



June 4, 2019

Lavington Pellet Limited Partnership
9900 School Road
Coldstream, B.C.,
V1B 3C7

Attention: **Jamie Colliss**
Re: **Air Emission Testing of May 7-8, 2019**
 Permit 107369, ME1718-407

As requested our firm provided a series of air emission tests at your facility in Lavington BC.

Testing Parameters

- Dryer 1 North & South Stack
 - o Total Particulate Testing (including Condensable Organics) State of Oregon Method 7
- Dryer 2 North & South Stack
 - o Total Particulate Testing (including Condensable Organics) State of Oregon Method 7

Key Personnel

- Report Generation: Matt McCall
- Field Supervisor: Dave Brandle/Dan Lawrence
- Plant Contact: Jamie Colliss

All testing procedures were conducted in accordance with acceptable methodologies as listed in the latest revision of the BC Field Sampling Manual. A copy of the method and/or Sampling Manual are digitally available upon request. All lab analysis for back half condensable organic fractions was analyzed by EXOVA Laboratories in Surrey BC. A copy of their report can be found in the Appendix of this report.

Results are summarized immediately following this cover letter. Please note that all results are expressed on a dry basis and reference conditions of 20 deg C, 1 atm pressure.

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

Sincerely,

MCCALL ENVIRONMENTAL

Matt McCall

Summary of Test Results

Dryer 1 North Stack May 7, 2019 Summary of Test Results 1-3

Gas Temperature:	104 °F	40 °C
Moisture Content (by volume):	3.44 %	
Average Stack Gas Velocity:	43.1 ft/sec	13.1 m/sec
Total Actual Gas Flow Rate:	203303 ACFM	
Dry Gas flow Rate at Reference Conditions:	173868 SCFM	82.1 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.004 gr/ft ³	9.4 mg/m ³
Front Half Particulate	0.002 gr/ft ³	4.8 mg/m ³
Back Half Condensibles	0.002 gr/ft ³	4.6 mg/m ³
Mass Emission Rate	6.13 lbs/hr	2.78 kg/hr

Dryer 1 South Stack May 7, 2019 Summary of Test Results 1-3

Gas Temperature:	88 °F	31 °C
Moisture Content (by volume):	3.52 %	
Average Stack Gas Velocity:	24.7 ft/sec	7.5 m/sec
Total Actual Gas Flow Rate:	54369 ACFM	
Dry Gas flow Rate at Reference Conditions:	47858 SCFM	22.6 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.002 gr/ft ³	5.1 mg/m ³
Front Half Particulate	0.001 gr/ft ³	2.6 mg/m ³
Back Half Condensibles	0.001 gr/ft ³	2.5 mg/m ³
Mass Emission Rate	0.91 lbs/hr	0.41 kg/hr

Dryer 2 North Stack May 8, 2019 Summary of Test Results 1-3

Gas Temperature:	98 °F	37 °C
Moisture Content (by volume):	3.84 %	
Average Stack Gas Velocity:	40.4 ft/sec	12.3 m/sec
Total Actual Gas Flow Rate:	190609 ACFM	
Dry Gas flow Rate at Reference Conditions:	164824 SCFM	77.8 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.004 gr/ft ³	9.9 mg/m ³
Front Half Particulate	0.003 gr/ft ³	7.3 mg/m ³
Back Half Condensibles	0.001 gr/ft ³	2.6 mg/m ³
Mass Emission Rate	6.09 lbs/hr	2.76 kg/hr

Dryer 2 South Stack May 8, 2019 Summary of Test Results 1-3

Gas Temperature:	87 °F	31 °C
Moisture Content (by volume):	3.14 %	
Average Stack Gas Velocity:	27.8 ft/sec	8.5 m/sec
Total Actual Gas Flow Rate:	61193 ACFM	
Dry Gas flow Rate at Reference Conditions:	54389 SCFM	25.7 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.002 gr/ft ³	5.5 mg/m ³
Front Half Particulate	0.002 gr/ft ³	3.6 mg/m ³
Back Half Condensibles	0.001 gr/ft ³	1.9 mg/m ³
Mass Emission Rate	1.13 lbs/hr	0.51 kg/hr

Pinnacle Pellet Lavington
Dryer 1 North Stack
Lavington, BC

May 7/19

Permit Number: 107369

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	104 ° F	40 ° C
Moisture Content (by volume):	3.44 %	
Average Stack Gas Velocity:	43.1 ft/sec	13.1 m/sec
Total Actual Gas Flow Rate:	203303 ACFM	
Dry Gas flow Rate at Reference Conditions:	173868 SCFM	82.1 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.004 gr/ft ³	9.4 mg/m ³
Front Half Particulate	0.002 gr/ft ³	4.8 mg/m ³
Back Half Condensibles	0.002 gr/ft ³	4.6 mg/m ³
Mass Emission Rate	6.13 lbs/hr	2.78 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	102 ° F	39 ° C
Moisture Content (by volume):	3.1 %	
Average Stack Gas Velocity:	42.9 ft/sec	13.1 m/sec
Total Actual Gas Flow Rate:	201945 ACFM	
Dry Gas flow Rate at Reference Conditions:	173956 SCFM	82.1 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.002 gr/ft ³	4.6 mg/m ³
Front Half Particulate	.001 gr/ft ³	1.8 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.8 mg/m ³
Mass Emission Rate	3.00 lbs/hr	1.36 kg/hr

TEST 2:

Gas Temperature:	104 ° F	40 ° C
Moisture Content (by volume):	3.4 %	
Average Stack Gas Velocity:	43.3 ft/sec	13.2 m/sec
Total Actual Gas Flow Rate:	203832 ACFM	
Dry Gas flow Rate at Reference Conditions:	174635 SCFM	82.4 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.008 gr/ft ³	19.4 mg/m ³
Front Half Particulate	.005 gr/ft ³	11.1 mg/m ³
Back Half Condensibles	.004 gr/ft ³	8.3 mg/m ³
Mass Emission Rate	12.69 lbs/hr	5.75 kg/hr

TEST 3:

Gas Temperature:	107 ° F	42 ° C
Moisture Content (by volume):	3.8 %	
Average Stack Gas Velocity:	43.3 ft/sec	13.2 m/sec
Total Actual Gas Flow Rate:	204133 ACFM	
Dry Gas flow Rate at Reference Conditions:	173014 SCFM	81.7 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.002 gr/ft ³	4.2 mg/m ³
Front Half Particulate	.001 gr/ft ³	1.4 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.8 mg/m ³
Mass Emission Rate	2.71 lbs/hr	1.23 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Pellet Lavington
Plant Location: Lavington, BC
Process: Dryer 1 North Stack
Permit Number: 107369
Job Number: ME1718-407
Pollution Control Permit: 15.0 mg/m3
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
45	46	47
May 7/19	May 7/19	May 7/19
9:08	10:30	11:40
10:13	11:34	12:43
60	60	60
DL/NB	DL/NB	DL/NB
MU-1013	MU-1013	MU-1013
28.35	28.35	28.35
-0.25	-0.25	-0.25
0.0	0.0	0.0
21.0	21.0	21.0
0.0	0.0	0.0
79.0	79.0	79.0
0.230	0.230	0.230
0.987	0.987	0.987
0.84574	0.84574	0.84574
78.54	78.54	78.54
20	25	28
6.0	4.0	4.0
0.0005	0.0002	0.0007
0.0015	0.0119	0.0008
0.0030	0.0090	0.0030
0.0050	0.0211	0.0045



**Pinnacle Pellet Lavington
Dryer 1 North Stack
Pinnacle Pellet Lavington**

Data for TEST 1		OVERALL ISOKINETICS - TEST 1: 1.000	
Delta P:	0.505 "H ₂ O	Us avg:	42.85 ft/sec
Delta H:	1.598	ACFM:	201945 ft ³ /min
Tm avg:	525.7 °R	SDCFM:	173956 ft ³ /min
Ts avg:	562.5 °R	Vm std:	38.33 ft ³
Bwo:	0.031	Vm corr:	40.11 ft ³
Md:	28.84	Vm:	40.64 ft ³
Ms:	28.50	MF:	0.9870
Pb:	28.35 "Hg	PCON:	4.61 mg/m ³
Pm:	28.47 "Hg	ERAT:	1.36 kg/hr
Ps:	28.33 "Hg		

Data for TEST 2		OVERALL ISOKINETICS - TEST 2: 0.998	
Delta P:	0.512 "H ₂ O	Us avg:	43.25 ft/sec
Delta H:	1.648	ACFM:	203832 ft ³ /min
Tm avg:	543.1 °R	SDCFM:	174635 ft ³ /min
Ts avg:	563.5 °R	Vm std:	38.42 ft ³
Bwo:	0.034	Vm corr:	41.53 ft ³
Md:	28.84	Vm:	42.08 ft ³
Ms:	28.47	MF:	0.9870
Pb:	28.35 "Hg	PCON:	19.39 mg/m ³
Pm:	28.47 "Hg	ERAT:	5.75 kg/hr
Ps:	28.33 "Hg		

Data for TEST 3		OVERALL ISOKINETICS - TEST 3: 0.997	
Delta P:	0.510 "H ₂ O	Us avg:	43.32 ft/sec
Delta H:	1.658	ACFM:	204133 ft ³ /min
Tm avg:	551.0 °R	SDCFM:	173014 ft ³ /min
Ts avg:	567.4 °R	Vm std:	38.01 ft ³
Bwo:	0.038	Vm corr:	41.69 ft ³
Md:	28.84	Vm:	42.24 ft ³
Ms:	28.43	MF:	0.9870
Pb:	28.35 "Hg	PCON:	4.18 mg/m ³
Pm:	28.47 "Hg	ERAT:	1.23 kg/hr
Ps:	28.33 "Hg		

Pinnacle Pellet Lavington
Dryer 1 South Stack
Lavington, BC

May 7/19

Permit Number: 107369

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	88 ° F	31 ° C
Moisture Content (by volume):	3.52 %	
Average Stack Gas Velocity:	24.7 ft/sec	7.5 m/sec
Total Actual Gas Flow Rate:	54369 ACFM	
Dry Gas flow Rate at Reference Conditions:	47858 SCFM	22.6 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.002 gr/ft ³	5.1 mg/m ³
Front Half Particulate	0.001 gr/ft ³	2.6 mg/m ³
Back Half Condensibles	0.001 gr/ft ³	2.5 mg/m ³
Mass Emission Rate	0.91 lbs/hr	0.41 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	86 ° F	30 ° C
Moisture Content (by volume):	3.4 %	
Average Stack Gas Velocity:	24.8 ft/sec	7.6 m/sec
Total Actual Gas Flow Rate:	54589 ACFM	
Dry Gas flow Rate at Reference Conditions:	48322 SCFM	22.8 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.002 gr/ft ³	4.9 mg/m ³
Front Half Particulate	.001 gr/ft ³	1.7 mg/m ³
Back Half Condensibles	.001 gr/ft ³	3.2 mg/m ³
Mass Emission Rate	0.89 lbs/hr	0.40 kg/hr

TEST 2:

Gas Temperature:	91 ° F	33 ° C
Moisture Content (by volume):	3.6 %	
Average Stack Gas Velocity:	24.7 ft/sec	7.5 m/sec
Total Actual Gas Flow Rate:	54270 ACFM	
Dry Gas flow Rate at Reference Conditions:	47515 SCFM	22.4 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.002 gr/ft ³	4.7 mg/m ³
Front Half Particulate	.001 gr/ft ³	2.5 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.2 mg/m ³
Mass Emission Rate	0.83 lbs/hr	0.38 kg/hr

TEST 3:

Gas Temperature:	89 ° F	31 ° C
Moisture Content (by volume):	3.5 %	
Average Stack Gas Velocity:	24.7 ft/sec	7.5 m/sec
Total Actual Gas Flow Rate:	54247 ACFM	
Dry Gas flow Rate at Reference Conditions:	47739 SCFM	22.5 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.002 gr/ft ³	5.6 mg/m ³
Front Half Particulate	.002 gr/ft ³	3.5 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.2 mg/m ³
Mass Emission Rate	1.01 lbs/hr	0.46 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Pellet Lavington
Plant Location: Lavington, BC
Process: Dryer 1 South Stack
Permit Number: 107369
Job Number: ME1718-407
Pollution Control Permit: 15.0 mg/m3
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

	TEST 1	TEST 2	TEST 3
Filter Number:	48	49	50
Date of Test:	May 7/19	May 7/19	May 7/19
Start Time:	1:18	2:33	3:48
Stop Time:	2:22	3:37	4:52
On-line Sampling Time:	60	60	60
Testing Personnel:	DL/NB	DL/NB	DL/NB
Sampler Model:	MU-1013	MU-1013	MU-1013
Barometric Pressure("Hg):	28.35	28.35	28.35
Static Pressure("H₂O):	-0.05	-0.05	-0.05
%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):	0.275	0.275	0.275
Meter Factor:	0.987	0.987	0.987
Type-S Pitot Tube Coefficient:	0.84295	0.84295	0.84295
Cross Sectional Area of Stack(ft²):	36.67	36.67	36.67
Impinger Condensate(g):	18	15	16
Weight of Moisture in Silica Gel(g):	7.0	11.0	9.0
Weight of Filter Particulate(g):	0.0006	0.0004	0.0006
Weight of Probe Washings(g):	0.0010	0.0019	0.0026
Weight of Impinger Content Organic(g):	0.0030	0.0020	0.0020
Total Weight of Particulate(g):	0.0046	0.0043	0.0052



**Pinnacle Pellet Lavington
Dryer 1 South Stack
Pinnacle Pellet Lavington**

Data for TEST 1		OVERALL ISOKINETICS - TEST 1: 1.011	
Delta P:	0.175 "H₂O	Us avg:	24.81 ft/sec
Delta H:	1.223	ACFM:	54589 ft³/min
Tm avg:	546.2 °R	SDCFM:	48322 ft³/min
Ts avg:	545.7 °R	Vm std:	33.02 ft³
Bwo:	0.034	Vm corr:	35.94 ft³
Md:	28.84	Vm:	36.41 ft³
Ms:	28.47	MF:	0.9870
Pb:	28.35 "Hg	PCON:	4.92 mg/m³
Pm:	28.44 "Hg	ERAT:	0.40 kg/hr
Ps:	28.35 "Hg		

Data for TEST 2		OVERALL ISOKINETICS - TEST 2: 1.010	
Delta P:	0.172 "H₂O	Us avg:	24.67 ft/sec
Delta H:	1.214	ACFM:	54270 ft³/min
Tm avg:	556.1 °R	SDCFM:	47515 ft³/min
Ts avg:	550.5 °R	Vm std:	32.38 ft³
Bwo:	0.036	Vm corr:	35.88 ft³
Md:	28.84	Vm:	36.35 ft³
Ms:	28.45	MF:	0.9870
Pb:	28.35 "Hg	PCON:	4.69 mg/m³
Pm:	28.44 "Hg	ERAT:	0.38 kg/hr
Ps:	28.35 "Hg		

Data for TEST 3		OVERALL ISOKINETICS - TEST 3: 1.009	
Delta P:	0.172 "H₂O	Us avg:	24.66 ft/sec
Delta H:	1.226	ACFM:	54247 ft³/min
Tm avg:	559.0 °R	SDCFM:	47739 ft³/min
Ts avg:	548.6 °R	Vm std:	32.52 ft³
Bwo:	0.035	Vm corr:	36.22 ft³
Md:	28.84	Vm:	36.70 ft³
Ms:	28.46	MF:	0.9870
Pb:	28.35 "Hg	PCON:	5.65 mg/m³
Pm:	28.44 "Hg	ERAT:	0.46 kg/hr
Ps:	28.35 "Hg		

Pinnacle Pellet Lavington
Dryer 2 North Stack
Lavington, BC

May 8/19

Permit Number: 107369

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	98 ° F	37 ° C
Moisture Content (by volume):	3.84 %	
Average Stack Gas Velocity:	40.4 ft/sec	12.3 m/sec
Total Actual Gas Flow Rate:	190609 ACFM	
Dry Gas flow Rate at Reference Conditions:	164824 SCFM	77.8 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.004 gr/ft ³	9.9 mg/m ³
Front Half Particulate	0.003 gr/ft ³	7.3 mg/m ³
Back Half Condensibles	0.001 gr/ft ³	2.6 mg/m ³
Mass Emission Rate	6.09 lbs/hr	2.76 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	93 ° F	34 ° C
Moisture Content (by volume):	3.9 %	
Average Stack Gas Velocity:	40.3 ft/sec	12.3 m/sec
Total Actual Gas Flow Rate:	189940 ACFM	
Dry Gas flow Rate at Reference Conditions:	165487 SCFM	78.1 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.006 gr/ft ³	13.3 mg/m ³
Front Half Particulate	.005 gr/ft ³	11.4 mg/m ³
Back Half Condensibles	.001 gr/ft ³	1.9 mg/m ³
Mass Emission Rate	8.22 lbs/hr	3.73 kg/hr

TEST 2:

Gas Temperature:	97 ° F	36 ° C
Moisture Content (by volume):	3.9 %	
Average Stack Gas Velocity:	40.9 ft/sec	12.5 m/sec
Total Actual Gas Flow Rate:	192704 ACFM	
Dry Gas flow Rate at Reference Conditions:	166788 SCFM	78.7 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	8.3 mg/m ³
Front Half Particulate	.002 gr/ft ³	5.4 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.8 mg/m ³
Mass Emission Rate	5.16 lbs/hr	2.34 kg/hr

TEST 3:

Gas Temperature:	103 ° F	40 ° C
Moisture Content (by volume):	3.7 %	
Average Stack Gas Velocity:	40.1 ft/sec	12.2 m/sec
Total Actual Gas Flow Rate:	189181 ACFM	
Dry Gas flow Rate at Reference Conditions:	162198 SCFM	76.5 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.004 gr/ft ³	8.0 mg/m ³
Front Half Particulate	.002 gr/ft ³	5.1 mg/m ³
Back Half Condensibles	.001 gr/ft ³	2.9 mg/m ³
Mass Emission Rate	4.89 lbs/hr	2.22 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Pellet Lavington
Plant Location: Lavington, BC
Process: Dryer 2 North Stack
Permit Number: 107369
Job Number: ME1718-407
Pollution Control Permit: 15.0 mg/m3
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

	TEST 1	TEST 2	TEST 3
Filter Number:	51	52	53
Date of Test:	May 8/19	May 8/19	May 8/19
Start Time:	8:07	9:21	10:37
Stop Time:	9:10	10:25	11:41
On-line Sampling Time:	60	60	60
Testing Personnel:	DL/NB	DL/NB	DL/NB
Sampler Model:	1013	1013	1013
Barometric Pressure("Hg):	28.45	28.45	28.45
Static Pressure("H₂O):	-0.30	-0.30	-0.30
%CO₂:	0.0	0.0	3.0
%O₂:	21.0	21.0	21.0
%CO:	0.0	0.0	0.0
%N₂:	79.0	79.0	76.0
Diameter of Nozzle(inches):	0.230	0.230	0.230
Meter Factor:	0.987	0.987	0.987
Type-S Pitot Tube Coefficient:	0.84574	0.84574	0.84574
Cross Sectional Area of Stack(ft²):	78.54	78.54	78.54
Impinger Condensate(g):	27	25	26
Weight of Moisture in Silica Gel(g):	5.0	7.0	4.0
Weight of Filter Particulate(g):	0.0015	0.0013	0.0014
Weight of Probe Washings(g):	0.0104	0.0044	0.0039
Weight of Impinger Content Organic(g):	0.0020	0.0030	0.0030
Total Weight of Particulate(g):	0.0139	0.0087	0.0083



Pinnacle Pellet Lavington
Dryer 2 North Stack
Pinnacle Pellet Lavington

Data for *TEST 1*

OVERALL ISOKINETICS - TEST 1: 1.016

Delta P:	0.454 "H ₂ O	Us avg:	40.31 ft/sec
Delta H:	1.446	ACFM:	189940 ft ³ /min
Tm avg:	520.3 °R	SDCFM:	165487 ft ³ /min
Ts avg:	553.3 °R	Vm std:	37.02 ft ³
Bwo:	0.039	Vm corr:	38.23 ft ³
Md:	28.84	Vm:	38.73 ft ³
Ms:	28.42	MF:	0.9870
Pb:	28.45 "Hg	PCON:	13.26 mg/m ³
Pm:	28.56 "Hg	ERAT:	3.73 kg/hr
Ps:	28.43 "Hg		

Data for *TEST 2*

OVERALL ISOKINETICS - TEST 2: 1.013

Delta P:	0.464 "H ₂ O	Us avg:	40.89 ft/sec
Delta H:	1.545	ACFM:	192704 ft ³ /min
Tm avg:	546.6 °R	SDCFM:	166788 ft ³ /min
Ts avg:	557.1 °R	Vm std:	37.22 ft ³
Bwo:	0.039	Vm corr:	40.36 ft ³
Md:	28.84	Vm:	40.89 ft ³
Ms:	28.42	MF:	0.9870
Pb:	28.45 "Hg	PCON:	8.25 mg/m ³
Pm:	28.56 "Hg	ERAT:	2.34 kg/hr
Ps:	28.43 "Hg		

Data for *TEST 3*

OVERALL ISOKINETICS - TEST 3: 1.019

Delta P:	0.450 "H ₂ O	Us avg:	40.15 ft/sec
Delta H:	1.502	ACFM:	189181 ft ³ /min
Tm avg:	555.1 °R	SDCFM:	162198 ft ³ /min
Ts avg:	563.3 °R	Vm std:	36.42 ft ³
Bwo:	0.037	Vm corr:	40.11 ft ³
Md:	29.32	Vm:	40.64 ft ³
Ms:	28.90	MF:	0.9870
Pb:	28.45 "Hg	PCON:	8.05 mg/m ³
Pm:	28.56 "Hg	ERAT:	2.22 kg/hr
Ps:	28.43 "Hg		

Pinnacle Pellet Lavington
Dryer 2 South Stack
Lavington, BC

May 8/19

Permit Number: 107369

AVERAGE OF AIR EMISSION TESTS 1 TO 3

Gas Temperature:	87 ° F	31 ° C
Moisture Content (by volume):	3.14 %	
Average Stack Gas Velocity:	27.8 ft/sec	8.5 m/sec
Total Actual Gas Flow Rate:	61193 ACFM	
Dry Gas flow Rate at Reference Conditions:	54389 SCFM	25.7 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	0.002 gr/ft ³	5.5 mg/m ³
Front Half Particulate	0.002 gr/ft ³	3.6 mg/m ³
Back Half Condensibles	0.001 gr/ft ³	1.9 mg/m ³
Mass Emission Rate	1.13 lbs/hr	0.51 kg/hr

SUMMARY OF AIR EMISSION TESTS

TEST 1:

Gas Temperature:	86 ° F	30 ° C
Moisture Content (by volume):	3.0 %	
Average Stack Gas Velocity:	27.8 ft/sec	8.5 m/sec
Total Actual Gas Flow Rate:	61145 ACFM	
Dry Gas flow Rate at Reference Conditions:	54511 SCFM	25.7 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.003 gr/ft ³	6.4 mg/m ³
Front Half Particulate	.002 gr/ft ³	4.5 mg/m ³
Back Half Condensibles	.001 gr/ft ³	1.9 mg/m ³
Mass Emission Rate	1.31 lbs/hr	0.60 kg/hr

TEST 2:

Gas Temperature:	89 ° F	31 ° C
Moisture Content (by volume):	2.9 %	
Average Stack Gas Velocity:	27.9 ft/sec	8.5 m/sec
Total Actual Gas Flow Rate:	61447 ACFM	
Dry Gas flow Rate at Reference Conditions:	54565 SCFM	25.8 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.002 gr/ft ³	5.1 mg/m ³
Front Half Particulate	.001 gr/ft ³	3.2 mg/m ³
Back Half Condensibles	.001 gr/ft ³	1.9 mg/m ³
Mass Emission Rate	1.05 lbs/hr	0.48 kg/hr

TEST 3:

Gas Temperature:	86 ° F	30 ° C
Moisture Content (by volume):	3.5 %	
Average Stack Gas Velocity:	27.7 ft/sec	8.4 m/sec
Total Actual Gas Flow Rate:	60985 ACFM	
Dry Gas flow Rate at Reference Conditions:	54090 SCFM	25.5 m ³ /sec
Total Particulate Concentration:		
Dry Basis Actual at Reference Conditions	.002 gr/ft ³	5.0 mg/m ³
Front Half Particulate	.001 gr/ft ³	3.1 mg/m ³
Back Half Condensibles	.001 gr/ft ³	1.9 mg/m ³
Mass Emission Rate	1.02 lbs/hr	0.46 kg/hr

DATA FOR TESTS 1 TO 3

Client: Pinnacle Pellet Lavington
Plant Location: Lavington, BC
Process: Dryer 2 South Stack
Permit Number: 107369
Job Number: ME1718-407
Pollution Control Permit: 15.0 mg/m3
Number of Tests: 3 tests
Minutes per Point: 2.5 minutes

	TEST 1	TEST 2	TEST 3
Filter Number:	54	55	56
Date of Test:	May 8/19	May 8/19	May 8/19
Start Time:	12:02	1:17	2:37
Stop Time:	1:06	2:22	3:37
On-line Sampling Time:	60	60	60
Testing Personnel:	DL/NB	DL/NB	DL/NB
Sampler Model:	MU-1013	MU-1013	MU-1013
Barometric Pressure("Hg):	28.45	28.45	28.45
Static Pressure("H₂O):	-0.10	-0.10	-0.10
%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):	0.275	0.275	0.275
Meter Factor:	0.987	0.987	0.987
Type-S Pitot Tube Coefficient:	0.84295	0.84295	0.84295
Cross Sectional Area of Stack(ft²):	36.67	36.67	36.67
Impinger Condensate(g):	19	13	20
Weight of Moisture in Silica Gel(g):	5.0	11.0	8.0
Weight of Filter Particulate(g):	0.0005	0.0003	0.0006
Weight of Probe Washings(g):	0.0042	0.0031	0.0026
Weight of Impinger Content Organic(g):	0.0020	0.0020	0.0020
Total Weight of Particulate(g):	0.0067	0.0054	0.0052



**Pinnacle Pellet Lavington
Dryer 2 South Stack
Pinnacle Pellet Lavington**

Data for TEST 1

OVERALL ISOKINETICS - TEST 1: 1.000

Delta P:	0.221 "H₂O	Us avg:	27.79 ft/sec
Delta H:	1.539	ACFM:	61145 ft³/min
Tm avg:	554.8 °R	SDCFM:	54511 ft³/min
Ts avg:	546.3 °R	Vm std:	36.80 ft³
Bwo:	0.030	Vm corr:	40.50 ft³
Md:	28.84	Vm:	41.03 ft³
Ms:	28.52	MF:	0.9870
Pb:	28.45 "Hg	PCON:	6.43 mg/m³
Pm:	28.56 "Hg	ERAT:	0.60 kg/hr
Ps:	28.44 "Hg		

Data for TEST 2

OVERALL ISOKINETICS - TEST 2: 1.011

Delta P:	0.222 "H₂O	Us avg:	27.93 ft/sec
Delta H:	1.561	ACFM:	61447 ft³/min
Tm avg:	561.2 °R	SDCFM:	54565 ft³/min
Ts avg:	548.6 °R	Vm std:	37.20 ft³
Bwo:	0.029	Vm corr:	41.41 ft³
Md:	28.84	Vm:	41.96 ft³
Ms:	28.52	MF:	0.9870
Pb:	28.45 "Hg	PCON:	5.13 mg/m³
Pm:	28.56 "Hg	ERAT:	0.48 kg/hr
Ps:	28.44 "Hg		

Data for TEST 3

OVERALL ISOKINETICS - TEST 3: 1.001

Delta P:	0.219 "H₂O	Us avg:	27.72 ft/sec
Delta H:	1.549	ACFM:	60985 ft³/min
Tm avg:	562.2 °R	SDCFM:	54090 ft³/min
Ts avg:	546.2 °R	Vm std:	36.53 ft³
Bwo:	0.035	Vm corr:	40.74 ft³
Md:	28.84	Vm:	41.28 ft³
Ms:	28.46	MF:	0.9870
Pb:	28.45 "Hg	PCON:	5.03 mg/m³
Pm:	28.56 "Hg	ERAT:	0.46 kg/hr
Ps:	28.44 "Hg		

Air Emission Monitoring Procedure

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 EPA Method 5 (See Figure 1).

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 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.

O₂, CO₂, CO (where applicable)

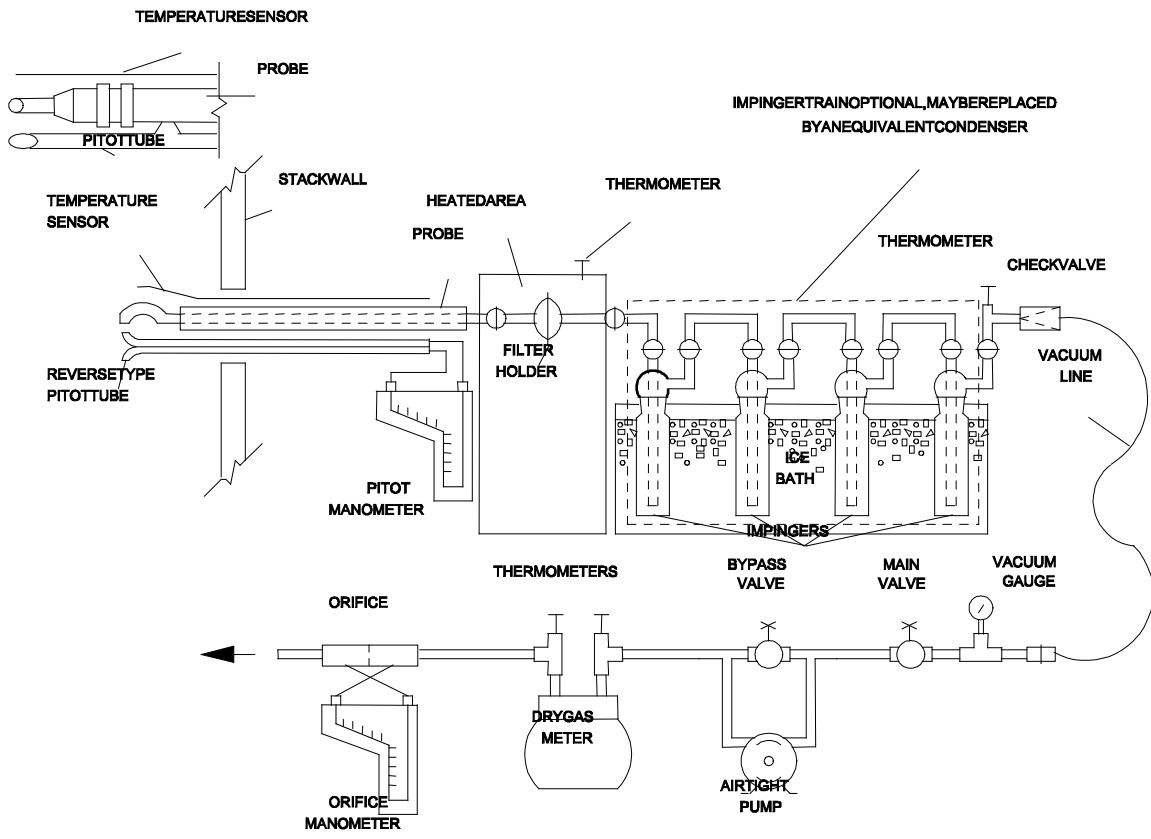
O₂, CO₂, and CO were found using either Fuji Analytical Analyzer by means of infrared and paramagnetic technology (EPA 3A) or by fyrite (EPA Method 3).

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.



EPA Method 5 Diagram- 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.

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

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

$$V_{w(\text{std})} = \frac{V_{lc} \rho_w R T_{\text{std}}}{M_w P_{\text{std}}} = K_2 V_{lc}$$
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.

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

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.

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

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.**

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

where:

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

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

Calculation from Intermediate Values.

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

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

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

Average Stack Gas Dry Volumetric Flow Rate.

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

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).

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

- 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),

$$= P_{\text{bar}} + P_g$$

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

McCALL ENVIRONMENTAL
TEMPERATURE CALIBRATION CERTIFICATE

Technician: D.Brandle

Date: January 15, 2019

Barometric Pressure: 28.1

Thermocouple I.D. : T-3

Calibration Medium	Mercury in Glass Thermometer (°F)		Temperature Device Reading
	Actual Reading	% Difference	
Ice Bath	34	0.00	34
Boiling Water	212	-0.94	210
Hot Oil	430	-1.16	425

Note: Temperature Device must read within 1.5% of certified mercury in glass thermometer to be acceptable.

Calibrating Technician Signature:



**CALIBRATION CERTIFICATE
DRY GAS METER**

DATE: Jan 9/19

CONSOLE MANUF.: NAPP/MILLENNIUM MODEL 32

CONSOLE I.D.: MU 1013

PARAMETER SUMMARY	RUN #1	RUN #2	RUN #3
Ta = Ambient (WTM) Temperature (oF.)	56.0	56.0	56.0
P=Pres. Differential at WTM ("Hg)	0.0677	0.1251	0.1766
Pb= Atmospheric Pressure ("Hg)	28.10	28.10	28.10
Pv= Vapour Pressure Water at Temp. Ta ("Hg)	0.4517	0.4517	0.4517
H=Pres. Differential at Orifice	1.0	2.0	3.0
Ti= Dry Test Meter Inlet Temp. (oF.)	71.0	66.0	74.0
To= Dry Test Meter Outlet Temp. (oF.)	70.0	63.0	73.0
Ri= Initial Dry Test volume (ft3)	0.00	0.00	0.00
Rf= Final Dry Test Volume (ft3)	5.03	4.98	5.07
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	28.0323	27.9749	27.9234
Pd= Pb + (^H/13.59) "Hg	28.1736	28.2472	28.3208
Tw= Ta +460 (oR.)	516.0	516.0	516.0
Td= [(Ti + To)/2] + 460 (oR.)	530.5	524.5	533.5
Bw= Pv/Pb ("Hg)	0.0161	0.0161	0.0161
WET TEST METER FACTOR (WTMF)	0.9922	0.9922	0.9922
ated Y Value)(WTMF)	0.9927	0.9867	0.9815
Y (MEAN)(WTMF) =	0.9870		

N.R. MCCALL & ASSOCIATES LTD.

Calibrating Technician Signature:



ORIFICE METER CALIBRATION

DATE: Jan 9/19

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	28.1	28.1	28.1
Y=gas meter factor	0.9927	0.9927	0.9867
Delta H=	0.5	1	1.5
Ri=int. gas meter vol.	0	0	0
Rf=final gas meter vol.	1.8	2.77	3.37
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.357372	0.5499558	0.6650358
To=meter outlet Temp (oF)	77	76	76
Tm=meter out temp. (oR)	537	536	536
Pm=Pb + ^H	28.136792	28.1735835	28.2103753
SQRT(Tm/Pm*H/Md)	0.5739619	0.81041895	0.991909
Ko=orifice const.	0.6226406	0.67860678	0.67046049

Ko MEAN = 0.657236

Ko*4*144= 378.56791

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:

ORIFICE METER CALIBRATION

DATE: Jan 9/19

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	28.1	28.1	28.1
Y=gas meter factor	0.9867	0.9815	0.9815
Delta H=	2	2.5	3
Ri=int. gas meter vol.	0	0	0
Rf=final gas meter vol.	3.9	4.37	4.77
min. samp	5	5	5
Qm=Y(Rf-Ri)/^T(FT3/MIN)	0.769626	0.857831	0.936351
To=meter outlet Temp (oF)	76	76	78
Tm=meter out temp. (oR)	536	536	538
Pm=Pb + ^H	28.247167	28.2839588	28.3207506
SQRT(Tm/Pm*H/Md)	1.1446117	1.2788822	1.40264454
Ko=orifice const.	0.6723905	0.67076624	0.66756115

Ko MEAN = 0.6702393

Ko*4*144= 386.05783

McCALL ENVIRONMENTAL LTD.

Calibrating Technician Signature:



Calibration Certificate for S-Type Pitot Tube

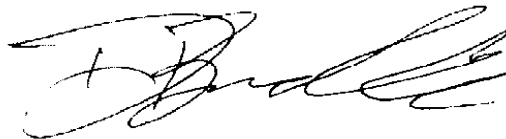
Date: Jan 15/19 Barometric Pressure ("Hg): 28.25
Pitot I.D.. **294** Wind Tunnel Temperature (^o F): 71.0
Nozzle: 0.250

Wind Velocity (ft/sec)	Ref.Pitot ("H ₂ O)	S-Type Pitot ("H ₂ O)	Pitot Factor
12.63	0.03431	0.04849	0.83276
21.19	0.09665	0.13581	0.83517
41.86	0.37711	0.51819	0.84455
65.41	0.92067	1.25359	0.84842
84.01	1.51873	2.06836	0.84833
105.94	2.41538	3.28817	0.84850

Average= 0.84295

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

Calibrating Technician:



Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Pinnacle Pellet Project Name: Dryers 1 & 2 Project Location: Lavington, BC LSD: P.O.:	Lot ID: 1349939 Control Number: C0088993 Date Received: May 10, 2019 Date Reported: May 16, 2019 Report Number: 2404727
Attn: Accounts Payable Sampled By: Company:	Proj. Acct. code:	

	Reference Number	1349939-1	1349939-2	1349939-3	
	Sample Date	May 07, 2019	May 07, 2019	May 07, 2019	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	Dryer 1 / North Stack Test 1 / 18.5°C	Dryer 1 / North Stack Test 2 / 18.5°C	Dryer 1 / North Stack Test 3 / 18.5°C	
	Matrix	Water	Water	Water	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	3	9	3
Volume	Sample volume	mL	320	310	330
pH adjustment	required prior to O&G extraction		Yes	Yes	Yes

Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Pinnacle Pellet Project Name: Dryers 1 & 2 Project Location: Lavington, BC LSD: P.O.:	Lot ID: 1349939 Control Number: C0088993 Date Received: May 10, 2019 Date Reported: May 16, 2019 Report Number: 2404727
Attn: Accounts Payable Sampled By: Company:	Proj. Acct. code:	

Reference Number	1349939-4	1349939-5	1349939-6
Sample Date	May 07, 2019	May 07, 2019	May 07, 2019
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Dryer 1 / South Stack Test 1 / 18.5°C	Dryer 1 / South Stack Test 2 / 18.5°C	Dryer 1 / South Stack Test 3 / 18.5°C
Matrix	Water	Water	Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total mg/sample	3	<2	<2	2
Volume	Sample volume mL	320	310	310	
pH adjustment	required prior to O&G extraction	Yes	Yes	Yes	

Analytical Report

Bill To: McCall Environmental 6733 Buchanan Road Coldstream, BC, Canada V1B 3C5	Project ID: Pinnacle Pellet Project Name: Dryers 1 & 2 Project Location: Lavington, BC LSD: P.O.:	Lot ID: 1349939 Control Number: C0088993 Date Received: May 10, 2019 Date Reported: May 16, 2019 Report Number: 2404727
Attn: Accounts Payable Sampled By: Company:	Proj. Acct. code:	

	Reference Number	1349939-7	1349939-8	1349939-9	
	Sample Date	May 08, 2019	May 08, 2019	May 08, 2019	
	Sample Time	NA	NA	NA	
	Sample Location				
	Sample Description	Dryer 2 / North Stack Test 1 / 18.5°C	Dryer 2 / North Stack Test 2 / 18.5°C	Dryer 2 / North Stack Test 3 / 18.5°C	
	Matrix	Water	Water	Water	
Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	<2	3	3
Volume	Sample volume	mL	330	320	330
pH adjustment	required prior to O&G extraction		Yes	Yes	Yes

Analytical Report


Bill To: McCall Environmental
 6733 Buchanan Road
 Coldstream, BC, Canada
 V1B 3C5
 Attn: Accounts Payable
 Sampled By:
 Company:

Project ID: Pinnacle Pellet
 Project Name: Dryers 1 & 2
 Project Location: Lavington, BC
 LSD:
 P.O.:
 Proj. Acct. code:

Lot ID: **1349939**
 Control Number: C0088993
 Date Received: May 10, 2019
 Date Reported: May 16, 2019
 Report Number: 2404727

Reference Number	1349939-10	1349939-11	1349939-12
Sample Date	May 08, 2019	May 08, 2019	May 08, 2019
Sample Time	NA	NA	NA
Sample Location			
Sample Description	Dryer 2 / South Stack Test 1 / 18.5°C	Dryer 2 / South Stack Test 2 / 18.5°C	Dryer 2 / South Stack Test 3 / 18.5°C
Matrix	Water	Water	Water

Analyte	Units	Results	Results	Results	Nominal Detection Limit
Aggregate Organic Constituents					
Oil and Grease	Total	mg/sample	<2	<2	2
Volume	Sample volume	mL	320	320	310
pH adjustment	required prior to O&G extraction		Yes	Yes	Yes


Approved by: 
 Carol Nam, Dipl. T.
 Quality Officer



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



North Carolina State University Environmental Programs

This certificate awarded to

Danny Lawrence

for satisfactory completion of course and examination for

SI: 414 Quality Assurance for Source Emission Measurements

Irma F. Vanderhall
Manager

Christine S. Murphy
Registrar

May 22, 2000

Date Completed

3.5 CEUs

Awarded under EPA Assistance Agreement CT - 825724



- i. Average hourly dryer exit gas temperature during testing;
40.5 °C
- ii. Average hourly dryer ODT for the biomass dryer system for the previous month;
30.8 ODT/hr
- iii. 90th percentile hourly ODT throughput for the biomass dryers (Section 4.3);
36.2 ODT/hr
- iv. Average hourly throughput ODT for the biomass dryer system during stack testing;
37.8 ODT/hr