

**Pinnacle Renewable Energy Inc
Williams Lake, BC
Dryer Stacks 1-4
November 25, 2021
Permit 17557**

Our Job Number: ME2021-302

Report Author: Matt McCall
McCall Environmental

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December 22, 2021

Pinnacle Pellet Inc.
1160 South Lakeside Dr.
Williams Lake, B.C.
V2J 6K9

Attention: **Mr. Ian Tencarre**

Reference: **Parameters Tested** – Total Particulate & Cond. Organics
Test Date(s) – November 25, 2021
Permit – PA-17557
McCall File Number – ME2021-302

As requested our firm has performed a series of air emission tests at your facility in Williams Lake BC.

Testing Parameters

Dryer Stacks 1-4

- Total Particulate and Condensable Organics State of Oregon Method

Key Personnel

- Report Generation: Matt McCall 250-542-5118
- Sr Field Tech: Danny Lawrence 250-857-5713
- Field Tech: Dave Brandle and Nick Angus 250-564-9106
- Plant Personnel: Ian Tencarre 250-267-7580

All stacks have been examined for cyclonic flow and determined to be tested as laminar in nature.

Test results are summarized immediately following this cover letter.

Lab analysis for condensable organic fractions was carried out by Element Labs in Surrey, B.C. A copy of their report is included in the Appendix of this report.

If you have any questions or concerns please don't hesitate to contact us at your earliest convenience.

MCCALL ENVIRONMENTAL

Matt McCall

Summary of Test Results

Dryer Results November 25, 2021

Total Particulate

Average of Triplicate Tests

Parameter	Stack 1	Stack2	Stack 3	Stack 4	Average/ Total	Permit
Test Date	Nov 25/21	Nov 25/21	Nov 25/21	Nov 25/21	N/A	
Gas Temperature (°C)	28.4	32.2	30.1	38.0	32.2	
% Moisture	3.09	2.85	2.90	2.79	2.91	
Velocity (m/sec)	7.73	8.60	7.68	8.22	8.06	
ACFM	47952	53318	47593	50992	199855	
Std. Dry Flow Rate (m³/sec)	19.91	21.91	19.69	20.58	82.09	90.00
Tot Part. Dry Basis ref. Cond. (mg/m³)	9.39	7.65	12.70	13.70	10.86	15.00
Front Half Particulate (mg/m³)	2.50	2.85	5.81	8.31	4.87	
Back Half Condensibles (mg/m³)	6.89	4.80	6.88	5.40	5.99	
Mass Emission Rate (kg/hr)	0.67	0.60	0.90	1.02	3.19	

* Mass Emission Rates (Flow, kg/hr are a total combined value, concentration, temp etc is averaged)

* Standard reference conditions are on a dry basis corrected to 20 deg C and a pressure of 29.92 inches Hg

Discussion Of Test Results

Test results are all in compliance with permitted limits.

Last time this sources was tested on September 29-30 of 2021 the average velocity was 78.37 m³/sec and at a concentration of 7.75 mg/m³.

These sources are turbulent however are not considered cyclonic and are tested with standard testing methodologies.

**Pinnacle Pellet
Dryer Stack 1
Williams Lake**

Nov 25/21

Permit Number: RA-17557

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	83 ° F	28 ° C
Moisture Content (by volume):	3.09 %	
Average Stack Gas Velocity:	25.4 ft/sec	7.7 m/sec
Total Actual Gas Flow Rate:	47952 ACFM	
Dry Gas flow Rate at Reference Conditions:	42180 SCFM	19.9 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.004 gr/ft ³	9.39 mg/m ³
Front Half Particulate	0.001 gr/ft ³	2.5 mg/m ³
Back Half Condensibles	0.003 gr/ft ³	6.9 mg/m ³
Mass Emission Rate	1.48 lbs/hr	0.67 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	80 ° F	26 ° C
Moisture Content (by volume):	3.1 %	
Average Stack Gas Velocity:	25.2 ft/sec	7.7 m/sec
Total Actual Gas Flow Rate:	47655 ACFM	
Dry Gas flow Rate at Reference Conditions:	42207 SCFM	19.9 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	9.3 mg/m ³
Front Half Particulate	.001 gr/ft ³	2.4 mg/m ³
Back Half Condensibles	.003 gr/ft ³	6.9 mg/m ³
Mass Emission Rate	1.47 lbs/hr	0.67 kg/hr

TEST 2:

Gas Temperature:	86 ° F	30 ° C
Moisture Content (by volume):	2.9 %	
Average Stack Gas Velocity:	25.4 ft/sec	7.7 m/sec
Total Actual Gas Flow Rate:	48035 ACFM	
Dry Gas flow Rate at Reference Conditions:	42127 SCFM	19.9 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	9.5 mg/m ³
Front Half Particulate	.001 gr/ft ³	2.8 mg/m ³
Back Half Condensibles	.003 gr/ft ³	6.7 mg/m ³
Mass Emission Rate	1.51 lbs/hr	0.68 kg/hr

TEST 3:

Gas Temperature:	84 ° F	29 ° C
Moisture Content (by volume):	3.2 %	
Average Stack Gas Velocity:	25.5 ft/sec	7.8 m/sec
Total Actual Gas Flow Rate:	48167 ACFM	
Dry Gas flow Rate at Reference Conditions:	42206 SCFM	19.9 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	9.3 mg/m ³
Front Half Particulate	.001 gr/ft ³	2.3 mg/m ³
Back Half Condensibles	.003 gr/ft ³	7.0 mg/m ³
Mass Emission Rate	1.47 lbs/hr	0.67 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Pellet
Plant Location: Williams Lake
Process: Dryer Stack 1
Permit Number: RA-17557
Job Number: ME2021-302
Pollution Control Permit: 15.0 mg/m3 22.5 m3/sec
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

Filter Number:
Date of Test:
Start Time:
Stop Time:
On-line Sampling Time:
Testing Personnel:
Sampler Model:
Barometric Pressure("Hg):
Static Pressure("H₂O):
%CO₂:
%O₂:
%CO:
%N₂:
Diameter of Nozzle(inches):
Meter Factor:
Type-S Pitot Tube Coefficient:
Cross Sectional Area of Stack(ft²):
Impinger Condensate(g):
Weight of Moisture in Silica Gel(g):
Weight of Filter Particulate(g):
Weight of Probe Washings(g):
Weight of Impinger Content Organic(g):
Total Weight of Particulate(g):

TEST 1	TEST 2	TEST 3
27	28	29
Nov 25/21	Nov 25/21	Nov 25/21
9:36	10:55	12:10
10:42	11:59	1:13
60	60	60
DL/AB	DL/AB	DL/AB
1013	1013	1013
27.95	27.95	27.95
-0.20	-0.20	-0.20
0.0	0.0	0.0
21.0	21.0	21.0
0.0	0.0	0.0
79.0	79.0	79.0
0.275	0.275	0.275
0.9954	0.9954	0.9954
0.84158	0.84158	0.84158
31.5	31.5	31.5
18	15	18
4.0	6.0	5.0
0.0001	0.0001	0.0001
0.0021	0.0025	0.0020
0.0064	0.0062	0.0064
0.0086	0.0088	0.0085

Sampling Data for - *TEST 1*

Nov 25/21

Pinnacle Pellet

Dryer Stack 1

Williams Lake

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.20	1.23	54	55	81	0.00	0.98
A-11	0.19	1.17	49	47	77	1.48	1.01
A-10	0.22	1.37	53	50	76	2.96	1.03
A-9	0.20	1.24	54	51	77	4.60	0.96
A-8	0.18	1.11	54	49	76	6.05	1.02
A-7	0.17	1.05	56	53	82	7.52	1.01
A-6	0.17	1.06	57	57	78	8.93	0.98
A-5	0.18	1.12	57	56	80	10.31	0.98
A-4	0.16	1.00	60	58	78	11.73	1.01
A-3	0.16	1.01	63	59	78	13.11	1.03
A-2	0.17	1.07	64	59	78	14.53	0.97
A-1	0.17	1.07	64	60	78	15.90	0.99
B-12	0.21	1.32	65	60	81	17.31	0.95
B-11	0.20	1.26	66	63	80	18.81	1.05
B-10	0.18	1.14	69	65	79	20.43	0.94
B-9	0.19	1.20	70	65	81	21.82	0.97
B-8	0.17	1.08	71	67	80	23.28	1.02
B-7	0.18	1.15	71	68	80	24.74	0.99
B-6	0.17	1.09	75	70	79	26.20	0.97
B-5	0.16	1.02	75	70	80	27.60	0.98
B-4	0.17	1.09	77	72	80	28.98	0.96
B-3	0.18	1.15	77	73	83	30.37	0.94
B-2	0.19	1.22	79	76	83	31.77	0.94
B-1	0.19	1.16	79	75	83	33.22	0.96
						34.69	

Sampling Data for - *TEST 2*

Nov 25/21

Pinnacle Pellet

Dryer Stack 1

Williams Lake

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
B-12	0.19	1.22	80	80	90	0.00	0.97
B-11	0.20	1.27	73	75	84	1.49	0.98
B-10	0.20	1.28	75	75	83	3.03	0.97
B-9	0.18	1.14	73	73	84	4.56	1.02
B-8	0.17	1.08	74	73	84	6.07	0.99
B-7	0.18	1.14	75	75	83	7.50	1.05
B-6	0.17	1.08	76	76	83	9.06	0.97
B-5	0.17	1.09	77	77	85	10.47	0.95
B-4	0.18	1.15	78	78	85	11.85	0.98
B-3	0.18	1.15	81	78	87	13.32	0.97
B-2	0.18	1.15	83	81	85	14.78	0.97
B-1	0.17	1.10	80	80	85	16.25	1.01
A-12	0.22	1.42	82	82	85	17.72	0.95
A-11	0.20	1.29	82	82	85	19.31	0.99
A-10	0.19	1.23	83	82	85	20.88	1.08
A-9	0.19	1.23	83	82	85	22.55	0.93
A-8	0.17	1.10	84	84	86	24.00	1.02
A-7	0.18	1.16	88	87	86	25.50	0.95
A-6	0.17	1.11	88	87	86	26.94	0.99
A-5	0.19	1.24	88	88	87	28.40	0.97
A-4	0.18	1.17	89	89	89	29.92	0.99
A-3	0.17	1.11	90	90	86	31.43	1.02
A-2	0.17	1.11	90	90	87	32.94	0.95
A-1	0.18	1.17	91	91	88	34.35	0.94
						35.79	

Sampling Data for - *TEST 3*

Nov 25/21

Pinnacle Pellet

Dryer Stack 1

Williams Lake

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.21	1.37	92	92	89	0.00	0.97
A-11	0.2	1.31	86	92	84	1.60	0.98
A-10	0.19	1.25	86	89	81	3.17	0.98
A-9	0.2	1.31	87	88	82	4.70	0.95
A-8	0.18	1.18	87	88	82	6.23	0.99
A-7	0.19	1.25	89	89	82	7.74	0.95
A-6	0.17	1.12	90	89	81	9.23	1.03
A-5	0.17	1.12	90	91	82	10.76	0.97
A-4	0.18	1.19	91	91	82	12.20	1.02
A-3	0.17	1.12	93	92	83	13.77	0.96
A-2	0.17	1.12	93	92	84	15.20	0.94
A-1	0.18	1.19	95	94	83	16.61	0.92
B-12	0.22	1.46	94	95	85	18.03	0.99
B-11	0.20	1.32	95	95	86	19.72	0.96
B-10	0.20	1.33	98	97	84	21.28	0.96
B-9	0.18	1.20	98	97	85	22.85	0.98
B-8	0.18	1.19	98	97	85	24.36	0.99
B-7	0.17	1.13	97	97	86	25.90	0.97
B-6	0.17	1.12	98	98	88	27.35	1.05
B-5	0.18	1.19	98	98	86	28.92	0.93
B-4	0.18	1.19	97	98	86	30.36	0.96
B-3	0.18	1.19	98	98	86	31.85	0.94
B-2	0.17	1.12	97	97	86	33.31	0.99
B-1	0.17	1.12	96	97	86	34.79	0.97
						36.25	

**Pinnacle Pellet
Dryer Stack 1
Pinnacle Pellet**

Data for **TEST 1**

OVERALL ISOKINETICS - TEST 1 0.985

Delta P:	0.181 "H ₂ O	Us avg:	25.21 ft/sec
Delta H:	1.141	ACFM:	47655 ft ³ /min
Tm avg:	523.3 °R	SDCFM:	42207 ft ³ /min
Ts avg:	539.5 °R	Vm std:	32.65 ft ³
Bwo:	0.031	Vm corr:	34.53 ft ³
Md:	28.84	Vm:	34.69 ft ³
Ms:	28.51	MF:	0.9954
Pb:	27.95 "Hg	PCON:	9.30 mg/m ³
Pm:	28.03 "Hg	ERAT:	0.67 kg/hr
Ps:	27.94 "Hg		

Data for **TEST 2**

OVERALL ISOKINETICS - TEST 2 0.984

Delta P:	0.182 "H ₂ O	Us avg:	25.42 ft/sec
Delta H:	1.175	ACFM:	48035 ft ³ /min
Tm avg:	541.6 °R	SDCFM:	42127 ft ³ /min
Ts avg:	545.5 °R	Vm std:	32.54 ft ³
Bwo:	0.029	Vm corr:	35.63 ft ³
Md:	28.84	Vm:	35.79 ft ³
Ms:	28.52	MF:	0.9954
Pb:	27.95 "Hg	PCON:	9.55 mg/m ³
Pm:	28.04 "Hg	ERAT:	0.68 kg/hr
Ps:	27.94 "Hg		

Data for **TEST 3**

OVERALL ISOKINETICS - TEST 3 0.973

Delta P:	0.183 "H ₂ O	Us avg:	25.49 ft/sec
Delta H:	1.212	ACFM:	48167 ft ³ /min
Tm avg:	553.6 °R	SDCFM:	42206 ft ³ /min
Ts avg:	544.3 °R	Vm std:	32.25 ft ³
Bwo:	0.032	Vm corr:	36.08 ft ³
Md:	28.84	Vm:	36.25 ft ³
Ms:	28.49	MF:	0.9954
Pb:	27.95 "Hg	PCON:	9.31 mg/m ³
Pm:	28.04 "Hg	ERAT:	0.67 kg/hr
Ps:	27.94 "Hg		

Pinnacle Pellet
Nov 25/21
Dryer Stack 2
Permit Number: RA-17557
Williams Lake, BC
AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	90 ° F	32 ° C
Moisture Content (by volume):	2.85 %	
Average Stack Gas Velocity:	28.2 ft/sec	8.6 m/sec
Total Actual Gas Flow Rate:	53318 ACFM	
Dry Gas flow Rate at Reference Conditions:	46429 SCFM	21.9 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.003 gr/ft ³	7.65 mg/m ³
Front Half Particulate	0.001 gr/ft ³	2.9 mg/m ³
Back Half Condensibles	0.002 gr/ft ³	4.8 mg/m ³
Mass Emission Rate	1.33 lbs/hr	0.60 kg/hr

SUMMARY OF AIR EMISSION TESTS
TEST 1:

Gas Temperature:	88 ° F	31 ° C
Moisture Content (by volume):	2.3 %	
Average Stack Gas Velocity:	28.2 ft/sec	8.6 m/sec
Total Actual Gas Flow Rate:	53267 ACFM	
Dry Gas flow Rate at Reference Conditions:	46826 SCFM	22.1 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	9.6 mg/m ³
Front Half Particulate	.002 gr/ft ³	4.4 mg/m ³
Back Half Condensibles	.002 gr/ft ³	5.2 mg/m ³
Mass Emission Rate	1.69 lbs/hr	0.77 kg/hr

TEST 2:

Gas Temperature:	91 ° F	33 ° C
Moisture Content (by volume):	2.5 %	
Average Stack Gas Velocity:	28.1 ft/sec	8.6 m/sec
Total Actual Gas Flow Rate:	53042 ACFM	
Dry Gas flow Rate at Reference Conditions:	46304 SCFM	21.9 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.003 gr/ft ³	7.2 mg/m ³
Front Half Particulate	.001 gr/ft ³	2.1 mg/m ³
Back Half Condensibles	.002 gr/ft ³	5.1 mg/m ³
Mass Emission Rate	1.24 lbs/hr	0.56 kg/hr

TEST 3:

Gas Temperature:	91 ° F	33 ° C
Moisture Content (by volume):	3.8 %	
Average Stack Gas Velocity:	28.4 ft/sec	8.7 m/sec
Total Actual Gas Flow Rate:	53644 ACFM	
Dry Gas flow Rate at Reference Conditions:	46156 SCFM	21.8 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.003 gr/ft ³	6.2 mg/m ³
Front Half Particulate	.001 gr/ft ³	2.0 mg/m ³
Back Half Condensibles	.002 gr/ft ³	4.1 mg/m ³
Mass Emission Rate	1.07 lbs/hr	0.48 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Pellet
Plant Location: Williams Lake, BC
Process: Dryer Stack 2
Permit Number: RA-17557
Job Number: ME2021-302
Pollution Control Permit: 15.0 mg/m3 22.5 m3/sec
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

	TEST 1	TEST 2	TEST 3
Filter Number:	21	22	23
Date of Test:	Nov 25/21	Nov 25/21	Nov 25/21
Start Time:	9:42	10:52	12:04
Stop Time:	10:45	11:56	1:09
On-line Sampling Time:	60	60	60
Testing Personnel:	CB/KS	CB/KS	CB/KS
Sampler Model:	980	980	980
Barometric Pressure("Hg):	27.95	27.95	27.95
Static Pressure("H₂O):	-0.15	-0.15	-0.15
%CO₂:	0.0	0.0	0.0
%O₂:	21.0	21.0	21.0
%CO:	0.0	0.0	0.0
%N₂:	79.0	79.0	79.0
Diameter of Nozzle(inches):	0.300	0.300	0.300
Meter Factor:	1.0015	1.0015	1.0015
Type-S Pitot Tube Coefficient:	0.83867	0.83867	0.83867
Cross Sectional Area of Stack(ft²):	31.5	31.5	31.5
Impinger Condensate(g):	16	18	34
Weight of Moisture in Silica Gel(g):	6.0	5.0	2.0
Weight of Filter Particulate(g):	0.0005	0.0002	0.0001
Weight of Probe Washings(g):	0.0050	0.0023	0.0024
Weight of Impinger Content Organic(g):	0.0064	0.0062	0.0050
Total Weight of Particulate(g):	0.0119	0.0087	0.0075

Sampling Data for - TEST 1

Nov 25/21

Pinnacle Pellet

Dryer Stack 2

Williams Lake, BC

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.28	1.99	49	49	86	77.43	1.00
A-11	0.30	2.16	61	51	87	79.51	1.01
A-10	0.29	2.11	68	52	87	81.71	0.99
A-9	0.29	2.12	72	53	87	83.86	1.08
A-8	0.26	1.91	76	55	87	86.22	1.05
A-7	0.25	1.84	78	57	88	88.40	0.98
A-6	0.21	1.55	80	58	87	90.40	1.03
A-5	0.20	1.48	82	60	88	92.33	0.98
A-4	0.19	1.41	83	62	88	94.13	1.05
A-3	0.17	1.27	84	64	88	96.02	0.98
A-2	0.17	1.27	85	64	88	97.70	1.01
A-1	0.16	1.20	86	66	88	99.43	1.00
B-12	0.24	1.80	86	67	88	101.09	0.98
B-11	0.24	1.80	90	68	89	103.09	0.98
B-10	0.26	1.95	90	69	89	105.09	1.07
B-9	0.28	2.12	93	74	89	107.37	0.91
B-8	0.29	2.19	93	71	88	109.39	0.93
B-7	0.23	1.74	94	72	89	111.50	0.99
B-6	0.21	1.59	94	73	88	113.49	0.98
B-5	0.19	1.44	94	74	88	115.38	1.02
B-4	0.19	1.44	94	74	88	117.25	0.94
B-3	0.18	1.37	95	77	88	118.98	1.06
B-2	0.18	1.38	98	78	88	120.89	0.95
B-1	0.20	1.53	98	79	88	122.60	1.00
						124.50	

Sampling Data for - TEST 2

Nov 25/21

Pinnacle Pellet

Dryer Stack 2

Williams Lake, BC

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.26	2.02	86	81	91	26.10	1.04
A-11	0.29	2.27	91	82	92	28.33	0.95
A-10	0.29	2.29	99	82	92	30.47	0.94
A-9	0.28	2.22	105	83	92	32.61	0.94
A-8	0.25	1.99	106	84	91	34.72	0.96
A-7	0.24	1.92	109	86	91	36.78	1.00
A-6	0.22	1.76	108	87	91	38.88	0.99
A-5	0.20	1.60	108	88	91	40.87	1.00
A-4	0.19	1.53	109	89	90	42.80	1.01
A-3	0.18	1.44	109	90	92	44.70	1.00
A-2	0.17	1.37	110	91	91	46.53	0.98
A-1	0.16	1.29	109	93	91	48.28	1.04
B-12	0.23	1.86	110	93	90	50.08	1.02
B-11	0.24	1.94	111	94	91	52.20	1.01
B-10	0.25	2.02	115	94	91	54.34	0.99
B-9	0.28	2.27	115	95	91	56.49	1.09
B-8	0.30	2.44	117	96	90	58.99	0.96
B-7	0.24	1.96	118	96	90	61.29	0.99
B-6	0.21	1.71	116	97	90	63.41	0.93
B-5	0.19	1.55	117	98	91	65.28	0.99
B-4	0.18	1.47	117	99	90	67.17	1.00
B-3	0.18	1.47	116	100	91	69.03	1.01
B-2	0.17	1.38	116	99	91	70.91	1.00
B-1	0.18	1.47	114	100	90	72.72	0.96
						74.51	

Sampling Data for - TEST 3

Nov 25/21

Pinnacle Pellet

Dryer Stack 2

Williams Lake, BC

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.28	2.22	97	96	93	75.69	0.96
A-11	0.29	2.33	109	97	93	77.83	0.99
A-10	0.29	2.35	115	97	92	80.11	0.99
A-9	0.28	2.27	116	98	92	82.40	1.01
A-8	0.27	2.19	117	99	93	84.70	1.01
A-7	0.24	1.95	117	99	92	86.97	0.97
A-6	0.22	1.78	116	99	92	89.03	1.03
A-5	0.21	1.70	116	99	92	91.11	0.97
A-4	0.19	1.54	116	100	92	93.04	1.04
A-3	0.18	1.46	116	99	92	95.01	0.96
A-2	0.16	1.30	115	99	90	96.78	1.03
A-1	0.16	1.30	116	100	91	98.57	1.00
B-12	0.25	2.04	116	100	90	100.31	0.96
B-11	0.26	2.13	119	101	91	102.40	1.03
B-10	0.26	2.14	122	102	90	104.68	0.98
B-9	0.27	2.22	122	103	91	106.87	1.03
B-8	0.29	2.39	124	104	90	109.21	1.01
B-7	0.22	1.81	125	105	91	111.58	0.95
B-6	0.21	1.73	123	105	90	113.54	1.02
B-5	0.20	1.65	124	106	91	115.59	0.98
B-4	0.19	1.57	124	107	91	117.52	1.03
B-3	0.18	1.49	124	107	91	119.49	1.00
B-2	0.18	1.49	124	108	91	121.36	0.95
B-1	0.19	1.57	124	109	91	123.13	1.05
						125.14	

Pinnacle Pellet
 Dryer Stack 2
 Pinnacle Pellet

Data for TEST 1
OVERALL ISOKINETICS - TEST 1 0.999

Delta P:	0.225 "H ₂ O	Us avg:	28.18 ft/sec
Delta H:	1.694	ACFM:	53267 ft ³ /min
Tm avg:	534.8 °R	SDCFM:	46826 ft ³ /min
Ts avg:	547.9 °R	Vm std:	43.67 ft ³
Bwo:	0.023	Vm corr:	47.14 ft ³
Md:	28.84	Vm:	47.07 ft ³
Ms:	28.59	MF:	1.0015
Pb:	27.95 "Hg	PCON:	9.62 mg/m ³
Pm:	28.07 "Hg	ERAT:	0.77 kg/hr
Ps:	27.94 "Hg		

Data for TEST 2
OVERALL ISOKINETICS - TEST 2 0.991

Delta P:	0.222 "H ₂ O	Us avg:	28.06 ft/sec
Delta H:	1.802	ACFM:	53042 ft ³ /min
Tm avg:	560.6 °R	SDCFM:	46304 ft ³ /min
Ts avg:	550.9 °R	Vm std:	42.86 ft ³
Bwo:	0.025	Vm corr:	48.48 ft ³
Md:	28.84	Vm:	48.41 ft ³
Ms:	28.57	MF:	1.0015
Pb:	27.95 "Hg	PCON:	7.17 mg/m ³
Pm:	28.08 "Hg	ERAT:	0.56 kg/hr
Ps:	27.94 "Hg		

Data for TEST 3
OVERALL ISOKINETICS - TEST 3 0.999

Delta P:	0.226 "H ₂ O	Us avg:	28.38 ft/sec
Delta H:	1.859	ACFM:	53644 ft ³ /min
Tm avg:	569.9 °R	SDCFM:	46156 ft ³ /min
Ts avg:	551.3 °R	Vm std:	43.07 ft ³
Bwo:	0.038	Vm corr:	49.52 ft ³
Md:	28.84	Vm:	49.45 ft ³
Ms:	28.43	MF:	1.0015
Pb:	27.95 "Hg	PCON:	6.17 mg/m ³
Pm:	28.09 "Hg	ERAT:	0.48 kg/hr
Ps:	27.94 "Hg		

**Pinnacle Pellet
Dryer Stack 3
Williams Lake**

Nov 25/21

Permit Number: RA-17557

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	86 ° F	30 ° C
Moisture Content (by volume):	2.90 %	
Average Stack Gas Velocity:	25.2 ft/sec	7.7 m/sec
Total Actual Gas Flow Rate:	47593 ACFM	
Dry Gas flow Rate at Reference Conditions:	41727 SCFM	19.7 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.006 gr/ft ³	12.70 mg/m ³
Front Half Particulate	0.003 gr/ft ³	5.8 mg/m ³
Back Half Condensibles	0.003 gr/ft ³	6.9 mg/m ³
Mass Emission Rate	1.98 lbs/hr	0.90 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	89 ° F	31 ° C
Moisture Content (by volume):	2.9 %	
Average Stack Gas Velocity:	25.0 ft/sec	7.6 m/sec
Total Actual Gas Flow Rate:	47297 ACFM	
Dry Gas flow Rate at Reference Conditions:	41285 SCFM	19.5 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.005 gr/ft ³	12.4 mg/m ³
Front Half Particulate	.002 gr/ft ³	5.5 mg/m ³
Back Half Condensibles	.003 gr/ft ³	6.9 mg/m ³
Mass Emission Rate	1.91 lbs/hr	0.87 kg/hr

TEST 2:

Gas Temperature:	84 ° F	29 ° C
Moisture Content (by volume):	2.8 %	
Average Stack Gas Velocity:	25.3 ft/sec	7.7 m/sec
Total Actual Gas Flow Rate:	47816 ACFM	
Dry Gas flow Rate at Reference Conditions:	42091 SCFM	19.9 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.005 gr/ft ³	12.5 mg/m ³
Front Half Particulate	.002 gr/ft ³	5.7 mg/m ³
Back Half Condensibles	.003 gr/ft ³	6.8 mg/m ³
Mass Emission Rate	1.97 lbs/hr	0.90 kg/hr

TEST 3:

Gas Temperature:	85 ° F	30 ° C
Moisture Content (by volume):	3.0 %	
Average Stack Gas Velocity:	25.2 ft/sec	7.7 m/sec
Total Actual Gas Flow Rate:	47664 ACFM	
Dry Gas flow Rate at Reference Conditions:	41806 SCFM	19.7 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.006 gr/ft ³	13.2 mg/m ³
Front Half Particulate	.003 gr/ft ³	6.3 mg/m ³
Back Half Condensibles	.003 gr/ft ³	6.9 mg/m ³
Mass Emission Rate	2.07 lbs/hr	0.94 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Pellet
Plant Location: Williams Lake
Process: Dryer Stack 3
Permit Number: RA-17557
Job Number: ME2021-302
Pollution Control Permit: 15.0 mg/m3 22.5 m3/sec
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

Filter Number:
Date of Test:
Start Time:
Stop Time:
On-line Sampling Time:
Testing Personnel:
Sampler Model:
Barometric Pressure("Hg):
Static Pressure("H₂O):
%CO₂:
%O₂:
%CO:
%N₂:
Diameter of Nozzle(inches):
Meter Factor:
Type-S Pitot Tube Coefficient:
Cross Sectional Area of Stack(ft²):
Impinger Condensate(g):
Weight of Moisture in Silica Gel(g):
Weight of Filter Particulate(g):
Weight of Probe Washings(g):
Weight of Impinger Content Organic(g):
Total Weight of Particulate(g):

TEST 1	TEST 2	TEST 3
30	31	32
Nov 25/21	Nov 25/21	Nov 25/21
1:35	2:50	4:07
2:40	3:55	5:12
60	60	60
DL/AB	DL/AB	DL/AB
1013	1013	1013
27.95	27.95	27.95
-0.10	-0.10	-0.10
0.0	0.0	0.0
21.0	21.0	21.0
0.0	0.0	0.0
79.0	79.0	79.0
0.275	0.275	0.275
0.9954	0.9954	0.9954
0.84158	0.84158	0.84158
31.5	31.5	31.5
16	14	16
4.0	6.0	5.0
0.0003	0.0001	0.0001
0.0046	0.0051	0.0056
0.0062	0.0062	0.0063
0.0111	0.0114	0.0120

Sampling Data for - TEST 1

Nov 25/21

Pinnacle Pellet

Dryer Stack 3

Williams Lake

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.19	1.24	91	91	84	0.00	0.98
A-11	0.20	1.31	85	85	89	1.55	0.96
A-10	0.18	1.15	75	82	86	3.08	0.99
A-9	0.17	1.09	75	81	85	4.57	0.98
A-8	0.18	1.16	76	82	84	6.00	0.97
A-7	0.17	1.09	78	82	84	7.46	0.96
A-6	0.15	0.97	78	82	84	8.87	0.97
A-5	0.15	0.97	79	82	83	10.20	0.97
A-4	0.16	1.03	80	82	85	11.53	0.98
A-3	0.16	1.03	80	83	88	12.92	1.01
A-2	0.19	1.22	82	83	90	14.35	0.97
A-1	0.20	1.28	82	83	89	15.85	0.95
B-12	0.19	1.22	84	84	92	17.35	0.96
B-11	0.20	1.28	85	85	93	18.83	0.99
B-10	0.19	1.22	86	86	92	20.40	0.98
B-9	0.18	1.15	87	87	92	21.92	0.99
B-8	0.18	1.16	88	88	92	23.42	0.96
B-7	0.16	1.03	88	88	92	24.88	1.01
B-6	0.15	0.97	89	89	92	26.32	1.02
B-5	0.16	1.03	89	89	91	27.73	1.03
B-4	0.16	1.04	92	92	89	29.21	0.93
B-3	0.17	1.11	91	92	90	30.55	0.97
B-2	0.18	1.17	92	92	90	31.99	0.92
B-1	0.21	1.37	92	92	91	33.40	1.02
						35.08	

Sampling Data for - TEST 2

Nov 25/21

Pinnacle Pellet

Dryer Stack 3

Williams Lake

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
B-12	0.18	1.17	93	93	90	0.00	0.96
B-11	0.20	1.31	86	89	84	1.48	0.96
B-10	0.19	1.24	82	87	83	3.03	0.98
B-9	0.19	1.23	83	87	86	4.56	0.99
B-8	0.18	1.17	85	86	84	6.10	0.99
B-7	0.18	1.17	87	88	85	7.61	0.97
B-6	0.16	1.04	87	88	84	9.09	0.98
B-5	0.15	0.98	87	88	82	10.50	0.97
B-4	0.16	1.05	87	87	81	11.86	0.95
B-3	0.18	1.18	88	88	83	13.23	0.95
B-2	0.20	1.31	90	91	82	14.68	0.99
B-1	0.21	1.38	91	91	85	16.29	0.99
A-12	0.20	1.31	90	89	83	17.93	0.98
A-11	0.20	1.31	92	91	86	19.51	0.98
A-10	0.17	1.11	92	92	85	21.10	1.00
A-9	0.18	1.18	90	90	84	22.59	0.95
A-8	0.18	1.18	89	91	84	24.05	0.96
A-7	0.16	1.05	91	92	83	25.53	0.98
A-6	0.15	0.99	92	91	84	26.96	0.98
A-5	0.15	0.99	91	92	83	28.33	0.97
A-4	0.18	1.19	92	92	84	29.70	0.96
A-3	0.20	1.32	92	91	84	31.18	0.97
A-2	0.20	1.32	92	91	87	32.76	0.94
A-1	0.21	1.38	92	92	86	34.28	0.96
						35.88	

Sampling Data for - TEST 3

Nov 25/21

Pinnacle Pellet

Dryer Stack 3

Williams Lake

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.18	1.18	95	95	90	0.00	1.01
A-11	0.21	1.38	90	94	87	1.55	0.98
A-10	0.17	1.11	87	90	85	3.17	0.98
A-9	0.19	1.24	85	89	85	4.62	0.98
A-8	0.17	1.11	86	89	86	6.15	1.03
A-7	0.16	1.05	87	88	84	7.68	0.96
A-6	0.15	0.98	88	89	84	9.06	0.98
A-5	0.16	1.05	87	89	83	10.43	0.99
A-4	0.17	1.11	88	89	84	11.86	0.99
A-3	0.17	1.11	88	88	85	13.33	0.96
A-2	0.19	1.24	89	88	86	14.75	0.94
A-1	0.21	1.37	89	89	86	16.22	0.96
B-12	0.20	1.31	91	90	84	17.80	0.95
B-11	0.20	1.31	91	92	86	19.33	0.97
B-10	0.18	1.18	92	92	86	20.90	0.98
B-9	0.17	1.12	93	94	86	22.41	0.98
B-8	0.17	1.12	93	93	87	23.88	0.99
B-7	0.16	1.05	93	91	85	25.36	0.99
B-6	0.16	1.05	92	93	86	26.80	0.99
B-5	0.16	1.05	91	95	86	28.24	0.99
B-4	0.18	1.18	92	93	85	29.68	0.96
B-3	0.20	1.31	93	92	84	31.16	0.96
B-2	0.20	1.31	93	93	85	32.72	0.99
B-1	0.21	1.38	93	93	85	34.33	0.95
						35.91	



Pinnacle Pellet
Dryer Stack 3
Pinnacle Pellet

Data for **TEST 1**

OVERALL ISOKINETICS - TEST 1 0.977

Delta P:	0.176 "H ₂ O	Us avg:	25.03 ft/sec
Delta H:	1.137	ACFM:	47297 ft ³ /min
Tm avg:	545.1 °R	SDCFM:	41285 ft ³ /min
Ts avg:	548.6 °R	Vm std:	31.69 ft ³
Bwo:	0.029	Vm corr:	34.92 ft ³
Md:	28.84	Vm:	35.08 ft ³
Ms:	28.53	MF:	0.9954
Pb:	27.95 "Hg	PCON:	12.37 mg/m ³
Pm:	28.03 "Hg	ERAT:	0.87 kg/hr
Ps:	27.94 "Hg		

Data for **TEST 2**

OVERALL ISOKINETICS - TEST 2 0.973

Delta P:	0.181 "H ₂ O	Us avg:	25.30 ft/sec
Delta H:	1.190	ACFM:	47816 ft ³ /min
Tm avg:	549.5 °R	SDCFM:	42091 ft ³ /min
Ts avg:	544.3 °R	Vm std:	32.16 ft ³
Bwo:	0.028	Vm corr:	35.71 ft ³
Md:	28.84	Vm:	35.88 ft ³
Ms:	28.53	MF:	0.9954
Pb:	27.95 "Hg	PCON:	12.52 mg/m ³
Pm:	28.04 "Hg	ERAT:	0.90 kg/hr
Ps:	27.94 "Hg		

Data for **TEST 3**

OVERALL ISOKINETICS - TEST 3 0.978

Delta P:	0.180 "H ₂ O	Us avg:	25.22 ft/sec
Delta H:	1.179	ACFM:	47664 ft ³ /min
Tm avg:	550.7 °R	SDCFM:	41806 ft ³ /min
Ts avg:	545.4 °R	Vm std:	32.11 ft ³
Bwo:	0.030	Vm corr:	35.74 ft ³
Md:	28.84	Vm:	35.91 ft ³
Ms:	28.52	MF:	0.9954
Pb:	27.95 "Hg	PCON:	13.20 mg/m ³
Pm:	28.04 "Hg	ERAT:	0.94 kg/hr
Ps:	27.94 "Hg		

**Pinnacle Pellet
Dryer Stack 4
Williams Lake**

Nov 25/21

Permit Number: RA-17557

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	100 ° F	38 ° C
Moisture Content (by volume):	2.79 %	
Average Stack Gas Velocity:	27.0 ft/sec	8.2 m/sec
Total Actual Gas Flow Rate:	50992 ACFM	
Dry Gas flow Rate at Reference Conditions:	43607 SCFM	20.6 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.006 gr/ft ³	13.70 mg/m ³
Front Half Particulate	0.004 gr/ft ³	8.3 mg/m ³
Back Half Condensibles	0.002 gr/ft ³	5.4 mg/m ³
Mass Emission Rate	2.24 lbs/hr	1.02 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	106 ° F	41 ° C
Moisture Content (by volume):	2.9 %	
Average Stack Gas Velocity:	27.2 ft/sec	8.3 m/sec
Total Actual Gas Flow Rate:	51435 ACFM	
Dry Gas flow Rate at Reference Conditions:	43492 SCFM	20.5 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.005 gr/ft ³	11.2 mg/m ³
Front Half Particulate	.002 gr/ft ³	5.7 mg/m ³
Back Half Condensibles	.002 gr/ft ³	5.5 mg/m ³
Mass Emission Rate	1.82 lbs/hr	0.83 kg/hr

TEST 2:

Gas Temperature:	99 ° F	37 ° C
Moisture Content (by volume):	2.7 %	
Average Stack Gas Velocity:	26.9 ft/sec	8.2 m/sec
Total Actual Gas Flow Rate:	50833 ACFM	
Dry Gas flow Rate at Reference Conditions:	43606 SCFM	20.6 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.007 gr/ft ³	15.0 mg/m ³
Front Half Particulate	.004 gr/ft ³	9.5 mg/m ³
Back Half Condensibles	.002 gr/ft ³	5.5 mg/m ³
Mass Emission Rate	2.45 lbs/hr	1.11 kg/hr

TEST 3:

Gas Temperature:	96 ° F	35 ° C
Moisture Content (by volume):	2.8 %	
Average Stack Gas Velocity:	26.8 ft/sec	8.2 m/sec
Total Actual Gas Flow Rate:	50708 ACFM	
Dry Gas flow Rate at Reference Conditions:	43724 SCFM	20.6 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.007 gr/ft ³	14.9 mg/m ³
Front Half Particulate	.004 gr/ft ³	9.7 mg/m ³
Back Half Condensibles	.002 gr/ft ³	5.2 mg/m ³
Mass Emission Rate	2.45 lbs/hr	1.11 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Pellet
Plant Location: Williams Lake
Process: Dryer Stack 4
Permit Number: RA-17557
Job Number: ME2021-302
Pollution Control Permit: 15.0 mg/m3 22.5 m3/sec
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

Filter Number:
Date of Test:
Start Time:
Stop Time:
On-line Sampling Time:
Testing Personnel:
Sampler Model:
Barometric Pressure("Hg):
Static Pressure("H₂O):
%CO₂:
%O₂:
%CO:
%N₂:
Diameter of Nozzle(inches):
Meter Factor:
Type-S Pitot Tube Coefficient:
Cross Sectional Area of Stack(ft²):
Impinger Condensate(g):
Weight of Moisture in Silica Gel(g):
Weight of Filter Particulate(g):
Weight of Probe Washings(g):
Weight of Impinger Content Organic(g):
Total Weight of Particulate(g):

TEST 1	TEST 2	TEST 3
24	25	26
Nov 25/21	Nov 25/21	Nov 25/21
1:15	2:22	3:35
2:17	3:26	4:40
60	60	60
CB/KS	CB/KS	CB/KS
980	980	980
27.95	27.95	27.95
-0.24	-0.24	-0.24
0.0	0.0	0.0
21.0	21.0	21.0
0.0	0.0	0.0
79.0	79.0	79.0
0.300	0.300	0.300
1.0015	1.0015	1.0015
0.83867	0.83867	0.83867
31.5	31.5	31.5
23	19	17
3.0	5.0	8.0
0.0001	0.0002	0.0002
0.0066	0.0108	0.0110
0.0064	0.0064	0.0060
0.0131	0.0174	0.0172

Sampling Data for - *TEST 1*

Nov 25/21

Pinnacle Pellet

Dryer Stack 4

Williams Lake

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.15	1.15	91	90	97	26.46	1.03
A-11	0.16	1.22	93	90	100	28.14	1.03
A-10	0.17	1.30	96	92	101	29.88	1.05
A-9	0.18	1.38	99	91	101	31.71	1.04
A-8	0.18	1.38	100	89	101	33.57	1.03
A-7	0.20	1.53	100	88	101	35.41	1.02
A-6	0.20	1.54	101	88	100	37.33	1.02
A-5	0.21	1.62	102	88	100	39.26	1.03
A-4	0.22	1.69	103	88	101	41.25	1.05
A-3	0.20	1.53	103	88	103	43.33	0.95
A-2	0.20	1.53	103	88	103	45.12	1.03
A-1	0.19	1.46	104	90	104	47.06	0.99
B-12	0.24	1.83	103	90	106	48.88	1.03
B-11	0.24	1.83	105	91	107	51.01	1.00
B-10	0.25	1.90	103	90	108	53.09	1.01
B-9	0.25	1.91	103	88	109	55.22	1.02
B-8	0.23	1.74	105	89	112	57.37	0.97
B-7	0.22	1.66	106	89	113	59.33	1.00
B-6	0.19	1.44	107	90	112	61.30	1.01
B-5	0.18	1.37	106	91	109	63.15	1.04
B-4	0.18	1.37	105	91	111	65.01	1.03
B-3	0.20	1.50	106	90	118	66.86	1.01
B-2	0.21	1.58	108	92	117	68.76	1.02
B-1	0.24	1.82	108	93	115	70.72	1.03
						72.84	

Sampling Data for - *TEST 2*
 Pinnacle Pellet
 Dryer Stack 4
 Williams Lake

Nov 25/21

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.15	1.17	97	91	92	74.00	1.03
A-11	0.15	1.14	100	91	109	75.71	1.00
A-10	0.17	1.29	102	91	108	77.34	0.99
A-9	0.19	1.45	104	92	107	79.07	0.91
A-8	0.20	1.53	105	90	107	80.75	1.06
A-7	0.20	1.54	107	91	104	82.75	0.98
A-6	0.21	1.63	107	91	100	84.62	1.09
A-5	0.22	1.72	108	92	98	86.75	0.94
A-4	0.21	1.64	109	92	97	88.63	1.01
A-3	0.20	1.56	109	93	98	90.61	0.98
A-2	0.19	1.49	109	93	97	92.50	1.02
A-1	0.18	1.41	109	93	97	94.42	1.02
B-12	0.23	1.80	109	92	97	96.28	1.02
B-11	0.25	1.95	109	93	97	98.38	1.01
B-10	0.25	1.95	111	93	99	100.55	0.97
B-9	0.24	1.87	110	94	99	102.64	0.98
B-8	0.23	1.80	110	94	98	104.71	1.01
B-7	0.21	1.64	109	94	98	106.79	0.99
B-6	0.20	1.57	108	94	95	108.74	1.01
B-5	0.18	1.41	108	93	94	110.69	0.98
B-4	0.17	1.33	106	92	95	112.48	1.04
B-3	0.18	1.40	107	93	98	114.32	1.08
B-2	0.20	1.56	107	93	98	116.29	1.01
B-1	0.23	1.79	108	93	99	118.22	0.99
						120.25	

Sampling Data for - *TEST 3*

Nov 25/21

Pinnacle Pellet

Dryer Stack 4

Williams Lake

SAMPLE POINT	VELOCITY HEAD ("H ₂ O)	ORIFICE PRESSURE ("H ₂ O)	DRY GAS METER		STACK GAS TEMP (° F)	GAS SAMPLE VOLUME (ft ³)	ISOKINETICS
			TEMP IN (° F)	TEMP OUT (° F)			
A-12	0.16	1.21	90	85	103	23.33	1.08
A-11	0.17	1.31	97	90	100	25.13	1.03
A-10	0.17	1.31	101	88	99	26.92	1.07
A-9	0.18	1.40	104	89	96	28.79	1.00
A-8	0.19	1.46	105	90	103	30.59	0.98
A-7	0.20	1.55	108	90	100	32.41	1.02
A-6	0.20	1.56	108	91	98	34.35	1.00
A-5	0.21	1.64	110	91	97	36.26	0.97
A-4	0.21	1.65	110	92	96	38.17	0.92
A-3	0.20	1.57	111	93	96	39.99	1.00
A-2	0.19	1.49	113	95	97	41.92	1.02
A-1	0.18	1.42	114	96	96	43.84	0.97
B-12	0.22	1.74	113	97	96	45.62	0.93
B-11	0.25	1.98	112	98	94	47.51	0.97
B-10	0.25	1.99	114	99	93	49.61	0.96
B-9	0.24	1.96	113	99	94	51.70	0.98
B-8	0.22	1.74	113	98	93	53.78	0.99
B-7	0.22	1.74	112	97	93	55.80	1.01
B-6	0.21	1.66	111	96	94	57.85	0.94
B-5	0.18	1.42	110	94	92	59.72	1.01
B-4	0.17	1.35	112	95	91	61.57	0.98
B-3	0.19	1.51	112	95	91	63.33	1.06
B-2	0.21	1.67	111	95	91	65.33	1.02
B-1	0.22	1.75	111	96	91	67.36	0.98
						69.35	



Pinnacle Pellet
Dryer Stack 4
Pinnacle Pellet

Data for **TEST 1**

OVERALL ISOKINETICS - TEST 1 1.018

Delta P:	0.203 "H ₂ O	Us avg:	27.21 ft/sec
Delta H:	1.553	ACFM:	51435 ft ³ /min
Tm avg:	556.1 °R	SDCFM:	43492 ft ³ /min
Ts avg:	566.2 °R	Vm std:	41.37 ft ³
Bwo:	0.029	Vm corr:	46.45 ft ³
Md:	28.84	Vm:	46.38 ft ³
Ms:	28.53	MF:	1.0015
Pb:	27.95 "Hg	PCON:	11.18 mg/m ³
Pm:	28.06 "Hg	ERAT:	0.83 kg/hr
Ps:	27.93 "Hg		

Data for **TEST 2**

OVERALL ISOKINETICS - TEST 2 1.006

Delta P:	0.201 "H ₂ O	Us avg:	26.90 ft/sec
Delta H:	1.568	ACFM:	50833 ft ³ /min
Tm avg:	559.7 °R	SDCFM:	43606 ft ³ /min
Ts avg:	559.2 °R	Vm std:	40.99 ft ³
Bwo:	0.027	Vm corr:	46.32 ft ³
Md:	28.84	Vm:	46.25 ft ³
Ms:	28.55	MF:	1.0015
Pb:	27.95 "Hg	PCON:	14.99 mg/m ³
Pm:	28.07 "Hg	ERAT:	1.11 kg/hr
Ps:	27.93 "Hg		

Data for **TEST 3**

OVERALL ISOKINETICS - TEST 3 0.996

Delta P:	0.201 "H ₂ O	Us avg:	26.83 ft/sec
Delta H:	1.587	ACFM:	50708 ft ³ /min
Tm avg:	561.3 °R	SDCFM:	43724 ft ³ /min
Ts avg:	555.6 °R	Vm std:	40.67 ft ³
Bwo:	0.028	Vm corr:	46.09 ft ³
Md:	28.84	Vm:	46.02 ft ³
Ms:	28.54	MF:	1.0015
Pb:	27.95 "Hg	PCON:	14.94 mg/m ³
Pm:	28.07 "Hg	ERAT:	1.11 kg/hr
Ps:	27.93 "Hg		

Air Emission Monitoring Procedure **State Of Oregon Method 7**

Particulate Sampling (Napp-Baldwin Model 31 Sampler)

Particulate sampling and gas velocity measurements were conducted using a Napp-Baldwin Model 31 stack sampler in accordance with the methods specified in State of Oregon Method 7 (See Figure 1). The State of Oregon Method 7 sampling train is a modified Method 5 sample train with the addition of a non heated filter in-between the third and fourth impinger.

The air discharge was sampled isokinetically at the centroid of a series of equal area segments across the duct or stack. The stack gas velocity and temperature were recorded during the sample collection period with a calibrated pitot tube and thermocouple mounted on the sampling probe. The sample was delivered from the probe to a cyclone and a filter holder containing a 110mm Type A glass fiber filter. The gas sample was then drawn in through a series of four glass impingers which condensed and absorbed the water from the gas. A leakless vacuum pump carried the sampled gas through a dry gas test meter where the volume, temperature, and pressure were measured; and finally through a flow indicating orifice which allowed for the rapid adjustment to isokinetic sampling rates.

At the end of each test, the probe interior, cyclone and connecting tubing from the probe to the filter housing were rinsed with distilled water and acetone. These washings were evaporated to dryness and the resulting solids were weighed. The weight of the cyclone flask and the filter was used together with the weight of solids in the washings to calculate the filterable particulate concentration. The moisture content of the stack gas was determined from the quantity of water condensed in the impingers and absorbed in the silica gel.

Condensable Organics are collected in the impinger train and a rinsing procedure is employed utilizing solvents such as Hexane or Methylene Chloride in between tests. The rinsings and condensate are forwarded to a laboratory accredited to perform the analysis in accordance with the method and a copy of that report is included in the Appendix of any report issued.

O₂, CO₂, CO (where applicable)

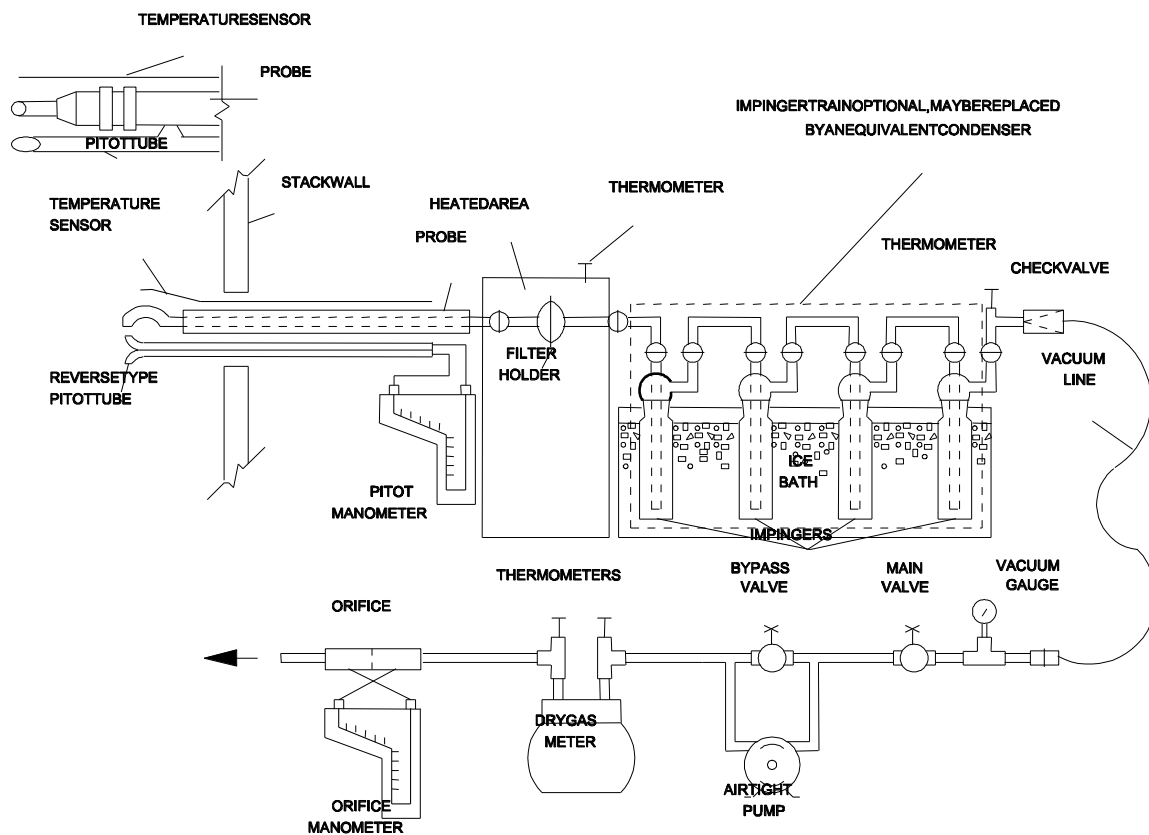
O₂, CO₂, and CO were found using either Fuji Analytical Analyzer by means of infrared and paramagnetic technology (EPA 3A) or by fyrite (EPA Method 3).

NO_x (where applicable)

NO_x was found using and API Model 252 NO_x analyzer that utilizes chemiluminescent technology. Stack gas was Samples were taken over a minimum period of three hours.

VOC's (where applicable)

Hydrocarbons were measured in accordance with EPA method 25A. Samples were drawn in one hour test runs using a total hydrocarbon analyzer that utilizes Flame Ionization Technology.



Modified EPA Method 5 Diagram (State of Oregon Method 7)- Figure 1

CALCULATIONS

Carry out calculations, retaining at least one extra decimal figure beyond that of the acquired data. Round off figures after the final calculation. Other forms of the equations may be used as long as they give equivalent results.

Nomenclature.

- A_n = Cross-sectional area of nozzle, m^2 (ft^2).
 B_{ws} = Water vapor in the gas stream, proportion by volume.
 C_a = Acetone blank residue concentration, mg/g .
 C_s = Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, $g/dscm$ ($g/dscf$).
 I = Percent of isokinetic sampling.
 L_a = Maximum acceptable leakage rate for either a pretest leak check or for a leak check following a component change; equal to $0.00057 m^3/min$ ($0.02 cfm$) or 4 percent of the average sampling rate, whichever is less.
 L_i = Individual leakage rate observed during the leak check conducted prior to the " i^{th} " component change ($i = 1, 2, 3...n$), m^3/min (cfm).
 L_p = Leakage rate observed during the post-test leak check, m^3/min (cfm).
 m_a = Mass of residue of acetone after evaporation, mg .
 m_n = Total amount of particulate matter collected, mg .
 M_w = Molecular weight of water, $18.0 g/g\text{-mole}$ ($18.0 lb/lb\text{-mole}$).
 P_{bar} = Barometric pressure at the sampling site, $mm\ Hg$ ($in.\ Hg$).
 P_s = Absolute stack gas pressure, $mm\ Hg$ ($in.\ Hg$).
 P_{std} = Standard absolute pressure, $760\ mm\ Hg$ ($29.92\ in.\ Hg$).
 R = Ideal gas constant, $0.06236 \frac{[(mmHg)(m^3)]}{[(^{\circ}K)(g\text{-mole})]}$
 $\{21.85 \frac{[(in.\ Hg)(ft^3)]}{[(^{\circ}R)(lb\text{-mole})]}\}$.
 T_m = Absolute average DGM temperature (see Figure 5-2), $^{\circ}K$ ($^{\circ}R$).
 T_s = Absolute average stack gas temperature (see Figure 5-2), $^{\circ}K$ ($^{\circ}R$).
 T_{std} = Standard absolute temperature, $293^{\circ}K$ ($528^{\circ}R$).
 V_a = Volume of acetone blank, ml .
 V_{aw} = Volume of acetone used in wash, ml .
 V_{lc} = Total volume liquid collected in impingers and silica gel (see Figure 5-3), ml .
 V_m = Volume of gas sample as measured by dry gas meter, dcm (dcf).
 $V_{m(std)}$ = Volume of gas sample measured by the dry gas meter, corrected to standard conditions, $dscm$ ($dscf$).
 $V_{w(std)}$ = Volume of water vapor in the gas sample, corrected to standard conditions, scm (scf).
 v_s = Stack gas velocity, calculated by Method 2, Equation 2-9, using data obtained from Method 5, m/sec (ft/sec).
 W_a = Weight of residue in acetone wash, mg .
 Y = Dry gas meter calibration factor.
 ΔH = Average pressure differential across the orifice meter (see Figure 5-2), $mm\ H_2O$ ($in.\ H_2O$).
 ρ_a = Density of acetone, mg/ml (see label on bottle).
 ρ_w = Density of water, $0.9982\ g/ml$ ($0.002201\ lb/ml$).
 θ = Total sampling time, min .
 θ_1 = Sampling time interval, from the beginning of a run until the first component change, min .
 θ_i = Sampling time interval, between two successive component changes, beginning with the interval between the first and second changes, min .
 θ_p = Sampling time interval, from the final (n^{th}) component change until the end of the sampling run, min .
 13.6 = Specific gravity of mercury.
 60 = Sec/min .
 100 = Conversion to percent.

Average Dry Gas Meter Temperature and Average Orifice Pressure Drop.

Dry Gas Volume. Correct the sample volume measured by the dry gas meter to standard conditions (20°C, 760 mm Hg or 68°F, 29.92 in. Hg) by using Equation 5-1.

$$V_{m(std)} = V_m Y \left(\frac{T_{std}}{T_m} \right) \left[\frac{P_{bar} + \frac{\Delta H}{13.6}}{P_{std}} \right]$$

$$= K_1 V_m Y \frac{P_{bar} + \left(\frac{\Delta H}{13.6} \right)}{T_m}$$
Eq. 5-1

where:

$$K_1 = 0.3858 \text{ } ^\circ\text{K/mm Hg for metric units,}$$

$$= 17.64 \text{ } ^\circ\text{R/in. Hg for English units.}$$

NOTE: Equation 5-1 can be used as written unless leakage rate observed during any of the mandatory leak checks (i.e., the post-test leak check or leak checks conducted prior to component changes) exceeds L_a . If L_p or L_i exceeds L_a , Equation 5-1 must be modified as follows:

(a) Case I. No component changes made during sampling run. In this case, replace V_m in Equation 5-1 with the expression:

$$[V_m - (L_p - L_a) \theta]$$

(b) Case II. One or more component changes made during the sampling run. In this case, replace V_m in Equation 5-1 by the expression:

$$\left[V_m - (L_1 - L_a) \theta_1 - \sum_{i=2}^n (L_i - L_a) \theta_i - (L_p - L_a) \theta_p \right]$$

and substitute only for those leakage rates (L_i or L_p) which exceed L_a .

Volume of Water Vapor.

$$V_{w(std)} = \frac{V_{lc} \rho_w R T_{std}}{M_w P_{std}} = K_2 V_{lc}$$
Eq. 5-2

where:

$$K_2 = 0.001333 \text{ m}^3/\text{ml for metric units,}$$

$$= 0.04707 \text{ ft}^3/\text{ml for English units.}$$

Moisture Content.

$$B_{ws} = \frac{V_{w(std)}}{V_{m(std)} + V_{w(std)}} \quad \text{Eq. 5-3}$$

Acetone Blank Concentration.

$$C_a = \frac{m_a}{V_a \rho_a} \quad \text{Eq. 5-4}$$

Acetone Wash Blank.

$$W_a = C_a V_{aw} \rho_a \quad \text{Eq. 5-5}$$

Total Particulate Weight. Determine the total particulate matter catch from the sum of the weights obtained from Containers 1 and 2 less the acetone blank (see Figure 5-3).

Particulate Concentration.

$$C_s = (0.001 \text{ g/mg})(m_n / V_{m(std)}) \quad \text{Eq. 5-6}$$

Conversion Factors:

<u>From</u>	<u>To</u>	<u>Multiply by</u>
scf	m ³	0.02832
g/ft ³	gr/ft ³	15.43
g/ft ³	lb/ft ³	2.205 x 10 ⁻³
g/ft ³	g/m ³	35.31

Isokinetic Variation.**Calculation from Raw Data.**

$$I = \frac{100 T_s [K_3 V_{1c} + (V_m Y / T_m)(P_{bar} + \Delta H / 13.6)]}{60 \theta v_s P_s A_n} \quad \text{Eq. 5-7}$$

where:

$K_3 = 0.003454 [(\text{mm Hg})(\text{m}^3)]/[(\text{ml})(^\circ\text{K})]$ for metric units,

$= 0.002669 [(\text{in. Hg})(\text{ft}^3)]/[(\text{ml})(^\circ\text{R})]$ for English units.

Calculation from Intermediate Values.

$$I = \frac{100 T_s V_{m(std)} P_{std}}{60 T_{std} v_s \theta A_n P_s (1 - B_{ws})}$$

$$= \frac{K_4 T_s V_{m(std)}}{P_s v_s A_n \theta (1 - B_{ws})}$$
Eq.5-8

where:

$K_4 = 4.320$ for metric units,

$= 0.09450$ for English units.

Acceptable Results. If 90 percent $\leq I \leq 110$ percent, the results are acceptable. If the PM results are low in comparison to the standard, and "I" is over 110 percent or less than 90 percent, the Administrator may opt to accept the results. Citation 4 in the Bibliography may be used to make acceptability judgments. If "I" is judged to unacceptable, reject the results, and repeat the test.

Average Stack Gas Velocity.

$$v_s = K_p C_p (\sqrt{\Delta p})_{avg} \sqrt{\frac{T_{s(avg)}}{P_s M_s}}$$

Average Stack Gas Dry Volumetric Flow Rate.

$$Q_{sd} = 3,600(1 - B_{ws}) v_s A \frac{T_{std}}{T_{s(avg)}} \frac{P_s}{P_{std}}$$

where:

A	=	Cross-sectional area of stack, m^2 (ft^2).
B_{ws}	=	Water vapor in the gas stream (from Method 5 or Reference Method 4), proportion by volume.
C_p	=	Pitot tube coefficient, dimensionless.
K_p	=	Pitot tube constant,
M_d	=	Molecular weight of stack gas, dry basis (see Section 3.6), g/gmole (lb/lb-mole).
M_s	=	Molecular weight of stack gas, wet basis, g/g-mole (lb/lb-mole).

$$= M_d (1 - B_{ws}) + 18.0 B_{ws}$$
Eq. 2-5

P_{bar}	=	Barometric pressure at measurement site, mm Hg (in. Hg).
P_g	=	Stack static pressure, mm Hg (in. Hg).
P_s	=	Absolute stack pressure, mm Hg (in. Hg),

$$= P_{bar} + P_g$$

P_{std}	=	Standard absolute pressure, 760 mm Hg (29.92 in. Hg).
Q_{sd}	=	Dry volumetric stack gas flow rate corrected to standard conditions, $ds m^3/hr$ (dscf/hr).
t_s	=	Stack temperature, $^{\circ}C$ ($^{\circ}F$).
T_s	=	Absolute stack temperature, $^{\circ}K$ ($^{\circ}R$).

Calibration Certificate for S-Type Pitot Tube

Date: 05-Jan-21 *Barometric Pressure ("Hg):* 29.78
Pitot I.D.: **217** *Wind Tunnel Temperature (^oF):* 70.0
Nozzle: 0.250

<i>Wind Velocity (ft/sec)</i>	<i>Ref.Pitot ("H₂O)</i>	<i>S-Type Pitot ("H₂O)</i>	<i>Pitot Factor</i>
13.51	0.04147	0.05467	0.86230
19.93	0.09031	0.12262	0.84962
41.60	0.39339	0.54073	0.84442
62.13	0.87726	1.25293	0.82840
79.94	1.45249	2.09036	0.82524
101.14	2.32467	3.37170	0.82204

Average= 0.83867

Note: The new pitot tip should be installed so that the serial number engraved is aligned directly into the gas stream.

Calibrating Technician Signature:



Calibration Certificate for S-Type Pitot Tube

Date: Jan 10/21 *Barometric Pressure ("Hg):* 28.25
Pitot I.D.: **242** *Wind Tunnel Temperature (^oF):* 71.0
Nozzle: 0.250

<i>Wind Velocity (ft/sec)</i>	<i>Ref.Pitot ("H₂O)</i>	<i>S-Type Pitot ("H₂O)</i>	<i>Pitot Factor</i>
13.07	0.03676	0.05091	0.84120
19.56	0.08230	0.11495	0.83765
42.21	0.38343	0.53104	0.84123
64.61	0.89820	1.20776	0.85375
84.98	1.55395	2.11982	0.84763
106.66	2.44808	3.49980	0.82799

Average= 0.84158

Note: The new pitot tip should be installed so that the serial number engraved is aligned directly into the gas stream.



CALIBRATION CERTIFICATE DRY GAS METER

DATE: 02-Jul-21

CONSOLE MANUF.: NAPP/MILLENNIUM MODEL 32

CONSOLE I.D.: MU 1013

PARAMETER SUMMARY	RUN #1	RUN #2	RUN #3
Ta = Ambient (WTM) Temperature (oF.)	70.0	70.0	70.0
P=Pres. Differential at WTM ("Hg)	0.0684	0.1361	0.1876
Pb= Atmospheric Pressure ("Hg)	27.90	27.90	27.90
Pv= Vapour Pressure Water at Temp. Ta ("Hg)	0.7390	0.7390	0.7390
H=Pres. Differential at Orifice	1.0	2.0	3.0
Ti= Dry Test Meter Inlet Temp. (oF.)	77.0	75.0	81.0
To= Dry Test Meter Outlet Temp. (oF.)	77.0	76.0	80.0
Ri= Initial Dry Test volume (ft3)	0.00	0.00	0.00
Rf= Final Dry Test Volume (ft3)	4.89	4.85	4.88
Vi= Initial Wet Test Volume (ft3)	0.0	0.0	0.0
Vf= Final Wet Test Volume (ft3)	5.000	5.000	5.000
Pw= Pb - (^P/13.59) "Hg	27.8316	27.7639	27.7124
Pd= Pb + (^H/13.59) "Hg	27.9736	28.0472	28.1208
Tw= Ta +460 (oR.)	530.0	530.0	530.0
Td= [(Ti + To)/2] + 460 (oR.)	537.0	535.5	540.5
Bw= Pv/Pb ("Hg)	0.0265	0.0265	0.0265
WET TEST METER FACTOR (WTMF)	0.9922	0.9922	0.9922
ated Y Value)(WTMF)	0.9956	0.9960	0.9946

Y (MEAN)(WTMF) = 0.9954

N.R. MCCALL & ASSOCIATES LTD.

Calibrating Technician Signature:



ORIFICE METER CALIBRATION

DATE: 02-Jul-21

CONSOLE I.D. MU 1013

	RUN 1	RUN 2	RUN 3
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	27.9	27.9	27.9
Y=gas meter factor	0.9956	0.9956	0.9960
Delta H=	0.5	1	1.5
Ri=int. gas meter vol.	0	0	0
Rf=final gas meter vol.	1.88	2.8	3.39
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.3743456	0.557536	0.675288
To=meter outlet Temp (oF)	79	81	81
Tm=meter out temp. (oR)	539	541	541
Pm=Pb + ^H	27.936792	27.9735835	28.0103753
SQRT(Tm/Pm*H/Md)	0.5770844	0.8170955	1.00007608
Ko=orifice const.	0.6486843	0.68233884	0.67523663

Ko MEAN = 0.6687533

Ko*4*144= 385.20187

McCALL ENVIRONMENTAL LTD.



Calibrating Technician Signature:

ORIFICE METER CALIBRATION

DATE: 02-Jul-21

CONSOLE I.D. MU 1013

	RUN 4	RUN 5	RUN 6
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	27.9	27.9	27.9
Y=gas meter factor	0.9960	0.9946	0.9946
Delta H=	2	2.5	3
Ri=int. gas meter vol.	0	0	0
Rf=final gas meter vol.	3.89	4.37	4.82
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.774888	0.8692804	0.9587944
To=meter outlet Temp (oF)	81	82	82
Tm=meter out temp. (oR)	541	542	542
Pm=Pb + ^H	28.047167	28.0839588	28.1207506
SQRT(Tm/Pm*H/Md)	1.1540307	1.29059127	1.41284675
Ko=orifice const.	0.6714622	0.67355205	0.6786259

Ko MEAN = 0.6745467

Ko*4*144= 388.53891

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:



CALIBRATION CERTIFICATE DRY GAS METER

DATE: 16-Jul-21

CONSOLE MANUF.: NAPP MODEL 31

CONSOLE I.D.: C-980

PARAMETER SUMMARY	RUN #1	RUN #2	RUN #3
Ta = Ambient (WTM) Temperature (oF.)	73.4	73.4	73.4
P=Pres. Differential at WTM ("Hg)	0.0809	0.1545	0.2133
Pb= Atmospheric Pressure ("Hg)	28.30	28.30	28.30
Pv= Vapour Pressure Water at Temp. Ta ("Hg)	0.8181	0.8181	0.8181
H=Pres. Differential at Orifice	1.0	2.0	3.0
Ti= Dry Test Meter Inlet Temp. (oF.)	108.0	93.0	107.0
To= Dry Test Meter Outlet Temp. (oF.)	82.0	76.0	84.0
Ri= Initial Dry Test volume (ft3)	28.12	14.10	34.51
Rf= Final Dry Test Volume (ft3)	33.10	18.93	39.47
Vi= Initial Wet Test Volume (ft3)	0.0	0.0	0.0
Vf= Final Wet Test Volume (ft3)	5.000	5.000	5.000
Pw= Pb - (^P/13.59) "Hg	28.2191	28.1455	28.0867
Pd= Pb + (^H/13.59) "Hg	28.3736	28.4472	28.5208
Tw= Ta +460 (oR.)	533.4	533.4	533.4
Td= [(Ti + To)/2] + 460 (oR.)	555.0	544.5	555.5
Bw= Pv/Pb ("Hg)	0.0289	0.0289	0.0289
WET TEST METER FACTOR (WTMF)	0.9922	0.9922	0.9922
ated Y Value)(WTMF)	1.0011	1.0074	0.9961
Y (MEAN)(WTMF) =	1.0015		

N.R. MCCALL & ASSOCIATES LTD.

Calibrating Technician Signature:



ORIFICE METER CALIBRATION

DATE: July 16/2021

CONSOLE I.D. C-980

	RUN 1	RUN 2	RUN 3
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	28.3	28.3	28.3
Y=gas meter factor	1.0011	1.0011	1.0074
Delta H=	0.5	1	1.5
Ri=int. gas meter vol.	39.9	42.8	46.5
Rf=final gas meter vol.	42.12	45.88	50.28
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.4444884	0.6166776	0.7615944
To=meter outlet Temp (oF)	83	84	86
Tm=meter out temp. (oR)	543	544	546
Pm=Pb + ^H	28.336792	28.3735835	28.4103753
SQRT(Tm/Pm*H/Md)	0.5751191	0.81356189	0.99758912
Ko=orifice const.	0.7728632	0.75799716	0.76343495

Ko MEAN = 0.7647651

Ko*4*144= 440.50469

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:



ORIFICE METER CALIBRATION

DATE: July 16/2021

CONSOLE I.D. C-980

	RUN 4	RUN 5	RUN 6
MD= mol. wt. dry air	28.967	28.967	28.967
Pb=bar. pressure "Hg	28.3	28.3	28.3
Y=gas meter factor	1.0074	0.9961	0.9961
Delta H=	2	2.5	3
Ri=int. gas meter vol.	50.9	55.9	61.2
Rf=final gas meter vol.	55.17	60.65	66.38
min. samp	5	5	5
$Q_m = Y(R_f - R_i) / \Delta T (FT^3 / MIN)$	0.8603196	0.946295	1.0319596
Tm=meter out temp. (oF)	87	88	89
Tm=meter out temp. (oR.)	547	548	549
$P_m = P_b + \Delta H$	28.447167	28.483959	28.520751
$SQRT(T_m / P_m * H / M_d)$	1.1522253	1.288571	1.4119345
Ko=orifice const.	0.7466592	0.7343755	0.7308835

Ko MEAN = 0.7373061

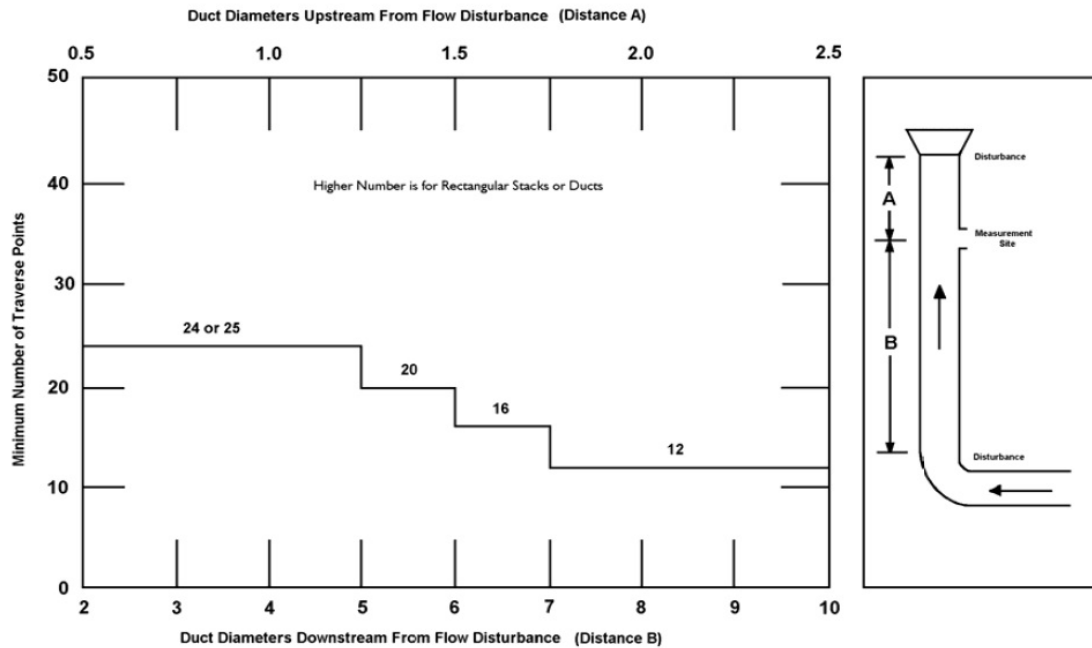
$Ko^4 * 144 = 424.68829$

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:



Site Diagram & Sample Point Selection



Client: [Pinnacle Pellet Williams Lake](#)

Source: [Dryer Stacks 1-4](#)

Pollution Abatement Equipment:

Duct Diameters Up (A): [>2](#)

Duct Diameters Down (B): [4](#)

Area of Stack (ft): [31.5](#)

Stack Diameter (in): [76](#)

Zero (in): [4](#)

Number of Points: [24](#)

Cyclonic Angle: [5°](#)

Traverse Points (in):

PT-1	1.6
PT-2	5.1
PT-3	8.97
PT-4	13.45
PT-5	19
PT-6	26.98
PT-7	49.02
PT-8	57
PT-9	62.55
PT-10	67.03
PT-11	70.91
PT-12	74.4



This is to verify that
Matthew McCall
has successfully completed
a course of study in
Source Testing for Particulates
(35 hours)

Endorsed by
The B.C. Ministry of Environment

Dated at Burnaby, British Columbia, Canada
December 14, 1990


DEAN


REGISTRAR

BRITISH COLUMBIA INSTITUTE OF TECHNOLOGY



MOUNT ROYAL COLLEGE

Faculty of Continuing Education and Extension

David Brandle

has successfully completed

The program of studies and is awarded the certificate in

STACK SAMPLING

May 3 – May 7, 2004

May, 2004
Date

Doreen Brandle
Dean
Faculty of Continuing Education and Extension

MOUNT ROYAL UNIVERSITY

Faculty of Continuing Education and Extension

Chris Bodden

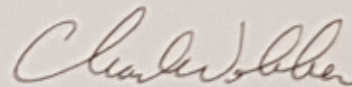
has successfully completed

Stack Sampling Seminar

35 Hours / 2017

June 23, 2017

Date



Dean

Faculty of Continuing Education and Extension



Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Pinnacle Pellet Project Name: Dryer Stacks Project Location: W. Lake, BC LSD: P.O.:	Lot ID: 1540422 Control Number: Date Received: Dec 1, 2021 Date Reported: Dec 8, 2021 Report Number: 2700023
Attn: Accounts Payable Sampled By: D. Lawrence Company: McCall Env.	Proj. Acct. code:	

		Reference Number	1540422-1	1540422-2	1540422-3
		Sample Date	Nov 25, 2021	Nov 25, 2021	Nov 25, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Dryer Stack 1 / Test 1 / 13.4°C	Dryer Stack 1 / Test 2 / 13.4°C	Dryer Stack 1 / Test 3 / 13.4°C
		Matrix	Water	Water	Water
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/L	<20	<20	<20
pH adjustment	adjustment required		Yes	Yes	Yes

Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Pinnacle Pellet Project Name: Dryer Stacks Project Location: W. Lake, BC LSD: P.O.:	Lot ID: 1540422 Control Number: Date Received: Dec 1, 2021 Date Reported: Dec 8, 2021 Report Number: 2700023
Attn: Accounts Payable Sampled By: D. Lawrence Company: McCall Env.	Proj. Acct. code:	

		Reference Number	1540422-4	1540422-5	1540422-6
		Sample Date	Nov 25, 2021	Nov 25, 2021	Nov 25, 2021
		Sample Time	NA	NA	NA
		Sample Location			
		Sample Description	Dryer Stack 2 / Test 1 / 13.4°C	Dryer Stack 2 / Test 2 / 13.4°C	Dryer Stack 2 / Test 3 / 13.4°C
		Matrix	Water	Water	Water
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/L	<20	<20	<15
pH adjustment	adjustment required	Yes	Yes	Yes	5

Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Pinnacle Pellet Project Name: Dryer Stacks Project Location: W. Lake, BC LSD: P.O.:	Lot ID: 1540422 Control Number: Date Received: Dec 1, 2021 Date Reported: Dec 8, 2021 Report Number: 2700023
Attn: Accounts Payable Sampled By: D. Lawrence Company: McCall Env.	Proj. Acct. code:	

		Reference Number	1540422-7	1540422-8	1540422-9	Nominal Detection Limit
		Sample Date	Nov 25, 2021	Nov 25, 2021	Nov 25, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	Dryer Stack 3 / Test 1 / 13.4°C	Dryer Stack 3 / Test 2 / 13.4°C	Dryer Stack 3 / Test 3 / 13.4°C	
		Matrix	Water	Water	Water	
Analyte	Units	Results	Results	Results		
Aggregate Organic Constituents						
Oil and Grease	Total	mg/L	<20	<20	<20	5
pH adjustment	adjustment required		Yes	Yes	Yes	

Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Pinnacle Pellet Project Name: Dryer Stacks Project Location: W. Lake, BC LSD: P.O.:	Lot ID: 1540422 Control Number: Date Received: Dec 1, 2021 Date Reported: Dec 8, 2021 Report Number: 2700023
Attn: Accounts Payable Sampled By: D. Lawrence Company: McCall Env.	Proj. Acct. code:	

		Reference Number	1540422-10	1540422-11	1540422-12	
		Sample Date	Nov 25, 2021	Nov 25, 2021	Nov 25, 2021	
		Sample Time	NA	NA	NA	
		Sample Location				
		Sample Description	Dryer Stack 4 / Test 1 / 13.4°C	Dryer Stack 4 / Test 2 / 13.4°C	Dryer Stack 4 / Test 3 / 13.4°C	
		Matrix	Water	Water	Water	
Analyte		Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents						
Oil and Grease	Total	mg/L	<20	<20	<20	5
pH adjustment	adjustment required		Yes	Yes	Yes	

Approved by:



Benjamin Morris, B.Sc
Operations Manager

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

Generation and distribution of the report, and approval by the digitized signature above, are performed through a secure and controlled automatic process.

ME 2021-302

Client: P.P. W. LAKE			Console: 1013		Pb: 27.95 "Hg		Filter: 27		File:		Date: NOV 25/21	
Process: DRYER ST. 1			Mf: 9954		Static: -20 "H ₂ O		Flask: 1		+		%CO ₂	
Test: 1			K _p : 6688		Ps: 27.94		Silica: 27		+		0	
Personnel: DL LAB			Pitot: 242		Pm: 28.06		Total Vol: 318 ml					
Start time: 9:36			C _p : 84158		Area: 31.50 ft ²		Start Vol: 300 ml					
Stop time: 10:42			Nozzle: .275		Bwo: .05		Plant Type:				Mix:	
Permitt #			Start Leakage Rate@ 15 "Hg .007 ft ³ /min		Pollution Abatement Equip:							
up strm down strm			Finish Leakage Rate@ 15 "Hg .009 ft ³ /min		Load:		Burner:				Fuel Type:	
SAMPLE POINT	DELTA P ("H ₂ O)	DELTA H ("H ₂ O)	GAS METER TEMP (°F)		STACK (°F)	VOLUME (ft ³)	BOX TEMP (°F)	LAST IMP (°F)	PROBE (°F)	VACUUM ("Hg)	MIN/PT= 2.5 ZERO=	
			IN	OUT								
A-12	.20	1.23	54	55	81	0.00	246	1050	467	5		
11	.19	1.17	49	47	77	1.48						
10	.22	1.37	53	50	76	2.96						
9	.20	1.24	54	51	77	4.60						
8	.18	1.11	54	49	76	6.05						
7	.17	1.05	56	53	82	7.52	251			5		
6	.17	1.06	57	57	78	8.93						
5	.18	1.12	57	56	80	10.31						
4	.16	1.00	60	58	78	11.73						
3	.16	1.01	63	59	78	13.11	252			5		
2	.17	1.07	64	59	78	14.53						
1	.17	1.07	64	60	78	15.90						
B-12	.21	1.32	65	60	81	17.31						
11	.20	1.26	66	63	80	18.81	252			5		
10	.18	1.14	69	65	79	20.48						
9	.19	1.20	70	65	81	21.82						
8	.17	1.08	71	67	80	23.28						
7	.18	1.15	71	68	80	24.74	254			5		
6	.17	1.09	75	70	79	26.20						
5	.16	1.02	75	70	80	27.60						
4	.17	1.09	77	72	80	28.98						
3	.18	1.15	77	73	83	30.37	259			4		
2	.19	1.22	79	76	83	31.77						
1	.18	1.16	79	75	83	33.22						
						34.69						

Client: P.P. W. LAKE			Console: 1013		Pb: 27.95 "Hg	Filter: 28	File:		Date: Nov 25/21		
Process: DRYER ST. 1			Mf: 9954		Static: -.20 "H ₂ O	Flask: /	+	%CO ₂	%O ₂	CO	
Test: 2			K _p : 16688		Ps: 27.94	Silica: 28	+	0	21		
Personnel: OL / AB			Pitot: 242		Pm: 28.06	Total Vol: 315 ml					
Start time: 10:55			C _p : 84158		Area: 31.50 ft ²	Start Vol: 300 ml					
Stop time: 11:59			Nozzle: 275		Bwo: 1.05	Plant Type:	Mix:				
Permitt #			Start Leakage Rate@ 15 "Hg .007 ft ³ /min			Pollution Abatement Equip:					
up strm down strm			Finish Leakage Rate@ 15 "Hg .007 ft ³ /min			Load:	Burner:	Fuel Type:			
SAMPLE POINT	DELTA P ("H ₂ O)	DELTA H ("H ₂ O)	GAS METER TEMP (°F)		STACK (°F)	VOLUME (ft ³)	BOX TEMP (°F)	LAST IMP (°F)	PROBE (°F)	VACUUM ("Hg)	MIN/PT= 2.5 ZERO=
			IN	OUT							
B-12	.19	1.22	80	80	90	0.00	237	ICBD	H ₂ T	3	
11	.20	1.27	73	75	84	1.49					
10	.20	1.28	75	75	83	3.02					
9	.18	1.14	73	73	84	4.56					
8	.17	1.08	74	73	84	6.07				3	
7	.18	1.14	75	75	83	7.50	243				
6	.17	1.08	76	76	83	9.06					
5	.17	1.09	77	77	85	10.47					
4	.18	1.15	78	78	85	11.85				3	
3	.18	1.15	81	78	87	13.32					
2	.18	1.15	83	81	85	14.78	252				
1	.17	1.10	80	80	85	16.25					
A-12	.22	1.42	82	82	85	17.77				3	
11	.20	1.29	82	82	85	19.31					
10	.19	1.23	83	82	85	20.88					
9	.19	1.23	83	82	85	22.55					
8	.17	1.10	84	84	86	24.00	255				
7	.18	1.16	88	87	86	25.50				3	
6	.17	1.11	88	87	86	26.94					
5	.19	1.24	88	88	87	28.40					
4	.18	1.17	89	89	89	29.92					
3	.17	1.11	90	90	86	31.43					
2	.17	1.11	90	90	87	32.94	261			3	
1	.18	1.17	91	91	88	34.35					
						35.79					

Client: P. PELLET			Console: 1013		Pb: 27.95 "Hg	Filter: 29	File:		Date: Nov 25/21		
Process: D ST.1			Mf: 9954		Static: -.20 "H ₂ O	Flask: -	+	%CO ₂	%O ₂	CO	
Test: 3-			K _o : 1.6688		Ps: 27.94	Silica: 29	+	0	21		
Personnel: DL / AB			Pitot: 242		Pm: 28.06	Total Vol: 318 ml					
Start time: 12:10			C _p : .84158		Area: 31.50 ft ²	Start Vol: 300 ml					
Stop time: 1:13			Nozzle: .275		Bwo: .05	Plant Type:				Mix:	
Permitt #			Start Leakage Rate@ 15 "Hg, .008 ft ³ /min			Pollution Abatement Equip:					
up strm down strm			Finish Leakage Rate@ 15 "Hg, .009 ft ³ /min			Load:		Burner:		Fuel Type:	
SAMPLE POINT	DELTA P ("H ₂ O)	DELTA H ("H ₂ O)	GAS METER TEMP (°F)		STACK (°F)	VOLUME (ft ³)	BOX TEMP (°F)	LAST IMP (°F)	PROBE (°F)	VACUUM ("Hg)	MIN/PT ZERO-
			IN	OUT							
A-12	.21	1.37	92	92	89	0.00	238	1080	1407	5	
11	.20	1.31	86	92	84	1.60					
10	.19	1.25	86	89	81	3.17					
9	.20	1.31	87	88	82	4.70					
8	.18	1.18	87	88	82	6.23				5	
7	.19	1.25	89	89	82	7.74					
6	.17	1.12	90	89	81	9.23	236				
5	.17	1.12	90	91	82	10.76					
4	.18	1.19	91	91	82	12.20				5	
3	.17	1.12	93	92	83	13.71					
2	.17	1.12	93	92	84	15.20					
1	.18	1.19	95	94	85	16.64					
B-12	.22	1.46	91	95	85	18.03	241				
11	.20	1.32	95	95	86	19.72				5	
10	.20	1.33	98	97	84	21.28					
9	.18	1.20	98	97	85	22.85					
8	.18	1.19	98	97	85	24.36					
7	.17	1.13	97	97	86	25.90					
6	.17	1.12	98	98	88	27.35	253				
5	.18	1.19	98	98	86	28.92					
4	.18	1.19	97	98	86	30.36				4	
3	.18	1.19	98	98	86	31.85					
2	.17	1.12	97	97	86	33.31					
1	.17	1.12	96	97	86	34.79					
						36.25					

Client Name: Binnacle Pellet
Williams Lake
 Process: Dryer Stack 2
 Test Number: 1
 Date: Nov 25 2000
 Start Time 942
 Finish Time 1045
 Starting Vol. 300
 Final Vol. 316
 Flask: filter 2
 Console: 950
 Stack Diameter

BP 27.95
 DN 300
 CP .53504
 MF 1.0015
 Moist. 4.9
 PM 28.06
 AS 31.50
 Ko .7373
 Pitot 217
 Port
 Static - .15
 PS 27.94

CO ₂	O ₂	CO	N ₂
0	70.9		

Duct Diameters

Up-Stream

Duct Diameters

Downstream

Personnel: CB KS

Mean Yaw Angle

Leakage Rate @ 15 inches

Start: .008 Finish: 1010

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
412	.28	1.99	49	49	86	77.43	1	270	1002	
11	.30	2.16	61	51	87	79.51				
10	.29	2.11	65	52	87	81.71	2			
9	.29	2.12	72	53	87	83.86				
8	.26	1.91	76	55	87	86.22	2			
7	.25	1.84	78	57	88	88.40				
6	.21	1.55	80	58	87	90.40	2			
5	.20	1.48	82	60	88	92.33				
4	.19	1.41	83	62	88	94.13	2			
3	.17	1.27	84	64	88	96.02				
2	.17	1.27	85	64	88	97.70	2			
1	.16	1.20	86	66	88	99.43				
B12	.24	1.80	86	67	88	101.09	2			
11	.24	1.80	90	68	89	103.09				
10	.26	1.95	90	69	89	105.09	5			
9	.28	2.12	93	74	89	107.37				
8	.29	2.19	93	71	88	109.39	5			
7	.23	1.74	94	72	89	111.50				
6	.21	1.59	94	73	88	113.49	5			
5	.19	1.44	94	74	88	115.38				
4	.19	1.44	94	74	88	117.25	5			
3	.18	1.37	95	77	88	118.98				
2	.18	1.38	98	78	88	120.89	6			
1	.20	1.53	98	79	88	122.60				
						124.50				

Client Name: Pinnacle Pellet
Williams Lake
 Process: Danger Stacks
 Test Number: 2
 Date: Nov 25 2001
 Start Time: 10:52
 Finish Time: 11:56
 Starting Vol. 300
 Final Vol. 318
 Flask: filled 27
 Console: 950
 Stack Diameter

BP 27.45
 DN 27.00
 CP 8.86
 MF 1.05
 Moist. 2%
 PM 27.78
 AS 31.50
 Ko 1.72
 Pitot 27.7
 Port
 Static -15
 PS 27.74

CO ₂	O ₂	CO	N ₂
0	20.7		

Duct Diameters

Up-Stream

Duct Diameters

Downstream

Personnel: CB KS

Mean Yaw Angle

Leakage Rate @ 15 inches

Start: 007 Finish: 007

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	26	2.02	86	81	91	26.10	2	270	100	
11	29	2.27	91	82	92	28.33				
10	29	2.29	99	82	92	30.47	1			
9	28	2.27	105	83	92	32.61				
8	25	1.99	106	84	91	34.72	1			
7	24	1.92	109	85	91	36.78				
6	22	1.76	108	87	91	38.88	1			
5	20	1.60	108	88	91	40.87				
4	19	1.53	109	89	90	42.80	1			
3	18	1.44	109	90	92	44.70				
2	17	1.37	110	91	91	46.53	1			
1	16	1.29	109	93	91	48.28				
B12	23	1.86	110	93	90	50.08	1			
11	24	1.94	111	94	91	52.20				
10	25	2.02	115	94	91	54.34	1			
9	28	2.24	115	95	91	56.49				
8	30	2.44	117	96	90	58.99	1			
7	24	1.96	118	96	90	61.29				
6	21	1.71	116	97	90	63.41	1			
5	19	1.55	117	98	91	65.28				
4	18	1.47	117	99	90	67.17	1			
3	18	1.47	116	100	91	69.03				
2	17	1.38	116	99	91	70.91	1			
1	16	1.47	114	100	90	72.72				
						74.51				

Client Name: Pinnacle Valley
Williams Fork
 Process: Large Stack
 Test Number: 7
 Date: Nov 25, 2011
 Start Time 12:04
 Finish Time 1:09
 Starting Vol. 500
 Final Vol. 334
 Flask: 500
 Console: 70
 Stack Diameter

BP 27.95
 DN 2.00
 CP 83864
 MF 1.0015
 Moist. 2%
 PM 72.00
 AS 31.50
 Ko .7373
 Pitot 2.15
 Port
 Static .15
 PS 72.00

CO ₂	O ₂	CO	N ₂
0	20.0		

Duct Diameters
 Up-Stream
 Duct Diameters
 Downstream
 Mean Yaw Angle

Personnel: CB KCS

Leakage Rate @ 15 inches

Start: 1011 Finish: 1012

Load:

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
1	.28	2.27	97	95	93	75.69	1	270	1000	
2	.29	2.33	109	97	93	77.83				
3	.29	2.35	115	97	92	80.11	7			
4	.28	2.27	116	98	92	82.40				
5	.27	2.19	117	99	93	84.70	2			
6	.24	1.95	117	99	92	86.97				
7	.22	1.78	116	99	92	89.03	2			
8	.21	1.70	116	99	92	91.01				
9	.20	1.54	116	100	92	93.04	1			
10	.18	1.46	116	99	92	95.01				
11	.16	1.30	115	99	90	96.78	1			
12	.16	1.30	116	100	91	98.57				
13	.25	2.04	116	100	90	100.31	1			
14	.26	2.13	119	101	91	102.40				
15	.26	2.14	122	102	90	104.68	1			
16	.27	2.22	122	103	91	106.87				
17	.29	2.39	124	104	90	109.21	1			
18	.22	1.81	125	105	91	111.58				
19	.21	1.73	123	105	90	113.54	1			
20	.20	1.65	124	106	91	115.59				
21	.19	1.57	124	107	91	117.52	1			
22	.18	1.49	124	107	91	119.49				
23	.18	1.49	124	108	91	121.36	1			
24	.19	1.57	124	109	91	123.13				
						125.14				

W. LAKE

Client: P. PELLET			Console: 1013		Pb: 27.95 "Hg	Filter: 30	File:		Date: Nov 25/21		
Process: D. ST. 3			Mf: 9954		Static: -.10 "H ₂ O	Flask: -	+	%CO ₂	%O ₂	CO	
Test: 1-			K _o : 16688		Ps: 27.94	Silica: 30	+	0	21		
Personnel: DL 1AB			Pitot: 242		Pm: 28.06	Total Vol: 316 ml					
Start time: 1:35			C _P : 84158		Area: ft	Start Vol: 300 ml					
Stop time: 2:40			Nozzle: 278		Bwo: .05	Plant Type:		Mix:			
Permitt #			Start Leakage Rate@ 15 "Hg .004 ft ³ /min			Pollution Abatement Equip:					
up strm down strm			Finish Leakage Rate@ 15 "Hg .008 ft ³ /min			Load:		Burner:		Fuel Type:	
SAMPLE POINT	DELTA P ("H ₂ O)	DELTA H ("H ₂ O)	GAS METER TEMP (°F)		STACK (°F)	VOLUME (ft ³)	BOX TEMP (°F)	LAST IMP (°F)	PROBE (°F)	VACUUM ("Hg)	MIN/PT= 2.5 ZERO=
A-12	.19	1.24	91	91	84	0.00	232	1000	Hot	4	
11	.20	1.31	85	85	87	1.55					
10	.18	1.15	75	82	86	3.08					
9	.17	1.09	75	81	85	4.57					
8	.17	1.16	76	82	84	6.00	240			3	
7	.17	1.09	78	82	84	7.46					
6	.15	.97	78	82	84	8.87					
5	.15	.97	79	82	83	10.20					
4	.16	1.03	80	82	85	11.53	246			3	
3	.16	1.03	80	82	88	12.92					
2	.19	1.22	82	83	90	14.35					
1	.20	1.28	82	83	89	15.85					
B-12	.19	1.22	84	84	92	17.35	248			3	
11	.20	1.28	85	85	92	18.83					
10	.19	1.22	86	86	92	20.40					
9	.18	1.15	87	87	92	21.92					
8	.18	1.16	88	88	92	23.42	250			3	
7	.16	1.03	88	88	92	24.98					
6	.15	.97	89	89	92	26.32					
5	.16	1.03	89	89	91	27.73					
4	.16	1.04	92	92	89	29.21	250			3	
3	.17	1.11	91	92	90	30.55					
2	.18	1.17	92	92	90	31.90					
1	.21	1.37	92	92	91	33.40					
						35.08					

Client: P. PELLET			Console: 1013		Pb: 27.95 "Hg		Filter: 31		File:		Date: Nov 25/21	
Process: D. ST 3			Mf: 9954		Static: -.10 "H ₂ O		Flask: -		+		%CO ₂	%O ₂
Test: 2			K ₀ : 6688		Ps: 27.94		Silica: 31		+		0	21
Personnel: DL / AB			Pitot: 242		Pm: 28.06		Total Vol: 314 ml					
Start time: 2:50			C _p : 84158		Area: ft ²		Start Vol: 300 ml					
Stop time: 3:55			Nozzle: 275		Bwo: 105		Plant Type:				Mix:	
Permitt #			Start Leakage Rate@ 15 "Hg 1067 ft ³ /min		Pollution Abatement Equip:							
up strm down strm			Finish Leakage Rate@ 15 "Hg 1011 ft ³ /min		Load:		Burner:				Fuel Type:	
SAMPLE POINT	DELTA P ("H ₂ O)	DELTA H ("H ₂ O)	GAS METER TEMP (°F)		STACK (°F)	VOLUME (ft ³)	BOX TEMP (°F)	LAST IMP (°F)	PROBE (°F)	VACUUM ("Hg)	MIN/PT-25 ZERO-	
			IN	OUT								
B-12	.18	1.17	93	93	90	0.00	236	1080	AST.	4		
11	.20	1.31	86	89	84	1.48						
10	.19	1.24	82	87	83	3.03						
9	.19	1.23	83	87	86	4.56						
8	.18	1.17	85	86	84	6.10				4		
7	.18	1.17	87	88	85	7.61	243					
6	.16	1.04	87	88	84	9.09						
5	.15	.98	87	88	82	10.50						
4	.16	1.05	87	87	81	11.86				5		
3	.18	1.18	88	88	83	13.23						
2	.20	1.31	90	91	82	14.68	251					
1	.21	1.38	91	91	85	16.29						
A-12	.20	1.31	90	89	83	17.93						
11	.20	1.31	92	91	86	19.51				5		
10	.17	1.11	92	92	85	21.10						
9	.18	1.18	90	90	84	22.59	252					
8	.18	1.18	89	91	84	24.05						
7	.16	1.05	91	92	83	25.53				5		
6	.15	.99	92	91	84	26.96						
5	.15	.99	91	92	83	28.33						
4	.18	1.19	92	92	84	29.70						
3	.20	1.32	92	91	84	31.18	250					
2	.20	1.32	92	91	87	32.76				5		
1	.21	1.38	92	92	86	34.28						
						35.88						

Client: P. PELLET			Console: 1013		Pb: 27.95 "Hg	Filter: 32	File:		Date: Nov 25/21		
Process: D. ST. 3			Mf: 9954		Static: -10 "H ₂ O	Flask: /	+	%CO ₂	%O ₂	CO	
Test: 3			K ₀ : 16688		Ps: 27.94	Silica: 32	+	0	21		
Personnel: DL AB			Pitot: 242		Pm: 28.06	Total Vol: 316 ml					
Start time: 4:07			C _p : 84158		Area: ft ²	Start Vol: 300 ml					
Stop time: 5:12			Nozzle: 275		Bwo: 105	Plant Type:			Mix:		
Permitt #			Start Leakage Rate@ 15 "Hg .006 ft ³ /min			Pollution Abatement Equip:					
up strm down strm			Finish Leakage Rate@ 15 "Hg .007 ft ³ /min			Load: Burner:			Fuel Type:		
SAMPLE POINT	DELTA P ("H ₂ O)	DELTA H ("H ₂ O)	GAS METER TEMP (°F)		STACK (°F)	VOLUME (ft ³)	BOX TEMP (°F)	LAST IMP (°F)	PROBE (°F)	VACUUM ("Hg)	MIN/PT= 2.5 ZERO=
			IN	OUT							
A-12	.18	1.18	95	95	90	0.00	233	iced	Hot	4	
11	.21	1.38	90	94	87	1.55					
10	.17	1.11	87	90	85	3.17					
9	.19	1.24	85	89	85	4.62					
8	.17	1.11	86	89	86	6.15				4	
7	.16	1.05	87	88	84	7.68	247				
6	.15	.98	88	89	84	9.06					
5	.16	1.05	87	89	83	10.43					
4	.17	1.11	88	89	84	11.86				3	
3	.17	1.11	88	88	85	13.33					
2	.19	1.24	89	88	86	14.75	249				
1	.21	1.37	89	89	86	16.22					
B-12	.20	1.31	91	90	84	17.80					
11	.20	1.51	91	92	86	19.33				3	
10	.18	1.18	92	92	86	20.90					
9	.17	1.12	93	94	86	22.41	253				
8	.17	1.12	93	93	87	23.88					
7	.16	1.05	93	91	85	25.36				4	
6	.16	1.05	92	92	86	26.80					
5	.16	1.05	91	95	86	28.24					
4	.18	1.18	92	93	85	29.68					
3	.20	1.31	93	92	84	31.16	251				
2	.20	1.31	93	93	85	32.72				3	
1	.21	1.38	93	93	85	34.33					
						35.91					

Client Name: Pinnacle Pellet
Williams Lake
 Process: Dryer Stack 4
 Test Number: 1
 Date: Nov 25 2021
 Start Time: 115
 Finish Time: 217
 Starting Vol.: 300
 Final Vol.: 323
 Flask: filter 24
 Console: 980
 Stack Diameter:

BP 27.95
 DN 1300
 CP 183357
 MF 10015
 Moist. 39%
 PM 28.06
 AS 31.50
 Ko 14073
 Pitot 217
 Port
 Static -24
 PS 27.93

CO ₂	O ₂	CO	N ₂
0	20.7		

Personnel: CB KS

Leakage Rate @ 15 inches

Load:

Duct Diameters

Up-Stream

Duct Diameters

Downstream

Mean Yaw Angle

Start: 1013 Finish: 1010

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.15	1.15	91	90	97	26.46	2	270	1000	
11	.16	1.22	93	90	100	28.14				
10	.17	1.30	96	92	101	29.88	2			
9	.18	1.38	94	91	101	31.71				
8	.18	1.38	100	89	101	33.57	2			
7	.20	1.53	100	88	101	35.41				
6	.20	1.54	101	88	100	37.33	2			
5	.21	1.62	102	88	100	39.26				
4	.22	1.69	103	88	101	41.25	3			
3	.20	1.53	103	88	103	43.33				
2	.20	1.53	103	88	103	45.12	4			
1	.19	1.46	104	90	104	47.06				
B12	.24	1.83	103	90	106	48.88	4			
11	.24	1.83	105	91	107	51.01				
10	.25	1.90	103	90	108	53.09	4			
9	.25	1.91	103	89	104	55.22				
8	.23	1.74	105	89	112	57.37	5			
7	.22	1.66	106	89	113	59.33				
6	.19	1.44	107	90	112	61.30	4			
5	.18	1.37	106	91	109	63.15				
4	.18	1.37	105	91	111	65.01	3			
3	.20	1.50	106	90	118	66.86				
2	.21	1.58	108	92	117	68.76	3			
1	.24	1.82	108	93	115	70.72				
						72.84				

Client Name: Pinnacle Pellet
Williams Lake
 Process: Dryer Stack 4
 Test Number: 2
 Date: Nov 25 2021
 Start Time 222
 Finish Time 326
 Starting Vol. 300
 Final Vol. 319
 Flask: filter 25
 Console: 980
 Stack Diameter

BP 27.95
 DN 300
 CP .83867
 MF 1.0015
 Moist. 3%
 PM 28.06
 AS 31.50
 Ko .7373
 Pitot 217
 Port
 Static -1.24
 PS 27.93

CO ₂	O ₂	CO	N ₂
0	20.9		

Personnel: C.B. K5

Leakage Rate @ 15 inches

Load:

23

Duct Diameters

Up-Stream

Duct Diameters

Downstream

Mean Yaw Angle

Start: 1008 Finish: 1009

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.15	1.17	97	91	92	74.00	2	270	1000	
11	.15	1.14	100	91	109	75.71				
10	.17	1.29	102	91	108	77.34	2			
9	.19	1.45	104	92	107	79.07				
8	.20	1.53	105	90	107	80.75	2			
7	.20	1.54	107	91	104	82.75				
6	.21	1.63	107	91	100	84.62	1			
5	.22	1.72	108	92	98	86.75				
4	.21	1.64	109	92	97	88.63	2			
3	.20	1.56	109	93	98	90.61				
2	.19	1.49	109	93	97	92.50	1			
1	.18	1.41	109	93	97	94.42				
B12	.23	1.80	109	92	97	96.28	1			
11	.25	1.95	109	93	97	98.38				
10	.25	1.95	111	93	99	100.55	2			
9	.24	1.87	110	94	99	102.64				
8	.23	1.80	110	94	98	104.71	2			
7	.21	1.64	109	94	98	106.79				
6	.20	1.57	108	94	95	108.74	2			
5	.18	1.41	108	93	94	110.69				
4	.17	1.33	106	92	95	112.48	1			
3	.18	1.40	107	93	98	114.32				
2	.20	1.56	107	93	98	116.79	1			
1	.23	1.79	108	93	99	118.22				
						120.25				

Client Name: Pinnacle Pellet
Williams Lake
 Process: Dryer Stack 4
 Test Number: 3
 Date: Nov 25 2021
 Start Time: 3:35
 Finish Time: 4:40
 Starting Vol.: 300
 Final Vol.: 317
 Flask: Filter 26
 Console: 980
 Stack Diameter: _____

BP 27.95
 DN 300
 CP .83867
 MF 1.0015
 Moist. 3%
 PM 28.06
 AS 31.50
 Ko .7373
 Pitot 217
 Port _____
 Static -.241
 PS 27.93

CO ₂	O ₂	CO	N ₂
0	20.9		

Personnel: CB 105

Leakage Rate @ 15 inches

Load:

Duct Diameters

Up-Stream

Duct Diameters

Downstream

Mean Yaw Angle

Start: 1008 Finish: .012

Sample Points	Delta P	Delta H	Temp. In	Temp. Out	Stack Temp.	Gas Volume	Pump Vacuum	Box Temp.	Last Imp. Temp.	Points
A12	.16	1.21	90	85	103	23.33	1	270	iced	
11	.17	1.31	97	90	100	25.13				
10	.17	1.31	101	88	99	26.92	1			
9	.18	1.40	104	89	96	28.79				
8	.19	1.46	105	90	103	30.59	1			
7	.20	1.55	108	90	100	32.41				
6	.20	1.56	108	91	98	34.35	1			
5	.21	1.64	110	91	97	36.26				
4	.21	1.65	110	92	96	38.17	1			
3	.20	1.57	111	93	95	39.99				
2	.19	1.49	113	95	97	41.72	1			
1	.18	1.42	114	96	96	43.84				
B12	.22	1.74	113	97	96	45.62	1			
11	.25	1.98	112	98	94	47.51				
10	.25	1.99	114	99	93	49.61	1			
9	.24	1.90	113	99	94	51.70				
8	.22	1.74	113	98	93	53.78	1			
7	.22	1.74	112	97	93	55.80				
6	.21	1.66	111	96	94	57.85	1			
5	.18	1.42	110	94	92	59.72				
4	.17	1.35	112	95	91	61.57	1			
3	.19	1.51	112	95	91	63.33				
2	.21	1.67	111	95	91	65.33	1			
1	.22	1.75	111	96	91	67.36				
						69.35				



PRINCE GEORGE | VANCOUVER

Pinnacle Renewable Energy Inc.
Williams Lake

Daily production rate November 25th

28.8 MT/hr

Average for the previous calendar month

25.4 MT/hr

90th percentile production rate

28.7 MT/hr

Average Dryer Fan 1 exit gas temperature

Included in Stack Test

Average Dryer Fan 2 exit gas temperature

Included in Stack Test

Average Dryer Fan 3 exit gas temperature

Included in Stack Test

Average Dryer Fan 4 exit gas temperature

Included in Stack Test

Average Cyclofilter exit gas temperature, [°C]

Included in Stack Test

Volumetric emission flow rates, [m³/hour]

Included in Stack Test

TPM, [mg/m³]

Included in Stack Test

PM, [mg/m³]

Included in Stack Test

PRINCE GEORGE

8545 Willow Cale Road, Prince George, BC V2N 6Z9
TF. 1-877-737-4344 P. 250-562-5562 F. 250-562-5584

VANCOUVER

350 - 3600 Lysander Lane, Richmond, BC V7B 1C3
P. 604-270-9613 F. 604-270-9914

| www.pinnaclepellet.com |

