL	1000	1000	1000
Volume	aliquot volume	mL	25	25	25
Volume	Final	mL	40	40	40
Mercury	Fraction 3B	µg/sample	<0.08	<0.08	<0.08
Mercury	As Tested	µg/L	0.13	2.00	0.18
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	0.041	0.64	0.058

Analytical Report

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: Metals and Hg Samples Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538904 Control Number: Date Received: Nov 26, 2021 Date Reported: Dec 17, 2021 Report Number: 2697550
Attn: Missy		
Sampled By:		
Company:		

		Reference Number	1538904-4	1538904-5	1538904-6
		Sample Date	Nov 22, 2021	Nov 22, 2021	Nov 22, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Unit 2 Run 1 (MV Unit 2 Run-1 + 4 Bottles)	Unit 2 Run 2 (MV Unit 2 Run-2 + 4 Bottles)	Unit 2 Run 3 (MV Unit 2 Run-3 + 4 Bottles)
		Matrix	Stack Samples	Stack Samples	Stack Samples
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A					
Aluminum	µg	25	20	10	5
Antimony	µg	7	<2	<2	2.5
Arsenic	µg	<1	<1	<1	1
Cadmium	µg	<0.3	<0.3	<0.3	0.25
Chromium	µg	0.81	1.3	1.0	0.2
Cobalt	µg	<0.3	<0.3	<0.3	0.25
Copper	µg	0.4	1	1	0.25
Lead	µg	2	2.9	3.4	1.5
Manganese	µg	2.6	1	0.8	0.25
Nickel	µg	11	7.6	1	0.5
Phosphorus	µg	47	47	40	2.5
Selenium	µg	<2	4.0	<2	1.5
Tellurium	µg	<2	<2	<2	2
Thallium	µg	<2	<2	2.6	1.5
Vanadium	µg	<1	2	1	1
Zinc	µg	5.2	7.1	9.8	0.5
Back Half Metals Fraction 2A					
Aluminum	µg	10	23	10	5
Antimony	µg	<2	<2	<2	2.5
Arsenic	µg	<0.9	<0.9	<0.8	1
Cadmium	µg	<0.2	<0.2	<0.2	0.25
Chromium	µg	<0.2	0.58	<0.2	0.2
Cobalt	µg	0.4	0.3	<0.2	0.25
Copper	µg	<0.2	3.7	0.4	0.25
Lead	µg	<1	2.4	<1	1.5
Manganese	µg	1	2.2	0.7	0.25
Nickel	µg	0.8	0.7	0.5	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	<1	<1	1.5
Vanadium	µg	<0.9	0.9	<0.8	1
Zinc	µg	2	5.2	2.5	0.5
Volume	Sample	mL	825	950	
Volume	aliquot volume	mL	775	900	
Mercury by CVAA					
Mercury	As Tested	µg/L	<0.05	<0.05	0.05

Analytical Report

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: Metals and Hg Samples Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538904 Control Number: Date Received: Nov 26, 2021 Date Reported: Dec 17, 2021 Report Number: 2697550
Attn: Missy		
Sampled By:		
Company:		

		Reference Number	1538904-4	1538904-5	1538904-6
		Sample Date	Nov 22, 2021	Nov 22, 2021	Nov 22, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Unit 2 Run 1 (MV Unit 2 Run-1 + 4 Bottles)	Unit 2 Run 2 (MV Unit 2 Run-2 + 4 Bottles)	Unit 2 Run 3 (MV Unit 2 Run-3 + 4 Bottles)
		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
Dilution Factor	As Tested	1	1	1	
Volume	Sample	mL	825	825	950
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	<0.4
Mercury	As Tested	µg/L	<0.05	0.09	<0.05
Dilution Factor	As Tested	1	1	1	
Volume	Sample	mL	175	140	170
Volume	aliquot volume	mL	25	25	25
Volume	Final	mL	40	40	40
Mercury	Fraction 3A	µg/sample	<0.01	0.02	<0.01
Mercury	As Tested	µg/L	<0.05	<0.05	<0.05
Dilution Factor	As Tested	1	1	1	
Volume	Sample	mL	1000	1000	1000
Volume	aliquot volume	mL	25	25	25
Volume	Final	mL	40	40	40
Mercury	Fraction 3B	µg/sample	<0.08	<0.08	<0.08
Mercury	As Tested	µg/L	0.12	0.69	0.20
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	0.038	0.22	0.064

Analytical Report

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: Metals and Hg Samples Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538904 Control Number: Date Received: Nov 26, 2021 Date Reported: Dec 17, 2021 Report Number: 2697550
Attn: Missy		
Sampled By:		
Company:		

		Reference Number	1538904-7	1538904-8	1538904-9
		Sample Date	Nov 22, 2021	Nov 23, 2021	Nov 23, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Unit 3 Run 1 (MV U3 R-1 + 4 Bottles)	Unit 3 Run 2 (MV Unit 3 R-2 + 4 Bottles)	Unit 3 Run 3 (Unit 3 - R3 + 4 Bottles)
		Matrix	Stack Samples	Stack Samples	Stack Samples
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Front Half Metals Fraction 1A					
Aluminum	µg	29	20	10	5
Antimony	µg	5	3	6	2.5
Arsenic	µg	<1	<1	<1	1
Cadmium	µg	1.0	0.7	0.7	0.25
Chromium	µg	1.7	1.1	4.09	0.2
Cobalt	µg	<0.3	<0.3	<0.3	0.25
Copper	µg	2.7	2.9	2.9	0.25
Lead	µg	7.7	8.1	7.2	1.5
Manganese	µg	1	0.8	2.8	0.25
Nickel	µg	2	1	20	0.5
Phosphorus	µg	63	50	48	2.5
Selenium	µg	<2	2	<2	1.5
Tellurium	µg	<2	<2	<2	2
Thallium	µg	2	3.7	<2	1.5
Vanadium	µg	1	<1	<1	1
Zinc	µg	55.9	58.8	51.9	0.5
Back Half Metals Fraction 2A					
Aluminum	µg	10	9	10	5
Antimony	µg	<2	<2	<2	2.5
Arsenic	µg	2.4	<0.8	3.9	1
Cadmium	µg	<0.2	<0.2	<0.2	0.25
Chromium	µg	0.45	0.50	0.35	0.2
Cobalt	µg	0.4	0.3	0.5	0.25
Copper	µg	0.4	1	0.4	0.25
Lead	µg	<1	<1	<1	1.5
Manganese	µg	1	2	0.3	0.25
Nickel	µg	<0.4	<0.4	<0.4	0.5
Phosphorus	µg	10	20	10	2.5
Selenium	µg	<1	<1	<1	1.5
Tellurium	µg	<2	4.8	3.7	2
Thallium	µg	<1	<1	<1	1.5
Vanadium	µg	<0.8	<0.8	<0.9	1
Zinc	µg	3.4	2	1	0.5
Volume	Sample	mL	950	800	
Volume	aliquot volume	mL	900	750	
Mercury by CVAA					
Mercury	As Tested	µg/L	<0.05	0.08	0.05

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: **1538904**
Control Number:
Date Received: Nov 26, 2021
Date Reported: Dec 17, 2021
Report Number: 2697550

		Reference Number	1538904-7	1538904-8	1538904-9	Nominal Detection Limit
		Sample Date	Nov 22, 2021	Nov 23, 2021	Nov 23, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	Unit 3 Run 1 (MV U3 R-1 + 4 Bottles)	Unit 3 Run 2 (MV Unit 3 R-2 + 4 Bottles)	Unit 3 Run 3 (Unit 3 - R3 + 4 Bottles)	
		Matrix	Stack Samples	Stack Samples	Stack Samples	
Analyte	Units	Results	Results	Results		
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	0.03	0.02	
Mercury	As Tested	µg/L	0.08	<0.05	<0.05	0.05
Dilution Factor	As Tested	1	1	1		
Volume	Sample	mL	950	950	800	
Volume	aliquot volume	mL	5.0	5.0	5.0	
Volume	Final	mL	40	40	40	
Mercury	Fraction 2B	µg/sample	0.6	<0.4	<0.3	
Mercury	As Tested	µg/L	0.20	<0.05	<0.05	0.05
Dilution Factor	As Tested	1	1	1		
Volume	Sample	mL	155	165	150	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3A	µg/sample	0.051	<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	1000	1000	1000	
Volume	aliquot volume	mL	25	25	25	
Volume	Final	mL	40	40	40	
Mercury	Fraction 3B	µg/sample	<0.08	<0.08	<0.08	
Mercury	As Tested	µg/L	2.76	0.30	0.09	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	0.88	0.096	0.03	

Approved by:



Max Hewitt
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

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: Metals and Hg Samples Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538904 Control Number: Date Received: Nov 26, 2021 Date Reported: Dec 17, 2021 Report Number: 2697550
Attn: Missy Sampled By: Company:		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Mercury in Air (VAN) - 1B	EMC	* Metals Emissions from Stationary Sources, 29	Dec 3, 2021	Element Vancouver
Mercury in Air (VAN) - 1B	EMC	* Metals Emissions from Stationary Sources, 29	Dec 17, 2021	Element Vancouver
Mercury in Air (VAN) - 2B	EMC	* Metals Emissions from Stationary Sources, 29	Nov 29, 2021	Element Vancouver
Mercury in Air (VAN) - 3A	EMC	* Metals Emissions from Stationary Sources, 29	Dec 15, 2021	Element Vancouver
Mercury in Air (VAN) - 3B	EMC	* Metals Emissions from Stationary Sources, 29	Dec 15, 2021	Element Vancouver
Mercury in Air (VAN) - 3C	EMC	* Metals Emissions from Stationary Sources, 29	Dec 15, 2021	Element Vancouver
Metals in Stack Samples - Back half (VAN)	EMC	* Metals Emissions from Stationary Sources, 29	Dec 16, 2021	Element Vancouver
Metals in Stack Samples - Front half (VAN)	EMC	* Metals Emissions from Stationary Sources, 29	Nov 30, 2021	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.

The test report shall not be reproduced except in full, without the written approval of the laboratory.



www.Element.com

Project Information

Project ID: Metro Vancouver WTE
Project Name: Metals and Hg Samples
Project Location:
Legal Location:
PO/AFE#:
Proj. Acct. Code:
Quote #:

Invoice To
Company: A. Lanfranco & Associates Inc.
Address: 101-9488 189 Street
Surrey BC, V4N 4W7
Attention:
Phone: 604-881-2582
Cell:
Fax:
E-mail: mark.lanfranco@alanfranco.com
Agreement ID:
Copy of Report: YES / NO

Report To
Company:
Address:
Attention:
Phone:
Cell:
Fax:
E-mail 1:
E-mail 2:
Copy of Invoice: YES / NO

Additional Reports to

1) Name:
E-mail:
2) Name:
E-mail:
Sample Custody
Sampled by:
Company:
I authorize Element to proceed with the work indicated on this form:
Signature:
Date/Time:

Report Results

Requirements

- ☐ Same Day (200%)
☐ Next Day/Two Day (100%)
☐ Three or Four Days (50%)
☒ 5 to 7 Days (Regular TAT)

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

- ☒ Email ☐ QA/QC
☐ Online ☒ PDF
☐ Fax ☐ Excel

- ☐ HCDWORG ☐ SPIGEC
☐ AB Tier 1 ☐ BCCSR
Other (list below)

Date Required

Special Instructions/Comments (please include contact information including phone number if different from above).

*Front and Back ICAP as per EPA Method 29. *Hg analysis as per EPA Method 29. *Please report µg/sample.

Site I.D.	Sample Description	Depth start end in cm m	Date/Time sampled	Matrix	Sampling method	Number of Containers	Front ICAP	Back ICAP	Front Hg	Back Hg	5A Hg	5B Hg								
1	Unit 1 Run 1 (Unit 1 R-1 + 4 Bottles)		18-Nov-21			5	✓	✓	✓	✓	✓	✓								
2	Unit 1 Run 2 (MV Unit 1 Run-2 + 4 Bottles)		19-Nov-21			5	✓	✓	✓	✓	✓	✓								
3	Unit 1 Run 3 (Unit 1 Run-3 + 4 Bottles)		19-Nov-21			5	✓	✓	✓	✓	✓	✓								
4																				
5	Unit 2 Run 1 (MV unit 2 Run- 1 + 4 Bottles)		22-Nov-21			5	✓	✓	✓	✓	✓	✓								
6	Unit 2 Run 2 (MV unit 2 Run-2 + 4 Bottles)		22-Nov-21			5	✓	✓	✓	✓	✓	✓								
7	Unit 2 Run 3 (MV unit 2 Run-3 + 4 Bottles)		22-Nov-21			5	✓	✓	✓	✓	✓	✓								
8																				
9	Unit 3 Run 1 (MV U3 R-1 + 4 Bottles)		22-Nov-21			5	✓	✓	✓	✓	✓	✓								
10	Unit 3 Run 2 (MV Unit 3 R-2 + 4 Bottles)		23-Nov-21			5	✓	✓	✓	✓	✓	✓								
11	Unit 3 Run 3 (Unit 3 - R-3 + 4 Bottles)		23-Nov-21			5	✓	✓	✓	✓	✓	✓								
12																				
13																				
14																				
15																				

Please indicate any potentially hazardous samples

Submission of this form acknowledges acceptance of Element's Standard of terms and conditions (<https://www.element.com/terms/terms-and-conditions>).

Page ____ of ____ Control #
ED 120-005

Indicate lot # or affix barcode

Lot: 1538904 COC



Temp. received: 18.4 °C
Date/Time stamp: NOV 25 21:15:15
Delivery Method: HD
Waybill:
Received by: UC

Report Transmission Cover Page

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: NH3 Blank Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538432 Control Number: Date Received: Nov 24, 2021 Date Reported: Nov 30, 2021 Report Number: 2696833
Attn: Missy Sampled By: Company:		

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 - Merge Reports	PDF	COC / Test Report
Email - Multiple Reports By Agreement	PDF	COA
Email - Single Report	PDF	COR

Notes To Clients:

- Nov 30, 2021 - Reduction of analytical volume was necessary for ammonia in air analysis due to matrix effects in lot 1538432. Detection limits are adjusted accordingly.

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: NH3 Blank
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1538432**
Control Number:
Date Received: Nov 24, 2021
Date Reported: Nov 30, 2021
Report Number: 2696833

		Reference Number	1538432-1	1538432-2	1538432-3
		Sample Date	Nov 19, 2021	Nov 22, 2021	Nov 23, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Unit 1 NH3 Blank	Unit 2 NH3 Blank	Unit 3 NH3 Blank
		Matrix	Stack Samples	Stack Samples	Stack Samples
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Air Quality					
Ammonium - N	As Tested	µg/L	1080	2630	224
Dilution Factor	As Tested		1.00	10.0	1.00
Sample Volume	Sample volume	mL	318	188	188
Ammonium - N		µg/sample	342	494	42.1

Approved by:



Max Hewitt
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.

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: NH3 Blank
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1538432**
Control Number:
Date Received: Nov 24, 2021
Date Reported: Nov 30, 2021
Report Number: 2696833

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Ammonium in Impingers (VAN)	APHA	* Flow Injection Analysis, 4500-NH3 H	Nov 30, 2021	Element Vancouver

** Reference Method Modified*

References

APHA Standard Methods for the Examination of Water and Wastewater

Comments:

- Nov 30, 2021 - Reduction of analytical volume was necessary for ammonia in air analysis due to matrix effects in lot 1538432. Detection limits are adjusted accordingly.

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.



www.Element.com

Project Information

Project ID: Metro Vancouver WTE
Project Name: NH₃ Blanks
Project Location:
Legal Location:
PO/AFE#:
Proj. Acct. Code:
Quote #:

Invoice To
Company: A. Lanfranco & Associates Inc.
Address: 101-9488 189 Street
Surrey BC, V4N 4W7
Attention:
Phone: 604-881-2582
Cell:
Fax:
E-mail: mark.lanfranco@alanfranco.com
Agreement ID:
Copy of Report: YES / NO

Report To
Company:
Address:
Attention:
Phone:
Cell:
Fax:
E-mail 1:
E-mail 2:
Copy of Invoice: YES / NO

Additional Reports to
1) Name:
E-mail:
2) Name:
E-mail:

Sample Custody
Sampled by:
Company:
I authorize Element to proceed with the work indicated on this form:
Signature:
Date/Time:

Report Results

Requirements

- ☐ Same Day (200%)
☐ Next Day/Two Day (100%)
☐ Three or Four Days (50%)
☒ 5 to 7 Days (Regular TAT)

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

- ☒ Email ☐ QA/QC
☐ Online ☒ PDF
☐ Fax ☐ Excel

- ☐ HCDWORG ☐ SPIGEC
☐ AB Tier 1 ☐ BCCSR

Other (list below)

Date Required

Special Instructions/Comments (please include contact information including phone number if different from above).

Please report µg/sample and volumes +/- 1 mL

Site I.D.	Sample Description	Depth start end in cm m	Date/Time sampled	Matrix	Sampling method	Number of Containers	Enter tests above (✓ relevant samples below)
1	Unit 1 NH ₃ Blank		19-Nov-21			1	✓
2							
3	Unit 2 NH ₃ Blank		22-Nov-21			1	✓
4							
5	Unit 3 NH ₃ Blank		23-Nov-21			1	✓
6							
7							
8							
9							
10							
11							
12							
13							
14							
15							

Please indicate any potentially hazardous samples

Submission of this form acknowledges acceptance of Element's Standard of terms and conditions (<https://www.element.com/terms/terms-and-conditions>)

Lot: 1538432 COC



Temp. received: 19.1 °C Date/Time stamp: 11/24/21 14:02

Delivery Method:

Waybill:

Received by:

Page ____ of ____ Control #
ED 120-005

Report Transmission Cover Page

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: NH3 Samples Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538430 Control Number: Date Received: Nov 24, 2021 Date Reported: Nov 30, 2021 Report Number: 2696830
Attn: Missy Sampled By: Company:		

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 - Merge Reports	PDF	COC / Test Report
Email - Multiple Reports By Agreement	PDF	COA
Email - Single Report	PDF	COR

Notes To Clients:

- Nov 30, 2021 - Reduction of analytical volume was necessary for ammonia in air analysis due to matrix effects in lot 1538430. Detection limits are adjusted accordingly.

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: NH3 Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1538430**
Control Number:
Date Received: Nov 24, 2021
Date Reported: Nov 30, 2021
Report Number: 2696830

		Reference Number	1538430-1	1538430-2	1538430-3
		Sample Date	Nov 19, 2021	Nov 19, 2021	Nov 19, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Unit 1 NH3 Run 1	Unit 1 NH3 Run 2	Unit 1 NH3 Run 3
		Matrix	Stack Samples	Stack Samples	Stack Samples
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Air Quality					
Ammonium - N	As Tested	µg/L	21100	17000	15300
Dilution Factor	As Tested		100	100	100
Sample Volume	Sample volume	mL	326	348	312
Ammonium - N		µg/sample	6870	5920	4770

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: NH3 Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1538430**
Control Number:
Date Received: Nov 24, 2021
Date Reported: Nov 30, 2021
Report Number: 2696830

		Reference Number	1538430-4	1538430-5	1538430-6
		Sample Date	Nov 22, 2021	Nov 22, 2021	Nov 22, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Unit 2 NH3 Run 1	Unit 2 NH3 Run 2	Unit 2 NH3 Run 3
		Matrix	Stack Samples	Stack Samples	Stack Samples
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Air Quality					
Ammonium - N	As Tested	µg/L	18600	12600	3300
Dilution Factor	As Tested		100	100	10.0
Sample Volume	Sample volume	mL	320	305	242
Ammonium - N		µg/sample	5970	3830	798

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: NH3 Samples
Project Location:
LSD:
P.O.:
Proj. Acct. code:

Lot ID: **1538430**
Control Number:
Date Received: Nov 24, 2021
Date Reported: Nov 30, 2021
Report Number: 2696830

		Reference Number	1538430-7	1538430-8	1538430-9	
		Sample Date	Nov 23, 2021	Nov 23, 2021	Nov 23, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	Unit 3 NH3 Run 1	Unit 3 NH3 Run 2	Unit 3 NH3 Run 3	
		Matrix	Stack Samples	Stack Samples	Stack Samples	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Air Quality						
Ammonium - N	As Tested	µg/L	2190	1900	448	10
Dilution Factor	As Tested		10.0	10.0	1.00	
Sample Volume	Sample volume	mL	254	246	250	
Ammonium - N		µg/sample	556	469	112	

Approved by:



Max Hewitt
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.

Methodology and Notes

Bill To: A. Lanfranco & Associates #101, 9488 - 189 Street Surrey, BC, Canada V4N 4W7	Project ID: Metro Vancouver WTE Project Name: NH3 Samples Project Location: LSD: P.O.: Proj. Acct. code:	Lot ID: 1538430 Control Number: Date Received: Nov 24, 2021 Date Reported: Nov 30, 2021 Report Number: 2696830
Attn: Missy Sampled By: Company:		

Method of Analysis

Method Name	Reference	Method	Date Analysis Started	Location
Ammonium in Impingers (VAN)	APHA	* Flow Injection Analysis, 4500-NH3 H <i>* Reference Method Modified</i>	Nov 30, 2021	Element Vancouver

References

APHA	Standard Methods for the Examination of Water and Wastewater
------	--

Comments:

- Nov 30, 2021 - Reduction of analytical volume was necessary for ammonia in air analysis due to matrix effects in lot 1538430. Detection limits are adjusted accordingly.

Please direct any inquiries regarding this report to our Client Services group.

Results relate only to samples as submitted.

The test report shall not be reproduced except in full, without the written approval of the laboratory.



www.Element.com

Project Information

Project ID: Metro Vancouver WTE
Project Name: NH₃ Samples
Project Location:
Legal Location:
PO/AFE#:
Proj. Acct. Code:
Quote #:

Invoice To
Company: A. Lanfranco & Associates Inc.
Address: 101-9488 189 Street
Surrey BC, V4N 4W7
Attention:
Phone: 604-881-2582
Cell:
Fax:
E-mail: mark.lanfranco@alanfranco.com
Agreement ID:
Copy of Report: YES / NO

Report To
Company: SAME
Address:
Attention:
Phone:
Cell:
Fax:
E-mail 1:
E-mail 2:
Copy of Invoice: YES / NO

Additional Reports to

1) Name:
E-mail:
2) Name:
E-mail:

Sample Custody

Sampled by:
Company:
I authorize Element to proceed with the work indicated on this form:
Signature:
Date/Time:

Report Results

Requirements

- ☐ Same Day (200%)
☐ Next Day/Two Day (100%)
☐ Three or Four Days (50%)
☒ 5 to 7 Days (Regular TAT)

When "ASAP" is requested, turn around will default to a 100% RUSH priority, with pricing and turn around time to match. Please contact the lab prior to submitting RUSH samples. If not all samples require RUSH, please indicate in the special instructions.

- ☒ Email ☐ QA/QC
☐ Online ☒ PDF
☐ Fax ☐ Excel

- ☐ HCDWORG ☐ SPIGEC
☐ AB Tier 1 ☐ BCCSR

Other (list below)

Date Required

Special Instructions/Comments (please include contact information including phone number if different from above).

Please report µg/sample and volumes +/- 1 mL

	Site I.D.	Sample Description	Depth start end in cm m		Date/Time sampled	Matrix	Sampling method	Number of Containers ↓	Enter tests above (✓ relevant samples below)											
1		Unit 1 NH ₃ Run 1			19-Nov-21			1	✓											
2		Unit 1 NH ₃ Run 2			19-Nov-21			1	✓											
3		Unit 1 NH ₃ Run 3			19-Nov-21			1	✓											
4																				
5		Unit 2 NH ₃ Run 1			22-Nov-21			1	✓											
6		Unit 2 NH ₃ Run 2			22-Nov-21			1	✓											
7		Unit 2 NH ₃ Run 3			22-Nov-21			1	✓											
8																				
9		Unit 3 NH ₃ Run 1			23-Nov-21			1	✓											
10		Unit 3 NH ₃ Run 2			23-Nov-21			1	✓											
11		Unit 3 NH ₃ Run 3			23-Nov-21			1	✓											
12																				
13																				
14																				
15																				

Please indicate any potentially hazardous samples

Submission of this form acknowledges acceptance of Element's Standard of terms and conditions (<https://www.element.com/terms/terms-and-conditions>)

Page ____ of ____ Control #
ED 120-005

Lot: 1538430 COC



Temp. received: (9.1) °C Date/Time stamp: NOV 24 21 14:32
Delivery Method:
Waybill:
Received by:

CERTIFICATE OF ANALYSIS

Work Order : **VA21C6255**
Client : **A. Lanfranco & Associates Inc.**
Contact : Mark Lanfranco
Address : Unit # 101 9488 - 189 St
 Surrey BC Canada V4N 4W7
Telephone : 604 881 2582
Project : Metro Vancouver WTE
PO : HF
C-O-C number : ----
Sampler : A. Lanfranco
Site : ----
Quote number : Standing Offer
No. of samples received : 12
No. of samples analysed : 12

Page : 1 of 4
Laboratory : Vancouver - Environmental
Account Manager : Brent Mack
Address : 8081 Lougheed Highway
 Burnaby BC Canada V5A 1W9
Telephone : 778-370-3279
Date Samples Received : 24-Nov-2021 14:15
Date Analysis Commenced : 30-Nov-2021
Issue Date : 03-Dec-2021 11:56

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

Signatories	Position	Laboratory Department
Courtney Cox	Analyst	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
µg/sample	micrograms per sample
mL	millilitre

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Qualifiers

<i>Qualifier</i>	<i>Description</i>
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.



Analytical Results

Sub-Matrix: Impinger

Client sample ID

					Unit 1 HF Run 1	Unit 1 HF Run 2	Unit 1 HF Run 3	Unit 2 HF Run 1	Unit 2 HF Run 2
(Matrix: Air)									
Client sampling date / time					19-Nov-2021	19-Nov-2021	19-Nov-2021	22-Nov-2021	22-Nov-2021
Analyte	CAS Number	Method	LOR	Unit	VA21C6255-001	VA21C6255-002	VA21C6255-003	VA21C6255-004	VA21C6255-005
					Result	Result	Result	Result	Result
Field Tests									
volume, impinger	----	EP248	0.1	mL	270	355	355	340	325
Anions and Nutrients									
fluoride	16984-48-8	E248.F	5.0	µg/sample	11.6	<17.8 ^{DLDS}	<17.8 ^{DLDS}	<17.0 ^{DLDS}	<16.2 ^{DLDS}

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Impinger

Client sample ID

					Unit 2 HF Run 3	Unit 3 HF Run 1	Unit 3 HF Run 2	Unit 3 HF Run 3	Unit 1 HF Blank
(Matrix: Air)									
Client sampling date / time					22-Nov-2021	23-Nov-2021	23-Nov-2021	23-Nov-2021	19-Nov-2021
Analyte	CAS Number	Method	LOR	Unit	VA21C6255-006	VA21C6255-007	VA21C6255-008	VA21C6255-009	VA21C6255-010
					Result	Result	Result	Result	Result
Field Tests									
volume, impinger	----	EP248	0.1	mL	330	335	335	320	200
Anions and Nutrients									
fluoride	16984-48-8	E248.F	5.0	µg/sample	<5.0	6.4	5.6	<16.0 ^{DLDS}	<5.0

Please refer to the General Comments section for an explanation of any qualifiers detected.

Analytical Results

Sub-Matrix: Impinger

Client sample ID

					Unit 2 HF Blank	Unit 3 HF Blank	----	----	----
(Matrix: Air)									
Client sampling date / time					22-Nov-2021	23-Nov-2021	----	----	----
Analyte	CAS Number	Method	LOR	Unit	VA21C6255-011	VA21C6255-012	-----	-----	-----
					Result	Result	----	----	----
Field Tests									
volume, impinger	----	EP248	0.1	mL	245	280	----	----	----
Anions and Nutrients									
fluoride	16984-48-8	E248.F	5.0	µg/sample	<5.0	<5.0	----	----	----

Please refer to the General Comments section for an explanation of any qualifiers detected.

Page : 4 of 4
Work Order : VA21C6255
Client : A. Lanfranco & Associates Inc.
Project : Metro Vancouver WTE



QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: VA21C6255	Page	: 1 of 5
Client	: A. Lanfranco & Associates Inc.	Laboratory	: Vancouver - Environmental
Contact	: Mark Lanfranco	Account Manager	: Brent Mack
Address	: Unit # 101 9488 - 189 St Surrey BC Canada V4N 4W7	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	: 604 881 2582	Telephone	: 778-370-3279
Project	: Metro Vancouver WTE	Date Samples Received	: 24-Nov-2021 14:15
PO	: HF	Issue Date	: 03-Dec-2021 11:56
C-O-C number	: ----		
Sampler	: A. Lanfranco		
Site	: ----		
Quote number	: Standing Offer		
No. of samples received	: 12		
No. of samples analysed	: 12		

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances.

DQO: Data Quality Objective.

LOR: Limit of Reporting (detection limit).

RPD: Relative Percent Difference.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: Air

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 1 HF Blank	E248.F	19-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	12 days	✔
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 1 HF Run 1	E248.F	19-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	12 days	✔
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 1 HF Run 2	E248.F	19-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	12 days	✔
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 1 HF Run 3	E248.F	19-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	12 days	✔
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 3 HF Blank	E248.F	23-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	8 days	✔
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 3 HF Run 1	E248.F	23-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	8 days	✔
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 3 HF Run 2	E248.F	23-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	8 days	✔



Matrix: Air

Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 3 HF Run 3	E248.F	23-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	8 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 2 HF Blank	E248.F	22-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	9 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 2 HF Run 1	E248.F	22-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	9 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 2 HF Run 2	E248.F	22-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	9 days	✓
Anions and Nutrients : Fluoride by IC (Impinger, mg/sample)										
HDPE Unit 2 HF Run 3	E248.F	22-Nov-2021	30-Nov-2021	----	----		30-Nov-2021	28 days	9 days	✓

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Air**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Fluoride by IC (Impinger, mg/sample)	E248.F	356307	1	12	8.3	5.0	✓
Laboratory Control Samples (LCS)							
Fluoride by IC (Impinger, mg/sample)	E248.F	356307	1	12	8.3	5.0	✓
Method Blanks (MB)							
Fluoride by IC (Impinger, mg/sample)	E248.F	356307	1	12	8.3	5.0	✓
Matrix Spikes (MS)							
Fluoride by IC (Impinger, mg/sample)	E248.F	356307	1	12	8.3	5.0	✓



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Fluoride by IC (Impinger, mg/sample)	E248.F Vancouver - Environmental	Air	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. Reported sample volumes are for the bottle/sub-sample submitted for the listed analyses.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation of Anions for IC (Impinger)	EP248 Vancouver - Environmental	Air	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. Reported sample volumes are for the bottle/sub-sample submitted for the listed analyses.

QUALITY CONTROL REPORT

Work Order : **VA21C6255**

Page : 1 of 3

Client : A. Lanfranco & Associates Inc.
Contact : Mark Lanfranco
Address : Unit # 101 9488 - 189 St
 Surrey BC Canada V4N 4W7
Telephone : 604 881 2582
Project : Metro Vancouver WTE
PO : HF
C-O-C number : ----
Sampler : A. Lanfranco
Site : ----
Quote number : Standing Offer
No. of samples received : 12
No. of samples analysed : 12

Laboratory : Vancouver - Environmental
Account Manager : Brent Mack
Address : 8081 Lougheed Highway
 Burnaby, British Columbia Canada V5A 1W9
Telephone : 778-370-3279
Date Samples Received : 24-Nov-2021 14:15
Date Analysis Commenced : 30-Nov-2021
Issue Date : 03-Dec-2021 11:56

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percentage Difference (RPD) and Acceptance Limits
- Matrix Spike (MS) Report; Recovery and Acceptance Limits
- Reference Material (RM) Report; Recovery and Acceptance Limits
- Method Blank (MB) Report; Recovery and Acceptance Limits
- Laboratory Control Sample (LCS) Report; Recovery and Acceptance Limits

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Courtney Cox	Analyst	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

- Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number = Chemical Abstracts Services number is a unique identifier assigned to discrete substances.
- DQO = Data Quality Objective.
- LOR = Limit of Reporting (detection limit).
- RPD = Relative Percentage Difference
- # = Indicates a QC result that did not meet the ALS DQO.

Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test specific).

Sub-Matrix: Air					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Anions and Nutrients (QC Lot: 356307)											
VA21C6255-001	Unit 1 HF Run 1	fluoride	16984-48-8	E248.F	5.0	mg/sample	11.6	0.0119	0.0004	Diff <2x LOR	----
		volume, impinger	----	EP248	0.1	mL	µg/sample 270	270		Diff <2x LOR	----

Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: Air						
Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Anions and Nutrients (QC Lot: 356307)						
fluoride	16984-48-8	E248.F	0.005	mg/sample	<0.0050	----
volume, impinger	----	EP248	0.1	mL	500	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: Air

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Anions and Nutrients (QCLot: 356307)									
fluoride	16984-48-8	E248.F	0.005	mg/sample	0.5 mg/sample	102	90.0	110	----

Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: Air

					Matrix Spike (MS) Report				
					Spike		Recovery (%)	Recovery Limits (%)	
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High
Anions and Nutrients (QCLot: 356307)									
VA21C6255-002	Unit 1 HF Run 2	fluoride	16984-48-8	E248.F	1.84 mg/sample	1.775 mg/sample	104	75.0	125

- No Matrix Spike (MS) Results are required to be reported.



2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

LABORATORY REPORT

December 27, 2021

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

RE: Metro Vancouver WTEF

Dear Mark:

Enclosed are the results of the samples submitted to our laboratory on November 29, 2021. For your reference, these analyses have been assigned our service request number P2106244.

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.

Respectfully submitted,

ALS | Environmental

By Sue Anderson at 4:18 pm, Dec 27, 2021

Sue Anderson
Project Manager



2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

Client: A. Lanfranco and Associates Inc.
Project: Metro Vancouver WTEF

Service Request No: P2106244

CASE NARRATIVE

The samples were received intact under chain of custody on November 29, 2021 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.

Methane, Ethene, Ethane and C3 through C6, C6+ Hydrocarbons Analysis

The samples were analyzed per modified EPA Method TO-3 for methane, ethene, ethane, and 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 or AIHA-LAP, LLC accreditation.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.



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 Simi Valley, CA 93065
 T: +1 805 526 7161
www.alsglobal.com

ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	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)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1776326
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-008
Pennsylvania DEP	http://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	T104704413-19-10
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272019-10
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.
Project ID: Metro Vancouver WTEF

Service Request: P2106244

Date Received: 11/29/2021
Time Received: 10:00

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	TO-3 Modified - C1C6+ Can	TO-3 Modified - MEEPP Can
MV WTE Unit 1 RUN #1	P2106244-001	Air	11/19/2021	10:45	SC00658	-2.76	4.05	X	X
MV WTE Unit 1 RUN #2	P2106244-002	Air	11/19/2021	12:20	SC02315	-2.60	4.20	X	X
MV WTE Unit 1 RUN #3	P2106244-003	Air	11/19/2021	13:40	SC00374	-1.17	3.75	X	X
MV WTE Unit 2 RUN #1	P2106244-004	Air	11/22/2021	09:58	SC01479	-4.69	4.10	X	X
MV WTE Unit 2 RUN #2	P2106244-005	Air	11/22/2021	11:42	SC02303	-1.66	3.73	X	X
MV WTE Unit 2 RUN #3	P2106244-006	Air	11/22/2021	13:00	SC02040	-2.71	3.67	X	X
MV WTE Unit 3 RUN #1	P2106244-007	Air	11/23/2021	09:49	SC01882	-3.69	3.80	X	X
MV WTE Unit 3 RUN #2	P2106244-008	Air	11/23/2021	11:01	SC01973	-2.53	3.89	X	X
MV WTE Unit 3 RUN #3	P2106244-009	Air	11/23/2021	12:25	SC00568	-2.07	3.91	X	X



Page 1 of 1

Air - Chain of Custody Record & Analytical Service Request

ALS

Phone (805) 526-7161
Fax (805) 526-7270

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. P2A06244	
Company Name & Address (Reporting Information)										ALS Contact:	
A. Lanfranco & Associates Inc. Unit 101 - 9488 189 street, Surrey, BC V4N 4W7										Project Name Metro Vancouver WTEF	
Project Manager Mark Lanfranco										Project Number	
Phone 604 881 2582										P.O. # / Billing Information	
Fax										Bill to account	
Email Address for Result Reporting mark.lanfranco@alanfranco.com										Sampler (Print & Sign) Scott Ferguson	
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	Analysis Method	Comments e.g. Actual Preservative or specific instructions	
											TO-3 (list on file)
MV WTE Unit 1 RUN #1	1	Nov. 19	1045	sc00658	oa2014	-30	-8	6L	✓		
MV WTE Unit 1 RUN #2	2	Nov. 19	1220	sc02315	oa00152	-30	-8	6L	✓		
MV WTE Unit 1 RUN #3	3	Nov. 19	1340	sc00374	oa01156	-29	-6	6L	✓		
50											
MV WTE Unit 2 RUN #1	4	Nov. 22	0958	sc01479	oa00843	-28	-10	6L	✓		
MV WTE Unit 2 RUN #2	5	Nov. 22	1142	sc02303	oa01501	-27	-6	6L	✓		
MV WTE Unit 2 RUN #3	6	Nov. 22	1300	sc02040	oa00100	-30	-7	6L	✓		
MV WTE Unit 3 RUN #1	7	Nov. 23	0949	sc01882	oa02223	-30	-9	6L	✓		
MV WTE Unit 3 RUN #2	8	Nov. 23	1101	sc01973	oa00465	-29	-6	6L	✓		
MV WTE Unit 3 RUN #3	9	Nov. 23	1225	sc00568	oa01616	-30	-6	6L	✓		
Report Tier Levels - please select										Chain of Custody Seal: (Circle)	
Tier I - Results (Default if not specified)										INTACT	
Tier II (Results + QC Summaries)										BROKEN	
Tier III (Results + QC & Calibration Summaries)										ABSENT	
Tier IV (Data Validation Package) 10% Surcharge											
Relinquished by: (Signature)										Date: 11/29/24 Time: 1000	
Relinquished by: (Signature)										Date: _____ Time: _____	
Cooler / Blank Temperature °C											

ALS Environmental **Sample Acceptance Check Form**

Client: A. Lanfranco and Associates Inc. Work order: P2106244
 Project: Metro Vancouver WTEF
 Sample(s) received on: 11/29/21 Date opened: 11/29/21 by: DENISE.POSADA

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 <u>if necessary</u> 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? | ☐ | ☐ | ☒ |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2106244-001.01	6.0 L Source Can					
P2106244-002.01	6.0 L Source Can					
P2106244-003.01	6.0 L Source Can					
P2106244-004.01	6.0 L Source Can					
P2106244-005.01	6.0 L Source Can					
P2106244-006.01	6.0 L Source Can					
P2106244-007.01	6.0 L Source Can					
P2106244-008.01	6.0 L Source Can					
P2106244-009.01	6.0 L Source Can					

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

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 1 RUN #1

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-001

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00658

Date Collected: 11/19/21

Date Received: 11/29/21

Date Analyzed: 12/1/21

Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.76 **Final Pressure (psig):** 4.05

Container Dilution Factor: 1.57

Compound	Result ppmV	MRL ppmV	Data Qualifier
C ₃ as Propane	ND	0.79	
C ₄ as n-Butane	ND	0.79	
C ₅ as n-Pentane	ND	0.79	
C ₆ as n-Hexane	ND	0.79	
C ₆ + as n-Hexane	ND	1.6	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 1 RUN #2

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-002

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC02315

Date Collected: 11/19/21

Date Received: 11/29/21

Date Analyzed: 12/1/21

Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.60 **Final Pressure (psig):** 4.20

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	1.6	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 1 RUN #3

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-003

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00374

Date Collected: 11/19/21

Date Received: 11/29/21

Date Analyzed: 12/1/21

Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -1.17 **Final Pressure (psig):** 3.75

Container Dilution Factor: 1.36

Compound	Result ppmV	MRL ppmV	Data Qualifier
C ₃ as Propane	ND	0.68	
C ₄ as n-Butane	ND	0.68	
C ₅ as n-Pentane	ND	0.68	
C ₆ as n-Hexane	ND	0.68	
C ₆ + as n-Hexane	ND	1.4	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 2 RUN #1

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-004

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01479

Date Collected: 11/22/21

Date Received: 11/29/21

Date Analyzed: 12/1/21

Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -4.69 **Final Pressure (psig):** 4.10

Container Dilution Factor: 1.88

Compound	Result ppmV	MRL ppmV	Data Qualifier
C ₃ as Propane	ND	0.94	
C ₄ as n-Butane	ND	0.94	
C ₅ as n-Pentane	ND	0.94	
C ₆ as n-Hexane	ND	0.94	
C ₆ + as n-Hexane	ND	1.9	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 2 RUN #2

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-005

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC02303

Date Collected: 11/22/21

Date Received: 11/29/21

Date Analyzed: 12/1/21

Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -1.66 **Final Pressure (psig):** 3.73

Container Dilution Factor: 1.41

Compound	Result ppmV	MRL ppmV	Data Qualifier
C ₃ as Propane	ND	0.71	
C ₄ as n-Butane	ND	0.71	
C ₅ as n-Pentane	ND	0.71	
C ₆ as n-Hexane	ND	0.71	
C ₆ + as n-Hexane	ND	1.4	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 2 RUN #3

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-006

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC02040

Date Collected: 11/22/21

Date Received: 11/29/21

Date Analyzed: 12/1/21

Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.71 **Final Pressure (psig):** 3.67

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	1.5	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 3 RUN #1

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-007

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01882

Date Collected: 11/23/21

Date Received: 11/29/21

Date Analyzed: 12/2/21

Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -3.69 **Final Pressure (psig):** 3.80

Container Dilution Factor: 1.68

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	1.7	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 3 RUN #2

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-008

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01973

Date Collected: 11/23/21

Date Received: 11/29/21

Date Analyzed: 12/2/21

Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.53 **Final Pressure (psig):** 3.89

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	1.5	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 3 RUN #3

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-009

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00568

Date Collected: 11/23/21

Date Received: 11/29/21

Date Analyzed: 12/2/21

Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.07 **Final Pressure (psig):** 3.91

Container Dilution Factor: 1.47

Compound	Result ppmV	MRL ppmV	Data Qualifier
C ₃ as Propane	ND	0.74	
C ₄ as n-Butane	ND	0.74	
C ₅ as n-Pentane	ND	0.74	
C ₆ as n-Hexane	ND	0.74	
C ₆ + as n-Hexane	ND	1.5	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: Method Blank

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P211201-MB

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/01/21

Volume(s) Analyzed: 1.0 ml(s)

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	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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: Method Blank

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P211202-MB

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/02/21

Volume(s) Analyzed: 1.0 ml(s)

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	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

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P211201-DLCS

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/01/21

Volume(s) Analyzed: NA ml(s)

Compound	Spike Amount	Result		% Recovery		ALS	RPD	RPD	Data
	LCS / DLCS ppmV	LCS ppmV	DLCS ppmV	LCS	DLCS	Acceptance Limits			
Propane	1,000	1,090	1,090	109	109	92-120	0	6	
n-Butane	1,000	1,080	1,090	108	109	91-121	0.9	6	
n-Pentane	1,000	1,060	1,060	106	106	89-118	0	6	
n-Hexane	1,000	1,100	1,100	110	110	92-125	0	6	

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE / DUPLICATE LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P211202-DLCS

Test Code: EPA TO-3 Modified

Instrument ID: HP5890 II/GC8/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/02/21

Volume(s) Analyzed: NA ml(s)

Compound	Spike Amount	Result		% Recovery		ALS	RPD	RPD	Data
	LCS / DLCS ppmV	LCS ppmV	DLCS ppmV	LCS	DLCS	Acceptance Limits			
Propane	1,000	1,090	1,090	109	109	92-120	0	6	
n-Butane	1,000	1,090	1,090	109	109	91-121	0	6	
n-Pentane	1,000	1,060	1,070	106	107	89-118	0.9	6	
n-Hexane	1,000	1,100	1,120	110	112	92-125	2	6	

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 1 RUN #1

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-001

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00658

Date Collected: 11/19/21

Date Received: 11/29/21

Date Analyzed: 12/7/21

Volume(s) Analyzed: 0.50 ml(s)

Initial Pressure (psig): -2.76 Final Pressure (psig): 4.05

Container Dilution Factor: 1.57

CAS #	Compound	Result mg/m ³	MRL mg/m ³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	4.4	1.0	6.7	1.6	
74-85-1	Ethene	ND	0.54	ND	0.47	
74-84-0	Ethane	ND	0.58	ND	0.47	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 1 RUN #2

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-002

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC02315

Date Collected: 11/19/21

Date Received: 11/29/21

Date Analyzed: 12/7/21

Volume(s) Analyzed: 0.50 ml(s)

Initial Pressure (psig): -2.60 Final Pressure (psig): 4.20

Container Dilution Factor: 1.56

CAS #	Compound	Result mg/m ³	MRL mg/m ³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	1.4	1.0	2.2	1.6	
74-85-1	Ethene	ND	0.54	ND	0.47	
74-84-0	Ethane	ND	0.58	ND	0.47	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 1 RUN #3

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-003

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00374

Date Collected: 11/19/21

Date Received: 11/29/21

Date Analyzed: 12/7/21

Volume(s) Analyzed: 0.50 ml(s)

Initial Pressure (psig): -1.17 Final Pressure (psig): 3.75

Container Dilution Factor: 1.36

CAS #	Compound	Result mg/m ³	MRL mg/m ³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	2.1	0.89	3.3	1.4	
74-85-1	Ethene	ND	0.47	ND	0.41	
74-84-0	Ethane	ND	0.50	ND	0.41	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 2 RUN #1

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-004

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01479

Date Collected: 11/22/21

Date Received: 11/29/21

Date Analyzed: 12/7/21

Volume(s) Analyzed: 0.50 ml(s)

Initial Pressure (psig): -4.69 **Final Pressure (psig):** 4.10

Container Dilution Factor: 1.88

CAS #	Compound	Result mg/m ³	MRL mg/m ³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	1.8	1.2	2.7	1.9	
74-85-1	Ethene	ND	0.65	ND	0.56	
74-84-0	Ethane	ND	0.69	ND	0.56	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 2 RUN #2

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-005

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC02303

Date Collected: 11/22/21

Date Received: 11/29/21

Date Analyzed: 12/7/21

Volume(s) Analyzed: 0.50 ml(s)

Initial Pressure (psig): -1.66 **Final Pressure (psig):** 3.73

Container Dilution Factor: 1.41

CAS #	Compound	Result mg/m ³	MRL mg/m ³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	1.7	0.92	2.5	1.4	
74-85-1	Ethene	ND	0.49	ND	0.42	
74-84-0	Ethane	ND	0.52	ND	0.42	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 2 RUN #3

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-006

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC02040

Date Collected: 11/22/21

Date Received: 11/29/21

Date Analyzed: 12/7/21

Volume(s) Analyzed: 0.50 ml(s)

Initial Pressure (psig): -2.71 Final Pressure (psig): 3.67

Container Dilution Factor: 1.53

CAS #	Compound	Result mg/m ³	MRL mg/m ³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	1.2	1.0	1.9	1.5	
74-85-1	Ethene	ND	0.53	ND	0.46	
74-84-0	Ethane	ND	0.56	ND	0.46	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 3 RUN #1

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-007

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01882

Date Collected: 11/23/21

Date Received: 11/29/21

Date Analyzed: 12/7/21

Volume(s) Analyzed: 0.50 ml(s)

Initial Pressure (psig): -3.69 **Final Pressure (psig):** 3.80

Container Dilution Factor: 1.68

CAS #	Compound	Result mg/m ³	MRL mg/m ³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	ND	1.1	ND	1.7	
74-85-1	Ethene	ND	0.58	ND	0.50	
74-84-0	Ethane	ND	0.62	ND	0.50	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 3 RUN #2

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-008

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC01973

Date Collected: 11/23/21

Date Received: 11/29/21

Date Analyzed: 12/7/21

Volume(s) Analyzed: 0.50 ml(s)

Initial Pressure (psig): -2.53 **Final Pressure (psig):** 3.89

Container Dilution Factor: 1.53

CAS #	Compound	Result mg/m ³	MRL mg/m ³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	1.6	1.0	2.4	1.5	
74-85-1	Ethene	ND	0.53	ND	0.46	
74-84-0	Ethane	ND	0.56	ND	0.46	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: MV WTE Unit 3 RUN #3

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P2106244-009

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Container ID: SC00568

Date Collected: 11/23/21

Date Received: 11/29/21

Date Analyzed: 12/7/21

Volume(s) Analyzed: 0.50 ml(s)

Initial Pressure (psig): -2.07 Final Pressure (psig): 3.91

Container Dilution Factor: 1.47

CAS #	Compound	Result mg/m ³	MRL mg/m ³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	1.3	0.96	2.0	1.5	
74-85-1	Ethene	ND	0.51	ND	0.44	
74-84-0	Ethane	ND	0.54	ND	0.44	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: Method Blank

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P211207-MB

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/07/21

Volume(s) Analyzed: 0.50 ml(s)

CAS #	Compound	Result mg/m ³	MRL mg/m ³	Result ppmV	MRL ppmV	Data Qualifier
74-82-8	Methane	ND	0.66	ND	1.0	
74-85-1	Ethene	ND	0.34	ND	0.30	
74-84-0	Ethane	ND	0.37	ND	0.30	

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

Page 1 of 1

Client: A. Lanfranco and Associates Inc.

Client Sample ID: Duplicate Lab Control Sample

Client Project ID: Metro Vancouver WTEF

ALS Project ID: P2106244

ALS Sample ID: P211207-DLCS

Test Code: EPA TO-3 Modified

Instrument ID: HP5890A/GC10/FID

Analyst: Gilbert Gutierrez

Sampling Media: 6.0 L Summa Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 12/07/21

Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount	Result		% Recovery		ALS	RPD	RPD	Data
		LCS / DLCS ppmV	LCS ppmV	DLCS ppmV	LCS	DLCS	Acceptance Limits			
74-82-8	Methane	1.52	1.61	1.65	106	109	70-130	3	15	
74-85-1	Ethene	1.51	1.42	1.40	94	93	70-130	1	15	
74-84-0	Ethane	1.50	1.41	1.39	94	93	70-130	1	15	

APPENDIX - C

COMPUTER GENERATED RESULTS

Client: Metro Vancouver
Jobsite: WTE (Burnaby, BC)
Source: Unit 1

Date: 18-Nov-21
Run: 1 - Particulate / Metals
Run Time: 10:57 - 13:02

Concentrations:

Particulate	2.94 mg/dscm	0.00128 gr/dscf
	1.59 mg/Acm	0.00070 gr/Acf
	2.58 mg/dscm (@ 11% O2)	0.00113 gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.202 Kg/hr	0.446 lb/hr
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Flue Gas Characteristics:

Flow	1147 dscm/min	40503 dscf/min
	19.11 dscm/sec	675 dscf/sec
	2117 Acm/min	74754 Acf/min

Velocity	13.851 m/sec	45.44 f/sec
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Temperature	155.3 oC	311.5 oF
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Moisture	17.4 %
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Gas Analysis	9.6 % O2
	10.4 % CO2

30.045 Mol. Wt (g/gmole) Dry
27.950 Mol. Wt (g/gmole) Wet

Sample Parameters:

Sample Volume	2.6884 dscm	94.942 dscf
Sample Time	120.0 minutes	
Isokineticity	103.5 %	

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

Client:	Metro Vancouver	Date:	18-Nov-21
Jobsite:	WTE (Burnaby, BC)	Run:	1 - Particulate / Metals
Source:	Unit 1	Run Time:	11:10 - 13:15

Control Unit (Y)	1.0032	Collection:	Gas Analysis (Vol. %):	Condensate Collection:
Nozzle Diameter (in.)	0.3080	Filter (grams) 0.00600	CO2 O2	Impinger 1 196.0
Pitot Factor	0.8461	Washings (grams) 0.00190	10.50 9.50	Impinger 2 122.0
Baro. Press. (in. Hg)	29.93	Traverse 1	10.25 9.75	Impinger 3 58.0
Static Press. (in. H2O)	-17.00	Traverse 2		Impinger 4 22.0
Stack Height (ft)	30			Impinger 5 10.0
Stack Diameter (in.)	70.90			Impinger 6 5.0
Stack Area (sq.ft.)	27.417			Gel 11.9
Minutes Per Reading	5.0			
Minutes Per Point	5.0			

Total (grams) 0.00790	10.38	9.63	Gain (grams) 424.9
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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	601.000								
1	5.0	604.540	0.35	1.75	57	57	5	310	1.5	103.1
2	10.0	608.180	0.37	1.86	57	57	5	308	4.7	103.0
3	15.0	611.990	0.40	2.03	58	58	6	309	8.4	103.6
4	20.0	616.160	0.48	2.43	58	58	6	309	12.5	103.6
5	25.0	620.250	0.46	2.34	59	59	7	308	17.7	103.5
6	30.0	624.290	0.45	2.29	59	59	7	309	25.2	103.5
7	35.0	628.630	0.52	2.64	59	59	7	311	45.6	103.6
8	40.0	632.590	0.43	2.18	60	60	7	311	53.2	103.7
9	45.0	636.360	0.39	1.98	60	60	6	311	58.3	103.6
10	50.0	640.180	0.40	2.04	60	60	6	309	62.5	103.5
11	55.0	643.910	0.38	1.94	60	60	6	307	66.1	103.5
12	60.0	647.690	0.39	1.99	60	60	6	306	69.4	103.5
Traverse 2	0.0	647.690								
1	5.0	651.200	0.34	1.72	60	60	6	313	1.5	103.3
2	10.0	654.750	0.35	1.76	60	60	5	318	4.7	103.4
3	15.0	657.640	0.23	1.16	61	61	5	315	8.4	103.2
4	20.0	660.650	0.25	1.27	61	61	5	315	12.5	103.2
5	25.0	664.010	0.31	1.57	61	61	5	314	17.7	103.4
6	30.0	667.480	0.33	1.67	62	62	9	315	25.2	103.4
7	35.0	672.120	0.59	2.99	62	62	9	315	45.6	103.8
8	40.0	676.680	0.57	2.89	62	62	9	314	53.2	103.7
9	45.0	681.320	0.59	2.99	62	62	9	315	58.3	103.8
10	50.0	686.000	0.60	3.04	62	62	9	315	62.5	103.8
11	55.0	689.930	0.42	2.14	62	62	6	310	66.1	103.6
12	60.0	693.722	0.39	2.00	62	62	6	308	69.4	103.6
Average:			0.416	2.111	60.2	60.2	6.5	311.5		103.5

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

Date: 19-Nov-21
Run: 2 - Particulate / Metals
Run Time: 10:44 - 12:45

Concentrations:

Particulate	0.69 mg/dscm	0.00030 gr/dscf
	0.38 mg/Acm	0.00016 gr/Acf
	0.61 mg/dscm (@ 11% O2)	0.00027 gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.047 Kg/hr	0.104 lb/hr
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Flue Gas Characteristics:

Flow	1137 dscm/min	40161 dscf/min
	18.95 dscm/sec	669 dscf/sec
	2099 Acm/min	74113 Acf/min
Velocity	13.732 m/sec	45.05 f/sec
Temperature	153.7 oC	308.7 oF
Moisture	17.5 %	
Gas Analysis	9.7 % O2	
	10.5 % CO2	
	30.066 Mol. Wt (g/gmole) Dry	
	27.949 Mol. Wt (g/gmole) Wet	

Sample Parameters:

Sample Volume	2.6651 dscm	94.120 dscf
Sample Time	120.0 minutes	
Isokineticity	103.4 %	

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

Client:

Jobsite:

Source:

Metro Vancouver
WTE (Burnaby, B.C)
Unit 1

Date:

Run:

Run Time:

19-Nov-21
2 - Particulate / Metals
10:44 - 12:45

Control Unit (Y)	1.0032	Collection:	Gas Analysis (Vol. %):		Condensate Collection:			
Nozzle Diameter (in.)	0.3080		Filter (grams)	0.00005	CO2	Impinger 1	228.0	
Pitot Factor	0.8461		Washings (grams)	0.00180	O2	Impinger 2	100.0	
Baro. Press. (in. Hg)	30.03				10.25	10.00	Impinger 3	48.0
Static Press. (in. H2O)	-19.00				10.75	9.30	Impinger 4	16.0
Stack Height (ft)	30	Total (grams) 0.00185				Impinger 5	8.0	
Stack Diameter (in.)	70.90					Impinger 6	4.0	
Stack Area (sq.ft.)	27.417					Gel	21.6	
Minutes Per Reading	5.0			10.50	9.65	Gain (grams)	425.6	
Minutes Per Point	5.0							

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ΔP (in. H2O)	Orifice ΔH (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	731.100								
1	5.0	734.320	0.29	1.45	60	60	5	313	1.5	103.2
2	10.0	737.850	0.35	1.75	59	59	5	313	4.7	103.3
3	15.0	741.180	0.31	1.55	59	59	5	313	8.4	103.4
4	20.0	744.230	0.26	1.30	59	59	5	312	12.5	103.3
5	25.0	747.230	0.25	1.26	60	60	5	310	17.7	103.3
6	30.0	750.570	0.31	1.56	60	60	5	310	25.2	103.4
7	35.0	754.940	0.53	2.67	61	61	8	310	45.6	103.5
8	40.0	759.480	0.57	2.88	62	62	8	311	53.2	103.3
9	45.0	763.950	0.55	2.78	63	63	6	311	58.3	103.6
10	50.0	768.390	0.54	2.74	64	64	6	310	62.5	103.6
11	55.0	772.070	0.37	1.88	64	64	6	309	66.1	103.5
12	60.0	775.710	0.36	1.84	65	65	6	307	69.4	103.4
Traverse 2	0.0	775.710								
1	5.0	779.410	0.37	1.89	66	66	6	306	1.5	103.4
2	10.0	783.350	0.42	2.15	66	66	6	306	4.7	103.4
3	15.0	787.520	0.47	2.41	66	66	7	306	8.4	103.5
4	20.0	791.830	0.50	2.56	67	67	7	306	12.5	103.6
5	25.0	796.180	0.51	2.61	67	67	8	307	17.7	103.6
6	30.0	800.400	0.48	2.46	67	67	8	308	25.2	103.6
7	35.0	804.150	0.38	1.99	67	67	7	308	45.6	103.4
8	40.0	808.190	0.44	2.25	67	67	7	307	53.2	103.5
9	45.0	812.090	0.41	2.10	67	67	7	307	58.3	103.5
10	50.0	815.940	0.40	2.05	67	67	7	307	62.5	103.4
11	55.0	819.740	0.39	2.00	67	67	7	307	66.1	103.4
12	60.0	823.404	0.36	1.85	67	67	7	305	69.4	103.6
Average:			0.409	2.083	64.0	64.0	6.4	308.7		103.4

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

Date: 19-Nov-21
Run: 3 - Particulate / Metals
Run Time: 12:59 - 15:00

Concentrations:

Particulate	1.3 mg/dscm	0.0006 gr/dscf
	0.7 mg/Acm	0.0003 gr/Acf
	1.1 mg/dscm (@ 11% O2)	0.0005 gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.083 Kg/hr	0.183 lb/hr
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Flue Gas Characteristics:

Flow	1070 dscm/min	37801 dscf/min
	17.84 dscm/sec	630 dscf/sec
	1959 Acm/min	69189 Acf/min

Velocity	12.820 m/sec	42.06 f/sec
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Temperature	151.9 oC	305.3 oF
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Moisture	17.2 %
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Gas Analysis	9.3 % O2
	10.8 % CO2

30.093 Mol. Wt (g/gmole) Dry
28.013 Mol. Wt (g/gmole) Wet

Sample Parameters:

Sample Volume	2.4738 dscm	87.361 dscf
Sample Time	120.0 minutes	
Isokineticity	102.1 %	

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

Client:	Metro Vancouver	Date:	19-Nov-21
Jobsite:	WTE (Burnaby, B.C)	Run:	3 - Particulate / Metals
Source:	Unit 1	Run Time:	12:59 - 15:00

Control Unit (Y)	1.0032	Collection:	Gas Analysis (Vol. %):	Condensate Collection:
Nozzle Diameter (in.)	0.3080	Filter (grams) 0.00180	CO2 O2	Impinger 1 218.0
Pitot Factor	0.8461	Washings (grams) 0.00140	11.00 9.00	Impinger 2 100.0
Baro. Press. (in. Hg)	30.02	Traverse 1	10.50 9.65	Impinger 3 32.0
Static Press. (in. H2O)	-19.00	Traverse 2		Impinger 4 8.0
Stack Height (ft)	30	Total (grams) 0.00320		Impinger 5 6.0
Stack Diameter (in.)	70.90			Impinger 6 2.0
Stack Area (sq.ft.)	27.417			Gel 19.7
Minutes Per Reading	5.0		10.75 9.33	Gain (grams) 385.7
Minutes Per Point	5.0			

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ΔP (in. H2O)	Orifice ΔH (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	824.000								
1	5.0	827.290	0.30	1.50	65	65	6	305	1.5	101.8
2	10.0	830.740	0.33	1.65	64	64	6	305	4.7	102.0
3	15.0	834.140	0.32	1.60	64	64	7	305	8.4	102.1
4	20.0	837.980	0.41	2.05	64	64	7	305	12.5	102.0
5	25.0	841.780	0.40	2.01	65	65	7	305	17.7	102.0
6	30.0	845.490	0.38	1.91	65	65	7	305	25.2	102.1
7	35.0	849.290	0.40	2.01	65	65	6	305	45.6	102.0
8	40.0	852.810	0.34	1.71	65	65	6	304	53.2	102.3
9	45.0	856.210	0.32	1.61	65	65	6	304	58.3	101.9
10	50.0	859.570	0.31	1.56	66	66	6	303	62.5	102.0
11	55.0	862.820	0.29	1.46	66	66	6	303	66.1	102.0
12	60.0	866.130	0.30	1.51	66	66	6	303	69.4	102.1
Traverse 2	0.0	866.130								
1	5.0	869.490	0.31	1.56	65	65	6	302	1.5	102.1
2	10.0	872.730	0.29	1.45	65	65	6	306	4.7	102.1
3	15.0	875.850	0.27	1.35	65	65	6	306	8.4	101.8
4	20.0	878.920	0.26	1.30	65	65	6	306	12.5	102.1
5	25.0	882.150	0.29	1.45	65	65	6	307	17.7	101.8
6	30.0	885.330	0.28	1.40	65	65	6	307	25.2	102.0
7	35.0	889.620	0.51	2.55	65	65	9	308	45.6	102.3
8	40.0	894.040	0.54	2.70	66	66	9	308	53.2	102.3
9	45.0	898.380	0.52	2.60	66	66	9	308	58.3	102.3
10	50.0	902.680	0.51	2.56	66	66	9	307	62.5	102.3
11	55.0	906.390	0.38	1.91	66	66	9	306	66.1	102.0
12	60.0	909.951	0.35	1.76	65	66	9	305	69.4	102.0
Average:			0.359	1.799	65.2	65.2	6.9	305.3		102.1

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

Date: 22-Nov-21
Run: 1 - Particulate / Metals
Run Time: 09:28 - 11:30

Concentrations:

Particulate	1.7 mg/dscm	0.0007 gr/dscf
	0.9 mg/Acm	0.0004 gr/Acf
	1.5 mg/dscm (@ 11% O2)	0.0006 gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.108 Kg/hr	0.237 lb/hr
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Flue Gas Characteristics:

Flow	1063 dscm/min	37556 dscf/min
	17.72 dscm/sec	626 dscf/sec
	1944 Acm/min	68659 Acf/min

Velocity	12.722 m/sec	41.74 f/sec
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Temperature	153.5 oC	308.3 oF
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Moisture	16.4 %
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Gas Analysis	9.5 % O2
	11.0 % CO2

	30.140 Mol. Wt (g/gmole) Dry
	28.143 Mol. Wt (g/gmole) Wet

Sample Parameters:

Sample Volume	2.4604 dscm	86.891 dscf
Sample Time	120.0 minutes	
Isokineticity	102.7 %	

*** Standard Conditions:**

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

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

Date: 22-Nov-21
Run: 1 - Particulate / Metals
Run Time: 09:28 - 11:30

Control Unit (Y)	0.9885	Collection:	Gas Analysis (Vol. %):	Condensate Collection:
Nozzle Diameter (in.)	0.3073	Filter (grams) 0.00005	CO2 O2	Impinger 1 196.0
Pitot Factor	0.8450	Washings (grams) 0.00410	11.00 9.50	Impinger 2 100.0
Baro. Press. (in. Hg)	29.98		11.00 9.50	Impinger 3 30.0
Static Press. (in. H2O)	-20.00	Total (grams) 0.00415		Impinger 4 12.0
Stack Height (ft)	30			Impinger 5 6.0
Stack Diameter (in.)	70.90			Impinger 6 2.0
Stack Area (sq.ft.)	27.417			Cel 17.5
Minutes Per Reading	5.0		11.00 9.50	Gain (grams) 363.5
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	266.500								
1	5.0	269.780	0.30	1.51	50	50	4	300	1.5	102.6
2	10.0	273.110	0.31	1.55	51	51	4	304	4.7	102.6
3	15.0	276.270	0.28	1.40	51	51	4	307	8.4	102.6
4	20.0	279.320	0.26	1.30	52	52	4	309	12.5	102.7
5	25.0	282.370	0.26	1.30	53	53	4	310	17.7	102.5
6	30.0	285.660	0.30	1.50	55	55	4	312	25.2	102.7
7	35.0	290.160	0.56	2.80	56	56	6	312	45.6	103.0
8	40.0	294.782	0.57	2.87	58	58	6	311	53.2	104.4
9	45.0	299.220	0.55	2.78	60	60	6	311	58.3	101.6
10	50.0	303.850	0.58	2.93	61	61	6	311	62.5	103.1
11	55.0	308.310	0.54	2.73	61	61	5	311	66.1	102.9
12	60.0	312.700	0.52	2.64	62	62	5	309	69.4	102.8
Traverse 2	0.0	312.700								
1	5.0	316.740	0.43	2.22	63	63	5	297	1.5	102.9
2	10.0	320.930	0.47	2.40	64	64	5	310	4.7	102.8
3	15.0	325.070	0.46	2.34	64	64	5	311	8.4	102.8
4	20.0	329.260	0.47	2.39	64	64	5	311	12.5	102.9
5	25.0	333.080	0.39	1.99	65	65	4	311	17.7	102.7
6	30.0	336.750	0.36	1.84	65	65	4	310	25.2	102.6
7	35.0	339.620	0.22	1.12	65	65	4	309	45.6	102.4
8	40.0	342.290	0.19	0.97	65	65	4	307	53.2	102.3
9	45.0	344.960	0.19	0.97	65	65	4	308	58.3	102.4
10	50.0	347.560	0.18	0.92	65	65	4	307	62.5	102.3
11	55.0	350.010	0.16	0.82	65	65	4	307	66.1	102.3
12	60.0	352.542	0.17	0.87	65	65	4	305	69.4	102.4
Average:			0.363	1.840	60.2	60.2	4.6	308.3		102.7

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

Date: 22-Nov-21
Run: 2 - Particulate / Metals
Run Time: 12:12 - 14:14

Concentrations:

Particulate	3.44 mg/dscm	0.00150 gr/dscf
	1.82 mg/Acm	0.00080 gr/Acf
	2.98 mg/dscm (@ 11% O2)	0.00130 gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.217 Kg/hr	0.479 lb/hr
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Flue Gas Characteristics:

Flow	1053 dscm/min	37186 dscf/min
	17.55 dscm/sec	620 dscf/sec
	1988 Acf/min	70207 Acf/min

Velocity	13.008 m/sec	42.68 f/sec
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Temperature	155.0 oC	311.1 oF
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Moisture	18.8 %
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Gas Analysis	9.5 % O2
	11.0 % CO2

30.138 Mol. Wt (g/gmole) Dry
27.855 Mol. Wt (g/gmole) Wet

Sample Parameters:

Sample Volume	2.3975 dscm	84.666 dscf
Sample Time	120.0 minutes	
Isokineticity	105.1 %	

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

Client:	Metro Vancouver	Date:	22-Nov-21
Jobsite:	WTE (Burnaby, B.C)	Run:	2 - Particulate / Metals
Source:	Unit 2	Run Time:	12:12 - 14:14

Control Unit (Y)	0.9885	Collection:		Gas Analysis (Vol. %):		Condensate Collection:	
Nozzle Diameter (in.)	0.3073	Filter (grams)	0.00005	CO2	O2	Impinger 1	246.0
Pitot Factor	0.8450	Washings (grams)	0.00820	11.50	8.90	Impinger 2	100.0
Baro. Press. (in. Hg)	29.98			10.50	10.00	Impinger 3	36.0
Static Press. (in. H2O)	-20.00					Impinger 4	8.0
Stack Height (ft)	29.98					Impinger 5	4.0
Stack Diameter (in.)	70.90					Impinger 6	2.0
Stack Area (sq.ft.)	27.417					Gel	20.7
Minutes Per Reading	5.0			11.00	9.45	Gain (grams)	416.7
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	359.200								
1	5.0	363.100	0.40	2.08	63	63	4	293	1.5	105.2
2	10.0	367.020	0.41	2.10	63	63	4	306	4.7	105.3
3	15.0	371.020	0.43	2.18	63	63	4	312	8.4	105.3
4	20.0	374.880	0.40	2.03	64	64	4	312	12.5	105.2
5	25.0	378.740	0.40	2.03	64	64	4	312	17.7	105.2
6	30.0	382.700	0.42	2.13	64	64	4	312	25.2	105.3
7	35.0	386.040	0.30	1.52	64	64	4	312	45.6	104.9
8	40.0	389.810	0.38	1.94	65	65	4	312	53.2	105.2
9	45.0	393.050	0.28	1.43	66	66	4	311	58.3	104.9
10	50.0	395.990	0.23	1.18	66	66	4	310	62.5	104.9
11	55.0	398.800	0.21	1.08	66	66	4	309	66.1	104.8
12	60.0	401.410	0.18	0.92	67	67	4	309	69.4	104.9
Traverse 2	0.0	401.410								
1	5.0	404.890	0.32	1.64	66	66	4	307	1.5	105.2
2	10.0	408.130	0.28	1.43	66	66	4	313	4.7	105.0
3	15.0	411.320	0.27	1.38	67	67	4	314	8.4	105.2
4	20.0	414.450	0.26	1.33	67	67	4	314	12.5	105.1
5	25.0	417.510	0.25	1.27	67	67	4	315	17.7	104.9
6	30.0	420.810	0.29	1.48	67	67	4	315	25.2	105.1
7	35.0	425.480	0.58	2.95	67	67	4	315	45.6	105.5
8	40.0	430.160	0.58	2.97	68	68	4	313	53.2	105.4
9	45.0	434.630	0.53	2.71	68	68	6	314	58.3	105.3
10	50.0	438.260	0.35	1.79	68	68	6	315	62.5	105.1
11	55.0	442.820	0.55	2.82	68	68	6	312	66.1	105.3
12	60.0	447.430	0.56	2.88	68	68	6	309	69.4	105.4
Average:			0.369	1.886	65.9	65.9	4.3	311.1		105.1

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

Date: 22-Nov-21
Run: 3 - Particulate / Metals
Run Time: 14:37 - 16:39

Concentrations:

Particulate	1.0 mg/dscm	0.0004 gr/dscf
	0.5 mg/Acm	0.0002 gr/Acf
	0.8 mg/dscm (@ 11% O2)	0.0003 gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.06 Kg/hr	0.141 lb/hr
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Flue Gas Characteristics:

Flow	1052 dscm/min	37160 dscf/min
	17.54 dscm/sec	619 dscf/sec
	1979 Acm/min	69886 Acf/min
Velocity	12.949 m/sec	42.48 f/sec
Temperature	157.8 oC	316.1 oF
Moisture	18.0 %	
Gas Analysis	8.3 % O2	
	11.6 % CO2	
	30.183 Mol. Wt (g/gmole) Dry	
	27.995 Mol. Wt (g/gmole) Wet	

Sample Parameters:

Sample Volume	2.4645 dscm	87.035 dscf
Sample Time	120.0 minutes	
Isokineticity	103.9 %	

*** Standard Conditions:**

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

Client:	Metro Vancouver	Date:	22-Nov-21
Jobsite:	WTE (Burnaby, B.C)	Run:	3 - Particulate / Metals
Source:	Unit 2	Run Time:	14:37 - 16:39

Control Unit (Y)	0.9885	Collection:		Gas Analysis (Vol. %):		Condensate Collection:		
Nozzle Diameter (in.)	0.3073	Filter (grams)	0.00130		CO2	O2	Impinger 1	222.0
Pitot Factor	0.8480	Washings (grams)	0.00120	Traverse 1	11.50	8.00	Impinger 2	112.0
Baro. Press. (in. Hg)	29.98			Traverse 2	11.63	8.63	Impinger 3	32.0
Static Press. (in. H2O)	-20.00	Total (grams) 0.0025					Impinger 4	10.0
Stack Height (ft)	30						Impinger 5	4.0
Stack Diameter (in.)	70.90						Impinger 6	3.0
Stack Area (sq.ft.)	27.417						Gel	21.9
Minutes Per Reading	5.0				11.57	8.32	Gain (grams)	404.9
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	448.150								
1	5.0	451.440	0.29	1.47	65	65	5	313	1.5	103.8
2	10.0	454.780	0.30	1.52	64	64	5	315	4.7	104.0
3	15.0	457.890	0.26	1.32	64	64	5	315	8.4	103.9
4	20.0	460.870	0.24	1.21	63	63	5	315	12.5	103.8
5	25.0	463.910	0.25	1.26	63	63	5	314	17.7	103.7
6	30.0	467.130	0.28	1.41	63	63	5	315	25.2	103.9
7	35.0	471.380	0.49	2.47	63	63	5	316	45.6	104.0
8	40.0	475.850	0.54	2.73	63	63	5	316	53.2	104.3
9	45.0	480.270	0.53	2.67	63	63	6	316	58.3	104.1
10	50.0	484.650	0.52	2.62	63	63	6	317	62.5	104.2
11	55.0	488.950	0.50	2.52	63	63	6	316	66.1	104.2
12	60.0	493.214	0.49	2.48	64	64	6	316	69.4	104.2
Traverse 2	0.0	493.214								
1	5.0	497.140	0.42	2.11	63	63	6	318	1.5	103.8
2	10.0	501.120	0.43	2.17	63	63	6	317	4.7	104.0
3	15.0	505.190	0.45	2.27	63	63	6	318	8.4	104.0
4	20.0	509.130	0.42	2.12	63	63	6	317	12.5	104.1
5	25.0	513.020	0.41	2.07	63	63	6	317	17.7	104.0
6	30.0	516.910	0.41	2.07	63	63	6	317	25.2	104.0
7	35.0	520.240	0.30	1.51	63	63	6	316	45.6	103.9
8	40.0	523.400	0.27	1.36	64	64	6	317	53.2	103.2
9	45.0	526.440	0.25	1.25	64	64	6	316	58.3	103.6
10	50.0	529.360	0.23	1.16	64	64	6	317	62.5	103.8
11	55.0	532.150	0.21	1.06	64	64	6	316	66.1	103.7
12	60.0	534.870	0.20	1.01	64	64	6	316	69.4	103.6
Average:			0.362	1.827	63.4	63.4	3.0	316.1		103.9

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

Date: 22-Nov-21
Run: 1 - Particulate / Metals
Run Time: 11:40 - 13:45

Concentrations:

Particulate	3.73 mg/dscm	0.00163 gr/dscf
	2.09 mg/Acm	0.00091 gr/Acf
	3.31 mg/dscm (@ 11% O2)	0.00145 gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.256 Kg/hr	0.564 lb/hr
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Flue Gas Characteristics:

Flow	1145 dscm/min	40433 dscf/min
	19.08 dscm/sec	674 dscf/sec
	2044 Acm/min	72179 Acf/min

Velocity	13.374 m/sec	43.88 f/sec
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Temperature	154.2 oC	309.6 oF
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Moisture	14.5 %
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Gas Analysis	9.8 % O2
	10.1 % CO2

30.010 Mol. Wt (g/gmole) Dry
28.263 Mol. Wt (g/gmole) Wet

Sample Parameters:

Sample Volume	2.4153 dscm	85.296 dscf
Sample Time	120.0 minutes	
Isokineticity	103.4 %	

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

Client:	Metro Vancouver	Date:	22-Nov-21
Jobsite:	WTE (Burnaby, B.C)	Run:	1 - Particulate / Metals
Source:	Unit 3	Run Time:	11:40 - 13:45

Control Unit (Y)	1.0040	Collection:		Gas Analysis (Vol. %):		Condensate Collection:		
Nozzle Diameter (in.)	0.2923	Filter (grams)	0.00390	Traverse 1	CO2	O2	Impinger 1	162.0
Pitot Factor	0.8461	Washings (grams)	0.00510		Traverse 2	10.00	9.75	Impinger 2
Baro. Press. (in. Hg)	29.99			10.25		9.75	Impinger 3	16.0
Static Press. (in. H2O)	-19.00	Total (grams) 0.00900					Impinger 4	9.0
Stack Height (ft)	30						Impinger 5	5.0
Stack Diameter (in.)	70.90						Impinger 6	3.0
Stack Area (sq.ft.)	27.417						Gel	15.5
Minutes Per Reading	5.0				10.13	9.75	Gain (grams)	308.5
Minutes Per Point	5.0							

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ΔP (in. H2O)	Orifice ΔH (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	919.850								
1	5.0	923.440	0.42	1.83	52	52	5	310	1.5	104.5
2	10.0	927.160	0.45	1.96	53	53	5	312	4.7	104.6
3	15.0	930.880	0.45	1.96	54	54	5	313	8.4	104.5
4	20.0	934.470	0.42	1.83	54	54	5	310	12.5	104.1
5	25.0	937.990	0.40	1.74	53	53	4	309	17.7	104.7
6	30.0	941.580	0.42	1.83	54	54	4	309	25.2	104.0
7	35.0	944.810	0.34	1.48	55	55	6	308	45.6	103.7
8	40.0	947.940	0.32	1.39	56	56	6	308	53.2	103.3
9	45.0	950.970	0.30	1.31	57	57	8	309	58.3	103.2
10	50.0	953.790	0.26	1.13	56	56	8	310	62.5	103.4
11	55.0	956.450	0.23	1.00	57	57	7	311	66.1	103.5
12	60.0	959.070	0.22	0.96	58	58	7	311	69.4	104.0
Traverse 2	0.0	959.070								
1	5.0	962.220	0.32	1.39	57	57	8	310	1.5	103.9
2	10.0	965.410	0.33	1.44	58	58	8	311	4.7	103.5
3	15.0	968.690	0.35	1.52	59	59	8	310	8.4	103.1
4	20.0	971.970	0.35	1.52	59	59	8	310	12.5	103.1
5	25.0	975.100	0.32	1.39	60	60	6	310	17.7	102.7
6	30.0	978.240	0.32	1.39	60	60	6	311	25.2	103.1
7	35.0	982.420	0.57	2.48	60	60	6	311	45.6	103.1
8	40.0	986.710	0.60	2.61	61	61	6	310	53.2	102.9
9	45.0	991.080	0.62	2.70	61	61	5	305	58.3	102.8
10	50.0	995.070	0.52	2.26	62	62	5	305	62.5	102.2
11	55.0	998.860	0.47	2.04	62	62	4	307	66.1	102.2
12	60.0	1002.580	0.45	1.96	63	63	4	310	69.4	102.5
Average:			0.394	1.713	57.5	57.5	6.0	309.6		103.4

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

Date: 23-Nov-21
Run: 2 - Particulate / Metals
Run Time: 09:36 - 11:38

Concentrations:

Particulate	0.91 mg/dscm	0.00040 gr/dscf
	0.51 mg/Acm	0.00022 gr/Acf
	0.77 mg/dscm (@ 11% O2)	0.00034 gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.059 Kg/hr	0.131 lb/hr
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Flue Gas Characteristics:

Flow	1085 dscm/min	38314 dscf/min
	18.08 dscm/sec	639 dscf/sec
	1953 Acm/min	68975 Acf/min

Velocity	12.780 m/sec	41.93 f/sec
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Temperature	156.4 oC	313.5 oF
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Moisture	14.4 %
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Gas Analysis	9.1 % O2
	10.9 % CO2

30.105 Mol. Wt (g/gmole) Dry
28.364 Mol. Wt (g/gmole) Wet

Sample Parameters:

Sample Volume	2.4641 dscm	87.019 dscf
Sample Time	120.0 minutes	
Isokineticity	100.3 %	

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

Client:	Metro Vancouver	Date:	23-Nov-21
Jobsite:	WTE (Burnaby, B.C)	Run:	2 - Particulate / Metals
Source:	Unit 3	Run Time:	09:36 - 11:38

Control Unit (Y)	1.0032	Collection:	Gas Analysis (Vol. %):	Condensate Collection:
Nozzle Diameter (in.)	0.3080	Filter (grams) 0.00220	CO2 O2	Impinger 1 166.0
Pitot Factor	0.8461	Washings (grams) 0.00005	11.00 9.00	Impinger 2 100.0
Baro. Press. (in. Hg)	29.84	Traverse 1	10.75 9.25	Impinger 3 18.0
Static Press. (in. H2O)	-19.00	Traverse 2		Impinger 4 6.0
Stack Height (ft)	30	Total (grams) 0.00225		Impinger 5 3.0
Stack Diameter (in.)	70.90			Impinger 6 1.0
Stack Area (sq.ft.)	27.417			Gel 16.7
Minutes Per Reading	5.0		10.88 9.13	Gain (grams) 310.7
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	912.400								
1	5.0	915.550	0.27	1.36	68	68	4	320	1.5	100.1
2	10.0	918.750	0.28	1.41	66	66	4	318	4.7	100.1
3	15.0	922.150	0.32	1.60	60	60	4	313	8.4	100.4
4	20.0	925.330	0.28	1.40	60	60	4	314	12.5	100.4
5	25.0	928.560	0.29	1.45	60	60	5	315	17.7	100.3
6	30.0	931.840	0.30	1.50	60	60	5	315	25.2	100.1
7	35.0	936.080	0.50	2.50	60	60	5	315	45.6	100.5
8	40.0	940.320	0.50	2.50	60	60	5	315	53.2	100.5
9	45.0	944.610	0.51	2.55	60	60	5	314	58.3	100.6
10	50.0	948.860	0.50	2.51	60	60	5	313	62.5	100.6
11	55.0	952.940	0.46	2.32	60	60	5	309	66.1	100.4
12	60.0	956.890	0.43	2.17	60	60	5	308	69.4	100.4
Traverse 2	0.0	956.890								
1	5.0	960.690	0.40	2.01	61	61	4	314	1.5	100.3
2	10.0	964.540	0.41	2.05	61	61	4	315	4.7	100.5
3	15.0	968.530	0.44	2.21	61	61	4	314	8.4	100.5
4	20.0	972.650	0.47	2.36	61	61	4	314	12.5	100.4
5	25.0	976.830	0.48	2.42	62	62	4	313	17.7	100.6
6	30.0	980.830	0.44	2.21	62	62	4	313	25.2	100.5
7	35.0	983.600	0.21	1.06	63	63	4	312	45.6	100.2
8	40.0	986.430	0.22	1.11	63	63	4	312	53.2	100.0
9	45.0	989.390	0.24	1.21	63	63	4	311	58.3	100.1
10	50.0	992.350	0.24	1.21	63	63	4	311	62.5	100.1
11	55.0	995.180	0.22	1.11	63	63	4	312	66.1	100.0
12	60.0	997.950	0.21	1.06	63	63	4	313	69.4	100.2
Average:			0.359	1.804	61.7	61.7	4.3	313.5		100.3

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

Date: 23-Nov-21
Run: 3 - Particulate / Metals
Run Time: 12:06 - 14:08

Concentrations:

Particulate	4.27 mg/dscm	0.00187 gr/dscf
	2.31 mg/Acm	0.00101 gr/Acf
	3.63 mg/dscm (@ 11% O2)	0.00159 gr/dscf (@ 11% O2)

Emission Rates:

Particulate	0.273 Kg/hr	0.602 lb/hr
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Flue Gas Characteristics:

Flow	1065 dscm/min	37610 dscf/min
	17.75 dscm/sec	627 dscf/sec
	1970 Acf/min	69556 Acf/min

Velocity	12.888 m/sec	42.28 f/sec
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Temperature	154.7 oC	310.5 oF
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Moisture	17.0 %
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Gas Analysis	9.3 % O2
	10.8 % CO2

30.090 Mol. Wt (g/gmole) Dry
28.037 Mol. Wt (g/gmole) Wet

Sample Parameters:

Sample Volume	2.4822 dscm	87.658 dscf
Sample Time	120.0 minutes	
Isokineticity	102.9 %	

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

Client:	Metro Vancouver	Date:	23-Nov-21
Jobsite:	WTE(Burnaby,B.C)	Run:	3 - Particulate / Metals
Source:	Unit 3	Run Time:	12:06 - 14:08

Control Unit (Y)	1.0032	Collection:	Gas Analysis (Vol. %):	Condensate Collection:
Nozzle Diameter (in.)	0.3080	Filter (grams) 0.00430	CO2 O2	Impinger 1 234.0
Pitot Factor	0.8461	Washings (grams) 0.00630	Traverse 1 10.50 9.50	Impinger 2 74.0
Baro. Press. (in. Hg)	29.84		Traverse 2 11.00 9.00	Impinger 3 36.0
Static Press. (in. H2O)	-19.00	Total (grams) 0.01060		Impinger 4 12.0
Stack Height (ft)	30			Impinger 5 6.0
Stack Diameter (in.)	70.90			Impinger 6 2.0
Stack Area (sq.ft.)	27.417			Gel 17.0
Minutes Per Reading	5.0		10.75 9.25	Gain (grams) 381.0
Minutes Per Point	5.0			

Traverse / Point	Time (min.)	Dry Gas Meter (ft3)	Pitot ^P (in. H2O)	Orifice ^H (in. H2O)	Dry Gas Inlet (oF)	Dry Gas Temperature Outlet (oF)	Vacuum (in. Hg.)	Stack Temp. (oF)	Wall Dist. (in.)	Isokin. (%)
Traverse 1	0.0	0.100								
1	5.0	4.040	0.42	2.14	63	63	7	307	1.5	103.2
2	10.0	8.050	0.44	2.22	63	63	7	313	4.7	103.1
3	15.0	12.140	0.46	2.32	63	63	8	314	8.4	102.9
4	20.0	16.230	0.46	2.32	62	62	8	311	12.5	102.9
5	25.0	20.400	0.48	2.41	61	61	8	312	17.7	103.0
6	30.0	24.170	0.39	1.97	62	62	8	310	25.2	102.9
7	35.0	27.070	0.23	1.16	62	62	5	310	45.6	102.8
8	40.0	29.900	0.22	1.11	62	62	5	310	53.2	102.6
9	45.0	32.930	0.25	1.27	63	63	5	310	58.3	102.9
10	50.0	35.960	0.25	1.27	63	63	5	310	62.5	102.9
11	55.0	38.920	0.24	1.21	63	63	5	311	66.1	102.6
12	60.0	41.760	0.22	1.11	63	63	5	311	69.4	102.8
Traverse 2	0.0	41.760								
1	5.0	44.660	0.23	1.16	63	63	5	311	1.5	102.7
2	10.0	47.680	0.25	1.26	63	63	5	311	4.7	102.6
3	15.0	50.770	0.26	1.32	64	64	5	311	8.4	102.8
4	20.0	53.920	0.27	1.37	64	64	5	311	12.5	102.8
5	25.0	56.950	0.25	1.27	64	64	6	311	17.7	102.8
6	30.0	60.040	0.26	1.32	64	64	6	311	25.2	102.8
7	35.0	64.200	0.47	2.39	65	65	9	310	45.6	102.9
8	40.0	68.660	0.54	2.74	65	65	9	310	53.2	103.0
9	45.0	73.290	0.58	2.95	65	65	10	309	58.3	103.2
10	50.0	77.960	0.59	3.00	65	65	10	310	62.5	103.3
11	55.0	82.310	0.51	2.60	66	66	10	309	66.1	103.1
12	60.0	86.571	0.49	2.50	66	66	10	309	69.4	103.0
Average:			0.365	1.850	63.5	63.5	6.9	310.5		102.9

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

Sample Type: HF

Parameter		Test 1	Test 2	Test 3
Test Date		19-Nov-21	19-Nov-21	19-Nov-21
Test Time		11:05 - 12:05	12:21 - 13:21	13:34 - 14:34
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	30.03	30.03	30.03
DGM Factor	(Y)	1.0189	1.0189	1.0189
Initial Reading	(m ³)	72.863	73.459	74.071
Final Reading	(m ³)	73.450	74.068	74.661
Temp. Outlet	(Avg. oF)	51.5	57.5	58.5
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm ³)	0.62	0.64	0.61
HF	(mg)	0.012	0.009	0.009
Oxygen	(Vol. %)	9.7	9.7	9.3
HF	(mg/Sm ³)	0.020	0.015	0.015
HF	(mg/Sm ³ @ 11% O2)	0.017	0.013	0.013
Moisture	(Vol. %)	17.5	17.5	17.2

Tstd. (oF)

68

Pstd. (in. Hg)

29.92

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

Sample Type: NH₃

Parameter		Test 1	Test 2	Test 3
Test Date		19-Nov-21	19-Nov-21	19-Nov-21
Test Time		11:05 - 12:05	12:21 - 13:21	13:34 - 14:34
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	30.03	30.03	30.03
DGM Factor	(Y)	1.0316	1.0316	1.0316
Initial Reading	(m ³)	176.242	176.754	177.290
Final Reading	(m ³)	176.746	177.284	177.842
Temp. Outlet	(Avg. oF)	51.6	66.5	68.5
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm ³)	0.54	0.55	0.57
NH ₃	(mg)	8.4	7.2	5.8
Oxygen	(Vol. %)	9.7	9.7	9.3
NH ₃	(mg/Sm ³)	15.5	13.1	10.1
NH ₃	(mg/Sm ³ @ 11% O2)	13.6	11.5	8.7
Moisture	(Vol. %)	17.5	17.5	17.2

Tstd. (oF)

68

Pstd. (in. Hg)

29.92

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

Sample Type: HF

Parameter		Test 1	Test 2	Test 3
Test Date		22-Nov-21	22-Nov-21	22-Nov-21
Test Time		10:09 - 11:09	11:19 - 12:129	12:29 - 13:29
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	29.98	29.98	29.98
DGM Factor	(Y)	1.0190	1.0190	1.0190
Initial Reading	(m ³)	74.668	75.226	75.782
Final Reading	(m ³)	75.221	75.778	76.341
Temp. Outlet	(Avg. oF)	54.5	61.5	62.5
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm ³)	0.58100	0.57102	0.57799
HF	(mg)	0.009	0.009	0.003
Oxygen	(Vol. %)	9.5	8.3	8.3
HF	(mg/Sm³)	0.016	0.015	0.005
HF	(mg/Sm³ @ 11% O2)	0.014	0.012	0.004
Moisture (isokinetic)	(Vol. %)	18.8	18.8	18.0

*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: NH₃

Parameter		Test 1	Test 2	Test 3
Test Date		22-Nov-21	22-Nov-21	22-Nov-21
Test Time		10:09 - 11:09	11:19 - 12:19	12:29 - 13:29
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	29.98	29.98	29.98
DGM Factor	(Y)	1.0316	1.0316	1.0316
Initial Reading	(m ³)	177.853	178.350	178.871
Final Reading	(m ³)	178.344	178.864	179.439
Temp. Outlet	(Avg. oF)	54.5	67.0	67.0
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm ³)	0.52128	0.53297	0.58917
NH ₃	(mg)	7.3	4.7	1.0
Oxygen	(Vol. %)	9.5	8.3	8.3
NH₃	(mg/Sm³)	13.9	8.7	1.6
NH₃	(mg/Sm³ @ 11% O2)	12.0	6.9	1.3
Moisture (isokinetic)	(Vol. %)	18.8	18.8	18.0

*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: HF		Test 1	Test 2	Test 3
Parameter				
Test Date		23-Nov-21	23-Nov-21	23-Nov-21
Test Time		09:47 - 10:47	10:57 - 11:57	12:15 - 13:15
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	29.84	29.84	29.84
DGM Factor	(Y)	1.0189	1.0189	1.0189
Initial Reading	(m ³)	76.351	76.915	77.493
Final Reading	(m ³)	76.911	77.489	78.068
Temp. Outlet	(Avg. oF)	55.0	62.0	62.0
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm ³)	0.58457	0.59072	0.59175
HF	(mg)	0.007	0.006	0.008
Oxygen	(Vol. %)	9.1	9.1	9.3
HF	(mg/Sm³)	0.011	0.010	0.014
HF	(mg/Sm³ @ 11% O2)	0.009	0.008	0.012
Moisture (isokinetic)	(Vol. %)	14.4	14.4	17.0

*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		Test 1	Test 2	Test 3
Parameter				
Test Date		23-Nov-21	23-Nov-21	23-Nov-21
Test Time		09:47 - 10:47	10:57 - 11:57	12:15 - 13:15
Test Duration	(min.)	60	60	60
Baro. Press.	(in. Hg)	29.84	29.84	29.84
DGM Factor	(Y)	1.0316	1.0316	1.0316
Initial Reading	(m ³)	179.447	180.038	180.608
Final Reading	(m ³)	180.034	180.604	181.197
Temp. Outlet	(Avg. oF)	77.5	85.5	90.5
Orifice Press.	(ΔH in.H2O)	0.50	0.50	0.50
Gas Volume	(Sm ³)	0.59408	0.56433	0.58172
NH ₃	(mg)	0.7	0.6	0.1
Oxygen	(Vol. %)	9.1	9.1	9.3
NH₃	(mg/Sm³)	1.1	1.0	0.2
NH₃	(mg/Sm³ @ 11% O2)	1.0	0.8	0.2
Moisture (isokinetic)	(Vol. %)	14.4	14.4	17.0

*Wet Basis Calculated on moisture from isokinetic tests
Tstd. (oF) 68

Pstd. (in. Hg) 29.92

APPENDIX - D

FIELD DATA SHEETS

[illegible]

[illegible]

[illegible]

0.3073

[illegible]

[illegible]

V334

435AH

JH

CLIENT MV WTE					NOZZLE G-292		DIAMETER, IN. 2923		IMPINGER		INITIAL	FINAL	TOTAL GAIN		
SOURCE UNIT #3					PROBE 7C		Cp .8461		VOLUMES	(mL)	(mL)	(mL)			
PARAMETER / RUN No 1 METALS/PARTIC					PORT LENGTH				Imp. #1	0	267	163			
DATE NOV. 22/21					STATIC PRESSURE, IN. H ₂ O -19.00				Imp. #2	100	198	98			
OPERATOR: CIL #2.A					STACK DIAMETER 30.90				Imp. #3	100	116	16			
CONTROL UNIT FE 18					STACK HEIGHT 30				Imp. #4	0	9	9			
BAROMETRIC PRESSURE, IN. Hg 29.99					INITIAL LEAK TEST 0.004 @ 15"				Imp. #5	100	185	5			
ASSUMED MOISTURE, Bw 53					FINAL LEAK TEST 0.002 @ 15"				Imp. #6	100	103	3			
					Upstream Diameters				Downstream Diameters						
min Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Temperature °F					Pump Vac. IN. Hg	Fyrites				
					Dry Gas Outlet	Stack	Probe	Box	Impinger Exit		CO ₂ Vol. %	O ₂ Vol. %			
1	11:40	919.850													
2		923.44	.42	1.83	52	310	250	250	52	4					
3		927.16	.45	1.96	52	313	250	250	52	4	10.0	10.0			
4		930.88	.45	1.96	54	313	250	250	52	4					
5		934.60	.42	1.83	54	310	250	250	52	4					
6		937.99	.40	1.74	53	309	250	250	50	4					
7		941.58	.42	1.83	54	309	250	250	50	4					
8		944.81	.34	1.48	55	308	250	250	49	4	10.0	9.5			
9		947.92	.32	1.39	56	308	250	250	49	4					
10		950.94	.38	1.31	57	309	250	250	49	4					
11		953.78	.35	1.13	56	310	250	250	49	4					
12		956.45	.35	1.13	56	310	250	250	49	4					
13		959.07	.32	1.00	57	311	250	250	50	4					
14			.32	.96	58	311	250	250	50	4					
15															
16		962.32	.32	1.39	57	310	250	250	48	4					
17		965.41	.35	1.44	58	311	250	250	48	4	10.0	10.0			
18		968.69	.35	1.52	59	310	250	250	48	4					
19		971.97	.35	1.52	59	310	250	250	48	4					
20		975.10	.32	1.39	60	310	250	250	50	4					
21		978.24	.32	1.39	60	311	250	250	50	4					
22		982.42	.57	2.48	60	311	250	250	52	5					
23		986.71	.60	2.61	61	310	250	250	52	5	10.5	9.5			
24		991.08	.62	2.70	61	305	250	250	52	4					
25		995.07	.50	2.36	62	305	250	250	52	4					
26		998.86	.47	2.21	62	305	250	250	51	4					
27	13:45	1002.58	.45	1.96	63	310	250	250	51	4					

CLIENT <u>MV WTE</u>				NOZZLE <u>G-308</u>		DIAMETER, IN. <u>0.3080</u>		IMPINGER, INITIAL		FINAL		TOTAL GAIN		
SOURCE <u>UNIT #3</u>				PROBE <u>7C</u>		Cp <u>0.8461</u>		VOLUMES (mL)		(mL)		(mL)		
PARAMETER / RUN No <u>PARTIC/PANLS/Hy rem #2</u>				PORT LENGTH		Imp. #1 <u>100</u>		<u>466</u>		<u>366</u>				
DATE <u>NOV. 23, 2001</u>				STATIC PRESSURE, IN. H2O <u>19.0</u>		Imp. #3 <u>100</u>		<u>118</u>		<u>18</u>				
OPERATOR <u>GF</u>				STACK DIAMETER		Imp. #4 <u>0</u>		<u>6</u>		<u>6</u>				
CONTROL UNIT <u>ST CAC 2</u>				STACK HEIGHT		Imp. #5 <u>100</u>		<u>103</u>		<u>3</u>				
Y <u>10032</u>						Imp. #6 <u>100</u>		<u>101</u>		<u>1</u>				
ΔH@ <u>1.848</u>						Imp. #7 <u>66L</u>								
BAROMETRIC PRESSURE, IN. Hg <u>29.84</u>				INITIAL LEAK TEST <u>0.002</u>		<u>0.15" Hg</u>		Upstream Diameters						
ASSUMED MOISTURE, Bw <u>M%</u>				FINAL LEAK TEST		<u>0.15" Hg</u>		Downstream Diameters						
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H2O	Orifice ΔH IN. H2O	Temperature °F					Pump Vac. IN. Hg	Fyriles			
					Dry Gas Outlet	Stack	Probe	Box	Impinger Exit		CO ₂ Vol. %	O ₂ Vol. %		
1		912.400												
2	10	915.55	0.27	1.36	68	320	249	266	64	3.5	11	9		
3		918.75	0.28	1.41	66	318								
4	20	922.75	0.32	1.60	60	313								
5		928.32	0.28	1.40	60	314	249	261	58	3.5				
6	30	938.50	0.29	1.45	60	315								
7		938.81	0.30	1.50	60	315								
8	40	945.08	0.50	2.50	60	315	250	252	52	4.5	11	9		
9		940.32	0.50	2.50	60	315								
10	50	944.61	0.51	2.56	60	314								
11		948.86	0.50	2.51	60	313	251	262	52	4.5				
12	60	952.94	0.46	2.32	60	309								
		956.89	0.43	2.17	60	308								
1		960.69	0.40	2.01	61	314	248	259	51	4	11	9		
2	10	964.54	0.41	2.05	61	315								
3		968.53	0.44	2.21	61	314								
4	20	972.65	0.47	2.36	61	314	248	261	51	4				
5		976.83	0.48	2.42	62	313								
6	30	980.83	0.44	2.21	62	313								
7		983.60	0.21	1.06	63	312	249	262	51	3.5	10.5	9.5		
8	40	986.43	0.22	1.11	63	312								
9		989.39	0.24	1.21	63	311								
10	50	992.35	0.24	1.21	63	311	248	260	51	3.5				
11		995.18	0.22	1.11	63	312								
12	60	997.950	0.21	1.06	63	313								

CLIENT MV W16					NOZZLE Q-308		DIAMETER, IN. 0.3080		IMPINGER		INITIAL		FINAL		TOTAL GAIN	
SOURCE UNIT #3					PROBE 7C		Cp 0.8461		VOLUMES		(mL)		(mL)		(mL)	
PARAMETER / RUN No MGTMS/100DC/Hy Rm #3					PORT LENGTH				Imp. #1		1000		2.34		2.34	
DATE Nov. 23, 2001					STATIC PRESSURE, IN. H2O -19.0				Imp. #2		100		1.74		7.4	
OPERATOR: GF					STACK DIAMETER				Imp. #3		100		1.36		3.6	
CONTROL UNIT STAGE 2					STACK HEIGHT				Imp. #4		100		1.2		1.2	
Y 1.0032									Imp. #5		100		1.06		6	
ΔH@ 1.846									Imp. #6		100		1.02		2	
BAROMETRIC PRESSURE, IN. Hg 29.84					INITIAL LEAK TEST 0-002 @ 15" Hy				Upstream Diameters							
ASSUMED MOISTURE, Bw 1.16					FINAL LEAK TEST				Downstream Diameters							
Point	Clock Time	Dry Gas Meter ft ³	Pitot ΔP IN. H ₂ O	Orifice ΔH IN. H ₂ O	Temperature °F					Pump Vac. IN. Hg	Fyrites					
					Dry Gas Outlet	Stack	Probe	Box	Impinger Exit		CO ₂ Vol. %	O ₂ Vol. %				
1		0.100														
2	10	4.04	.42	2.14	63	304	250	248	56	7	10.5	9.5				
3		8.05	.44	2.22	63	313										
4	20	12.14	.46	2.32	63	314										
5		16.23	.46	2.32	62	311	250	258	51	7.5						
6	30	20.40	.48	2.41	61	312										
7		24.17	.49	1.97	62	310										
8	40	27.07	.23	1.16	62	310	251	250	51	5	10.5	9.5				
9		29.90	.22	1.11	62	310										
10	50	32.93	.24	1.27	63	310										
11		35.96	.25	1.27	63	310	247	256	50	5						
12	60	38.92	.24	1.21	63	311										
		41.76	.22	1.11	63	311										
1		44.66	.23	1.16	63	311	248	260	49	5.5	11	9				
2	10	47.68	.25	1.26	63	311										
3		50.77	.26	1.32	64	311										
4	20	53.92	.27	1.37	64	311	249	260	49	5.5						
5		56.95	.25	1.27	64	311										
6	30	60.04	.26	1.32	64	311										
7		64.20	.47	2.37	65	310	248	260	49	5.5	11	9				
8	40	68.66	.54	2.74	65	310										
9		73.29	.58	2.95	65	309										
10	50	77.96	.59	3.00												

A. Lanfranco and Associates Inc.

SH

Client COVANTA Y LMU-C 1.0189
 Source _____ Cp _____
 Parameter HF Pbar 30.03 Static _____
 Date NOV. 19/21 Operator Liam/Simon

Client MV WTE Y LMU-B 1.0316
 Source Unit #1 Cp _____
 Parameter NH3 Pbar 30.03 Static _____
 Date NOV. 19/21 Operator Liam/Simon

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

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) / (m³)	Temperature (°F)		Imp. Vol. (mL)	ΔP IN. H₂O		
			DGM Outlet	Stack		R1	R2	R3
1	11:05	72.8628	50					
2	12:05	73.4504	53					
3	12:21	73.4590	52					
3	1:21	74.0678	63					
3	1:34	74.0710	66					
3	2:34	74.6606	57					

Test No.	Time (hhmm)	DGM Volume (cu ft) / (m³)	Temperature (°F)		Imp. Vol. (mL)	ΔP IN. H₂O		
			DGM Outlet	Stack		R1	R2	R3
1	11:05	176.2418	50.1					
2	12:05	176.7460	53					
2	12:21	176.7542	64					
3	1:21	177.2842	69					
3	1:34	177.2896	68					
3	2:34	177.8416	69					

S.H.

A. Lanfranco and Associates Inc.

Client MU WTE Y LMU-C 1.0/89
 Source Unit #2 Cp
 Parameter HF Pbar 29.98 Static
 Date Nov. 22/21 Operator Liam/Simon

Client MU WTE Y LMU-B 1.03/6
 Source Unit #2 Cp
 Parameter NH3 Pbar 29.98 Static
 Date Nov. 22/21 Operator Liam/Simon

Leak Check	Run 1	Run 2	Run 3
Initial	0.000	0.000	0.000
Final	0.000	0.000	0.000

Leak Check	Run 1	Run 2	Run 3
Initial	0.000	0.000	0.000
Final	0.000	0.000	0.000

Test No.	Time (hhmm)	DGM Volume (cu ft) / (m³)	Temperature (°F)		Imp. Vol. (mL)	ΔP IN. H₂O		
			DGM Outlet	Stack		R1	R2	R3
1	10:09	74.6676	50					
	11:09	75.2214	59					
2	11:19	75.2259	60					
	12:19	75.7776	63					
3	12:29	75.7815	60					
	1:29	76.3410	65					

Test No.	Time (hhmm)	DGM Volume (cu ft) / (m³)	Temperature (°F)		Imp. Vol. (mL)	ΔP IN. H₂O		
			DGM Outlet	Stack		R1	R2	R3
1	10:09	177.8532	50					
	11:09	178.3440	59					
2	11:19	178.3504	67					
	12:19	178.8644	67					
3	12:29	178.8710	66					
	1:29	179.4392	68					

A. Lanfranco and Associates Inc.

S.H.

Client MV WTE Y LMU-C 10/89
 Source Unit 3 Cp 29.84 Static Static
 Parameter HF Pbar 29.84 Static Static
 Date Nov. 23/21 Operator Liam/Simon

Client MV WTE Y LMU-B 1.03/6
 Source Unit 3 Cp 29.84 Static Static
 Parameter NH3 Pbar 29.84 Static Static
 Date Nov. 23/21 Operator Liam/Simon

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

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) / (m³)	Temperature (°F)		Imp. Vol. (mL)	ΔP IN. H ₂ O		
			DGM Outlet	Stack		R1	R2	R3
1	9:47	76.3506	48					
	10:47	76.9110	62					
2	10:57	76.9150	59					
	11:57	77.4890	65					
3	12:15	77.4928	59					
	1:15	78.0678	65					

Test No.	Time (hhmm)	DGM Volume (cu ft) / (m³)	Temperature (°F)		Imp. Vol. (mL)	ΔP IN. H ₂ O		
			DGM Outlet	Stack		R1	R2	R3
1	9:47	179.4465	49					
	10:47	180.0336	65					
2	10:57	180.0380	63					
	11:57	180.6040	66					
3	12:15	180.6082	61					
	1:15	181.1970	66					

Canister sampling sheet

Plant MV LIE
File No. _____Test Date NOV. 19, 2021
Recovery Date _____Source: UNET#1

	Run#1	Run#2	Run#3			
Pbar in hg	30.03	30.03	30.03			
Canister number	SC00658	SC00315	SC00374			
Controller number	0A02014	0A00152	0A01156			
Initial: Start time	12:45	12:20	13:40			
Flask Vac. (in Hg)	-30	-30	-29			
Final: Finish time	10:45	13:20	14:40			
Flask Vac. (in Hg)	-8	-8	14:40 -6			

Source: UNET#2 NOV. 22, 2021

	Run#1	Run#2	Run#3			
Pbar in hg	29.98	29.98	29.98			
Canister number	SC01479	SC00303	SC02040			
Controller number	0A00843	0A01501	0A00100			
Initial: Start time	09:58	11:42	13:00			
Flask Vac. (in Hg)	-28	-27	-30			
Final: End time	10:58	12:42	14:00			
Flask Vac. (in Hg)	-10	-6	-7			

Source: UNET#3 NOV. 23, 2021

	Run#1	Run#2	Run#3			
Pbar in hg	29.84	29.84	29.84			
Canister number	SC01882	SC01973	0A01616			
Controller number	0A00023	0A00465	SC00568			
Initial: Start time	09:49	11:01	12:25			
Flask Vac. (in Hg)	-30	-29	-30			
Final: End time	10:49	12:01	13:25			
Flask Vac. (in Hg)	-9	-6	-6			

Source: _____

Pbar in hg						
Canister number						
Controller number						
Initial: Start time						
Flask Vac. (in Hg)						
Final: End time						
Flask Vac. (in Hg)						

Client	Source	Date
--------	--------	------

Metso Van WTE
Unit 1 (Sampled 19 Nov 2021)
Analyzed 22 Nov 2021

Technician _____
Ambient Temp (°C) _____
Barometric Pressure (in. Hg) _____

LA

[illegible]

Analyzer Range	O ₂	CO ₂	CO	THC	SO ₂	NO _x

[illegible]

APPENDIX – E

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: 29-Jun-21
Barometric Pressure: 29.63 (in. Hg)
Theoretical Critical Vacuum: 13.98 (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)^{0.5}/(min)).
!!!!!!!

----- DRY GAS METER READINGS -----									-CRITICAL ORIFICE READINGS-					
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps.		Final Temps.		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	-- Ambient Temperature --		
					Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)				Initial (deg F)	Final (deg F)	Average (deg F)
3.75	30.00	554.900	587.654	32.754	86.0	86.0	88.0	88.0	73	0.8185	18.0	81.0	93.0	87.0
1.90	31.00	588.300	612.913	24.613	88.0	88.0	90.0	90.0	63	0.5956	20.5	91.0	86.0	88.5
1.20	24.00	613.200	628.140	14.940	90.0	90.0	91.0	91.0	55	0.4606	22.0	89.0	90.0	89.5
0.68	41.00	628.400	647.782	19.382	91.0	91.0	91.0	91.0	48	0.3560	24.0	92.0	92.0	92.0
0.35	29.00	648.000	657.411	9.411	91.0	91.0	91.0	91.0	40	0.2408	25.0	95.0	93.0	94.0

***** RESULTS *****															
--- DRY GAS METER ---			----- ORIFICE -----		-- DRY GAS METER --			----- ORIFICE -----							
VOLUME CORRECTED	VOLUME CORRECTED		VOLUME CORRECTED	VOLUME CORRECTED	VOLUME NOMINAL	CALIBRATION FACTOR		CALIBRATION FACTOR							
Vm(std) (cu ft)	Vm(std) (liters)		Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)	Value (number)	Y Variation (number)	dH@							
						Value (number)	Variation (number)	Value (in H2O)	Value (mm H2O)	Variation (in H2O)				Ko (value)	
31.589	894.6		31.108	881.0	32.556	0.985	-0.004	1.875	47.63	-0.003				0.701	
23.543	666.7		23.359	661.5	24.514	0.992	0.004	1.793	45.53	-0.086				0.713	
14.227	402.9		13.973	395.7	14.690	0.982	-0.006	1.891	48.04	0.013				0.702	
18.417	521.6		18.408	521.3	19.440	1.000	0.011	1.801	45.74	-0.078				0.708	
8.935	253.0		8.791	249.0	9.318	0.984	-0.005	2.033	51.64	0.154				0.677	
Average Y----->						0.9885		Average dH@----->		1.879		47.7	Average Ko----->		0.700

TEMPERATURE CALIBRATION				
Calibration Standard ----->		Omega Model CL23A S/N:T-218768		
Reference Temperature Set-Point (deg F)	Temperature Device Reading (deg F)	Results		
		Variation (degF)	Percent of Absolute	
32	32	0	0.00%	
100	100	0	0.00%	
300	300	0	0.00%	
500	500	0	0.00%	
1000	1000	0	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 H2O that equates to 0.75 cm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +0.2.
For Temperature Device, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Scott Ferguson

Signature:



Date: June 29, 2021

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: **29-Jun-21**
Barometric Pressure: **29.63** (in. Hg)
Theoretical Critical Vacuum: **13.98** (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)^{0.5}(min)).
!!!!!!!

----- DRY GAS METER READINGS -----									-CRITICAL ORIFICE READINGS-					
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps.		Final Temps.		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	-- Ambient Temperature --		
					Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)				Initial (deg F)	Final (deg F)	Average (deg F)
3.75	15.00	839.100	855.399	16.299	86.0	86.0	86.0	86.0	73	0.8185	14.0	83.0	86.0	84.5
1.95	15.00	855.000	866.702	11.702	86.0	86.0	86.0	86.0	63	0.5956	16.0	86.0	85.0	85.5
1.15	15.00	868.400	877.535	9.135	86.0	86.0	87.0	87.0	55	0.4606	18.0	86.0	88.0	87.0
0.68	15.00	878.000	884.950	6.950	87.0	87.0	87.0	87.0	48	0.3560	19.0	87.0	89.0	88.0
0.33	15.00	885.300	890.056	4.756	87.0	87.0	87.0	87.0	40	0.2408	20.0	88.0	90.0	89.0

***** RESULTS *****														
--- DRY GAS METER ---			----- ORIFICE -----		-- DRY GAS METER --			----- ORIFICE -----						
VOLUME CORRECTED	VOLUME CORRECTED		VOLUME CORRECTED	VOLUME CORRECTED	VOLUME NOMINAL	CALIBRATION FACTOR		CALIBRATION FACTOR						
Vm(std) (cu ft)	Vm(std) (liters)		Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)	Value (number)	Variation (number)	Y		dH@		Variation (in H2O)	Ko (value)	
						Value (in H2O)	Value (mm H2O)	Variation (in H2O)						
15.748	446.0		15.590	441.5	16.241	0.990	-0.013	1.870	47.50	0.022			0.709	
11.256	318.8		11.334	321.0	11.829	1.007	0.004	1.840	46.73	-0.009			0.704	
8.762	248.1		8.753	247.9	9.160	0.999	-0.004	1.818	46.17	-0.031			0.715	
6.652	188.4		6.759	191.4	7.087	1.016	0.013	1.801	45.74	-0.048			0.706	
4.548	128.8		4.568	129.4	4.798	1.004	0.001	1.914	48.60	0.065			0.694	
Average Y----->						1.0032	Average dH@----->		1.848	46.9	Average Ko----->		0.706	

TEMPERATURE CALIBRATION			
Calibration Standard ----->		Omega Model CL23A S/N:T-218768	
Reference Temperature Set-Point (deg F)	Temperature Device Reading (deg F)	Results	
		Variation (degF)	Percent of Absolute
32	32	0	0.00%
100	100	0	0.00%
300	300	0	0.00%
500	500	0	0.00%
1000	1000	0	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 H2O that equates to 0.75 cm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +0.2.
For Temperature Devices, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Justin Ching

Signature:



Date: June 29, 2021

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: 28-Jun-21
Barometric Pressure: 29.65 (in. Hg)
Theoretical Critical Vacuum: 13.99 (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)^{0.5}(min)).
!!!!!!!

----- DRY GAS METER READINGS -----									-CRITICAL ORIFICE READINGS-					
dH (in H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Initial Temps.		Final Temps.		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	-- Ambient Temperature --		
					Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)				Initial (deg F)	Final (deg F)	Average (deg F)
3.75	15.00	635.100	651.301	16.201	84.0	84.0	84.0	84.0	73	0.8185	16.0	80.0	83.0	81.5
1.90	25.00	661.800	681.051	19.251	85.0	85.0	88.0	88.0	63	0.5956	17.0	90.0	90.0	90.0
1.20	15.00	652.000	661.148	9.148	84.0	84.0	86.0	86.0	55	0.4606	18.0	85.0	85.0	85.0
0.70	15.00	681.500	688.480	6.980	89.0	89.0	89.0	89.0	48	0.3560	20.0	89.0	91.0	90.0
0.34	17.00	688.600	694.022	5.422	89.0	89.0	89.0	89.0	40	0.2408	21.5	91.0	96.0	93.5

***** 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)	
15.721	445.2		15.644	443.0	16.196	0.995	-0.009		1.865	47.38	-0.014		0.707	
18.511	524.2		18.825	533.1	19.796	1.017	0.013		1.805	45.84	-0.074		0.705	
8.805	249.4		8.775	248.5	9.144	0.997	-0.007		1.894	48.10	0.015		0.703	
6.661	188.6		6.751	191.2	7.099	1.014	0.010		1.852	47.05	-0.027		0.699	
5.170	146.4		5.159	146.1	5.460	0.998	-0.006		1.979	50.27	0.100		0.687	
Average Y----->						1.0040		Average dH@----->	1.879	47.7		Average Ko----->	0.700	

TEMPERATURE CALIBRATION				
Calibration Standard ----->		Omega Model CL23A S/N:T-218768		
Reference Temperature Set-Point (deg F)	Temperature Device Reading (deg F)	Variation (deg F)	Results Percent of Absolute	
32	32	0	0.00%	
100	100	0	0.00%	
300	300	0	0.00%	
500	500	0	0.00%	
1000	1000	0	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 H2O that equates to 0.75 dm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +0.2.
For Temperature Device, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Scott Ferguson

Signature:



Date: June 28, 2021

A. Lanfranco & Associates Inc.

EPA Method 5
Meter Box Calibration
English Meter Box Units, English K' Factor

Model #: **LMU-C**
Serial #: **Wizit 4615**

Date: **05-Jul-21**
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-					
dH (in H2O)	Time (min)	Volume Initial (m³)	Volume Final (m³)	Volume Total (cu ft)	Initial Temps. Inlet Outlet (deg F) (deg F)		Final Temps. Inlet Outlet (deg F) (deg F)		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	-- Ambient Temperature -- Initial Final Average (deg F) (deg F) (deg F)		
0.00	32.00	49.965	50.382	14.719	76.0	76.0	77.0	77.0	48	0.3560	20.0	75.0	74.0	74.5
0.00	18.00	50.385	50.619	8.274	77.0	77.0	76.0	76.0	48	0.3560	20.0	73.0	77.0	75.0
0.00	17.00	50.630	50.851	7.805	77.0	77.0	78.0	78.0	48	0.3560	20.0	76.0	77.0	76.5

***** RESULTS *****											
--- DRY GAS METER ---			----- ORIFICE -----			-- DRY GAS METER --			----- ORIFICE -----		
VOLUME CORRECTED	VOLUME CORRECTED		VOLUME CORRECTED	VOLUME CORRECTED	VOLUME NOMINAL	CALIBRATION FACTOR Y			CALIBRATION FACTOR dH@		
Vm(std) (cu ft)	Vm(std) (liters)		Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)	Value (number)	Variation (number)		Value (in H2O)	Value (mm H2O)	Variation (in H2O)
14.480	410.1		14.743	417.5	14.931	1.018	-0.001		0.000	0.00	0.000
8.140	230.5		8.289	234.7	8.402	1.018	-0.001		0.000	0.00	0.000
7.664	217.0		7.818	221.4	7.947	1.020	0.001		0.000	0.00	0.000
Average Y----->						1.0189		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 H2O 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 Device, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Justin Ching

Signature: _____



Date: July 5, 2021

A. Lanfranco & Associates inc.

EPA Method 5
Meter Box Calibration
English Meter Box Units, English K' Factor

Model #: **LMU-B**
Serial #: **Wizit 6276**

Date: **05-Jul-21**
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-					
dH (in H2O)	Time (min)	Volume Initial (m³)	Volume Final (m³)	Volume Total (cu ft)	Initial Temps. Inlet (deg F) Outlet (deg F)		Final Temps. Inlet (deg F) Outlet (deg F)		Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (in Hg)	-- Ambient Temperature -- Initial (deg F) Final (deg F) Average (deg F)		
0.00	16.00	159.4450	159.6507	7.264	75.0	75.0	75.0	75.0	48	0.3560	20.0	74.0	76.0	75.0
0.00	15.00	159.6570	159.8493	6.791	76.0	76.0	75.0	75.0	48	0.3560	20.0	75.0	74.0	74.5
0.00	24.00	159.8810	160.1885	10.859	75.0	75.0	76.0	76.0	48	0.3560	20.0	74.0	73.0	73.5

***** RESULTS *****											
--- DRY GAS METER ---			----- ORIFICE -----			-- DRY GAS METER --			----- ORIFICE -----		
VOLUME CORRECTED	VOLUME CORRECTED		VOLUME CORRECTED	VOLUME CORRECTED	VOLUME NOMINAL	CALIBRATION FACTOR Y			CALIBRATION FACTOR dH@		
Vm(std) (cu ft)	Vm(std) (liters)		Vcr(std) (cu ft)	Vcr(std) (liters)	Vcr (cu ft)	Value (number)	Variation (number)		Value (in H2O)	Value (mm H2O)	Variation (in H2O)
7.166	203.0		7.368	208.7	7.469	1.028	-0.003		0.000	0.00	0.000
6.693	189.6		6.911	195.7	6.999	1.033	0.001		0.000	0.00	0.000
10.703	303.1		11.068	313.4	11.187	1.034	0.002		0.000	0.00	0.000
Average Y----->						1.0316		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 H2O 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: Scott Ferguson

Signature: _____



Date: July 5, 2021

Calibration Certificate

Date: 02-Aug-21
Calibrated by: Louis Agassiz
Authorizing Signature: 

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

Ambient Conditions: Temperature: 25 °C Barometric Pressure: 101.42 kPa Relative Humidity: 62%
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 Gas	Initial Evaluation				After Calibration				Certified Value (vol %)
	Instrument Reading (vol %)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (vol %)	% Calibration Error	Pass/Fail	Notes	
Zero	0.6	0.60	Pass		0.3	0.30	Pass		0
O ₂	11.5	0.50	Pass		11.5	0.50	Pass		11.00
Ambient	20.9	0.05	Pass		21.0	0.05	Pass		20.95

Performance Specification: +/- 1% O₂ (absolute diff)

CO Gas	Initial Evaluation				After Calibration				Certified Value (ppm)
	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	
Zero	0	0.0%	Pass		0	0.0%	Pass		0
1 Gas	500	6.0%	Fail	Recalibrated w 2, 3, and 4 gas	472	0.1%	Pass		472
2 Gas	1785	6.4%	Fail		1910	0.2%	Pass		1907
3 Gas	1000	0.5%	Pass		995	0.0%	Pass		995
4 Gas	267	11.1%	Fail		240	0.1%	Pass		240

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

NO Gas	Initial Evaluation				After Calibration				Certified Value (ppm)
	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	
Zero	0	0.0%	Pass		0	0.0%	Pass		0
1 Gas	452	4.5%	Pass	Recalibrated w 2 and 3 gas	473	0.1%	Pass		473
2 Gas	104	3.6%	Pass		100	0.4%	Pass		100.4
3 Gas	253	0.8%	Pass		255	0.0%	Pass		255
4 Gas	49	7.4%	Fail		46	0.8%	Pass		45.64

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

NIST Traceable Calibration Gases:

Cylinder	Cylinder ID Number	Certification Date	Expiration Date	Cylinder Pressure (PSI)	O ₂ (Vol. %)	CO (ppm)	NO (ppm)
Zero Gas (N ₂)	2735278Y	27-Jul-2020	26-Jul-2025	1000	0	0	0
1 Gas	SG9107852B	6-May-2021	5-May-2024	1780	-	471.5	473.4
2 Gas	XC004912B	10-Jun-2021	11-Jun-2029	1900	-	1907	100.4
3 Gas	DT0017994	10-Mar-2017	10-Mar-2025	300	-	995	255
4 Gas	CC428385	7-Apr-2021	8-Apr-2029	1600	-	240.3	45.64
O ₂ /CO ₂	SX30844	16-Mar-2021	17-Mar-2029	1400	11.00	-	-

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

Pitot Tube Calibration

Date: 07-Jul-21
Pbar (in.Hg): 29.92

Temp (R): 530
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)
0.055	0.075	15.5	0.8478	0.0017
0.125	0.170	23.4	0.8489	0.0028
0.250	0.340	33.1	0.8489	0.0028
0.450	0.620	44.4	0.8434	0.0027
0.650	0.900	53.4	0.8413	0.0047
Average :			0.8461	0.0030

Pitot ID: **ST 8A**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.085	0.115	19.3	0.8511	0.0078
0.120	0.165	22.9	0.8443	0.0010
0.175	0.240	27.7	0.8454	0.0021
0.430	0.600	43.4	0.8381	0.0052
0.680	0.950	54.6	0.8376	0.0057
Average :			0.8433	0.0044

Pitot ID: **7A**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.050	0.070	14.8	0.8367	0.0045
0.125	0.170	23.4	0.8489	0.0078
0.300	0.420	36.3	0.8367	0.0045
0.490	0.680	46.3	0.8404	0.0008
0.660	0.910	53.8	0.8431	0.0019
Average :			0.8412	0.0039

Pitot ID: **ST 8B**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.040	0.055	13.2	0.8443	0.0037
0.105	0.145	21.5	0.8425	0.0019
0.150	0.210	25.6	0.8367	0.0039
0.330	0.450	38.0	0.8478	0.0072
0.480	0.680	45.9	0.8318	0.0088
Average :			0.8406	0.0051

Pitot ID: **AL GVRD 1**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.040	0.055	13.2	0.8443	0.0007
0.125	0.170	23.4	0.8489	0.0039
0.250	0.340	33.1	0.8489	0.0039
0.360	0.500	39.7	0.8400	0.0050
0.580	0.800	50.4	0.8430	0.0021
Average :			0.8450	0.0031

Pitot ID: **ST 8C**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.065	0.090	16.9	0.8413	0.0027
0.150	0.210	25.6	0.8367	0.0019
0.270	0.370	34.4	0.8457	0.0071
0.465	0.650	45.1	0.8373	0.0013
0.650	0.920	53.4	0.8321	0.0065
Average :			0.8386	0.0039

Pitot ID: **7C**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.040	0.055	13.2	0.8443	0.0019
0.130	0.180	23.9	0.8413	0.0048
0.250	0.345	33.1	0.8427	0.0034
0.450	0.620	44.4	0.8434	0.0027
0.670	0.890	54.2	0.8590	0.0128
Average :			0.8461	0.0051

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: Michael Goods

Signature: 

Date:

July 7, 2021

A. LANFRANCO and ASSOCIATES INC.

ENVIRONMENTAL CONSULTANTS

GLASS NOZZLE DIAMETER CALIBRATION FORM

Calibrated by: Justin Ching
Date: June 28, 2021

Signature:



Nozzle I.D.	d1 (inch)	d2 (inch)	d3 (inch)	difference (inch)	average dia. (inch)	average area (ft ²)
A	0.1250	0.1240	0.1245	0.0010	0.1245	0.0000845
G-165	0.1640	0.1655	0.1660	0.0020	0.1652	0.0001488
G-178	0.1780	0.1780	0.1790	0.0010	0.1783	0.0001735
J	0.1880	0.1880	0.1880	0.0000	0.1880	0.0001928
E	0.1880	0.1895	0.1882	0.0015	0.1886	0.0001939
Q	0.2070	0.2050	0.2060	0.0020	0.2060	0.0002315
L	0.2112	0.2120	0.2105	0.0015	0.2112	0.0002434
G-218	0.2180	0.2175	0.2190	0.0015	0.2182	0.0002596
G-223	0.2220	0.2230	0.2225	0.0010	0.2225	0.0002700
G-2231	0.2230	0.2230	0.2225	0.0005	0.2228	0.0002708
G-225	0.2245	0.2250	0.2240	0.0010	0.2245	0.0002749
G-2251	0.2230	0.2260	0.2245	0.0030	0.2245	0.0002749
P-18	0.2375	0.2370	0.2380	0.0010	0.2375	0.0003076
G-245	0.2440	0.2450	0.2450	0.0010	0.2447	0.0003265
G-247	0.2450	0.2470	0.2470	0.0020	0.2463	0.0003310
G-253	0.2525	0.2520	0.2525	0.0005	0.2523	0.0003473
P	0.2580	0.2570	0.2575	0.0010	0.2575	0.0003616
P-2	0.2787	0.2790	0.2785	0.0005	0.2787	0.0004237
G-280	0.2780	0.2800	0.2810	0.0030	0.2797	0.0004266
G-282	0.2810	0.2820	0.2840	0.0030	0.2823	0.0004348
G-287	0.2870	0.2880	0.2860	0.0020	0.2870	0.0004493
G-292	0.2922	0.2920	0.2926	0.0006	0.2923	0.0004659
G-304	0.3040	0.3050	0.3040	0.0010	0.3043	0.0005052
MV-01	0.3050	0.3045	0.3055	0.0010	0.3050	0.0005074
G-3072	0.3070	0.3070	0.3080	0.0010	0.3073	0.0005152
G-309	0.3110	0.3080	0.3080	0.0030	0.3090	0.0005208
G-310	0.3090	0.3105	0.3095	0.0015	0.3097	0.0005230
G-311	0.3120	0.3100	0.3110	0.0020	0.3110	0.0005275
G-316	0.3160	0.3160	0.3170	0.0010	0.3163	0.0005458
V-06	0.3200	0.3210	0.3210	0.0010	0.3207	0.0005608
P-27	0.3387	0.3385	0.3390	0.0005	0.3387	0.0006258
G-344	0.3440	0.3450	0.3440	0.0010	0.3443	0.0006467
G-345	0.3450	0.3450	0.3450	0.0000	0.3450	0.0006492
G-346	0.3450	0.3460	0.3460	0.0010	0.3457	0.0006517
G-366	0.3650	0.3670	0.3650	0.0020	0.3657	0.0007293
G-367	0.3675	0.3650	0.3670	0.0025	0.3665	0.0007326
P-14	0.3910	0.3935	0.3920	0.0025	0.3922	0.0008388
G-437	0.4350	0.4345	0.4355	0.0010	0.4350	0.0010321
G-468	0.4677	0.4670	0.4670	0.0007	0.4672	0.0011907
P-29	0.4680	0.4680	0.4690	0.0010	0.4683	0.0011963
P-7	0.4965	0.4940	0.4930	0.0035	0.4945	0.0013337
B	0.5015	0.5030	0.5025	0.0015	0.5023	0.0013763
G-540	0.5405	0.5400	0.5405	0.0005	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

BAROMETER CALIBRATION FORM

Device	Cal Date	Pbar Env Canada		Device (inches of Hg)		Difference
		(kPa)	(inches of Hg)	Reading	Elevation Corrected	(Env Can - Elv Corr)
LA	29-Jun-21	100.7	29.74	29.61	29.68	0.06
DS	29-Jun-21	100.7	29.74	29.62	29.69	0.05
CL	29-Jun-21	100.7	29.74	29.63	29.70	0.04
ML	29-Jun-21	100.7	29.74	29.60	29.67	0.07
SB	29-Jun-21	100.7	29.74	29.62	29.69	0.05
SH	29-Jun-21	100.7	29.74	29.60	29.67	0.07
MG	29-Jun-21	100.7	29.74	29.65	29.72	0.02
SF	29-Jun-21	100.7	29.74	29.60	29.67	0.07
JG	29-Jun-21	100.7	29.74	29.65	29.72	0.02
JC	29-Jun-21	100.7	29.74	29.62	29.69	0.05
LF		101.8	30.07	30.08	30.15	-0.09

Calibrated by: Jeremy Gibbs

Signature:



Date:

29-Jun-21

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



MOUNT ROYAL COLLEGE

Faculty of Continuing Education and Extension

Carter Lanfranco

has successfully completed

Stack Sampling

May 2009

Date

Dean
Faculty of Continuing Education and Extension

Walter Smith & Associates, Inc.

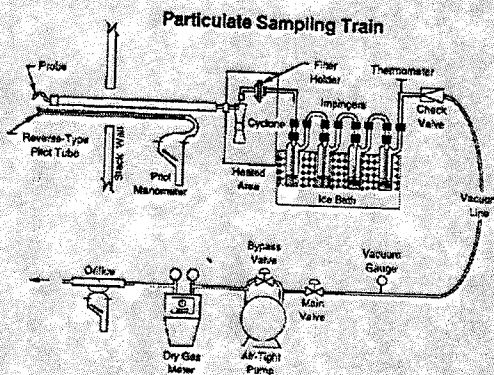
is hereby granted to:

Louis Agassiz

to certify that they have completed to satisfaction

Source Sampling & CEMS Workshop

Granted: March 11, 2011



Walter S. Smith

Walter S. Smith, PE, DEE 3.5 CEU

MOUNT ROYAL UNIVERSITY

Faculty of Continuing Education and Extension

Scott Ferguson

has successfully completed

Stack Sampling

2016

May 16, 2016

Date



Dean

Faculty of Continuing Education and Extension



Shawn Harrington

has met the requirements of

Stack Testing for Pollutants
(CHSC 7760)

School of Process, Energy and Natural Resources
Chemical Sciences Program

Endorsed by:

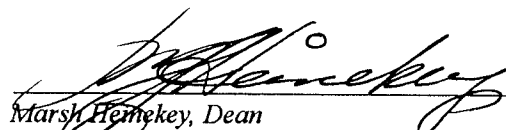


Environment
Canada

Environnement
Canada



Province of
British Columbia
Ministry of
Environment,
Lands and Parks


Marsh Hemekey, Dean
School of Process, Energy and Natural Resources

JUNE 21, 2001
Dated

Conflict of Interest Disclosure Statement

A qualified professional¹ 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);
- c) a personal or professional interest in a specific outcome;
- d) the promise of a long term or ongoing business relationship with the regulated person, that is contingent upon a specific outcome of work;
- 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

¹Qualified 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.



Declaration of Competency

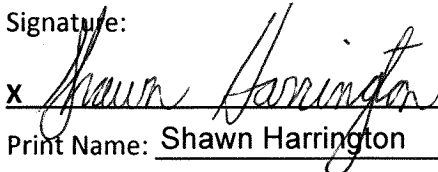
The Ministry of Environment and Climate Change Strategy relies on the work, advice, recommendations and in some cases decision making of qualified professionals¹, under government's professional reliance regime. With this comes an assumption that professionals who undertake work in relation to ministry legislation, regulations and codes of practice have the knowledge, experience and objectivity necessary to fulfill this role.

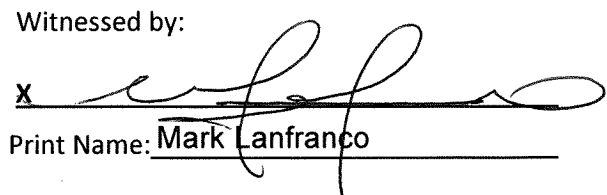
1. Name of Qualified Professional Shawn Harrington
Title Senior Environmental Technician /Project manager
2. Are you a registered member of a professional association in B.C.? ☐ Yes ☒ No
Name of Association: _____ Registration # _____
3. Brief description of professional services:
Environmental consulting ,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: 
Print Name: Shawn Harrington

Witnessed by: 
Print Name: Mark Lanfranco

Date signed: November 26, 2020

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1. Name of Qualified Professional

Carter Lanfanco

Title

Chief operations officer / caretaker

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:

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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

Print Name: Carter Lanfanco

Witnessed by:

X

Print Name: Shawn Harrington

Date signed: Dec. 7/2020

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Declaration

I Shawn Harrington as a member of Air and Waste Management Association
declare

Select one of the following:

- ☒ Absence from conflict of interest

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Signature:

x Shawn Harrington

Print name: Shawn Harrington

Date: Dec. 16, 2020

Witnessed by:

x Mark Lanfranco

Print name: Mark Lanfranco

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