

## Monthly Operating Reports

June 2020

---

The following June 2020 operating report was sent to the Ministry of Environment and Climate Change Strategy on August 13, 2020.

# Metro Vancouver - Waste-to-Energy Facility CONTINUOUS EMISSION MONITORING SYSTEM

June 2020

## 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	37.0	36.7	38.6
SO <sub>2</sub>	200	24 hr	61.5	71.5	106.1
NOx	190	24 hr	129.9	133.4	134.3
THC	10	24 hr	0.34	0.13	0.79
			Monthly Average (mg/dscm)		
			Unit 1	Unit 2	Unit 3
Opacity (%)			0.52	0.83	0.84
CO			26.6	28.3	30.1
THC			0.13	0.05	0.27
SO <sub>2</sub>			45.3	49.4	70.5
NOx			125.8	130.1	130.4

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

a. HCl – December 31, 2022

b. SO<sub>2</sub> – 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 (mg/dscm)	Action Taken
8-Jun 07:30	30 min	204.8	Adjusted airflow, modified feed rate.
8-Jun 10:30	30 min	114.4	Started gas burners, adjusted airflow, modified feed rate.
11-Jun 23:00	30 min	206.0	Started gas burners, adjusted airflow, modified feed rate.
17-Jun 08:00	30 min	117.5	Started gas burners, adjusted airflow, modified feed rate.
30-Jun 09:30	30 min	138.6	Started gas burners, adjusted airflow, modified feed rate.

Compliance Parameter: Carbon Monoxide

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

Unit No. 2

Date / Time	Duration	Exceedance (mg/dscm)	Action Taken
1-Jun 02:30	30 min	127.6	Started gas burners, adjusted airflow, modified feed rate.
15-Jun 15:00	30 min	103.6	Volatile fuel, started gas burners, adjusted airflow, modified feed rate.

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

Date / Time	Duration	Exceedance (mg/dscm)	Action Taken
2-Jun 14:30	30 min	134.0	Adjusted airflow, modified feed rate.
7-Jun 18:00	30 min	120.7	Started gas burners, adjusted airflow, modified feed rate.
9-Jun 15:30	30 min	114.6	Started gas burners, adjusted airflow, modified feed rate.
17-Jun 08:00	30 min	110.5	Started gas burners, adjusted airflow, modified feed rate.
17-Jun 12:00	30 min	100.1	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
20-Jun 00:30	30 min	813.0	Feed chute hang up, adjusted airflow, modified feed rate.
28-Jun 14:00	30 min	108.0	Feed chute hang up, adjusted airflow, modified feed rate, checked instrumentation.
29-Jun 03:30	30 min	132.2	Started gas burners, adjusted airflow, modified feed rate.

## 2.c. Transient Conditions

### Unable to close feed chute damper and Gas burners unavailable during shutdown

Unit	Duration	Date	Time
2	41 minutes	8-Jun-20	16:20-17:01
<b>Cause</b>			
<p>Auxiliary burners on unit 2 were unavailable, due to a safety permissive, to maintain the secondary combustion zone temperature during a boiler shutdown period as required. The operator was unable to close the feed chute damper during the shutdown as required.</p> <p>Unit 2 was placed in shutdown mode at 2020-06-08 16:20 following a induced draft fan outage due to an electrical issue. The boiler safety logic shut down the forced draft fan following the loss of the induced draft fan to prevent pressure build up in the boiler. The operator was unable to close the feed chute damper as the refuse was above the damper in the feed chute. The Provincial Boiler Pressure Vessel Safety Act and the Provincial Gas Act required a boiler purge following the restart of the fans as the boiler temperature was below the safety permissive. The auxiliary burners were unavailable for a period of 25 minutes between 2020-06-08 16:20 and 2020-06-08 16:45.</p>			
<b>Action Taken to Restore Steady State Conditions</b>			
<p>Covanta restarted the induced draft fan at 2020-06-08 16:22 and the forced draft fan at 2020-06-08 16:23. The natural gas burners were back online at 2020-06-08 16:45. The shutdown was completed at 2020-06-08 17:01.</p>			
<b>Remedial Action Planned and/or Taken</b>			
<p>Metro Vancouver's facility operator Covanta reviewed the outage with the operators.</p>			

### Gas burners unavailable during shutdown

Unit	Duration	Date	Time
3	35 minutes	29-Jun-20	15:12-15:47
<b>Cause</b>			
<p>Auxiliary burners on unit 3 were unavailable, due to a safety permissive, to maintain the secondary combustion zone temperature during a boiler shutdown period as required.</p> <p>Unit 3 was shutdown following a furnace temperature probe failure at 2020-06-29 15:11. The boiler operator turned off the forced draft fan to allow the operator to replace the failed temperature probe. The operator was unable to start the auxiliary burners, as the boiler safety interlock requires a boiler purge to ignite the burners when the boiler temperature is below the safety permissive. The auxiliary burners were unavailable for a period of 35 minutes between 2020-06-29 15:12 and 2020-06-29 15:47.</p>			

**Action Taken to Restore Steady State Conditions**

Covanta replaced the failed temperature probe at 2020-06-29 15:18. Covanta restarted the forced draft fan at 2020-06-29 15:32. The natural gas burners were back online at 2020-06-29 15:47. The shutdown was completed at 2020-06-29 16:36.

**Remedial Action Planned and/or Taken**

Metro Vancouver's facility operator Covanta reviewed the outage with the operators.

**Shutdown extended beyond 5 hours, unable to close feed chute, gas burners unavailable during shutdown**

Unit	Duration	Date	Time
1	11 hr 26 min	30-Jun-20	9:35-21:01

**Cause**

The turbo generator programmable logic controller tripped following the loss of main power and backup power. Following the turbine trip the facility had an issue with the air cooled condenser and the turbine bypass valve which resulted in high pressure in the boilers and the air cooled condenser. High pressure was released via the boiler safety relief valve and the air cooled condenser rupture disc. All three boilers were shut down to lower pressure and to maintain control. Auxiliary burners on unit 1 were unavailable, due to the operating issues, to maintain the secondary combustion zone temperature during a boiler shutdown period as required. The operator was unable to close the feed chute damper during the shutdown as required. Due to the significant number of process issues to resolve before restarting the boilers, the shutdown period extended beyond 5 hours.

Unit 1 was placed in shutdown mode at 2020-06-30 09:35 following the turbine trip. The operator was unable to close the feed chute damper as the refuse was above the damper in the feed chute. The Provincial Boiler Pressure Vessel Safety Act and the Provincial Gas Act required a boiler purge following the restart of the fans as the boiler temperature was below the safety permissive. The auxiliary burners were unavailable for a period of 10 hours and 3 minutes between 2020-06-30 09:35 and 2020-06-30 19:38.

**Action Taken to Restore Steady State Conditions**

Covanta investigated the issues with the turbine bypass valve control and the air cooled condenser rupture disc was replaced. Covanta restarted the forced draft fan at 2020-06-30 18:57. The natural gas burners were back online at 2020-06-30 19:38. The shutdown was completed at 2020-06-30 21:01.

**Remedial Action Planned and/or Taken**

Repaired the turbine programmable logic controller power supply. Covanta will further investigate the turbine bypass valve control logic during the upcoming total plant outage in July.

**Shutdown extended beyond 5 hours, unable to close feed chute, gas burners unavailable during shutdown**

Unit	Duration	Date	Time
2	11 hr 5 min	30-Jun-20	9:36-20:41

**Cause**

The turbo generator programmable logic controller tripped following the loss of main power and backup power. Following the turbine trip the facility had an issue with the air cooled condenser and the turbine bypass valve which resulted in high pressure in the boilers and the air cooled condenser. High pressure was released via the boiler safety relief valve and the air cooled condenser rupture disc. All three boilers were shut down to lower pressure and to maintain control. Auxiliary burners on unit 2 were unavailable, due to the operating issues, to maintain the secondary combustion zone temperature during a boiler shutdown period as required. The operator was unable to close the feed chute damper during the shutdown as required. Due to the significant number of process issues to resolve before restarting the boilers, the shutdown period extended beyond 5 hours.

Unit 2 was placed in shutdown mode at 2020-06-30 09:36 following the turbine trip. The operator was unable to close the feed chute damper as the refuse was above the damper in the feed chute. The Provincial Boiler Pressure Vessel Safety Act and the Provincial Gas Act required a boiler purge following the restart of the fans as the boiler temperature was below the safety permissive. The auxiliary burners were unavailable for a period of 9 hours and 31 minutes between 2020-06-30 09:36 and 2020-06-30 19:07.

**Action Taken to Restore Steady State Conditions**

Covanta had an issue with air cooled condenser during restart and a rupture disc was blown. The rupture disc was replaced and the startup proceeded. Covanta restarted the forced draft fan at 2020-06-30 18:41. The natural gas burners were back online at 2020-06-30 19:07. The shutdown was completed at 2020-06-30 20:41.

**Remedial Action Planned and/or Taken**

Repaired the turbine programmable logic controller power supply. Covanta will investigate the over pressurization of the air cooled condenser further during the upcoming total plant outage in July

**Shutdown extended beyond 5 hours, unable to close feed chute, gas burners unavailable during shutdown**

Unit	Duration	Date/Time	Time
3	10 hr 35 min	30-Jun-20	9:37-20:12

**Cause**

The turbo generator programmable logic controller tripped following the loss of main power and backup power. Following the turbine trip the facility had an issue with the air cooled condenser and the turbine bypass valve which resulted in high pressure in the boilers and the air cooled condenser. High pressure was released via the boiler safety relief valve and the air cooled condenser rupture disc. All three boilers were shut down to lower pressure and to maintain control. Auxiliary burners on unit 3 were unavailable, due to the operating issues, to maintain the secondary combustion zone temperature during a boiler shutdown period as required. The operator was unable to close the feed chute damper during the shutdown as required. Due to the significant number of process issues to resolve before restarting the boilers, the shutdown period extended beyond 5 hours.

Unit 3 was placed in shutdown mode at 2020-06-30 09:37 following the turbine trip. The operator was unable to close the feed chute damper as the refuse was above the damper in the feed chute. The Provincial Boiler Pressure Vessel Safety Act and the Provincial Gas Act required a boiler purge following the restart of the fans as the boiler temperature was below the safety permissive. The auxiliary burners were unavailable for a period of 9 hours and 57 minutes between 2020-06-30 09:37 and 2020-06-30 19:34.

**Action Taken to Restore Steady State Conditions**

Covanta had an issue with air cooled condenser during restart and a rupture disc was blown. The rupture disc was replaced and the startup proceeded. Covanta restarted the forced draft fan at 2020-06-30 19:11. The forced draft fan and induced draft fan tripped during the startup. Covanta restarted the induced draft fan at 2020-06-30 19:08 and the forced draft fan at 2020-06-30 19:11. The natural gas burners were back online at 2020-06-30 19:34. The shutdown was completed at 2020-06-30 20:12.

**Remedial Action Planned and/or Taken**

Repaired the turbine programmable logic controller power supply. Covanta will investigate the over pressurization of the air cooled condenser further during the upcoming total plant outage in July.

**3. 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	100	99	98
CO	90	Hour	100	99	98
SO <sub>2</sub>	90	Hour	100	99	98
NOx	90	Hour	100	99	98
THC	90	Hour	100	99	98
Stack Flow	90	Hour	100	98	100

## 4. Shutdown Report

### Unit 1

Duration in Hours	Reason	Date
0.17	Induced draft fan trip	June 11
0.23	Primary economizer inspection	June 17
0.35	High furnace pressure trip	June 23
0.48	Induced draft fan trip	June 24
0.57	Fabric filter baghouse bags replaced	June 27
1.68	Fabric filter baghouse bags replaced	June 27
25.35	Fabric filter baghouse bags replaced	June 29-30
11.43	Turbine controller and air cooled condenser high pressure release	June 30

### Unit 2

Duration in Hours	Reason	Date
0.23	Induced draft fan trip	June 5
0.67	Induced draft fan trip	June 5
0.38	Induced draft fan trip	June 7
0.68	Induced draft fan trip	June 8
0.98	Poor refuse quality	June 24
11.08	Turbine controller and air cooled condenser high pressure release	June 30

### Unit 3

Duration in Hours	Reason	Date
1.33	Poor refuse quality and temperature probe failure	June 29
10.58	Turbine controller and air cooled condenser high pressure release	June 30

## 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	21,634		
Waste Processed	tonnes/day	227	225	232
Maximum Waste Processed	tonnes/day	249	240	250
		Units 1, 2, and 3		
Natural Gas Consumed	m <sup>3</sup> /day	2,643		
	m <sup>3</sup> /month	79,283		
Fly ash disposed	tonnes	820		
Bottom ash disposed	tonnes	3,799		

## 7. Complaints and Responses

Date/Time	Complaint	Action Taken

June 2020 - Monthly CEMS Data

Date	Boiler #1										Boiler #2										Boiler #3									
	Stack Temp	O <sub>2</sub> (%)	SO <sub>2</sub> (mg/m <sup>3</sup> )	NO <sub>x</sub> (mg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	THC (mg/m <sup>3</sup> )	Opacity (%)	Furnace Temp	Stack Temp	O <sub>2</sub> (%)	SO <sub>2</sub> (mg/m <sup>3</sup> )	NO <sub>x</sub> (mg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	THC (mg/m <sup>3</sup> )	Opacity (%)	Furnace Temp	Stack Temp	O <sub>2</sub> (%)	SO <sub>2</sub> (mg/m <sup>3</sup> )	NO <sub>x</sub> (mg/m <sup>3</sup> )	CO (mg/m <sup>3</sup> )	THC (mg/m <sup>3</sup> )	Opacity (%)	Furnace Temp						
	(°C)							(°C)	(°C)							(°C)	(°C)							(°C)	(°C)					
6/1/20	156	9.8	35.5	123.9	25.5	0.12	0.62	153	9.5	48.9	130.4	33	0.10	0.69	935	150	10.3	76.1	133.3	32.1	0.08	0.57	878							
6/2/20	155	10.2	35	126.1	23	0.15	0.59	157	9.4	52.3	130	20.8	0.02	1.05	960	151	10.6	86	131.9	35.3	0.11	0.56	888							
6/3/20	157	9.7	36.2	123.7	28.3	0.13	0.60	156	9.4	36.7	129.8	22.5	0.01	0.00	956	150	9.7	68.5	130.1	27.3	0.02	0.60	914							
6/4/20	156	9.8	46.3	125.8	28.2	0.11	0.61	155	9.2	66.5	130.4	25.2	0.02	0.00	967	149	9.3	106.1	131.2	24.6	0.01	0.68	933							
6/5/20	157	9.5	29	124.9	28.4	0.15	0.65	155	9.2	39.6	131.1	25.9	0.03	0.30	966	150	9.4	69.8	130	22.9	0.00	0.80	930							
6/6/20	158	9.2	41.6	124.8	28.4	0.15	0.65	156	9.3	47.9	131.9	28.4	0.05	1.26	957	151	9.6	76.1	130.8	28.4	0.00	0.95	925							
6/7/20	159	9.6	48.9	126	27.2	0.15	0.57	156	9.3	62.1	129.4	31.6	0.07	1.16	930	150	9.2	79.4	130.8	27.2	0.11	1.09	903							
6/8/20	158	9.4	42.9	121.8	37	0.13	0.59	152	9.7	65.4	130.3	34.6	0.09	1.21	918	151	9.3	79.2	129.2	33.8	0.01	1.37	905							
6/9/20	158	9.5	40.3	120.8	34.7	0.34	0.65	152	9.5	34	129	26.7	0.08	1.57	930	151	9.6	58.7	129.2	35.8	0.31	1.60	904							
6/10/20	160	10	51.9	127.6	27.2	0.10	0.63	154	9.5	46.4	130.7	26.4	0.04	0.04	939	149	9.6	69.5	131.5	20.5	0.00	2.11	913							
6/11/20	159	10.1	45.4	129.9	31.2	0.13	0.55	154	9.6	49.7	131.9	26.3	0.05	0.46	945	149	9.7	83.9	134.3	23.1	0.14	0.99	913							
6/12/20	154	9.7	54.8	123.5	25.6	0.16	0.57	154	9.9	71.5	131.6	31.2	0.05	1.03	921	149	10	88	130.1	31.7	0.27	0.26	905							
6/13/20	158	9.8	42.9	123.5	27.1	0.19	0.61	152	9.6	49.6	133	30.1	0.04	0.92	935	147	9.7	64.9	131.5	31.3	0.33	0.23	906							
6/14/20	156	10	44.8	125.2	23.9	0.06	0.68	153	9.8	58.9	132.6	28.5	0.01	0.96	939	150	10	76.9	131.3	26	0.36	0.23	901							
6/15/20	159	9.5	41.7	124.9	25.7	0.10	0.63	152	9.7	40.3	133.4	27.9	0.07	1.30	919	149	9.6	52.9	130	24.2	0.34	0.27	905							
6/16/20	156	9.6	36.9	123.6	26.3	0.14	0.62	152	9.9	48.4	129.6	36.7	0.10	0.64	916	147	10.2	57.4	129.6	35.6	0.38	0.29	876							
6/17/20	156	9.9	48	124.8	24.7	0.17	0.48	152	9.7	47.7	130	35.1	0.06	0.62	919	148	9.8	66.7	128.8	31	0.39	0.32	899							
6/18/20	155	9.8	47.3	125.3	24.2	0.07	0.41	154	9.3	56.8	129.9	32.6	0.05	0.68	922	146	9.3	66.6	128.5	30.4	0.34	0.75	919							
6/19/20	156	10.2	48.5	128.9	19.8	0.05	0.32	154	9.5	51.5	131.1	29.8	0.04	0.95	915	148	9.3	62.2	129.4	35.8	0.43	1.06	905							
6/20/20	155	10.3	46.8	128.1	20.8	0.06	0.38	155	9.7	54.3	130.9	27.7	0.07	0.94	934	148	9.6	68.6	130.1	27.4	0.30	1.02	901							
6/21/20	158	10.1	61.5	127.8	24	0.05	0.41	152	9.4	33.7	127.8	32.3	0.05	0.62	940	148	10.1	73.7	129.6	36.3	0.36	1.11	887							
6/22/20	158	10.1	45.6	124.1	26.8	0.16	0.30	152	9.7	42.5	128.4	28.7	0.03	0.63	903	149	9.9	56.9	129.5	32.3	0.40	1.05	869							
6/23/20	158	10.1	45.6	124.1	26.8	0.16	0.30	152	9.7	42.5	128.4	28.7	0.03	0.63	903	149	9.9	56.9	129.5	32.3	0.40	1.05	869							
6/24/20	158	10.1	45.6	124.1	26.8	0.16	0.30	152	9.7	42.5	128.4	28.7	0.03	0.63	903	149	9.9	56.9	129.5	32.3	0.40	1.05	869							
6/25/20	156	9.9	56.3	128.8	28.6	0.18	0.20	153	9.6	50.8	127.7	25.7	0.13	0.67	919	148						0.95	879							
6/26/20	155	10.2	46.3	128.7	26.6	0.18	0.16	153	9.8	45.8	127.1	26.1	0.06	0.88	913	148	10	59.5	130.5	34.5	0.79	0.96	898							
6/27/20	153	10.3	55.3	126.6	22.6	0.16	0.63	151	9.8	52.5	127.5	22.3	0.03	1.21	941	146	10.1	64.1	129.8	28.7	0.45	1.02	908							
6/28/20	156	10.1	54.1	127.4	25.9	0.16	0.39	151	9.6	43.8	127.8	25.6	0.07	1.22	939	147	10.2	64	131.3	27.4	0.40	1.07	900							
6/29/20								154	9.4	60.1	130.7	22.1	0.03	0.83	920	146	10	91.5	129.2	38.6	0.57	1.09	892							
6/30/20																														
Average	157	9.9	45.3	125.8	26.6	0.13	0.52	153.6	9.6	49.4	130.1	28.3	0.05	0.83	933.3	148.7	9.8	70.5	130.4	30.1	0.27	0.84	901.8							
Min	153	9.2	29.0	120.8	19.8	0.04	0.16	151.0	9.2	21.5	127.1	20.8	0.01	0.00	903.0	146.0	9.2	45.9	128.4	20.5	0.00	0.23	869.0							
Max	160	10.3	61.5	129.9	37.0	0.34	0.68	157.0	9.9	71.5	133.4	36.7	0.13	1.57	967.0	151.0	10.6	106.1	134.3	38.6	0.79	2.11	933.0							
St Dev	1.8	0.29	7.37	2.29	3.64	0.06	0.15	1.70	0.20	10.75	1.80	4.05	0.03	0.37	16.55	1.54	0.35	12.98	1.35	0.20	0.45	1.11	15.23							

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