2023 Annual Report for Authorization 8808

Atlantic Power - Williams Lake Power Plant

Jacob Steyl

4455 Mackenzie Ave N, Williams Lake, V2G 5E8

Executive Summary

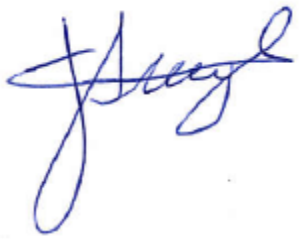
This Report details the Environmental Emissions from January 1, 2023 to December 31, 2023 and fulfils the requirement of section 3.6 of Authorization 8808 [1].

No rail ties or greater than 1% construction and demolition (C&D) waste were used as feedstock during the reporting period. A total of 332,349 wet tonnes of clean biomass was incinerated during 3,982 hours of normal operation.

During this time two discrete monitoring sessions (one for Air Discharge from the Stack and one for Ash Analysis) were performed. The test results were compared against the levels in Permit 8808 and the Hazardous Waste Regulation, and no exceedances of any of the parameters in Schedules A and D of the Permit measured.

Continuous Emissions Monitoring System (CEMS) measurements were also taken as required by the Permit throughout this Period, with no exceedances recorded.

Respectfully,



Jacob Steyl, P.Eng

January 8, 2024

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Nomenclature and Abbreviations

C&D - Construction and Demolition waste
MoE - Ministry of Environment
NO_2 - Nitrogen Dioxide
NO_x - Nitrogen Oxides
O_2 - Molecular Oxygen
TEQ - Toxic Equivalency
USEPA - United States Environmental Protection Agency

hr - Hour
kg/s - Kilograms per Second
lb/hr - Pounds per Hour
m^3/s - Cubic Meter per second
mg/kg – Milligrams per Kilogram (1 ppm)
mg/L - Milligrams per Liter
mg/m^3 - Milligrams per cubic Meter
MW – Megawatt
pg/g – Picogram per Gram (0.001ppb)
ppb - Parts Per Billion
ppm - Parts Per Million (1,000 ppb)
ton/hr - Imperial Ton per Hour
tonnes/hr - Metric Tonnes per Hour

1 Introduction

An amendment was issued for permit 8808 on 18 September 2019 to Atlantic Power Preferred Equity Ltd located at 4455 Mackenzie Ave N, Williams Lake, B.C., V2G 4R7. The revised permit calls for an Annual Report outlined in Section 3.6 of the Permit [1].

Jacob Steyl P.Eng, Maintenance Manager and Chris Turner, Controls Specialist, were responsible for collecting data and compiling this report. A. Lanfranco & Associates Inc. and Bureau Veritas conducted discrete monitoring outlined in sections 3.1.2 Schedule A and 3.1.3 Schedule D of the Permit [1].

The reporting window for this Report is 00:00 on 1 January 2023 to 00:00 1 January 2024. The Plant was curtailed for extended periods during the year, as show in Figure 1-1 and Table 2-1.

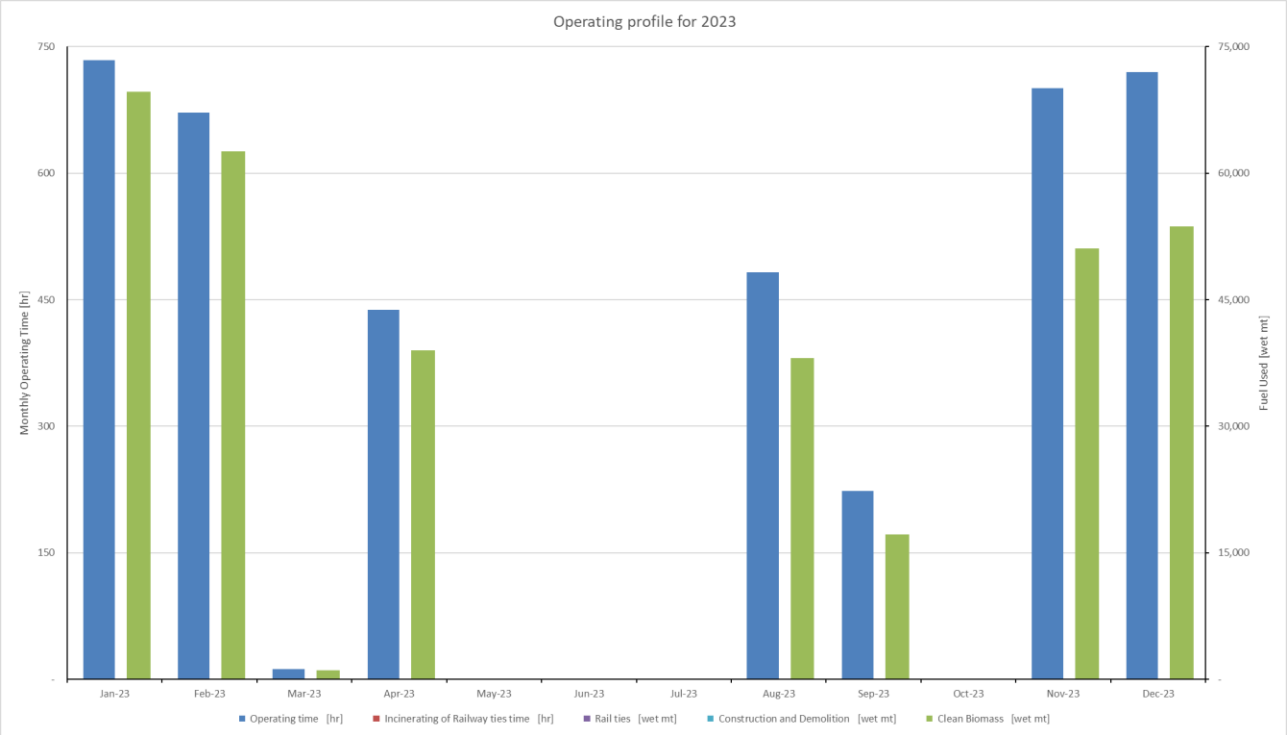

Figure 1-1: Normal Operating Profile for 2023

As no rail tie material was used as feedstock during the reporting period – Test Regimes Schedule A and D apply.

Corrective and preventative maintenance, as well as calibrations, were performed on the Air Emissions Controls and Continuous Emissions Monitoring System (CEMS) equipment of the Authorized Works during the reporting period.

2 Monthly Operating Hours

Table 2-1 shows the operating time and time incinerating railway ties for each month.

Table 2-1: Operating hours per month

	Operating time[1] *hr*	**Incinerating of Railway ties time[2]** *hr*
Jan-2023	734	0
Feb-2023	672	0
Mar-2023	12	0
Apr-2023	438	0
May-2023	-	0
Jun-2023	-	0
Jul-2023	-	0
Aug-2023	483	0
Sep-2023	223	0
Oct-2023	-	0
Nov-2023	700	0
Dec-2023	720	0
2023 Totals	**3,982**	**0**

3 Fuel

The fuel usage for the reporting period is shown in Table 3-1.

Table 3-1: Monthly and Annual Amounts of Fuel

	Rail ties *wet tonnes*	**Construction and Demolition** *wet tonnes*	**Clean Biomass** *wet tonnes*
Jan-2023	0	0	69,619
Feb-2023	0	0	62,586
Mar-2023	0	0	1,100
Apr-2023	0	0	39,012
May-2023	0	0	-
Jun-2023	0	0	-
Jul-2023	0	0	-
Aug-2023	0	0	38,067
Sep-2023	0	0	17,208
Oct-2023	0	0	-
Nov-2023	0	0	51,100
Dec-2023	0	0	53,658
2023 Totals	**0**	**0**	**332,349**

[1] Operating time for Figure 1-1 and Table 2-1 is taken as combusting-biomass and breaker-closed time
[2] Number of hours incinerating rail ties or greater than 1% construction and demolition waste

4 Continuous Emissions Monitoring

4.1 Sulphur Oxides

No rail ties or greater than 1% C&D waste was used as feedstock during the reporting period, therefore no monitoring for Sulphur Oxides was required or conducted.

4.2 Nitrogen Oxides

The maximum hourly Nitrogen Oxides (NO_x) as Nitrogen Dioxide (NO_2) per month and average for the month at 8% O_2 is show Table 4-1. The Permitted hourly average is 320 mg/m³ at 8% O_2 [1].

Table 4-1: Maximum hourly NO_x as NO_2 per month and average for the Month

	Maximum Hourly Average *mg/m³*	**Monthly Average** *mg/m³*
Jan-2023	292	233
Feb-2023	285	247
Mar-2023	263	254
Apr-2023	307	250
May-2023	-	-
Jun-2023	-	-
Jul-2023	-	-
Aug-2023	277	164
Sep-2023	254	221
Oct-2023	-	-
Nov-2023	289	224
Dec-2023	252	229

The average NO_x emissions for the year was 226 mg/m³ at 8% O_2. The maximum hourly average for the year is 307 mg/m³ at 8%O_2, below the Permitted level.

4.3 Hydrochloric Acid

No rail ties or greater than 1% C&D waste were used as feedstock during the reporting period, therefore no monitoring for Hydrochloric Acid was required or conducted.

4.4 Combustion Temperature

No rail ties or greater than 1% C&D waste were used as feedstock during the reporting period, therefore no monitoring of Combustion Temperature was required or conducted.

5 Discrete Monitoring

5.1 Air Emissions Stack Test

No rail ties or greater than 1% C&D waste were used as feedstock during the reporting period: Only Schedule A applies.

The permitted levels under Schedule A [1] is stated in Table 5-1.

A. Lanfranco & Associates Inc was retained to perform an Emission Compliance Survey and Monitoring Report, as per Schedule A of the Permit. The Triplicate test average results for the listed parameters for the Main Stack on August 30, 2023 are summarised in Table 5-1. The complete report can be found in Appendix A – Stack Particulate Test.

Table 5-1: Schedule A Discrete Monitoring Results

Parameter	Test Average	Permit Limits
Rate of Discharge (m^3/s)	94.3	110
Particulate (mg/m^3 @ 8% O_2)	2.97	20

Both parameter measures are below permitted levels.

The average steam flow during the Stack Test on August 30, 2023 was 599 klb/hr (75.4 kg/s). This meets the Operating Conditions requirements stipulated in section 3.3 of the Permit.

5.2 Ash Testing

No rail ties or greater than 1% C&D waste were used as feedstock during the reporting period: Only Schedule D applies.

The permitted levels as per Schedule D [1] are stated in Table 5-2.

Bureau Veritas was commissioned to perform ash analysis on a single ash sample collected before ash conditioning during normal operation. The results from the test are summarised in Table 5-2. The complete reports can be found in Appendix B - Ash Analysis Report.

Table 5-2: Schedule D Discrete Monitoring Results

Parameter	**Average**	**Permitted Limits** [2]
Arsenic (mg/L)	<0.1	2.5
Barium (mg/L)	1.95	100
Boron (mg/L)	0.2	500
Cadmium (mg/L)	<0.1	0.5
Chromium (mg/L)	0.15	5
Copper (mg/L)	<0.1	100
Lead (mg/L)	<0.1	5
Mercury (mg/L)	<0.002	0.1
Selenium (mg/L)	<0.1	1
Silver (mg/L)	<0.01	5
Uranium (mg/L)	<0.1	10
Zinc (mg/L)	<0.1	500
Dioxin/Furan TEQ (ppb)	0.402	100
Polycyclic Aromatic Hydrocarbon TEQ (ppm)	0.026	100

Parameter values marked with a less-than sign (<) are below the Reportable Detection Limit.

All the parameters measured were well below the values stipulated in the Hazardous Waste Regulation [2].

The average steam flow when the Ash Test sample was collected on August 30th was 599 klb/hr (75.4 kg/s). This meets the Operating Conditions requirements stipulated in section 3.3 of the Permit.

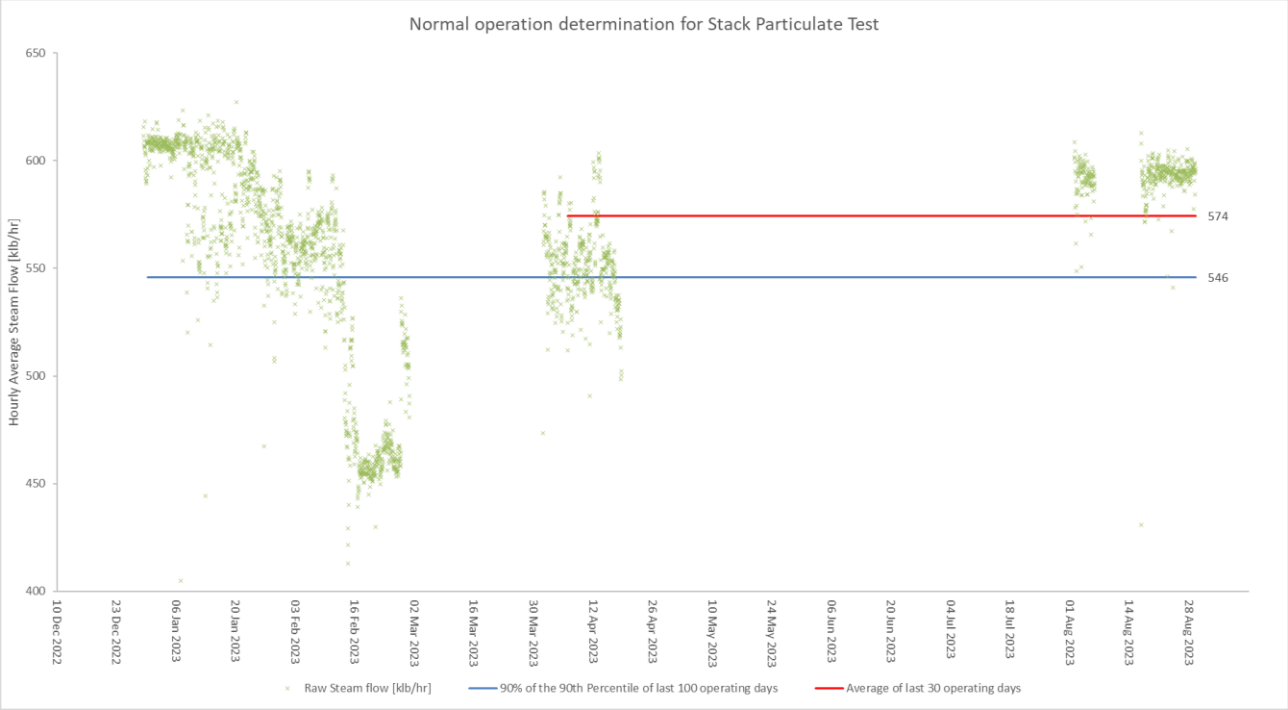

Figure 5-1: Hourly Average Steam Production data for August 30, 2023 Discrete Testing

6 Exceedances

No exceedances were recorded under normal operating conditions during the reporting period.

7 References

[1] Ministry of Environment, "Permit 8808 Amended 18 September 2019," Enviroment Canada, Williams Lake, 2016.

[2] Ministry of Attorney General, Hazardous Waste Regulation BC Reg 63/88, Victoria: Queens Printer, 1988.

Appendices

Appendix A – Stack Particulate Test

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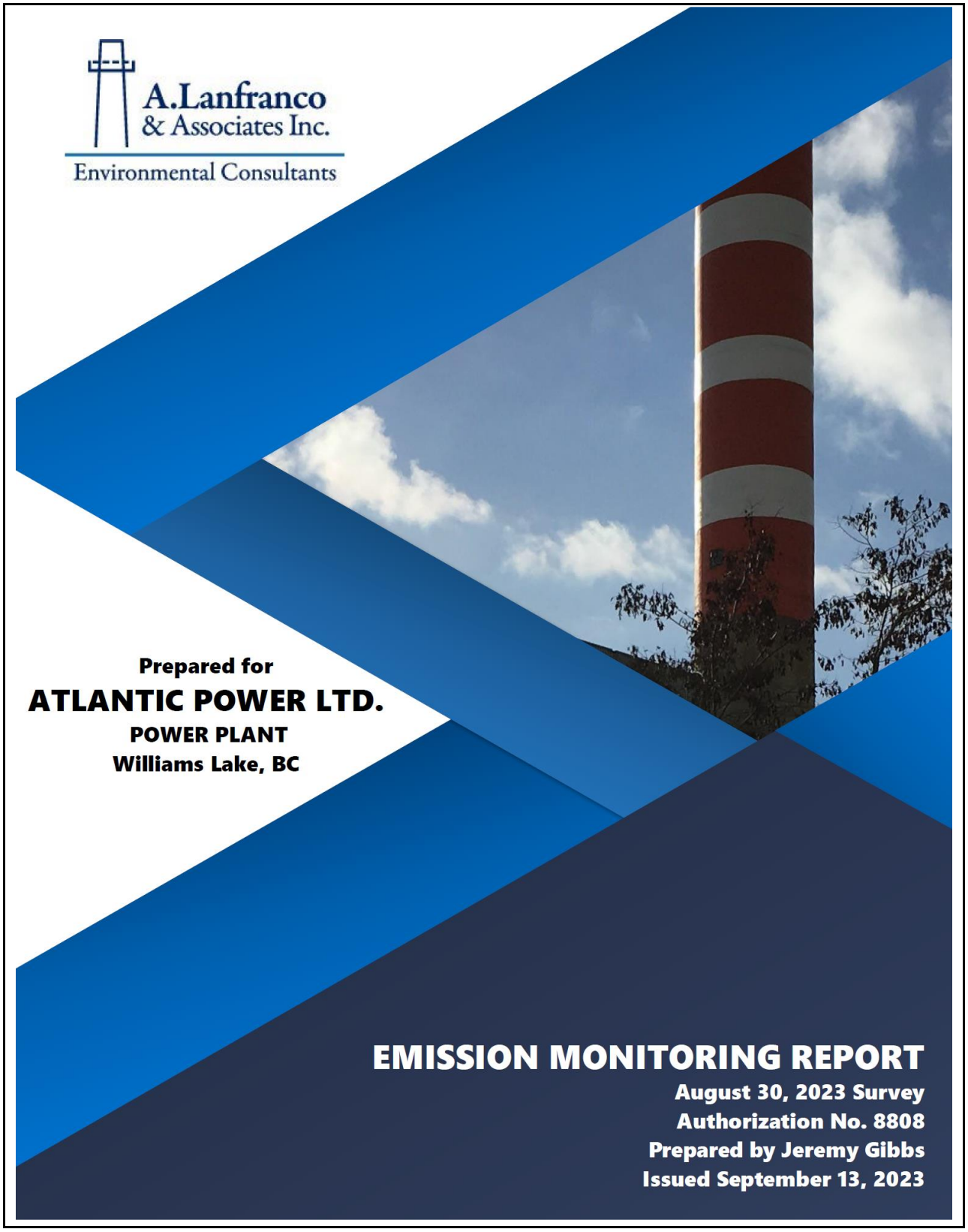

Prepared for
ATLANTIC POWER LTD.
POWER PLANT
Williams Lake, BC

EMISSION MONITORING REPORT

August 30, 2023 Survey
Authorization No. 8808
Prepared by Jeremy Gibbs
Issued September 13, 2023

A.Lanfranco & Associates Inc.
Environmental Consultants

CERTIFICATION

The field monitoring for this survey was conducted by certified stack test technicians as required by the British Columbia Ministry of Environment (BC MOE) Field Sampling Manual. The field crew consisted of:

Mr. J. Gibbs (certified) and Mr. B. Lester.

The report was prepared by Mr. J. Gibbs using reporting principles and guidelines generally acceptable to BC MOE.

The field crew and A. Lanfranco and Associates Inc. certify that the test methods used were BC MOE approved reference methods for the parameters investigated.

Report reviewed on Sept.13, 2023 by:

Mark Lanfranco, CST
President | Owner

A.Lanfranco & Associates Inc.
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APPENDICES

A.Lanfranco & Associates Inc.
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SUMMARY

The following table presents the triplicate test average results for the listed parameters for the Biomass fuelled boiler stack on August 30, 2023.

Parameter	Average	Permit Limits
Particulate (mg/Sm^3)	3.81	
Particulate (mg/Sm^3 @ 8% O_2)	2.97	20
Particulate (kg/hr)	1.29	
Flowrate (Sm^3/min)	5660	
Flowrate (Sm^3/sec)	94.3	110
O_2 (vol % dry)	4.21	
CO_2 (vol % dry)	16.4	

All results are at standard conditions of 20 °C and 101.325 kPa (dry)

The 3-run average boiler stack results for total particulate (2.97 mg/Sm^3 @ 8% O_2) is marginally higher than the previous results from October 2022 (1.9 mg/Sm^3 @ 8% O_2).

The 3-run average flowrate on the boiler stack for this survey is less than last October (94.3 compared to 97.7 m^3/min) and is below the permitted limit. The variability year to year is not significant and well within the range of outcomes during representative operating conditions.

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1 TEST PROGRAM ORGANIZATION and INTRODUCTION

Plant Testing Coordinator:	Mr. Jacob Steyl Maintenance Manager 4455 Mackenzie Avenue North Williams Lake, B.C. Canada V2G 5E8 Tel: (250) 267-2281 Email: steyl@atlanticpower.com
Project Manager/Sampling Contractor:	Mr. Mark Lanfranco President | Owner A. Lanfranco and Associates Inc. 101-9488 189 St Surrey, B.C. Canada V4N 4W7 Tel: (604) 881-2582 Email: mark.lanfranco@alanfranco.com
Sampling Crew:	Mr. J. Gibbs - A. Lanfranco and Associates Inc. Mr. B. Lester - A. Lanfranco and Associates Inc.

Atlantic Power Corporation commissioned A. Lanfranco & Associates Inc. to conduct an emission survey at their Power Plant in Williams Lake, BC. Emission tests were conducted on a waste-wood fired co-generation power plant authorized by British Columbia Ministry of Environment (BC MOE) Permit PA-8808.

On August 30, 2023, triplicate emission tests were performed for the following parameters:

- particulate concentration and emission rate
- discharge rate (flow rate)
- gas composition (CO_2, O_2 and moisture)

A. Lanfranco and Associates was responsible for the gravimetric analysis for this survey. Justin Ching, the lab manager for ALAA can be reached at 604-881-2582.

This report contains details of the test results and methodologies utilized.

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2 PROCESS DESCRIPTION

The process under investigation during this survey is a wood fuelled Boiler (E218415) discharging through a 3.5-meter stack. The process discharges to atmosphere following emission control by multi-clones, and a five-field electrostatic precipitator.

On August 30, 2023 the facility was operating at greater than 90% capacity relative to the previous 100 days. Operational data can be found in Table 3 of the results section.

3 METHODOLOGY

The sampling and analytical methods used throughout this survey conform to the procedures outlined in the BC source testing code and the BC air analytical manual. The following table shows the methodology followed.

Parameter	Reference Method
Sample and Velocity traverse points	EPS 1/RM/8 A Determination of Sampling Site and Traverse Points
Velocity and flowrate	EPS 1/RM/8 B Determination of Stack Gas Velocity and Volumetric Flow Rate (Type S Pitot Tube)
Gas molecular weight (O_2/CO_2)	EPA Method 3 Gas Analysis for the Determination of Dry Molecular Weight
Flue gas Moisture	EPS 1/RM/8 D Determination of Moisture Content
Particulate Matter	EPA Method 5 Determination of Particulate Matter Emissions from Stationary Sources

3.1 Sampling Techniques

Sampling of particulate (EPA Method 5) from the Main Stack was conducted using CAE and Apex sampling trains equipped with heated filter assemblies and a heated four-foot probe (Fig. 1). The impinger sections of the sampling trains were charged with de-ionized water for moisture determination. Cyclones were not used as part of the sampling apparatus.

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The stack was checked for cyclonic flow using methods outlined in the source test code. No cyclonic flow condition existed.

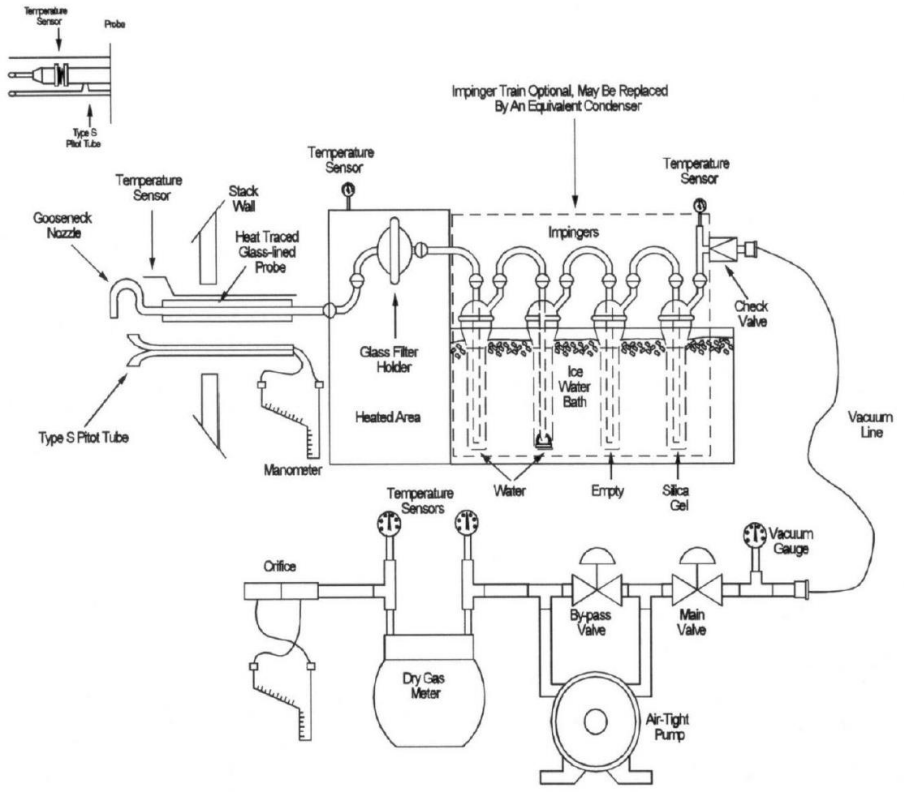

Figure 1: Method 5 Particulate Train

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Sampling Site and Traverse Points — Primary: EPA Method 1

This method is designed to aid in the representative measurement of pollutant emissions and/or total volumetric flow rate from a stationary source. A measurement site where the effluent stream is flowing in a known direction is selected, and the cross-section of the stack is divided into a number of equal areas. Traverse points are then located within each of these equal areas. At Williams Lake, four traverses of 3 points for a total of 12 points were measured per test.

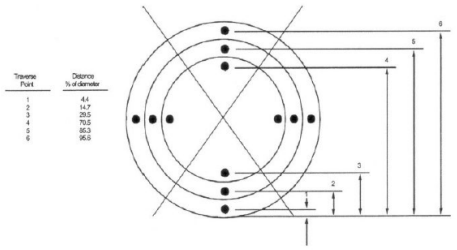

Figure 2. Example showing circular stack cross section divided into 12 equal areas, with location of traverse points.

Each point (equal area method) was sampled for 5 minutes (figure 4/4a) resulting in final sample volumes of about 1.2 cubic meters.

Stack Gas Velocity and Volumetric Flow Rate — Primary: EPA Method 2

The average gas velocity in a stack or duct is determined from the gas density and from the measurement of velocity pressure with an S-type pitot tube. A standard pitot tube may be used where plugging of the tube openings due to particulate matter and/or moisture is not likely to occur. Stack gas volumetric flow rate is determined from measurements of stack gas velocity, temperature, absolute pressure, dry gas composition, moisture content, and stack diameter.

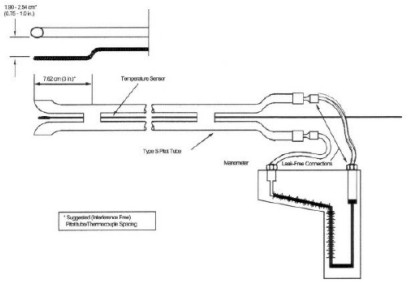

Figure 3. Type S Pitot Tube Manometer Assembly

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Figure - 4 **Location of Traverse Points in Circular Stacks**

(inches from inside w all to traverse point)

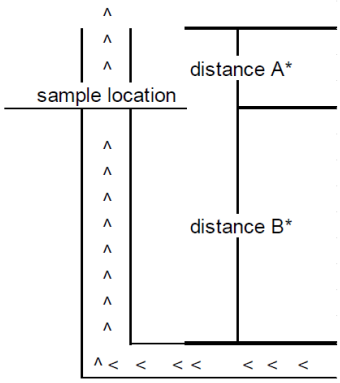
Client Stack I.D.: Atlantic Power

Diameter (inches)	138
Total Points	12
# of Ports Used	4
Points / Traverse	3

Diameters Upstream: > 2

Diameters Downstream: > 8

Point	Distance from Wall
1	6.1
2	20.1
3	40.8



* distance A : duct diameters upstream from flow disturbance
* distance B : duct diameters downstream from flow disturbance
< < < < : flow direction

Figure 4a **Location of Traverse Points in Circular Stacks**

(percent of diameter from inside w all to traverse point)

Traverse Point Number on a Diameter	Number of Traverse Points on a Diameter					
	2	4	6	8	10	12
1	14.6%	6.7%	4.4%	3.2%	2.6%	2.1%
2	85.4%	25.0%	14.6%	10.5%	8.2%	6.7%
3		75.0%	29.6%	19.4%	14.6%	11.8%
4		93.3%	70.4%	32.3%	22.6%	17.7%
5			85.4%	67.7%	34.2%	25.0%
6			95.6%	80.6%	65.8%	35.6%
7				89.5%	77.4%	64.4%
8				96.8%	85.4%	75.0%
9					91.8%	82.3%
10					97.4%	88.2%
11						93.3%
12						97.9%

Molecular Weight by Gas Analysis	Primary:	EPA Method 3/3a

An integrated or grab sample is extracted from a single point in the gas stream and analyzed for its components using a Fyrite analyzer, a gas chromatograph, or calibrated continuous analyzers.

Moisture Content	Primary:	EPA Method 4

A gas sample is extracted from a single point in the enclosed gas stream being sampled. The moisture is condensed and its weight measured. This weight, together with the volume of gas sampled, enables the stack gas moisture content to be calculated.

3.2 Analytical Techniques

Gravimetric analysis of the particulate samples was conducted by A. Lanfranco and Associates Inc. at their Surrey laboratory. All filters were conditioned by 105 °C drying, desiccation for 24 hours, and weighing of the particulate.

Probe washings were evaporated to dryness in porcelain dishes, desiccated for 24 hours and weighed. Blanks were carried through all procedures.

4 RESULTS

The results of the particulate and stack parameters were calculated using a computer program consistent with reporting requirements of BC MOE. Standard conditions used were 20 °C and 101.325 kPa (dry). Particulate concentrations were corrected to 8% O_2.

The "actual" flowrates results are volumetric flowrates at stack conditions. Detailed test results are presented in Table 1. Supporting data is presented in Table 2 and the Appendices. Calculations are presented in Appendix 2.

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TABLE 1 : MAIN STACK EMISSION RESULTS

Parameter	Test 1	Test 2	Test 3	Average
Test Date	30-Aug-23	30-Aug-23	30-Aug-23	
Test Time	10:10 - 11:14	11:24 - 12:28	12:40 - 13:44	
Duration (minutes)	60	60	60	60
Particulate (mg/Sm^3)	2.55	3.28	5.59	3.81
Particulate (mg/Sm^3 @ 8% O_2)	1.93	2.48	4.50	2.97
Particulate (kg/hr)	0.88	1.11	1.88	1.29
Particulate (kg/day)	21.0	26.6	45.2	30.9
Flowrate (Sm^3/min)	5717	5639	5615	5657
Flowrate (Sm^3/sec)	95.3	94.0	93.6	94.3
Flowrate (Am^3/min)	10859	10965	10955	10927
Temperature (°C)	157	161	160	159
O_2 (vol% dry)	3.88	3.88	4.88	4.21
CO_2 (vol% dry)	16.4	16.5	16.3	16.4
H_2O (vol%)	15.8	17.1	17.4	16.8
Isokinetic Variation (%)	102	103	103	103

All results are at standard conditions of 20 °C and 101.325 kPa (dry)

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TABLE 2: OPERATING CONDITIONS

	Steam Flow 30-Aug-23 (K lbs./hour)	Steam Flow Prev. 100 days (K lbs./hour)	Steam Flow % of Average (%)
Boiler Stack	599	603	99.3

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5 DISCUSSION OF RESULTS

The average particulate result for this survey was 2.97 mg/Sm^3 @ 8% O_2 and is well below the permitted level of 20 mg/Sm^3 @ 8% O_2. The results for particulate matter are quite comparable to previous results from this source. The results do not include condensable particulate matter.

The average flow rate measurement of 94.3 Sm^3/sec was also within the allowable limit of 110.0 Sm^3/sec.

On the test day the weather was warm and dry. Winds were calm. There were no environmental factors which impacted the testing.

There were no technical problems encountered in sample collection or analysis. Samples were collected isokinetically at all points and sampling equipment was operated in a normal steady manner during testing. The test results, therefore, are considered to be an accurate representation of emission characteristics for the process conditions maintained on the test date.

APPENDIX 1

COMPUTER OUTPUTS OF MEASURED AND CALCULATED DATA

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	**Date:**	30-Aug-23
Jobsite:	Williams Lake, B.C.	**Run:**	1 - Particulate
Source:	Main Stack	**Run Time:**	10:10 - 11:14

Particulate Concentration:		**2.6**	**mg/dscm**	0.0011 gr/dscf
		1.3	mg/Acm	0.0006 gr/Acf
		1.9	mg/dscm (@ 8% O2)	0.0008 gr/dscf (@ 8% O2)
Emission Rate:		0.88	Kg/hr	1.931 lb/hr
Sample Gas Volume:		1.1358	dscm	40.112 dscf
Total Sample Time:		60.0	minutes	
Average Isokineticity:		102.3	%	
Flue Gas Characteristics				
	Moisture:	15.79	%	
	Temperature	157.4	°C	315.3 °F
	Flow	5716.9	dscm/min	201893 dscf/min
		95.28	dscm/sec	3364.9 dscf/sec
		10859.3	Acm/min	383496 Acf/min
	Velocity	18.756	m/sec	61.54 f/sec
	Gas Analysis	3.88	% O_2	16.38 % CO_2
		30.775	Mol. Wt (g/gmole) Dry	28.758 Mol. Wt (g/gmole) Wet

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

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	**Date:**	30-Aug-23
Jobsite:	Williams Lake, B.C.	**Run:**	1 - Particulate
Source:	Main Stack	**Run Time:**	10:10 - 11:14

Control Unit (Y)	1.0051
Nozzle Diameter (in.)	0.2483
Pitot Factor	0.8423
Baro. Press. (in. Hg)	27.50
Static Press. (in. H_2O)	-0.37
Stack Height (ft)	200
Stack Diameter (in.)	138.0
Stack Area (sq.ft.)	103.869
Minutes Per Reading	5.0
Minutes Per Point	5.0
Port Length (inches)	8.0

Gas Analysis (Vol. %):

CO_2	O_2
16.50	4.00
16.50	3.50
16.50	4.00
16.00	4.00
Average = 16.38	**3.88**

Condensate Collection:

Impinger 1 (grams)	125.0
Impinger 2 (grams)	25.0
Impinger 3 (grams)	1.0
Impinger 4 (grams)	8.8
Total Gain (grams)	**159.8**

Collection:

Filter (grams)	**0.0010**
Washings (grams)	**0.0019**
Impinger (grams)	**0.0000**
Total (grams)	**0.0029**

Traverse	Point	Time (min.)	Dry Gas Meter (ft^3)	Pitot ^P (in. H_2O)	Orifice ^H (in. H_2O)	Dry Gas Temperature Inlet (°F)	Dry Gas Temperature Outlet (°F)	Stack (°F)	Wall Dist. (in.)	Isokin. (%)
		0.0	296.177							
1	1	5.0	299.370	0.560	1.53	79	79	313	6.1	102.2
	2	10.0	302.930	0.700	1.91	79	79	315	20.1	102.2
	3	15.0	306.590	0.740	2.02	78	78	314	40.8	102.3
		0.0	306.590							
2	1	5.0	310.380	0.790	2.16	79	79	315	6.1	102.4
	2	10.0	314.400	0.890	2.43	79	79	314	20.1	102.4
	3	15.0	318.140	0.770	2.11	80	80	315	40.8	102.2
		0.0	318.140							
3	1	5.0	321.190	0.510	1.40	81	81	315	6.1	102.0
	2	10.0	324.610	0.640	1.75	81	81	315	20.1	102.2
	3	15.0	328.270	0.730	2.01	82	82	315	40.8	102.3
		0.0	328.270							
4	1	5.0	332.240	0.860	2.36	82	82	317	6.1	102.5
	2	10.0	336.250	0.880	2.41	82	82	318	20.1	102.4
	3	15.0	340.370	0.930	2.54	82	82	318	40.8	102.4
			Average:	0.750	2.053	80.3	80.3	315.3		102.3

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	**Date:**	30-Aug-23
Jobsite:	Williams Lake, B.C.	**Run:**	2 - Particulate
Source:	Main Stack	**Run Time:**	11:24 - 12:28

Particulate Concentration:		**3.3**	**mg/dscm**	0.0014 gr/dscf
		1.7	mg/Acm	0.0007 gr/Acf
		2.5	mg/dscm (@ 8% O2)	0.0011 gr/dscf (@ 8% O2)
Emission Rate:		1.11	Kg/hr	2.446 lb/hr
Sample Gas Volume:		1.1285	dscm	39.855 dscf
Total Sample Time:		60.0	minutes	
Average Isokineticity:		103.0	%	
Flue Gas Characteristics				
	Moisture:	17.14	%	
	Temperature	160.6	°C	321.0 °F
	Flow	5639.2	dscm/min	199149 dscf/min
		93.99	dscm/sec	3319.1 dscf/sec
		10965.2	Acm/min	387237 Acf/min
	Velocity	18.939	m/sec	62.14 f/sec
	Gas Analysis	3.88	% O_2	16.45 % CO_2
		30.787	Mol. Wt (g/gmole) Dry	28.596 Mol. Wt (g/gmole) Wet

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

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	**Date:**	30-Aug-23
Jobsite:	Williams Lake, B.C.	**Run:**	2 - Particulate
Source:	Main Stack	**Run Time:**	11:24 - 12:28

Control Unit (Y)	1.0051
Nozzle Diameter (in.)	0.2483
Pitot Factor	0.8423
Baro. Press. (in. Hg)	27.50
Static Press. (in. H_2O)	-0.37
Stack Height (ft)	200
Stack Diameter (in.)	138.0
Stack Area (sq.ft.)	103.869
Minutes Per Reading	5.0
Minutes Per Point	5.0
Port Length (inches)	8.0

Gas Analysis (Vol. %):

CO_2	O_2
16.50	3.80
16.50	4.00
16.00	4.00
16.80	3.70
Average = 16.45	**3.88**

Condensate Collection:

Impinger 1 (grams)	151.0
Impinger 2 (grams)	15.0
Impinger 3 (grams)	0.0
Impinger 4 (grams)	9.1
Total Gain (grams)	**175.1**

Collection:

Filter (grams)	**0.0020**
Washings (grams)	**0.0017**
Impinger (grams)	**0.0000**
Total (grams)	**0.0037**

Traverse	Point	Time (min.)	Dry Gas Meter (ft^3)	Pitot ^P (in. H_2O)	Orifice ^H (in. H_2O)	Dry Gas Temperature Inlet (°F)	Dry Gas Temperature Outlet (°F)	Stack (°F)	Wall Dist. (in.)	Isokin. (%)
		0.0	340.870							
1	1	5.0	344.830	0.870	2.34	82	82	321	6.1	103.2
	2	10.0	348.810	0.880	2.37	82	82	321	20.1	103.2
	3	15.0	352.930	0.940	2.54	83	83	320	40.8	103.1
		0.0	352.930							
2	1	5.0	356.000	0.520	1.41	84	84	321	6.1	102.9
	2	10.0	359.410	0.640	1.73	84	84	321	20.1	103.1
	3	15.0	363.100	0.750	2.30	84	84	321	40.8	103.2
		0.0	363.100							
3	1	5.0	366.870	0.798	2.13	82	82	321	6.1	102.6
	2	10.0	370.870	0.890	2.40	82	82	321	20.1	103.1
	3	15.0	374.600	0.770	2.08	83	83	321	40.8	103.1
		0.0	374.600							
4	1	5.0	377.810	0.570	1.54	84	84	322	6.1	102.9
	2	10.0	381.340	0.690	1.86	84	84	322	20.1	102.9
	3	15.0	385.002	0.740	2.00	83	83	320	40.8	103.2
			Average:	0.755	2.058	83.1	83.1	321.0		103.0

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	**Date:**	30-Aug-23
Jobsite:	Williams Lake, B.C.	**Run:**	3 - Particulate
Source:	Main Stack	**Run Time:**	12:40 - 13:44

Particulate Concentration:		**5.6**	**mg/dscm**	0.0024 gr/dscf
		2.9	mg/Acm	0.0013 gr/Acf
		4.5	mg/dscm (@ 8% O2)	0.0020 gr/dscf (@ 8% O2)
Emission Rate:		1.88	Kg/hr	4.150 lb/hr
Sample Gas Volume:		1.1276	dscm	39.820 dscf
Total Sample Time:		60.0	minutes	
Average Isokineticity:		103.4	%	
Flue Gas Characteristics				
	Moisture:	17.43	%	
	Temperature	160.5	°C	320.8 °F
	Flow	5615.1	dscm/min	198297 dscf/min
		93.58	dscm/sec	3304.9 dscf/sec
		10955.0	Acm/min	386876 Acf/min
	Velocity	18.921	m/sec	62.08 f/sec
	Gas Analysis	4.88	% O_2	16.25 % CO_2
		30.795	Mol. Wt (g/gmole) Dry	28.565 Mol. Wt (g/gmole) Wet

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

A. Lanfranco and Associates Inc. - Emission Report

Client:	Atlantic Power	**Date:**	30-Aug-23
Jobsite:	Williams Lake, B.C.	**Run:**	3 - Particulate
Source:	Main Stack	**Run Time:**	12:40 - 13:44

Control Unit (Y)	1.0051
Nozzle Diameter (in.)	0.2483
Pitot Factor	0.8423
Baro. Press. (in. Hg)	27.50
Static Press. (in. H_2O)	-0.37
Stack Height (ft)	200
Stack Diameter (in.)	138.0
Stack Area (sq.ft.)	103.869
Minutes Per Reading	5.0
Minutes Per Point	5.0
Port Length (inches)	8.0

Gas Analysis (Vol. %):

CO_2	O_2
16.50	4.50
16.00	5.00
16.50	5.00
16.00	5.00
Average = **16.25**	**4.88**

Condensate Collection:

Impinger 1 (grams)	155.0
Impinger 2 (grams)	15.0
Impinger 3 (grams)	0.0
Impinger 4 (grams)	8.6
Total Gain (grams)	**178.6**

Collection:

Filter (grams)	**0.0020**
Washings (grams)	**0.0043**
Impinger (grams)	**0.0000**
Total (grams)	**0.0063**

Traverse	Point	Time (min.)	Dry Gas Meter (ft^3)	Pitot ^P (in. H_2O)	Orifice ^H (in. H_2O)	Dry Gas Temperature Inlet (°F)	Dry Gas Temperature Outlet (°F)	Stack (°F)	Wall Dist. (in.)	Isokin. (%)
		0.0	385.744							
1	1	5.0	388.970	0.570	1.55	86	86	321	6.1	103.2
	2	10.0	392.540	0.700	1.90	86	86	322	20.1	103.3
	3	15.0	396.200	0.730	1.99	87	87	321	40.8	103.4
		0.0	396.200							
2	1	5.0	400.040	0.800	2.18	88	88	321	6.1	103.5
	2	10.0	404.070	0.880	2.40	90	90	322	20.1	103.3
	3	15.0	407.830	0.760	2.08	91	91	322	40.8	103.5
		0.0	407.830							
3	1	5.0	410.950	0.520	1.43	93	93	320	6.1	103.1
	2	10.0	414.450	0.650	1.79	93	93	318	20.1	103.4
	3	15.0	418.180	0.740	2.04	94	94	319	40.8	103.2
		0.0	418.180							
4	1	5.0	422.190	0.860	2.36	92	92	321	6.1	103.6
	2	10.0	426.240	0.880	2.41	92	92	321	20.1	103.4
	3	15.0	430.434	0.940	2.58	93	93	322	40.8	103.5
			Average:	0.753	2.059	90.4	90.4	320.8		103.4

APPENDIX 2

CALCULATIONS

The following sections show the equations and define the variables that were used for this survey. The equations are organized in three sections. Equations 1-12 were used to calculate particulate concentration at standard conditions on a dry basis. Equations 13-27 were used to sample within the 100 ± 10% isokinetic variation and to confirm that sampling meets this isokinetic variation threshold. Equations 28-30 were used to calculate the volumetric flowrate of the stack flue gas.

A2.1 Contaminant Concentration Calculations

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

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

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

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

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

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

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

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

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

$$CO2C = \frac{\%CO_{2c}}{\%CO_{2m}} \quad \textbf{Equation 10}$$

$$\%O_{2m} = \frac{1}{n}\sum_{i=1}^{n} \%O_{2i}, where\ n = the\ number\ of\ O_2\ measurements \quad \textbf{Equation 11}$$

$$\%CO_{2m} = \frac{1}{n}\sum_{i=1}^{n} \%CO_{2i}, where\ n = the\ number\ of\ CO_2\ measurements \quad \textbf{Equation 12}$$

Where,

c	= Contaminant concentration
m	= Contaminant mass
m_i	= Net analytical mass (mg, ng, or µg)
$m_{ana,i}$	= Analytical mass (mg, ng, or µg)
m_{blank}	= Blank analytical mass (mg, ng, or µg)
m_{part}	= Total particulate mass (mg)
m_{filter}	= Net particulate gain from filter (mg)
m_{pw}	= Net particulate gain from probe wash (mg)
$V_{std(imp)}$	= Sample volume at standard conditions (ft^3)
V_{std}	= Sample volume at standard conditions (m^3)
V_{samp}	= Sample volume at actual conditions (ft^3)
V_{final}	= Final gas meter reading (ft^3)
V_{init}	= Initial gas meter reading (ft^3)
T_{std}	= Standard temperature (68 °F)
T_m	= Gas meter temperature (°F)
$T_{m(ave)}$	= Average gas meter temperature (°F)
P_m	= Absolute meter pressure (inches of Hg)
P_B	= Barometric pressure (inches of Hg)
ΔH_{ave}	= Average of individual point orifice pressures (inches of H_2O)
$\Delta H_{i(act)}$	= Individual recorded point orifice pressures (inches of H_2O)
OC	= Oxygen correction factor (dimensionless)
$CO2C$	= Carbon dioxide correction factor (dimensionless)
$\%O_{2c}$	= Oxygen concentration to correct to (% dry basis)
$\%O_{2m}$	= Average measured stack gas oxygen concentration (% dry basis)
$\%CO_{2c}$	= Carbon dioxide concentration to correct to (% dry basis)
$\%CO_{2m}$	= Average measured stack gas oxygen concentration (% dry basis)

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

A2.2 Isokinetic Variation Calculations

$$\Delta H_i = \frac{2.62 \times 10^7 \times c_p \times A_n \times (1 - B_{wo}) \times M_D \times (T_m + 459.67) \times \Delta p_i}{k_o \times M_w \times (T_{Stk} + 459.67)}$$ **Equation 13**

$$R_m = 85.49 \times c_p \times \sqrt{\Delta p_i} \times \sqrt{\frac{(T_{stk_i} + 459.67)}{M_w \times P_B}} \times 60 \times A_n \times \frac{(T_{m_i} + 459.67) \times (1 - B_{wo})}{(T_{stk_i} + 459.67) \times y}$$ **Equation 14**

$$A_n = \pi \left(\frac{d_n}{24}\right)^2$$ **Equation 15**

$$M_w = M_D \times (1 - B_{wo}) + 18 \times B_{wo}$$ **Equation 16**

$$M_D = 0.44 \times \%CO_2 + 0.32 \times \%O_2 + 0.28 \times (100 - \%CO_2 - \%O_2)$$ **Equation 17**

$$T_{Stk} = \frac{1}{n}\sum_{i=1}^{n} T_{Stk_i}, where\ n = the\ number\ of\ points$$ **Equation 18**

$$B_{wo} = \frac{V_{cond}}{V_{cond} + V_{std(imp)}}$$ **Equation 19**

$$V_{cond} = 0.04707 \times V_{gain}$$ **Equation 20**

$$Iso = \frac{1}{n}\sum_{i=1}^{n} Iso_i, where\ n = the\ number\ of\ points$$ **Equation 21**

$$Iso_i = \frac{v_{nzi}}{v_i}$$ **Equation 22**

$$v_i = 85.49 \times c_p \times \sqrt{\Delta p_i} \times \sqrt{\frac{(T_{Stk_i} + 459.67)}{(P_{Stk} \times M_W)}}$$ **Equation 23**

$$v_{nzi} = \frac{(V_i - V_{i-1}) \times y \times (T_{Stk_i} + 459.67) \times (P_B + \frac{\Delta H_{i(act)}}{13.6})}{A_n \times t_i \times 60 \times (T_{m(i)} + 459.67) \times P_{stk} \times (1 - B_{wo})}$$ **Equation 24**

$$P_{stk} = P_B + \frac{P_g}{13.6}$$ **Equation 25**

Appendix 2 Calculations

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Equation 26

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

Equation 27

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

Where,

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

A2.3 Volumetric Flowrate Calculations

$$Q_S = Q_A \times \frac{(T_{Std} + 459.67)}{(T_{Stk} + 459.67)} \times \frac{P_{Stk}}{P_{Std}}$$ **Equation 28**

$$Q_A = \frac{v_{stk} \times 60 \times A_{stk}}{35.315}$$ **Equation 29**

$$A_{stk} = \pi \left(\frac{d}{24}\right)^2$$ **Equation 30**

Where,

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

APPENDIX 3

FIELD DATA SHEETS

A. Lanfranco and Associates Inc.

CLIENT	Atlantic Power	NOZZLE	55-24	DIAMETER, IN.	.2483
SOURCE	Main Stack	PROBE	SA-5	Cp	.8423
PARAMETER / RUN No	Partic/1	PORT LENGTH	8.0		
DATE	6.30.23	STATIC PRESSURE, IN. H2O	-.37		
OPERATOR:	JG + BL	STACK DIAMETER	138.0		
CONTROL UNIT	Ju14	STACK HEIGHT	790		
Y	1.0051				
ΔH@	2.209				
BAROMETRIC PRESSURE, IN. Hg	27.50	INITIAL LEAK TEST	.000 @15"		
ASSUMED MOISTURE, Bw	15.%	FINAL LEAK TEST	.000 @15"		

IMPINGER VOLUMES	INITIAL (mL)	FINAL (mL)	TOTAL GAIN (mL)
Imp. #1	100	[illegible]	
Imp. #2	100	125	
Imp. #3	[illegible]	[illegible]	
Imp. #4	[illegible]		
Imp. #5			
Imp. #6			
Upstream Diameters			
Downstream Diameters			

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites CO_2 Vol. %	O_2 Vol. %		
	10:10	296.177												
1		299.37	.56	1.53	79	313	250	252	58	4.0				
2		302.93	.70	1.91	79	315					16.5	4.0		
3		306.59	.74	2.02	78	314	249	257	58	4.0				
1		310.38	.79	2.16	79	315	250	257	58	5.0				
2		314.40	.89	2.43	79	314					16.5	3.5		
3		318.14	.77	2.11	80	315	255	248	58	5.5				
1		321.19	.51	1.40	81	315	250	252	58	4.0				
2		324.61	.64	1.75	81	315					16.5	4.0		
3		328.27	.73	2.01	82	315	257	253	58	4.0				
1		332.24	.86	2.36	82	317	250	257	58	5.0				
2		336.25	.88	2.41	82	318					16.0	4.0		
3		340.570	.93	2.54	82	318	249	252	54	5.0				
	11:14	END test												

A. Lanfranco and Associates Inc.

CLIENT Atlantic Power	NOZZLE SS-24 DIAMETER, IN. .2483	IMPINGER VOLUMES	INITIAL (mL) / FINAL (mL) / TOTAL GAIN (mL)
SOURCE Main Stack	PROBE Cp .8423	Imp. #1	100 / 257
PARAMETER / RUN No Particle / R2	PORT LENGTH 8.0	Imp. #2	100 / 115
DATE 8.30.23	STATIC PRESSURE, IN. H2O -.37	Imp. #3	0 / 6
OPERATOR: JEF BL	STACK DIAMETER 138.0	Imp. #4	GEL /
CONTROL UNIT Sw 14 Y 1.005	STACK HEIGHT 200.0	Imp. #5	
ΔH@ 2.209		Imp. #6	
BAROMETRIC PRESSURE, IN. Hg 29.50	INITIAL LEAK TEST .000 @ 15"	Upstream Diameters	
ASSUMED MOISTURE, Bw 15%	FINAL LEAK TEST .000 @ 15"	Downstream Diameters	

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F					Pump Vac. IN. Hg	Fyrites			
					Dry Gas Outlet	Stack	Probe	Box	Impinger Exit		CO_2 Vol. %	O_2 Vol. %		
	11:24	340.870												
1		344.93	.87	2.34	82	321	250	249	57	5.0				
2		348.87	.88	2.34	82	321					16.5	3.8		
3		352.93	.94	2.54	83	320	251	248	57	5.0				
1		356.00	.52	1.41	84	321	250	252	57	4.5				
2		359.41	.64	1.73	84	321					16.5	4.0		
3		363.10	.75	2.03	84	321	251	252	57	4.5				
1		366.87	.79	2.13	82	321	250	247	57	4.5	16.0	4.0		
2		370.87	.84	2.40	82	321								
3		374.60	.77	2.08	83	321	252	248	57	4.5				
1		377.81	.57	1.54	84	322	250	252	56	4.5	16.8	3.7		
2		381.34	.69	1.86	84	322								
3		385.002	.74	2.00	83	320	251	253	56	4.5				
	12:28	END test												

A. Lanfranco and Associates Inc.

CLIENT Atlantic power	NOZZLE SS-24 DIAMETER, IN. .2483	IMPINGER VOLUMES	INITIAL (mL) / FINAL (mL) / TOTAL GAIN (mL)
SOURCE Main stack	PROBE 3A-3 Cp .84123	Imp. #1	100 / 255 /
PARAMETER / RUN No metals / R3	PORT LENGTH 8.0	Imp. #2	100 / 195 /
DATE 8.30.23	STATIC PRESSURE, IN. H2O -.37	Imp. #3	— / — /
OPERATOR: JG / BL	STACK DIAMETER 138.0	Imp. #4	GEL / /
CONTROL UNIT Y 1.0051 ΔH@ 2.209	STACK HEIGHT 200.0	Imp. #5	
BAROMETRIC PRESSURE, IN. Hg 27.50	INITIAL LEAK TEST .000@15"	Imp. #6	
ASSUMED MOISTURE, Bw 15%	FINAL LEAK TEST .000@15"	Upstream Diameters / Downstream Diameters	

Point	Clock Time	Dry Gas Meter ft³	Pitot ΔP IN. H_2O	Orifice ΔH IN. H_2O	Temperature °F Dry Gas Outlet	Stack	Probe	Box	Impinger Exit	Pump Vac. IN. Hg	Fyrites CO_2 Vol. %	O_2 Vol. %		
	12:40	385.744												
1		388.97	.57	1.55	86	321	250	258	58	.5				
2		392.54	.70	1.90	86	322					16.5	4.5		
3		396.20	.73	1.99	87	321	251	252	57	.5				
1		400.04	.80	2.18	88	321	250	257	57	1.0				
2		404.07	.88	2.40	90	322					16.0	[illegible]		
3		407.83	.76	2.08	91	322	249	252	57	1.0				
1		410.95	.52	1.43	93	320	250	249	57	.5				
2		414.45	.65	1.79	93	318					16.5	[illegible]		
3		418.18	.74	2.04	94	319	251	247	57	.5				
1		422.19	.86	2.36	92	321	250	253	56	.5	16.5	5.0		
2		426.24	.88	2.41	93	321								
3		430.434	.94	2.58	93	322	252	254	56	.5				
	13:44	END TEST												

Minimum steam flow required	574	klb/hr =	72.3	kg/s				
Average steam flow	599	klb/hr =	75.4	kg/s	=	96	th percentile	
	104%							
	99%							

The average steam flow for the test was 598.7 klb/hr, which is 99% of the 90th percentile of the last 100 operating days and 104% of the average steam flow for the last 30 full operating days.

Breaker closed during the day

Full Operating days

242

90% of the 90th Percentile of last 100 operating days	546	31 Dec 2022		242	13.7619
Average of last 30 operating days	574		07 Apr 2023		145

	2023-08-30 10:10	0			Average	n	σ		min	max
Test 1 Start	2023-08-30 10:10	1		Test 1 Avr Steam Flow	599.6	60	5.1		585	607
	2023-08-30 10:42	1	01:04		599.6					
Test 1 End	2023-08-30 11:14	1			599.6					
	2023-08-30 11:14	0								
	2023-08-30 11:24	0			Average	n	σ		min	max
Test 2 Start	2023-08-30 11:24	1		Test 2 Avr Steam Flow	597.5	60	8.0		583	617
	2023-08-30 11:56	1	01:04		597.5					
Test 2 End	2023-08-30 12:28	1			597.5					
	2023-08-30 12:28	0								
	2023-08-30 12:40	0			Average	n	σ		min	max
Test 3 Start	2023-08-30 12:40	1		Test 3 Avr Steam Flow	598.9	60	6.3		589	614
	2023-08-30 13:12	1	01:04		598.9					
Test 3 End	2023-08-30 13:44	1			598.9					
	2023-08-30 13:44	0								

			Average	n	σ
30 Aug 2023 10:01		90th percentile for 100 days	606.6	2377	94.2
31 Aug 2023 00:00			606.6		
30 Aug 2023 10:01		90% of the 90th percentile	545.9		
31 Aug 2023 00:00			545.9		

			Average	n	σ	min	max
30 Aug 2023 10:01							
31 Aug 2023 00:00		Average for 30 days	574.3	697	23.8	491	609
			574.3				

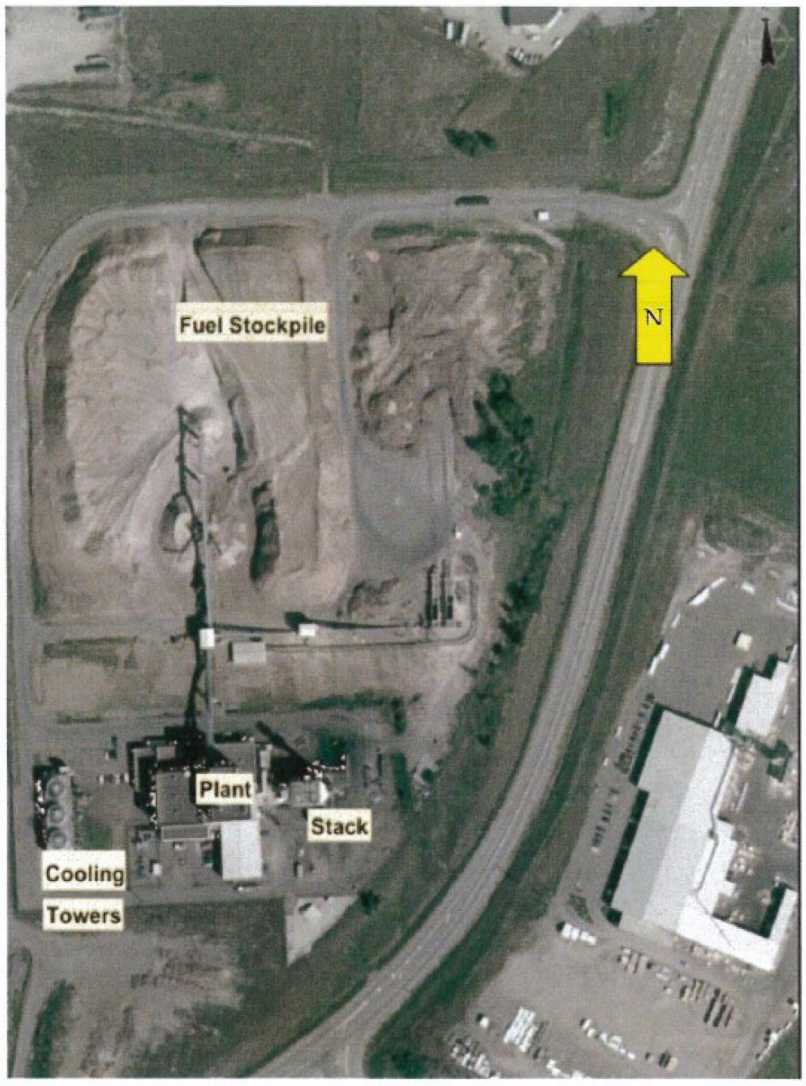
2023-08-30 10:10	Test Avr Steam Flow	598.7			
2023-08-30 11:57		598.7		6.6	583	617
2023-08-30 13:44		598.7			

90% of the 90th Percentile of last 100 operating days	31 Dec 2022			546			
	30 Aug 2023			546			
		-2σ	-1σ	30d Average	+1σ	+2σ	
Average of last 30 operating days	07 Apr 2023	527	550	574	598	622	
	30 Aug 2023	527	550	574	598	622	
		-2σ	-1σ	100d Average	+1σ	+2σ	
	31 Dec 2022	341	435	529	623	718	
	30 Aug 2023	341	435	529	623	718	

APPENDIX 4

SITE MAP

SITE PLAN



APPENDIX 5

CALIBRATION DATA AND CERTIFICATIONS

BAROMETER CALIBRATION FORM

Device	Cal Date	Pbar Env Canada (kPa)	Pbar Env Canada (inches of Hg)	Device (inches of Hg) Reading	Device (inches of Hg) Elevation Corrected	Difference (Env Can - Elv Corr)
LA	10-Jul-23	101.6	30.01	29.92	29.99	0.02
DS	10-Jul-23	101.6	30.01	29.91	29.98	0.03
CL	10-Jul-23	101.6	30.01	29.92	29.99	0.02
JC	10-Jul-23	101.6	30.01	29.89	29.96	0.05
LF	10-Jul-23	101.6	30.01	29.91	29.98	0.03
SH	10-Jul-23	101.6	30.01	29.90	29.97	0.04
CDO	10-Jul-23	101.6	30.01	29.89	29.96	0.05
JG	10-Jul-23	101.6	30.01	29.87	29.94	0.07
ML	10-Jul-23	101.6	30.01	29.89	29.96	0.05
BL	10-Jul-23	101.6	30.01	29.91	29.98	0.03

Calibrated by: Daryl Sampson Signature: Daryl Sampson Date: 10-Jul-23

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

Pitot Tube Calibration

Date: 27-Jun-23
Pbar (in.Hg): 29.84

Temp (R): 539
Dn (in.): 0.25

Pitot ID: **5A-1**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.057	0.077	16.0	0.8518	0.0059
0.180	0.240	28.4	0.8574	0.0115
0.245	0.345	33.1	0.8343	0.0116
0.425	0.570	43.6	0.8549	0.0090
0.560	0.795	50.0	0.8309	0.0149
		Average :	0.8458	0.0106

Pitot ID: **5A-2**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.055	0.075	15.7	0.8478	0.0046
0.090	0.125	20.1	0.8400	0.0031
0.280	0.370	35.4	0.8612	0.0181
0.360	0.500	40.1	0.8400	0.0031
0.530	0.760	48.7	0.8267	0.0164
		Average :	0.8432	0.0091

Pitot ID: **ST 5A**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.025	0.035	10.6	0.8367	0.0050
0.115	0.160	22.7	0.8393	0.0024
0.280	0.370	35.4	0.8612	0.0195
0.540	0.760	49.1	0.8345	0.0072
0.600	0.840	51.8	0.8367	0.0050
		Average :	0.8417	0.0078

Pitot ID: **ST 5B**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.055	0.075	15.7	0.8478	0.0012
0.125	0.180	23.6	0.8250	0.0216
0.200	0.280	29.9	0.8367	0.0099
0.360	0.500	40.1	0.8400	0.0066
0.680	0.840	55.1	0.8907	0.0441
		Average :	0.8468	0.0167

Pitot ID: **5A-3**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.055	0.075	15.7	0.8478	0.0110
0.125	0.180	23.6	0.8250	0.0118
0.200	0.280	29.9	0.8367	0.0001
0.360	0.500	40.1	0.8400	0.0032
0.540	0.760	49.1	0.8345	0.0023
		Average :	0.8368	0.0057

Pitot ID: **5A-4**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.055	0.075	15.7	0.8478	0.0110
0.125	0.180	23.6	0.8250	0.0118
0.280	0.370	35.4	0.8612	0.0245
0.470	0.680	45.8	0.8231	0.0137
0.530	0.760	48.7	0.8267	0.0100
		Average :	0.8368	0.0142

Pitot ID: **5A-5**

Reference Pitot (in H2O)	S-Type Pitot (in H2O)	Air Velocity (ft/s)	Pitot Coeff. Cp	Deviation (absolute)
0.055	0.075	15.7	0.8478	0.0055
0.170	0.230	27.6	0.8511	0.0089
0.200	0.270	29.9	0.8521	0.0098
0.470	0.680	45.8	0.8231	0.0192
0.540	0.755	49.1	0.8373	0.0050
		Average :	0.8423	0.0097

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: Jeremy Gibbs Signature: Date: June 27, 2023

A.Lanfranco & Associates inc.

EPA Method 5

Meter Box Calibration

English Meter Box Units, English K' Factor

Model #: JU 14
Serial #: 0028-030615-1

Date: 27-Jun-23
Barometric Pressure: 29.82 (In. Hg)
Theoretical Critical Vacuum: 14.07 (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-					
					Initial Temps.		Final Temps.					-- Ambient Temperature --		
dH (In H2O)	Time (min)	Volume Initial (cu ft)	Volume Final (cu ft)	Volume Total (cu ft)	Inlet (deg F)	Outlet (deg F)	Inlet (deg F)	Outlet (deg F)	Orifice Serial# (number)	K' Orifice Coefficient (see above)	Actual Vacuum (In Hg)	Initial (deg F)	Final (deg F)	Average (deg F)
4.10	24.00	578.500	603.936	25.436	73.0	73.0	77.0	77.0	73	0.8185	15.0	77.0	79.0	78.0
2.20	16.00	565.700	577.951	12.251	72.0	72.0	73.0	73.0	63	0.5956	18.0	78.0	77.0	77.5
1.80	19.00	604.400	615.844	11.444	77.0	77.0	79.0	79.0	55	0.4606	19.0	79.0	78.0	78.5
0.73	23.00	616.200	626.790	10.590	79.0	79.0	80.0	80.0	48	0.3560	20.0	78.0	79.0	78.5
0.38	16.00	627.100	632.181	5.081	81.0	81.0	81.0	81.0	40	0.2408	21.0	79.0	79.0	79.0

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

--- DRY GAS METER ---		--------- ORIFICE ---------			-- DRY GAS METER --		--------- ORIFICE ---------			
					CALIBRATION FACTOR Y		CALIBRATION FACTOR dH@			
VOLUME CORRECTED Vm(std) (cu ft)	VOLUME CORRECTED Vm(std) (liters)	VOLUME CORRECTED Vcr(std) (cu ft)	VOLUME CORRECTED Vcr(std) (liters)	VOLUME NOMINAL Vcr (cu ft)	Value (number)	Variation (number)	Value (In H2O)	Value (mm H2O)	Variation (In H2O)	Ko (value)
25.262	715.4	25.255	715.2	25.830	1.000	-0.005	2.049	52.03	-0.161	0.672
12.168	344.6	12.257	347.1	12.525	1.007	0.002	2.084	52.93	-0.126	0.662
11.239	318.3	11.246	318.5	11.513	1.001	-0.005	2.827	71.80	0.618	0.573
10.344	292.9	10.522	298.0	10.771	1.017	0.012	1.914	48.61	-0.295	0.686
4.945	140.0	4.949	140.1	5.071	1.001	-0.004	2.173	55.20	-0.036	0.654
				Average Y---------->	**1.0051**		**Average dH@----->**	**2.209**	**56.1**	**Average Ko----->**	**0.649**

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)	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 H20 that equates to 0.75 cfm of air at 68 F and 29.92 inches of Hg, acceptable tolerance of individual values from the average is +-0.2.
For Temperature Devicee, the reading must be within 1.5% of certified calibration standard (absolute temperature) to be acceptable.

Calibrated by: Justin Ching Signature: Justin Ching Date: June 27, 2023

A. LANFRANCO and ASSOCIATES INC.

ENVIRONMENTAL CONSULTANTS

NOZZLE DIAMETER CALIBRATION FORM

Calibrated by: Christian De La O
Date: 26-Jun-23
Signature: Chris Del A O

Nozzle I.D.	d1 (inch)	d2 (inch)	d3 (inch)	difference (inch)	average dia. (inch)	average area (ft^2)
ST01	0.1320	0.1315	0.1340	0.0025	0.1325	0.0000958
ST05	0.1750	0.1775	0.1775	0.0025	0.1767	0.0001702
SS-1	0.1775	0.1815	0.1785	0.0040	0.1792	0.0001751
SS-7	0.1805	0.1785	0.1775	0.0030	0.1788	0.0001744
SS-8	0.2090	0.2080	0.2100	0.0020	0.2090	0.0002382
ST10	0.2175	0.2170	0.2185	0.0015	0.2177	0.0002584
SS-18	0.2355	0.2350	0.2355	0.0005	0.2353	0.0003021
ST15	0.2430	0.2430	0.2415	0.0015	0.2425	0.0003207
SS-2	0.2470	0.2445	0.2465	0.0025	0.2460	0.0003301
SS-3	0.2485	0.2490	0.2490	0.0005	0.2488	0.0003377
SS-24	0.2500	0.2475	0.2475	0.0025	0.2483	0.0003364
B	0.2515	0.2525	0.2515	0.0010	0.2518	0.0003459
SS-14	0.2515	0.2485	0.2515	0.0030	0.2505	0.0003422
ST30	0.2510	0.2525	0.2525	0.0015	0.2520	0.0003464
ST20	0.2560	0.2575	0.2575	0.0015	0.2570	0.0003602
A	0.2585	0.2580	0.2575	0.0010	0.2580	0.0003631
SS-9	0.2730	0.2710	0.2730	0.0020	0.2723	0.0004045
ST40	0.2865	0.2865	0.2855	0.0010	0.2862	0.0004466
SS-30	0.2995	0.2980	0.3015	0.0035	0.2997	0.0004898
SS-13	0.3060	0.3070	0.3065	0.0010	0.3065	0.0005124
ST60	0.3060	0.3070	0.3050	0.0020	0.3060	0.0005107
ST50	0.3125	0.3090	0.3095	0.0035	0.3103	0.0005253
SS-10	0.3195	0.3155	0.3185	0.0040	0.3178	0.0005510
SS-327	0.3320	0.3300	0.3305	0.0020	0.3308	0.0005970
ST65	0.3385	0.3370	0.3385	0.0015	0.3380	0.0006231
ST66	0.3395	0.3375	0.3390	0.0020	0.3387	0.0006256
ST80	0.3670	0.3675	0.3670	0.0005	0.3672	0.0007353
ST75	0.3725	0.3725	0.3700	0.0025	0.3717	0.0007534
SS-5	0.3725	0.3735	0.3745	0.0020	0.3735	0.0007609
SS-16	0.3780	0.3765	0.3780	0.0015	0.3775	0.0007773
ST76	0.3750	0.3765	0.3780	0.0030	0.3765	0.0007731
ST85	0.4035	0.4020	0.4010	0.0025	0.4022	0.0008821
SS-15	0.4070	0.4070	0.4040	0.0030	0.4060	0.0008990
DD	0.4135	0.4145	0.4125	0.0020	0.4135	0.0009326
SS11	0.4225	0.4200	0.4225	0.0025	0.4217	0.0009698
ST70	0.4270	0.4260	0.4270	0.0010	0.4267	0.0009929
ST86	0.4565	0.4575	0.4545	0.0030	0.4562	0.0011349
C	0.4865	0.4890	0.4895	0.0030	0.4883	0.0013006
SS-491	0.4980	0.4960	0.4980	0.0020	0.4973	0.0013490
SS-49	0.5010	0.5010	0.5015	0.0005	0.5012	0.0013699
SS-6	0.4985	0.4985	0.4995	0.0010	0.4988	0.0013572
SS-492	0.4955	0.4955	0.4975	0.0020	0.4962	0.0013427
ST90	0.5050	0.5065	0.5045	0.0020	0.5053	0.0013928
ST92	0.5055	0.5040	0.5065	0.0025	0.5053	0.0013928
SS-558	0.5600	0.5600	0.5605	0.0005	0.5602	0.0017114
ST96	0.5605	0.5580	0.5615	0.0035	0.5600	0.0017104
SS-635	0.6435	0.6415	0.6430	0.0020	0.6427	0.0022527
SS-12	0.7460	0.7460	0.7470	0.0010	0.7463	0.0030380

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

A. LANFRANCO and ASSOCIATES INC.

ENVIRONMENTAL CONSULTANTS

TEMPERATURE CALIBRATION FORM

Calibrated by: Daryl Sampson

Date: 8-Jul-23

Signature: Daryl Sampson

TEMPERATURE DEVICE CALIBRATIONS

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

Calibration Certificate

Date:	08-Aug-23	**Insrtument Calibrated:**	Testo 2 (330-2LX)
Calibrated by:	Louis Agassiz	**Serial #:**	03282252
Authorizing Signature:		**Customer:**	ALA

Ambient Conditions: Temperature: 25 °C Barometric Pressure: 101.6 kPa Relative Humidity: 65%

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

O_2	Initial Evaluation				After Calibration				
Gas	Instrument Reading (vol %)	Calibration Error	Pass/Fail	Notes	Instrument Reading (vol %)	Calibration Error	Pass/Fail	Notes	Certified Value (vol %)
Zero	0.1	0.10	Pass		0	0.00	Pass		0
O_2	11.1	0.03	Pass		11.1	0.03	Pass		11.07
Ambient	21	0.04	Pass		21.0	0.04	Pass		20.96

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

CO	Initial Evaluation				After Calibration				
Gas	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Certified Value (ppm)
Zero	0	0.0%	Pass	Replaced CO cell	0	0.0%	Pass		0
1 Gas	592	25.6%	Fail		472	0.1%	Pass		472
2 Gas	2154	13.1%	Fail		1900	0.2%	Pass		1904
3 Gas	245	2.3%	Pass		251	0.1%	Pass		251

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

NO	Initial Evaluation				After Calibration				
Gas	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Instrument Reading (ppm)	% Calibration Error	Pass/Fail	Notes	Certified Value (ppm)
Zero	0	0.0%	Pass		0	0.0%	Pass		0
1 Gas	428	9.6%	Fail	Re cal on 1 Gas	473	0.1%	Pass		473.4
2 Gas	235	8.9%	Fail		261	1.2%	Pass		258.0
3 Gas	45	3.6%	Pass		45	3.6%	Pass		43.4

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

NIST Traceable Calibration Gases:

Cylinder	Cylinder ID Number	Certification Date	Expiration Date	Cylinder Pressure (PSI)	NO (ppm)	O_2 (Vol. %)	CO (ppm)
Zero Gas (N_2)	T97227026	10-Nov-2022	9-Nov-2027	2270	0	0	0
1 Gas	SG9107852B	6-May-2021	5-May-2024	950	473.4	0	471.5
2 Gas	CC320634	23-Mar-2018	23-Mar-2026	520	258	0	1904
3 Gas	CC22286	18-Nov-2022	19-Nov-2026	1030	43.42	0	250.7
O_2/CO_2	CC256047	11-Nov-2022	12-Nov-2030	1320	0	11.07	0

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

Canadian Association for Laboratory Accreditation Inc.

CALA

Certificate of Accreditation

A. Lanfranco and Associates Inc.
101 - 9488 - 189th Street
Surrey, British Columbia

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer to joint ISO-ILAC-IAF Communiqué dated April 2017).

CALA

Accreditation No.: 1004232
Issued On: 4/11/2023
Accreditation Date: 2/5/2021
Expiry Date: 10/11/2025

ilac-MRA CALA

President and CEO

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Declaration of Competency

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

1. Name of Qualified Professional Jeremy Gibbs
   Title Environmental technician
2. Are you a registered member of a professional association in B.C.? ☐ Yes ☑ No
   Name of Association: _____ Registration # _____
3. Brief description of professional services:
   Environmental Consultant Specialize in air and atmospheric sciences

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

Declaration

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

Signature: X _____
Print Name: Jeremy Gibbs
Date signed: Nov 1 2020

Witnessed by: X _____
Print Name: Connor Laan

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

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

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

July 2019

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Declaration of Competency

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1. Name of Qualified Professional: Mark Lanfranco

   Title: President | Owner

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

   Name of Association: _____ Registration # _____

3. Brief description of professional services:
   Environmental consulting, specializing in air and atmospheric sciences

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

Declaration

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

Signature:

X _____

Print Name: Mark Lanfranco

Witnessed by:

X _____

Print Name: Melissa Watkins

Date signed: Nov.16, 2020

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

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

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

July 2019

MOUNT ROYAL UNIVERSITY

Faculty of Continuing Education and Extension

Jeremy Shawn Gibbs

has successfully completed

Stack Sampling

35 Hours / 2019

May 22, 2019

Date

Dean
Faculty of Continuing Education and Extension

MOUNT ROYAL
UNIVERSITY
1910

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

Conflict of Interest Disclosure Statement

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

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

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

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

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 Jeremy Gibbs, 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.

BRITISH COLUMBIA | Ministry of Environment and Climate Change Strategy

☐ Real or perceived conflict of interest

Description and nature of conflict(s):

_____

_____

_____

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

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

_____

_____

_____

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: Jeremy Gross

Witnessed by:

X _____

Print name: Mark Lanfranco

Date: Dec.16, 2020

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

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

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

Appendix B - Ash Analysis Report

Your P.O. #: CC
Site Location: Williams Lake Power Plant
Your C.O.C. #: 70632

Attention: Jacob Steyl

ATLANTIC POWER (WILLIAMS LAKE) LTD.
4465 MACKENZIE AVENUE NORTH
WILLIAMS LAKE, BC
CANADA V2G 5E8

Report Date: 2023/10/13
Report #: R3410255
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C368751
Received: 2023/09/01, 09:40

Sample Matrix: Soil
Samples Received: 1

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Metals - TCLP	1	2023/09/08	2023/09/08	BBY7SOP-00001	EPA 1311, 6020bR2 m
Moisture	1	2023/09/03	2023/09/05	BBY8SOP-00017	BCMOE BCLM Dec2000 m
Non Routine/Non Validated Matrix Tested (2)	1	N/A	2023/09/01		
PAH in Soil by GC/MS (SIM)	1	2023/09/07	2023/09/07	BBY8SOP-00022	BCMOE BCLM Jul2017m
PAH TEQ Calculation, BC Reg. 132/92 (3)	1	N/A	2023/09/07	BBY WI-00033	Auto Calc
Total PAH and B(a)P Calculation (4)	1	N/A	2023/09/07	BBY WI-00033	Auto Calc
TCLP pH Measurements	1	N/A	2023/09/08	BBY7SOP-00005	EPA 1311
Dioxins/Furans in Soil (1613B) (1, 5)	1	2023/09/22	2023/10/04	BRL SOP-00410	EPA 1613B m
2378TCDF Confirmation (M8290A/M1613) (1)	1	2023/09/22	2023/10/12	BRL SOP-00406 BRL SOP-00410	EPA M8290Am/ M1613Bm

Remarks:

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

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

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

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

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Campobello, 6740 Campobello Road , Mississauga, ON, L5N 2L8
(2) Sample(s) analyzed using methodologies that have not been subjected to Bureau Veritas' standard validation process for the submitted matrix and is not an accredited method.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Your P.O. #: CC
Site Location: Williams Lake Power Plant
Your C.O.C. #: 70632

Attention: Jacob Steyl

ATLANTIC POWER (WILLIAMS LAKE) LTD.
4465 MACKENZIE AVENUE NORTH
WILLIAMS LAKE, BC
CANADA V2G 5E8

Report Date: 2023/10/13
Report #: R3410255
Version: 1 - Final

CERTIFICATE OF ANALYSIS

BUREAU VERITAS JOB #: C368751
Received: 2023/09/01, 09:40

Analysis performed with client consent, however results should be viewed with discretion.
(3) PAH TEQ = 0.1*benzo(a)anthracene + 1.0*benzo(a)pyrene + 0.1*benzo(b)fluoranthene + 0.1*benzo(k)fluoranthene + 1.1*dibenzo(a,h)anthracene + 0.2*indeno(1,2,3-cd)pyrene
(4) Total PAHs in Soil include: Quinoline, Naphthalene, 1-Methylnaphthalene, 2-Methylnaphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Acridine, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(b&j)fluoranthene, Benzo(k)fluoranthene, Benzo(a)pyrene, Indeno(1,2,3-cd)pyrene, Dibenz(a,h)anthracene, and Benzo(g,h,i)perylene.

Total PAHs in Sediment include (B.C. Reg. 116/2018, Schedule 3.4): Naphthalene, 2-Methylnaphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benzo(a)anthracene, Chrysene, Benzo(a)pyrene, and Dibenz(a,h)anthracene.
(5) Soils are reported on a dry weight basis unless otherwise specified.

Confirmatory runs for 2,3,7,8-TCDF are performed only if the primary result is greater than the RDL.

Encryption Key

Amita Sharma
Customer Solutions Representative
11 Dec 2023 16:26:51

Please direct all questions regarding this Certificate of Analysis to:
Customer Solutions, Western Canada Customer Experience Team
Email: customersolutionswest@bureauveritas.com
Phone# (604) 734 7276

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

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C368751
Report Date: 2023/10/13

ATLANTIC POWER (WILLIAMS LAKE) LTD.
Site Location: Williams Lake Power Plant
Your P.O. #: CC

RESULTS OF CHEMICAL ANALYSES OF SOIL

Bureau Veritas ID		BYB655	
Sampling Date		2023/08/30 15:30	
COC Number		70632	
	UNITS	Glass Jars (Amber) filled with Ash	QC Batch
MISCELLANEOUS			
Sample Matrix	N/A	ASH	ONSITE

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C368751
Report Date: 2023/10/13

ATLANTIC POWER (WILLIAMS LAKE) LTD.
Site Location: Williams Lake Power Plant
Your P.O. #: CC

PHYSICAL TESTING (SOIL)

Bureau Veritas ID		BYB655		
Sampling Date		2023/08/30 15:30		
COC Number		70632		
	UNITS	**Glass Jars (Amber) filled with Ash**	**RDL**	**QC Batch**
Physical Properties				
Moisture	%	<0.30	0.30	B094157
RDL = Reportable Detection Limit				

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C368751
Report Date: 2023/10/13

ATLANTIC POWER (WILLIAMS LAKE) LTD.
Site Location: Williams Lake Power Plant
Your P.O. #: CC

SEMIVOLATILE ORGANICS BY GC-MS (SOIL)

Bureau Veritas ID		BYB655		
Sampling Date		2023/08/30 15:30		
COC Number		70632		
	UNITS	Glass Jars (Amber) filled with Ash	RDL	QC Batch
Calculated Parameters				
PAH Toxicity Equivalency	mg/kg	0.026	0.020	B093537
RDL = Reportable Detection Limit				

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C368751
Report Date: 2023/10/13

ATLANTIC POWER (WILLIAMS LAKE) LTD.
Site Location: Williams Lake Power Plant
Your P.O. #: CC

ELEMENTS BY ATOMIC SPECTROSCOPY (SOIL)

Bureau Veritas ID		BYB655	
Sampling Date		2023/08/30 15:30	
COC Number		70632	
	UNITS	Glass Jars (Amber) filled with Ash	QC Batch
TCLP Extraction Procedure			
Initial pH of Sample	pH	12.6	B098934
pH after HCl	pH	12.3	B098934
Final pH of Leachate	pH	11.8	B098934
pH of Leaching Fluid	pH	2.93	B098934

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C368751
Report Date: 2023/10/13

ATLANTIC POWER (WILLIAMS LAKE) LTD.
Site Location: Williams Lake Power Plant
Your P.O. #: CC

DIOXIN AND FURANS BY HRMS (SOIL)

Bureau Veritas ID		BYB655						
Sampling Date		2023/08/30 15:30						
COC Number		70632			TOXIC EQUIVALENCY		# of	
	UNITS	Glass Jars (Amber) filled with Ash	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
DIOXINS								
2,3,7,8-Tetra CDD *	pg/g	70.9	0.111	0.999	1.00	70.9	1	B153102
1,2,3,7,8-Penta CDD *	pg/g	137	0.106	5.00	1.00	137	1	B153102
1,2,3,4,7,8-Hexa CDD *	pg/g	43.8	0.118	5.00	0.100	4.38	1	B153102
1,2,3,6,7,8-Hexa CDD *	pg/g	44.7	0.104	5.00	0.100	4.47	1	B153102
1,2,3,7,8,9-Hexa CDD *	pg/g	77.6	0.106	5.00	0.100	7.76	1	B153102
1,2,3,4,6,7,8-Hepta CDD *	pg/g	147	0.104	5.00	0.0100	1.47	1	B153102
Octa CDD *	pg/g	161	0.109	9.99	0.000300	0.0483	1	B153102
Total Tetra CDD *	pg/g	1670	0.111	0.999			14	B153102
Total Penta CDD *	pg/g	1430	0.106	5.00			12	B153102
Total Hexa CDD *	pg/g	687	0.109	5.00			7	B153102
Total Hepta CDD *	pg/g	280	0.104	5.00			2	B153102
2,3,7,8-Tetra CDF **	pg/g	<901 (1)	901	0.999	0.100	90.1	1	B153102
1,2,3,7,8-Penta CDF **	pg/g	200	0.102	5.00	0.0300	6.00	1	B153102
2,3,4,7,8-Penta CDF **	pg/g	306	0.120	5.00	0.300	91.8	1	B153102
1,2,3,4,7,8-Hexa CDF **	pg/g	148	0.0987	5.00	0.100	14.8	1	B153102
1,2,3,6,7,8-Hexa CDF **	pg/g	93.3	0.0955	5.00	0.100	9.33	1	B153102
2,3,4,6,7,8-Hexa CDF **	pg/g	88.7	0.0936	5.00	0.100	8.87	1	B153102
1,2,3,7,8,9-Hexa CDF **	pg/g	20.0	0.211	5.00	0.100	2.00	1	B153102
1,2,3,4,6,7,8-Hepta CDF **	pg/g	103	0.0948	5.00	0.0100	1.03	1	B153102
1,2,3,4,7,8,9-Hepta CDF **	pg/g	16.5	0.126	5.00	0.0100	0.165	1	B153102
Octa CDF **	pg/g	23.7	0.122	9.99	0.000300	0.00711	1	B153102
Total Tetra CDF **	pg/g	5800	0.112	0.999			17	B153102
Total Penta CDF **	pg/g	3080	0.109	5.00			15	B153102

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

* CDD = Chloro Dibenzo-p-Dioxin
** CDF = Chloro Dibenzo-p-Furan
(1) RT > 3 seconds - PCDD/DF analysis - Peak detected exceeds expected retention time (from internal standard) by greater than 3 seconds.

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C368751
Report Date: 2023/10/13

ATLANTIC POWER (WILLIAMS LAKE) LTD.
Site Location: Williams Lake Power Plant
Your P.O. #: CC

DIOXIN AND FURANS BY HRMS (SOIL)

Bureau Veritas ID		BYB655						
Sampling Date		2023/08/30 15:30						
COC Number		70632			TOXIC EQUIVALENCY		# of	
	UNITS	Glass Jars (Amber) filled with Ash	EDL	RDL	TEF (2005 WHO)	TEQ(DL)	Isomers	QC Batch
Total Hexa CDF **	pg/g	858	0.112	5.00			12	B153102
Total Hepta CDF **	pg/g	170	0.108	5.00			4	B153102
TCDF Confirmation								
Confirmation 2,3,7,8-Tetra CDF **	pg/g	415 (1)	0.14	5.0	0.100	41.5		B153103
TOTAL TOXIC EQUIVALENCY	pg/g					402		
Surrogate Recovery (%)								
37CL4 2378 Tetra CDD *	%	107						B153102
C13-1234678 HeptaCDD *	%	46						B153102
C13-1234678 HeptaCDF **	%	42						B153102
C13-123478 HexaCDD *	%	98						B153102
C13-123478 HexaCDF **	%	87						B153102
C13-1234789 HeptaCDF **	%	40						B153102
C13-123678 HexaCDD *	%	106						B153102
C13-123678 HexaCDF **	%	86						B153102
C13-12378 PentaCDD *	%	88						B153102
C13-12378 PentaCDF **	%	84						B153102
C13-123789 HexaCDF **	%	46						B153102
C13-234678 HexaCDF **	%	91						B153102
C13-23478 PentaCDF **	%	66						B153102
C13-2378 TetraCDD *	%	82						B153102
C13-2378 TetraCDF **	%	76						B153102
C13-OCDD *	%	16 (2)						B153102
Confirmation C13-2378 TetraCDF **	%	78						B153103

EDL = Estimated Detection Limit
RDL = Reportable Detection Limit
TEF = Toxic Equivalency Factor, TEQ = Toxic Equivalency Quotient,
The Total Toxic Equivalency (TEQ) value reported is the sum of Toxic Equivalent Quotients for the congeners tested.
WHO(2005): The 2005 World Health Organization, Human and Mammalian Toxic Equivalency Factors for Dioxins and Dioxin-like Compounds

** CDF = Chloro Dibenzo-p-Furan
* CDD = Chloro Dibenzo-p-Dioxin
(1) 5X Dilution
(2) Recovery outside method acceptance criteria due to matrix effects

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C368751
Report Date: 2023/10/13

ATLANTIC POWER (WILLIAMS LAKE) LTD.
Site Location: Williams Lake Power Plant
Your P.O. #: CC

TCLP METALS (SOIL)

Bureau Veritas ID		BYB655		
Sampling Date		2023/08/30 15:30		
COC Number		70632		
	UNITS	Glass Jars (Amber) filled with Ash	RDL	QC Batch
TCLP Extraction Procedure				
Leachate Antimony (Sb)	mg/L	<0.10	0.10	B100307
Leachate Arsenic (As)	mg/L	<0.10	0.10	B100307
Leachate Barium (Ba)	mg/L	1.95	0.10	B100307
Leachate Beryllium (Be)	mg/L	<0.10	0.10	B100307
Leachate Boron (B)	mg/L	0.20	0.10	B100307
Leachate Cadmium (Cd)	mg/L	<0.10	0.10	B100307
Leachate Chromium (Cr)	mg/L	0.15	0.10	B100307
Leachate Cobalt (Co)	mg/L	<0.10	0.10	B100307
Leachate Copper (Cu)	mg/L	<0.10	0.10	B100307
Leachate Iron (Fe)	mg/L	<0.50	0.50	B100307
Leachate Lead (Pb)	mg/L	<0.10	0.10	B100307
Leachate Mercury (Hg)	mg/L	<0.0020	0.0020	B100307
Leachate Molybdenum (Mo)	mg/L	0.28	0.10	B100307
Leachate Nickel (Ni)	mg/L	<0.10	0.10	B100307
Leachate Selenium (Se)	mg/L	<0.10	0.10	B100307
Leachate Silver (Ag)	mg/L	<0.010	0.010	B100307
Leachate Thallium (Tl)	mg/L	<0.10	0.10	B100307
Leachate Uranium (U)	mg/L	<0.10	0.10	B100307
Leachate Vanadium (V)	mg/L	<0.10	0.10	B100307
Leachate Zinc (Zn)	mg/L	<0.10	0.10	B100307
Leachate Zirconium (Zr)	mg/L	<0.10	0.10	B100307
RDL = Reportable Detection Limit				

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C368751
Report Date: 2023/10/13

ATLANTIC POWER (WILLIAMS LAKE) LTD.
Site Location: Williams Lake Power Plant
Your P.O. #: CC

CSR PAH IN SOIL BY GC-MS (SOIL)

Bureau Veritas ID		BYB655		
Sampling Date		2023/08/30 15:30		
COC Number		70632		
	UNITS	Glass Jars (Amber) filled with Ash	RDL	QC Batch
Calculated Parameters				
Low Molecular Weight PAH`s	mg/kg	<0.020	0.020	B092441
High Molecular Weight PAH`s	mg/kg	<0.050	0.050	B092441
Total PAH	mg/kg	<0.050	0.050	B092441
B[a]P TPE Total Potency Equivalents	mg/kg	0.024	0.010	B092441
Polycyclic Aromatics				
Naphthalene	mg/kg	<0.010	0.010	B098090
2-Methylnaphthalene	mg/kg	<0.020	0.020	B098090
Acenaphthylene	mg/kg	<0.0050	0.0050	B098090
Acenaphthene	mg/kg	<0.0050	0.0050	B098090
Fluorene	mg/kg	<0.020	0.020	B098090
Phenanthrene	mg/kg	<0.010	0.010	B098090
Anthracene	mg/kg	<0.0040	0.0040	B098090
Fluoranthene	mg/kg	<0.020	0.020	B098090
Pyrene	mg/kg	<0.020	0.020	B098090
Benzo(a)anthracene	mg/kg	<0.020	0.020	B098090
Chrysene	mg/kg	<0.020	0.020	B098090
Benzo(b&j)fluoranthene	mg/kg	<0.020	0.020	B098090
Benzo(b)fluoranthene	mg/kg	<0.020	0.020	B098090
Benzo(k)fluoranthene	mg/kg	<0.020	0.020	B098090
Benzo(a)pyrene	mg/kg	<0.020	0.020	B098090
Indeno(1,2,3-cd)pyrene	mg/kg	<0.020	0.020	B098090
Dibenz(a,h)anthracene	mg/kg	<0.020	0.020	B098090
Benzo(g,h,i)perylene	mg/kg	<0.050	0.050	B098090
Surrogate Recovery (%)				
D10-ANTHRACENE (sur.)	%	50		B098090
RDL = Reportable Detection Limit				

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GENERAL COMMENTS

Results relate only to the items tested.

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QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
B094157	IP1	Method Blank	Moisture	2023/09/05	<0.30		%	
B094157	IP1	RPD	Moisture	2023/09/05	0.50		%	20
B098090	MDW	Matrix Spike	D10-ANTHRACENE (sur.)	2023/09/07		82	%	50 - 140
			Naphthalene	2023/09/07		79	%	50 - 140
			2-Methylnaphthalene	2023/09/07		80	%	50 - 140
			Acenaphthylene	2023/09/07		79	%	50 - 140
			Acenaphthene	2023/09/07		81	%	50 - 140
			Fluorene	2023/09/07		82	%	50 - 140
			Phenanthrene	2023/09/07		80	%	50 - 140
			Anthracene	2023/09/07		81	%	50 - 140
			Fluoranthene	2023/09/07		82	%	50 - 140
			Pyrene	2023/09/07		78	%	50 - 140
			Benzo(a)anthracene	2023/09/07		77	%	50 - 140
			Chrysene	2023/09/07		80	%	50 - 140
			Benzo(b&j)fluoranthene	2023/09/07		75	%	50 - 140
			Benzo(b)fluoranthene	2023/09/07		73	%	50 - 140
			Benzo(k)fluoranthene	2023/09/07		78	%	50 - 140
			Benzo(a)pyrene	2023/09/07		78	%	50 - 140
			Indeno(1,2,3-cd)pyrene	2023/09/07		80	%	50 - 140
			Dibenz(a,h)anthracene	2023/09/07		74	%	50 - 140
			Benzo(g,h,i)perylene	2023/09/07		77	%	50 - 140
B098090	MDW	Spiked Blank	D10-ANTHRACENE (sur.)	2023/09/07		83	%	50 - 140
			Naphthalene	2023/09/07		75	%	50 - 140
			2-Methylnaphthalene	2023/09/07		78	%	50 - 140
			Acenaphthylene	2023/09/07		77	%	50 - 140
			Acenaphthene	2023/09/07		79	%	50 - 140
			Fluorene	2023/09/07		80	%	50 - 140
			Phenanthrene	2023/09/07		82	%	50 - 140
			Anthracene	2023/09/07		81	%	50 - 140
			Fluoranthene	2023/09/07		83	%	50 - 140
			Pyrene	2023/09/07		79	%	50 - 140
			Benzo(a)anthracene	2023/09/07		80	%	50 - 140
			Chrysene	2023/09/07		83	%	50 - 140
			Benzo(b&j)fluoranthene	2023/09/07		76	%	50 - 140
			Benzo(b)fluoranthene	2023/09/07		75	%	50 - 140
			Benzo(k)fluoranthene	2023/09/07		83	%	50 - 140
			Benzo(a)pyrene	2023/09/07		82	%	50 - 140
			Indeno(1,2,3-cd)pyrene	2023/09/07		82	%	50 - 140
			Dibenz(a,h)anthracene	2023/09/07		78	%	50 - 140
			Benzo(g,h,i)perylene	2023/09/07		80	%	50 - 140
B098090	MDW	Method Blank	D10-ANTHRACENE (sur.)	2023/09/07		87	%	50 - 140
			Naphthalene	2023/09/07	<0.010		mg/kg	
			2-Methylnaphthalene	2023/09/07	<0.020		mg/kg	
			Acenaphthylene	2023/09/07	<0.0050		mg/kg	
			Acenaphthene	2023/09/07	<0.0050		mg/kg	
			Fluorene	2023/09/07	<0.020		mg/kg	
			Phenanthrene	2023/09/07	<0.010		mg/kg	
			Anthracene	2023/09/07	<0.0040		mg/kg	
			Fluoranthene	2023/09/07	<0.020		mg/kg	
			Pyrene	2023/09/07	<0.020		mg/kg	
			Benzo(a)anthracene	2023/09/07	<0.020		mg/kg	
			Chrysene	2023/09/07	<0.020		mg/kg	
			Benzo(b&j)fluoranthene	2023/09/07	<0.020		mg/kg	
			Benzo(b)fluoranthene	2023/09/07	<0.020		mg/kg	

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QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Benzo(k)fluoranthene	2023/09/07	<0.020		mg/kg	
			Benzo(a)pyrene	2023/09/07	<0.020		mg/kg	
			Indeno(1,2,3-cd)pyrene	2023/09/07	<0.020		mg/kg	
			Dibenz(a,h)anthracene	2023/09/07	<0.020		mg/kg	
			Benzo(g,h,i)perylene	2023/09/07	<0.050		mg/kg	
B098090	MDW	RPD	Naphthalene	2023/09/07	NC		%	50
			2-Methylnaphthalene	2023/09/07	NC		%	50
			Acenaphthylene	2023/09/07	NC		%	50
			Acenaphthene	2023/09/07	NC		%	50
			Fluorene	2023/09/07	NC		%	50
			Phenanthrene	2023/09/07	NC		%	50
			Anthracene	2023/09/07	NC		%	50
			Fluoranthene	2023/09/07	NC		%	50
			Pyrene	2023/09/07	NC		%	50
			Benzo(a)anthracene	2023/09/07	NC		%	50
			Chrysene	2023/09/07	NC		%	50
			Benzo(b&j)fluoranthene	2023/09/07	NC		%	50
			Benzo(b)fluoranthene	2023/09/07	NC		%	50
			Benzo(k)fluoranthene	2023/09/07	NC		%	50
			Benzo(a)pyrene	2023/09/07	NC		%	50
			Indeno(1,2,3-cd)pyrene	2023/09/07	NC		%	50
			Dibenz(a,h)anthracene	2023/09/07	NC		%	50
			Benzo(g,h,i)perylene	2023/09/07	NC		%	50
B098934	S2L	Method Blank	Initial pH of Sample	2023/09/08	4.90		pH	
			pH after HCl	2023/09/08	NA		pH	
			Final pH of Leachate	2023/09/08	4.93		pH	
			pH of Leaching Fluid	2023/09/08	4.90		pH	
B098934	S2L	RPD	Initial pH of Sample	2023/09/08	0.33		%	N/A
			pH after HCl	2023/09/08	6.5		%	N/A
			Final pH of Leachate	2023/09/08	0		%	N/A
			pH of Leaching Fluid	2023/09/08	0		%	N/A
B100307	USH	Matrix Spike [BYB655-03]	Leachate Antimony (Sb)	2023/09/08		101	%	75 - 125
			Leachate Arsenic (As)	2023/09/08		106	%	75 - 125
			Leachate Barium (Ba)	2023/09/08		106	%	75 - 125
			Leachate Beryllium (Be)	2023/09/08		98	%	75 - 125
			Leachate Boron (B)	2023/09/08		97	%	75 - 125
			Leachate Cadmium (Cd)	2023/09/08		105	%	75 - 125
			Leachate Chromium (Cr)	2023/09/08		103	%	75 - 125
			Leachate Cobalt (Co)	2023/09/08		103	%	75 - 125
			Leachate Copper (Cu)	2023/09/08		96	%	75 - 125
			Leachate Iron (Fe)	2023/09/08		102	%	75 - 125
			Leachate Lead (Pb)	2023/09/08		105	%	75 - 125
			Leachate Mercury (Hg)	2023/09/08		103	%	75 - 125
			Leachate Molybdenum (Mo)	2023/09/08		109	%	75 - 125
			Leachate Nickel (Ni)	2023/09/08		97	%	75 - 125
			Leachate Selenium (Se)	2023/09/08		106	%	75 - 125
			Leachate Silver (Ag)	2023/09/08		93	%	75 - 125
			Leachate Thallium (Tl)	2023/09/08		98	%	75 - 125
			Leachate Uranium (U)	2023/09/08		107	%	75 - 125
			Leachate Vanadium (V)	2023/09/08		102	%	75 - 125
			Leachate Zinc (Zn)	2023/09/08		98	%	75 - 125
			Leachate Zirconium (Zr)	2023/09/08		106	%	75 - 125
B100307	USH	Spiked Blank	Leachate Antimony (Sb)	2023/09/08		99	%	75 - 125
			Leachate Arsenic (As)	2023/09/08		101	%	75 - 125

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Leachate Barium (Ba)	2023/09/08		99	%	75 - 125
			Leachate Beryllium (Be)	2023/09/08		94	%	75 - 125
			Leachate Boron (B)	2023/09/08		95	%	75 - 125
			Leachate Cadmium (Cd)	2023/09/08		101	%	75 - 125
			Leachate Chromium (Cr)	2023/09/08		96	%	75 - 125
			Leachate Cobalt (Co)	2023/09/08		97	%	75 - 125
			Leachate Copper (Cu)	2023/09/08		92	%	75 - 125
			Leachate Iron (Fe)	2023/09/08		98	%	75 - 125
			Leachate Lead (Pb)	2023/09/08		100	%	75 - 125
			Leachate Mercury (Hg)	2023/09/08		98	%	75 - 125
			Leachate Molybdenum (Mo)	2023/09/08		96	%	75 - 125
			Leachate Nickel (Ni)	2023/09/08		91	%	75 - 125
			Leachate Selenium (Se)	2023/09/08		100	%	75 - 125
			Leachate Silver (Ag)	2023/09/08		90	%	75 - 125
			Leachate Thallium (Tl)	2023/09/08		91	%	75 - 125
			Leachate Uranium (U)	2023/09/08		99	%	75 - 125
			Leachate Vanadium (V)	2023/09/08		95	%	75 - 125
			Leachate Zinc (Zn)	2023/09/08		97	%	75 - 125
			Leachate Zirconium (Zr)	2023/09/08		101	%	75 - 125
B100307	USH	Method Blank	Leachate Antimony (Sb)	2023/09/08	<0.10		mg/L	
			Leachate Arsenic (As)	2023/09/08	<0.10		mg/L	
			Leachate Barium (Ba)	2023/09/08	<0.10		mg/L	
			Leachate Beryllium (Be)	2023/09/08	<0.10		mg/L	
			Leachate Boron (B)	2023/09/08	<0.10		mg/L	
			Leachate Cadmium (Cd)	2023/09/08	<0.10		mg/L	
			Leachate Chromium (Cr)	2023/09/08	<0.10		mg/L	
			Leachate Cobalt (Co)	2023/09/08	<0.10		mg/L	
			Leachate Copper (Cu)	2023/09/08	<0.10		mg/L	
			Leachate Iron (Fe)	2023/09/08	<0.50		mg/L	
			Leachate Lead (Pb)	2023/09/08	<0.10		mg/L	
			Leachate Mercury (Hg)	2023/09/08	<0.0020		mg/L	
			Leachate Molybdenum (Mo)	2023/09/08	<0.10		mg/L	
			Leachate Nickel (Ni)	2023/09/08	<0.10		mg/L	
			Leachate Selenium (Se)	2023/09/08	<0.10		mg/L	
			Leachate Silver (Ag)	2023/09/08	<0.010		mg/L	
			Leachate Thallium (Tl)	2023/09/08	<0.10		mg/L	
			Leachate Uranium (U)	2023/09/08	<0.10		mg/L	
			Leachate Vanadium (V)	2023/09/08	<0.10		mg/L	
			Leachate Zinc (Zn)	2023/09/08	<0.10		mg/L	
			Leachate Zirconium (Zr)	2023/09/08	<0.10		mg/L	
B153102	éGP	Matrix Spike [BYB655-02]	37CL4 2378 Tetra CDD	2023/10/04		109	%	35 - 197
			C13-1234678 HeptaCDD	2023/10/04		48	%	23 - 140
			C13-1234678 HeptaCDF	2023/10/04		43	%	28 - 143
			C13-123478 HexaCDD	2023/10/04		105	%	32 - 141
			C13-123478 HexaCDF	2023/10/04		89	%	26 - 152
			C13-1234789 HeptaCDF	2023/10/04		35	%	26 - 138
			C13-123678 HexaCDD	2023/10/04		102	%	28 - 130
			C13-123678 HexaCDF	2023/10/04		86	%	26 - 123
			C13-12378 PentaCDD	2023/10/04		94	%	25 - 181
			C13-12378 PentaCDF	2023/10/04		86	%	24 - 185
			C13-123789 HexaCDF	2023/10/04		46	%	29 - 147
			C13-234678 HexaCDF	2023/10/04		91	%	28 - 136
			C13-23478 PentaCDF	2023/10/04		63	%	21 - 178
			C13-2378 TetraCDD	2023/10/04		84	%	25 - 164

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			C13-2378 TetraCDF	2023/10/04		80	%	24 - 169
			C13-OCDD	2023/10/04		10 (1)	%	17 - 157
			2,3,7,8-Tetra CDD	2023/10/04		26 (1)	%	67 - 158
			1,2,3,7,8-Penta CDD	2023/10/04		116	%	25 - 181
			1,2,3,4,7,8-Hexa CDD	2023/10/04		102	%	70 - 164
			1,2,3,6,7,8-Hexa CDD	2023/10/04		106	%	76 - 134
			1,2,3,7,8,9-Hexa CDD	2023/10/04		85	%	64 - 162
			1,2,3,4,6,7,8-Hepta CDD	2023/10/04		107	%	70 - 140
			Octa CDD	2023/10/04		140	%	78 - 144
			2,3,7,8-Tetra CDF	2023/10/04		103	%	75 - 158
			1,2,3,7,8-Penta CDF	2023/10/04		123	%	80 - 134
			2,3,4,7,8-Penta CDF	2023/10/04		126	%	68 - 160
			1,2,3,4,7,8-Hexa CDF	2023/10/04		97	%	72 - 134
			1,2,3,6,7,8-Hexa CDF	2023/10/04		102	%	84 - 130
			2,3,4,6,7,8-Hexa CDF	2023/10/04		95	%	70 - 156
			1,2,3,7,8,9-Hexa CDF	2023/10/04		130	%	78 - 130
			1,2,3,4,6,7,8-Hepta CDF	2023/10/04		104	%	82 - 122
			1,2,3,4,7,8,9-Hepta CDF	2023/10/04		103	%	78 - 138
			Octa CDF	2023/10/04		144	%	63 - 170
B153102	éGP	Spiked Blank	37CL4 2378 Tetra CDD	2023/10/01		110	%	35 - 197
			C13-1234678 HeptaCDD	2023/10/01		91	%	23 - 140
			C13-1234678 HeptaCDF	2023/10/01		81	%	28 - 143
			C13-123478 HexaCDD	2023/10/01		109	%	32 - 141
			C13-123478 HexaCDF	2023/10/01		96	%	26 - 152
			C13-1234789 HeptaCDF	2023/10/01		88	%	26 - 138
			C13-123678 HexaCDD	2023/10/01		103	%	28 - 130
			C13-123678 HexaCDF	2023/10/01		90	%	26 - 123
			C13-12378 PentaCDD	2023/10/01		101	%	25 - 181
			C13-12378 PentaCDF	2023/10/01		98	%	24 - 185
			C13-123789 HexaCDF	2023/10/01		92	%	29 - 147
			C13-234678 HexaCDF	2023/10/01		104	%	28 - 136
			C13-23478 PentaCDF	2023/10/01		76	%	21 - 178
			C13-2378 TetraCDD	2023/10/01		90	%	25 - 164
			C13-2378 TetraCDF	2023/10/01		92	%	24 - 169
			C13-OCDD	2023/10/01		93	%	17 - 157
			2,3,7,8-Tetra CDD	2023/10/01		103	%	67 - 158
			1,2,3,7,8-Penta CDD	2023/10/01		108	%	25 - 181
			1,2,3,4,7,8-Hexa CDD	2023/10/01		101	%	70 - 164
			1,2,3,6,7,8-Hexa CDD	2023/10/01		104	%	76 - 134
			1,2,3,7,8,9-Hexa CDD	2023/10/01		107	%	64 - 162
			1,2,3,4,6,7,8-Hepta CDD	2023/10/01		99	%	70 - 140
			Octa CDD	2023/10/01		104	%	78 - 144
			2,3,7,8-Tetra CDF	2023/10/01		94	%	75 - 158
			1,2,3,7,8-Penta CDF	2023/10/01		98	%	80 - 134
			2,3,4,7,8-Penta CDF	2023/10/01		102	%	68 - 160
			1,2,3,4,7,8-Hexa CDF	2023/10/01		97	%	72 - 134
			1,2,3,6,7,8-Hexa CDF	2023/10/01		100	%	84 - 130
			2,3,4,6,7,8-Hexa CDF	2023/10/01		90	%	70 - 156
			1,2,3,7,8,9-Hexa CDF	2023/10/01		102	%	78 - 130
			1,2,3,4,6,7,8-Hepta CDF	2023/10/01		105	%	82 - 122
			1,2,3,4,7,8,9-Hepta CDF	2023/10/01		105	%	78 - 138
			Octa CDF	2023/10/01		140	%	63 - 170
B153102	éGP	Method Blank	37CL4 2378 Tetra CDD	2023/09/27		82	%	35 - 197
			C13-1234678 HeptaCDD	2023/09/27		81	%	23 - 140

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QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			C13-1234678 HeptaCDF	2023/09/27		89	%	28 - 143
			C13-123478 HexaCDD	2023/09/27		85	%	32 - 141
			C13-123478 HexaCDF	2023/09/27		86	%	26 - 152
			C13-1234789 HeptaCDF	2023/09/27		97	%	26 - 138
			C13-123678 HexaCDD	2023/09/27		81	%	28 - 130
			C13-123678 HexaCDF	2023/09/27		83	%	26 - 123
			C13-12378 PentaCDD	2023/09/27		71	%	25 - 181
			C13-12378 PentaCDF	2023/09/27		64	%	24 - 185
			C13-123789 HexaCDF	2023/09/27		87	%	29 - 147
			C13-234678 HexaCDF	2023/09/27		95	%	28 - 136
			C13-23478 PentaCDF	2023/09/27		41	%	21 - 178
			C13-2378 TetraCDD	2023/09/27		63	%	25 - 164
			C13-2378 TetraCDF	2023/09/27		78	%	24 - 169
			C13-OCDD	2023/09/27		65	%	17 - 157
			2,3,7,8-Tetra CDD	2023/09/27	<0.137, EDL=0.137		pg/g	
			1,2,3,7,8-Penta CDD	2023/09/27	<0.146, EDL=0.146		pg/g	
			1,2,3,4,7,8-Hexa CDD	2023/09/27	<0.140, EDL=0.140		pg/g	
			1,2,3,6,7,8-Hexa CDD	2023/09/27	<0.139, EDL=0.139		pg/g	
			1,2,3,7,8,9-Hexa CDD	2023/09/27	<0.134, EDL=0.134		pg/g	
			1,2,3,4,6,7,8-Hepta CDD	2023/09/27	<0.140, EDL=0.140		pg/g	
			Octa CDD	2023/09/27	<0.249, EDL=0.249 (2)		pg/g	
			Total Tetra CDD	2023/09/27	<0.137, EDL=0.137		pg/g	
			Total Penta CDD	2023/09/27	<0.146, EDL=0.146		pg/g	
			Total Hexa CDD	2023/09/27	<0.138, EDL=0.138		pg/g	
			Total Hepta CDD	2023/09/27	<0.140, EDL=0.140		pg/g	
			2,3,7,8-Tetra CDF	2023/09/27	<0.149, EDL=0.149		pg/g	
			1,2,3,7,8-Penta CDF	2023/09/27	<0.122, EDL=0.122		pg/g	
			2,3,4,7,8-Penta CDF	2023/09/27	<0.176, EDL=0.176		pg/g	
			1,2,3,4,7,8-Hexa CDF	2023/09/27	<0.117, EDL=0.117		pg/g	
			1,2,3,6,7,8-Hexa CDF	2023/09/27	<0.117, EDL=0.117		pg/g	
			2,3,4,6,7,8-Hexa CDF	2023/09/27	<0.105, EDL=0.105		pg/g	
			1,2,3,7,8,9-Hexa CDF	2023/09/27	<0.132, EDL=0.132		pg/g	
			1,2,3,4,6,7,8-Hepta CDF	2023/09/27	<0.130, EDL=0.130		pg/g	
			1,2,3,4,7,8,9-Hepta CDF	2023/09/27	<0.151, EDL=0.151		pg/g	

Bureau Veritas Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Job #: C368751
Report Date: 2023/10/13

ATLANTIC POWER (WILLIAMS LAKE) LTD.
Site Location: Williams Lake Power Plant
Your P.O. #: CC

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Octa CDF	2023/09/27	0.208, EDL=0.133		pg/g	
			Total Tetra CDF	2023/09/27	<0.149, EDL=0.149		pg/g	
			Total Penta CDF	2023/09/27	<0.142, EDL=0.142		pg/g	
			Total Hexa CDF	2023/09/27	<0.117, EDL=0.117		pg/g	
			Total Hepta CDF	2023/09/27	<0.139, EDL=0.139		pg/g	
B153103	AGU	Method Blank	Confirmation C13-2378 TetraCDF	2023/10/12		96	%	40 - 135
			Confirmation 2,3,7,8-Tetra CDF	2023/10/12	<0.18, MDL=0.18		pg/g	

N/A = Not Applicable

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

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

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

Surrogate: A pure or isotopically labeled compound whose behavior mirrors the analytes of interest. Used to evaluate extraction efficiency.

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

(1) Recovery outside method acceptance criteria due to matrix effects

(2) EMPC / NDR - Peak detected does not meet ratio criteria and has resulted in an elevated detection limit.

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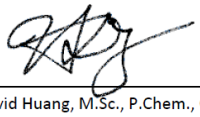
VALIDATION SIGNATURE PAGE

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

Angel Guerrero, Supervisor, Ultra Trace Analysis, HRMS



David Huang, M.Sc., P.Chem., QP, Scientific Services Manager

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

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Custody Tracking Form

W70632

Please use this form for custody tracking when submitting the work instructions via eCOC (electronic Chain of Custody). Please ensure your form has a barcode or a Bureau Veritas eCOC confirmation number in the top right hand side. This number links your electronic submission to your samples. This form should be placed in the cooler with your samples.

First Sample: Glass Jars (Amber) filled with Ash
Last Sample: Glass Jars (Amber) filled with Ash
Sample Count: 1

Relinquished By				Received By			
Print: Jacob Steyl	Sign	Date	2023/09/30	Print: HARIGNA JOSHI	Sign	Date	2023/09/01
		Time (24 HR)	15:30			Time (24 HR)	09:40
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM
Print	Sign	Date	YYYY/MM/DD	Print	Sign	Date	YYYY/MM/DD
		Time (24 HR)	HH:MM			Time (24 HR)	HH:MM

Unless otherwise agreed to, submissions and use of services are governed by Bureau Veritas' standard terms and conditions which can be found at www.bvna.com.

Triage Information

Sampled By (Print): Jacob Steyl

# of Coolers/Pkgs: 1/4

Rush ☐ Immediate Test ☐ Food Residue ☐
Micro ☐ Food Chemistry ☐

*** LABORATORY USE ONLY ***

Received At:
Labeled By:
Verified By:

Lab Comments: NO ICE

C368751_COC

Custody Seal		Cooling Media	Temperature °C		
Present (Y/N)	Intact (Y/N)	Present (Y/N)	1	2	3
N	N	N	19	19	19

Drinking Water Metals Preservation Check Done (Circle) YES NO

COR FCD-00383/3

Page 1 of 1

eCOC: W70632

Project Information:	C368751
Job Received:	2023/09/01 09:40
Expected TAT:	Standard TAT
Expected Arrival:	2023/08/31 15:00
Submitted By:	Jacob Steyl
Submitted To:	Burnaby ENV: 4606 Canada Way

Invoice Information

Attn: Jacob Steyl
ATLANTIC POWER (WILLIAMS LAKE) LTD.
4465 MACKENZIE AVENUE NORTH
WILLIAMS LAKE , BC , V2G 5E8
Email to:
jsteyl@atlanticpower.com

Report Information

Attn: Jacob Steyl
ATLANTIC POWER (WILLIAMS LAKE) LTD.
4465 MACKENZIE AVENUE NORTH
WILLIAMS LAKE , BC , V2G 5E8
Email to:
jsteyl@atlanticpower.com

Project Information

Quote #:	C21865, B71255, C30150
PO/AFE#:	CC
Project #:	
Site Location:	Williams Lake Power Plant

Analytical Summary

A: Standard TAT

Client Sample ID	Clnt Ref	Sampling Date/Time	Matrix	#Cont	CSR PAH in Soil by GC-MS	TCLP Metals	Dioxins/Furans in Soil (EPS 1/RM/23)	Moisture	PAH TEQ Calculation, BC Reg. 132/92	TCLP pH Measurements
Glass Jars (Amber) filled with Ash	1	2023/08/30 15:30	SOIL	4	A	A	A	A	A	A

Deadlines are estimates only and are subject to change. Please refer to your Job Confirmation report for final due dates.

Submission Information

# of Samples:	1
Details:	Add NONMATRIX code = ASH

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