

Monthly Operating Reports

February 2019

The following February 2019 operating report was sent to the Ministry of Environment and Climate Change Strategy on April 9, 2019.

Metro Vancouver - Waste-to-Energy Facility

CONTINUOUS EMISSION MONITORING SYSTEM

February 2019

1. MONTHLY SUMMARY REPORT

Parameter	Compliance Limit (mg/dscm)	Compliance Period	Maximum Measurement (mg/dscm)		
			Unit 1	Unit 2	Unit 3
CO	50	24 hr	42.2	39.6	34.2
SO ₂	200	24 hr	120.1	148.9	143.1
NOx	190	24 hr	137.1	135.8	140.7
THC	10	24 hr	1.21	0.83	0.59
			Monthly Average (mg/dscm)		
			Unit 1	Unit 2	Unit 3
Opacity			1.30	0.40	1.10
CO			30.6	27.9	26.7
THC			0.30	0.09	0.29
SO ₂			70.5	87.4	76.7
NOx			133.6	129.6	134.7

Interim Discharge Limits will apply until and including the following dates, at which point the Discharge Limits and Response Limits will apply

- a. THC – December 31, 2018
- b. HCl – December 31, 2022

- c. SO₂ – December 31, 2022

2. MONTHLY EXCEEDANCE REPORT

2.a. Discharge Limit Exceedances

Unit	Compliance Parameter	Discharge Limit (mg/dscm)	Date	Exceedance Level
	Reason/Action Taken			

2.b. Response Limit Exceedances

Compliance Parameter: Carbon Monoxide

Response Limit: 100 mg/dscm 1/2 hour average

Unit No. 1

Date / Time	Duration	Exceedance	Action Taken
3-Feb 22:00	30 min	103.3	Modified feedrate, went into shutdown.
6-Feb 05:30	30 min	183.3	Modified feedrate, adjusted airflow.
6-Feb 16:30	30 min	162.0	Modified feedrate, started gas burners, adjusted airflow.
8-Feb 08:30	30 min	108.4	Refuse plug in feedchute, started gas burners, adjusted airflow, and cleared blockage.
19-Feb 19:30	30 min	113.9	Started gas burners, adjusted airflow.

Compliance Parameter: Carbon Monoxide
Response Limit: 100 mg/dscm 1/2 hour average
Unit No. 2

Date / Time	Duration	Exceedance	Action Taken
1-Feb 08:00	30 min	115.4	Feeder hang up, started gas burners, adjusted airflow, cleared hang up.
7-Feb 10:00	30 min	207.5	Modified feedrate, adjusted airflow.
9-Feb 11:00	30 min	110.8	Short duration, resolved with no action taken.
10-Feb 04:00	30 min	101.2	Modified feedrate, adjusted airflow.
16-Feb 13:00	30 min	116.8	Modified feedrate, adjusted airflow.
20-Feb 08:30	30 min	170.8	Started gas burners, modified feedrate, adjusted airflow.
20-Feb 09:00	30 min	145.0	Started gas burners, modified feedrate, adjusted airflow.
23-Feb 01:00	30 min	121.4	Started gas burners, modified feedrate, adjusted airflow.
27-Feb 01:00	30 min	133.4	Modified feedrate, adjusted airflow.
27-Feb 22:00	30 min	107.0	Adjusted airflow.
28-Feb 10:30	30 min	123.9	Started gas burners, adjusted airflow.

Compliance Parameter: Carbon Monoxide
Response Limit: 100 mg/dscm 1/2 hour average
Unit No. 3

Date / Time	Duration	Exceedance	Action Taken
5-Feb 07:30	30 min	134.7	Modified feedrate, adjusted airflow.
6-Feb 12:30	30 min	112.9	Modified feedrate, adjusted airflow.
7-Feb 13:30	30 min	124.4	Feeder hang up. Modified feedrate, adjusted airflow.
11-Feb 12:00	30 min	103.9	Modified feedrate, adjusted airflow.
13-Feb 08:30	30 min	120.4	Short duration, resolved with no action taken.
14-Feb 06:30	30 min	158.2	Adjusted airflow.
14-Feb 15:30	30 min	105.6	Started gas burners, modified feedrate, adjusted airflow.
16-Feb 13:00	30 min	108.3	Forced draft fan tripped, shut down initiated.
21-Feb 11:30	30 min	129.7	Modified feedrate, adjusted airflow.

2.c. Transient Conditions

Gas Burners not available during shutdown

Unit	Duration	Date	Time	
#2	38 minutes	10-Feb-19	22:45-23:23	
Cause				
Auxiliary burners were unavailable for a period of 38 minutes between 22:45 and 23:23. Unit 2 feed chute was closed and the unit shut down at 2019-02-10 22:43 to allow Covanta's staff to inspect the unit's fabric filter bags for leaks. To ensure the safety of personnel the unit's forced draft fans are turned off during this inspection. During the shutdown the boiler's induced draft fan tripped at 2019-02-10 22:45. With both the forced draft fan and induced draft fans offline, the natural gas burners tripped per safety protocol to prevent unsafe burner operating conditions.				
Action Taken to Restore Steady State Conditions				
Covanta immediately halted the baghouse inspection and restarted both the induced draft fan and forced draft fans to purge the boiler and restart both natural gas burners. The natural gas burners were back online at 2019-02-10 23:23. Once the burners were back online, Covanta completed the fabric filter inspections. The shutdown was completed at 2019-02-10 23:53				
Remedial Action Planned and/or Taken				
Review the incident with all control room operators				

Furnace Temperature Below 800°C

Unit	Duration	Date/Time	Time	Average Temperature (°C)
#3	1 hour	16-Feb-19	13:20 - 13:41	780 degrees Celsius
Cause				
The boiler forced draft fan tripped due to high furnace pressure (safety interlock) creating upset operating conditions, culminating in a boiler outage. The secondary combustion zone temperature was reported as 780 degrees Celsius for the one-hour compliance period.				
Action Taken to Restore Steady State Conditions				
The operator restarted the forced draft fan to return the unit to regular operation. Following restart, the forced draft fan was taken offline due to high water level the boiler steam drum. The sequence of operational events prohibited the operation of the natural gas burners during the upset and outage. The boiler was offline from 2019-02-16 13:20 to 2019-02-16 13:41.				
Remedial Action Planned and/or Taken				
Investigate installing additional furnace temperature thermocouple for redundancy. Install purge air on the burner's pilot eye lens to increase reliability.				

2.d. CEMS Availability

Analyzer	Required Availability (% hours per quarter)	Averaging Period	Monthly Availability		
			Unit 1	Unit 2	Unit 3
Opacity	90	Hour	100	100	100
Oxygen	90	Hour	98	98	99
CO	90	Hour	98	98	99
SO ₂	90	Hour	98	98	99
NO _x	90	Hour	98	98	99
THC	90	Hour	97	95	98
Stack Flow	90	Hour	97	98	98

4. Shutdown Report

Unit 1

Duration in Hours	Reason	Date
0.52	Poor refuse quality	February 3
0.12	Tube leak inspection	February 5
21.10	Primary economizer tube leak	February 5-6
0.67	Tube leak inspection	February 7
0.53	Baghouse inspection	February 9
10.25	Generating bank inlet water wash	February 20

Unit 2

Duration in Hours	Reason	Date
14.48	Generating bank inlet water wash	February 4
35.72	Primary economizer tube leak	February 7 - 9
1.17	Baghouse inspection	February 10
1.50	Underfire air inspection	February 16
14.63	Generating bank inlet water wash	February 19
0.43	Feed chute hang up	February 28

Unit 3

Duration in Hours	Reason	Date
13.67	Generating bank inlet water wash	February 1
0.53	Baghouse insepection	February 9
0.48	High furnace pressure trip	February 16
12.23	Generating bank inlet water wash	February 23

5. Facility Bypass and Emergency/spill Event Report

Date/Time	Cause	Duration
	Action Taken	

6. Other Data

		UNIT 1	UNIT 2	UNIT 3
Waste Received	tonnes/day	19,675		
Waste Processed	tonnes/day	247	235	255
Maximum Waste Processed	tonnes/day	270	271	278
		Units 1, 2, and 3		
Natural Gas Consumed	m ³ /day	3,279		
	m ³ /month	91,800		
Fly ash disposed	tonnes	704		
Bottom ash disposed	tonnes	3,225		

7. Complaints and Responses

Date/Time	Complaint	Action Taken

February 2019 - Monthly CEMS Data

	Boiler #1								Boiler #2								Boiler #3							
	Stack Temp	O ₂ (%)	SO ₂ (mg/m³)	NO _x (mg/m³)	CO (mg/m³)	THC (mg/m³)	Opacity (%)	Furnace Temp	Stack Temp	O ₂ (%)	SO ₂ (mg/m³)	NO _x (mg/m³)	CO (mg/m³)	THC (mg/m³)	Opacity (%)	Furnace Temp	Stack Temp	O ₂ (%)	SO ₂ (mg/m³)	NO _x (mg/m³)	CO (mg/m³)	THC (mg/m³)	Opacity (%)	Furnace Temp
Date																								
2/1/19	149	9.5	85.1	133.9	42.2	0.23	0.77	941	152	9.2	101.6	126.5	30.3	0.10	0.18	922								
2/2/19	150	9	120.1	135	40.8	0.17	0.8	951	152	9.2	106.1	125.1	28.9	0.06	0.25	930	152	8.8	143.1	135.4	26.9	0.59	1.02	866
2/3/19	150	9.3	68.8	134.5	36.5	0.21	0.9	942	146	9.5	69.7	124.7	26.5	0.06	0.3	928	150	8.6	111	132.9	24.2	0.53	1.19	869
2/4/19	143	9.4	65.2	135.8	39.8	0.24	0.99	904									147	8.1	81	132.6	29.3	0.41	1.27	866
2/5/19									153	8.3	125.9	127	27.5	0.07	0.7	941	151	8.3	131.5	134	29.3	0.30	1.39	870
2/6/19	154	9.4	103.8	134.6	42.2		1.25	913	153	8.5	148.9	127.5	23.4	0.19	0.58	956	150	8.6	118.1	134.6	30.1	0.17	1.35	872
2/7/19	153	9.5	73.9	136	32.2	0.21	1.21	910	146	8.6	72.3	129	25		0.31	951	149	8.6	77.3	133.8	29.7	0.26	1.29	872
2/8/19	152	9.6	43.1	131.5	37.5	0.21	1.16	904									151	8.6	69.2	134	29.5	0.31	1.2	855
2/9/19	154	9.6	78.2	131.2	35.5	0.22	1.28	902									150	8.3	86.3	134.9	33.9	0.23	1.16	853
2/10/19	153	9.4	86.8	134	32.1	0.15	1.36	932	158	9	107.9	132	31.8	0.04	0.98	932	150	8.4	87.7	136.7	25.4	0.20	1.39	855
2/11/19	152	9.2	53.4	134.5	31.4	0.16	1.42	933	155	8.6	88.3	131.5	27.8	0.06	0.8	933	150	8.3	66.9	140.7	27	0.25	1.38	842
2/12/19	153	9.5	38	133.6	33.9	0.17	1.35	905	155	8.6	71.7	128.6	22.3	0.01	0.6	917	149	8.1	56.6	136	25.2	0.22	1.32	849
2/13/19	151	9.4	33.6	136.6	27.4	0.21	1.33	910	152	8.7	44.8	129.7	22.7	0.01	0.44	905	149	8.4	31.6	135.7	30.1	0.27	1.27	852
2/14/19	152	9.5	38.7	135.3	30.7	0.18	1.32	923	151	8.6	59.6	128.9	25.7	0.00	0.45	905	146	8.2	43.5	133.5	34.2	0.24	1.15	853
2/15/19	152	10.9	37.3	135.7	27.5	0.77	1.18	918	153	8.7	60.4	126.5	29.6	0.02	0.25	916	147	8.4	38	133.6	31.3	0.24	1.05	847
2/16/19	152	9.1	41	127.9	26	1.11	1.11	938	153	9.5	65.5	127.4	32.2	0.03	0.21	901	149	8.3	54	136.3	28.6	0.29	0.99	864
2/17/19	153	9.5	44.8	129.2	27.1	0.28	1.16	924	148	9.6	63.7	125.4	26	0.06	0.2	926	149	8.5	48.6	134.1	25.9	0.19	1.02	910
2/18/19	151	9.5	39.6	133.2	22.9	1.21	1.21	933	145	9.9	46.6	123.3	23.6	0.08	0.23	930	149	8.8	43.4	136.1	28.4	0.22	1.12	907
2/19/19	151	9.9	40.9	129.3	24.2	0.22	1.21	922									149	9.2	50.1	133.2	22.2	0.21	1.08	933
2/20/19									155	9.1	129.5	131.6	29	0.83	0.31	924	148	9.2	79.7	130.2	25.1	0.25	1.05	952
2/21/19	155	9.8	119.8	137.1	30.8	0.27	1.54	914	155	9.2	107.8	132.6	27.3	0.04	0.34	924	146	9.7	45	134.4	24.7	0.29	1	926
2/22/19	152	9.5	100.7	137	18.1	0.19	1.58	924	154	8.6	90.7	132.3	26.4	0.03	0.32	941	142	9.6	37.5	133	18.4	0.41	0.96	933
2/23/19	155	9.1	111.6	135.5	21.4	0.16	1.48	929	156	8.6	95.6	133.3	23.4	0.02	0.34	941								
2/24/19	155	9	106.6	133.2	20.8	0.18	1.5	939	157	8.4	101.8	134.2	18.9	0.01	0.36	951	151	8.6	137.1	137.6	24.1	0.28	1.11	940
2/25/19	154	9.5	78.8	133.2	29.1	0.20	1.55	929	155	8.7	82.9	133.7	27.7	0.02	0.36	941	149	8.8	95.1	138.3	27.8	0.52	1.11	891
2/26/19	152	9.3	72.4	133.7	27.7	0.18	1.67	929	155	8.8	86.3	133	37.8	0.03	0.52	935	150	8.7	87.2	133.8	19.1	0.24	1.19	898
2/27/19	153	9.4	86.6	132.1	28.7	0.18	1.62	931	157	9.4	94.8	135.8	39.6	0.05	0.36	919	147	8.6	97.2	133.2	19.3	0.28	0.49	900
2/28/19	151	9.4	63.6	131	28.8	0.17	1.57	915	155	9.3	74.5	130.7	35.7	0.15	0.34	924	152	8.9	76.7	132.3	23.5	0.20	0.1	893
Average	152.0	9.5	70.5	133.6	30.6	0.30	1.3	923.7	153.0	8.9	87.4	129.6	27.9	0.09	0.4	928.9	148.9	8.6	76.7	134.7	26.7	0.29	1.1	883.4
Min	143.0	9.0	33.6	127.9	18.1	0.15	0.8	902.0	145.0	8.3	44.8	123.3	18.9	0.00	0.2	901.0	142.0	8.1	31.6	130.2	18.4	0.17	0.1	842.0
Max	155.0	10.9	120.1	137.1	42.2	1.21	1.7	951.0	158.0	9.9	148.9	135.8	39.6	0.83	1.0	956.0	152.0	9.7	143.1	140.7	34.2	0.59	1.4	952.0
St Dev	2.42	0.36	28.14	2.44	6.60	0.29	0.25	13.40	3.54	0.43	26.18	3.43	4.94	0.17	0.20	14.47	2.15	0.41	32.20	2.15	4.13	0.11	0.28	32.77

Blank days have less than 18 hours of valid data due to unit shut downs.

According to standard guidelines used by Metro Vancouver Air Quality Policy and Environment Division, a minimum of 18 hours of valid data is required to generate a valid 24hr average.