

## Monthly Operating Reports

March 2021

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The following March 2021 operating report was sent to the Ministry of Environment and Climate Change Strategy on May 10, 2021.

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

March 2021

## 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	43.6	32.1	38.0
SO <sub>2</sub>	200	24 hr	133.4	101.2	113.4
NO <sub>x</sub>	190	24 hr	133.8	135.3	137.9
THC	10	24 hr	0.60	0.09	0.90
			Monthly Average (mg/dscm)		
			Unit 1	Unit 2	Unit 3
Opacity (%)			0.97	0.87	0.58
CO			24.3	20.4	29.3
THC			0.34	0.05	0.37
SO <sub>2</sub>			80.0	78.2	64.1
NO <sub>x</sub>			131.1	129.0	134.2

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

a. HCl – March 3, 2025

b. SO<sub>2</sub> – March 3, 2025

## 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
7-Mar 09:00	30 min	184.4	Feed chute hang-up, started gas burners, adjusted airflow, modified feed rate.
7-Mar 15:30	30 min	122.8	Forced draft fan trip, started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
8-Mar 06:00	30 min	100.7	Started gas burners, adjusted airflow, modified feed rate.
12-Mar 15:30	30 min	160.0	Started gas burners, adjusted airflow, modified feed rate.
29-Mar 19:00	30 min	103.6	Started gas burners, adjusted airflow, modified feed rate.
30-Mar 18:00	30 min	392.9	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
6-Mar 09:30	30 min	104.7	Started gas burners, adjusted airflow, modified feed rate.
10-Mar 18:30	30 min	108.8	Volatile fuel, started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
24-Mar 11:00	30 min	160.6	Started gas burners, adjusted airflow, modified feed rate.
25-Mar 07:00	30 min	174.4	Adjusted airflow, modified feed rate.
28-Mar 15:00	30 min	118.5	Power outage, unit shutdown
30-Mar 09:00	1 hr	208.5	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
3-Mar 15:30	30 min	101.8	Feed chute plugged, started gas burners, adjusted airflow, modified feed rate.
6-Mar 08:30	30 min	150.7	Started gas burners, adjusted airflow, modified feed rate.

## 2.c. Transient Conditions

### Gas burners unavailable during shutdown and furnace temperature average below 800C

Unit	Duration	Date	Time	
#2	16 minutes	3-Mar-21	08:05-08:21	
<b>Cause</b>				
Auxiliary burners on unit 2 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.				
Unit 2 was placed in shutdown mode at 2021-03-03 08:05 following a feed chute hang up. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge following the restart of the combustion fans. The auxiliary burners were unavailable for a period of 16 minutes between 2021-03-03 08:05 and 2021-03-03 08:21.				
<b>Action Taken to Restore Steady State Conditions</b>				
Covanta restarted the induced draft fan and forced draft fan at 2021-03-03 08:13. The natural gas burners were back online at 2021-03-03 08:21. The shutdown was completed at 2021-03-03 08:42.				
<b>Remedial Action Planned and/or Taken</b>				
Covanta checked the furnace temperature probes and replaced one that was suspected to be faulty.				

**Gas burners unavailable during shutdown and furnace temperature average below 800C**

Unit	Duration	Date	Time	
#2	25 minutes	26-Mar-21	06:48-07:13	
<b>Cause</b>				
Auxiliary burners on unit 2 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.				
Unit 2 was placed in shutdown mode at 2021-03-26 06:48 following a BC Hydro power failure. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge following the restart of the combustion fans. The auxiliary burners were unavailable for a period of 25 minutes between 2021-03-26 06:48 and 2021-03-26 07:13.				
<b>Action Taken to Restore Steady State Conditions</b>				
Covanta started the induced draft fan at 2021-03-26 06:58. The natural gas burners were back online at 2021-03-26 07:13. The shutdown was completed at 2021-03-26 07:29.				
<b>Remedial Action Planned and/or Taken</b>				
None				

**Gas burners unavailable during shutdown and furnace temperature average below 800C**

Unit	Duration	Date	Time	
#3	48 minutes	26-Mar-21	06:48-07:36	
<b>Cause</b>				
Auxiliary burners on unit 3 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.				
Unit 3 was placed in shutdown mode at 2021-03-26 06:48 due to a BC Hydro power outage. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge following the restart of the combustion fans. The auxiliary burners were unavailable for a period of 48 minutes between 2021-03-26 06:48 and 2021-03-26 07:36.				
<b>Action Taken to Restore Steady State Conditions</b>				
Covanta restarted the induced draft fan at 2021-03-26 06:48. The natural gas burners were back online at 2021-03-26 07:36. The shutdown was completed at 2021-03-26 07:47.				
<b>Remedial Action Planned and/or Taken</b>				
None				

**Gas burners unavailable during shutdown and furnace temperature average below 800C**

Unit	Duration	Date	Time	
#1	56 minutes	28-Mar-21	15:29-16:25	
<b>Cause</b>				
Auxiliary burners on unit 1 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.				
Unit 1 was placed in shutdown mode at 2021-03-28 15:29 due to a BC Hydro power outage. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge following the restart of the combustion fans. The auxiliary burners were unavailable for a period of 56 minutes between 2021-03-28 15:29 and 2021-03-28 16:25.				
<b>Action Taken to Restore Steady State Conditions</b>				
Covanta restarted the induced draft fan at 2021-03-28 15:31 and the forced draft fan at 15:32. The natural gas burners were back online at 2021-03-28 16:25. The shutdown was completed at 2021-03-28 17:11.				
<b>Remedial Action Planned and/or Taken</b>				
None				

**Gas burners unavailable during shutdown and furnace temperature average below 800C**

Unit	Duration	Date	Time	
#2	29 minutes	28-Mar-21	15:29-15:58	
<b>Cause</b>				
Auxiliary burners on unit 2 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.				
Unit 2 was placed in shutdown mode at 2021-03-28 15:29 due to a BC Hydro power outage. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge following the restart of the combustion fans. The auxiliary burners were unavailable for a period of 29 minutes between 2021-03-28 15:29 and 2021-03-28 15:58.				
<b>Action Taken to Restore Steady State Conditions</b>				
Covanta restarted the induced draft fan and forced draft fan at 2021-03-28 15:35. The natural gas burners were back online at 2021-03-28 15:58. The shutdown was completed at 2021-03-28 16:43.				
<b>Remedial Action Planned and/or Taken</b>				
None				

**Gas burners unavailable during shutdown and furnace temperature average below 800C**

Unit	Duration	Date	Time	
#3	29 minutes	28-Mar-21	15:29-15:58	
<b>Cause</b>				
Auxiliary burners on unit 3 were unavailable to maintain the secondary combustion zone temperature during boiler shutdown period.				
Unit 3 was placed in shutdown mode at 2021-03-28 15:29 due to a BC Hydro power outage. The Provincial Boiler Vessel Safety Act and the Provincial Gas Act require a boiler purge following the restart of the combustion fans. The auxiliary burners were unavailable for a period of 29 minutes between 2021-03-28 15:29 and 2021-03-28 15:58.				
<b>Action Taken to Restore Steady State Conditions</b>				
Covanta restarted the induced draft fan at 2021-03-28 15:32 and the forced draft fan at 15:33. The natural gas burners were back online at 2021-03-28 15:48. The shutdown was completed at 2021-03-28 15:59.				
<b>Remedial Action Planned and/or Taken</b>				
None				

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

Note: The availability for the Unit #3 stack flow meter was 88.9% for Q1 2021. This has been reported to the Ministry of Environment and Climate Change Strategy. The meter failed and Covanta experienced delays in sourcing a replacement. A spare unit has been procured to ensure a timely repair in the future.

### 4. Shutdown Report

#### Unit 1

Duration in Hours	Reason	Date
32.33	Primary economizer tube leak	March 4-5
30.26	Primary economizer tube leak	March 9-10
70.47	Annual minor maintenance outage	March 22-24
1.70	BC Hydro power interruption	March 28

#### Unit 2

Duration in Hours	Reason	Date
0.62	Feed chute plug	March 3
1.01	Induced draft fan trip	March 6-7
1.07	Underfire air compartment inspection	March 25
0.68	BC Hydro power interruption	March 26
1.23	BC Hydro power interruption	March 28

#### Unit 3

Duration in Hours	Reason	Date
3.70	CEMS leak	March 1-2
9.53	Overband magnet failure	March 11
4.48	Feeder positioner rod failure	March 12
1.20	BC Hydro power interruption	March 26
0.40	BC Hydro power interruption	March 28

### 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	20,682		
Waste Processed	tonnes/day	207	239	232
Maximum Waste Processed	tonnes/day	268	251	246
		Units 1, 2, and 3		
Natural Gas Consumed	m <sup>3</sup> /day	2,876		
	m <sup>3</sup> /month	89,151		
Fly ash disposed	tonnes	988		
Bottom ash disposed	tonnes	3,729		

**7. Complaints and Responses**

Date/Time	Complaint	Action Taken

## March 2021 - Monthly CEMS Data

Date	Boiler #1								Boiler #2								Boiler #3							
	Stack	O <sub>2</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	THC	Opacity	Furnace	Stack	O <sub>2</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	THC	Opacity	Furnace	Stack	O <sub>2</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	THC	Opacity	Furnace
	Temp	(%)	(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )	(%)	Temp	Temp	(%)	(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )	(%)	Temp	Temp	(%)	(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )	(mg/m <sup>3</sup> )	(%)	Temp
3/1/21	155	10	43.4	131.8	28.6	0.46	0.99	946	152	9.4	61.7	129.4	18.7	0.04	0.19	964	156	10	43.1	133	29.2	0.90	0.52	928
3/2/21	157	10.2	62	132.8	25.4	0.31	1.02	947	152	9.4	88.5	128.9	17.1	0.01	1.07	963	156	9.8	53.8	135.9	38	0.34	0.55	935
3/3/21	155	9.9	51.7	132.4	24	0.27	0.97	950	152	9.1	77.7	128.1	15.6	0.06	0.67	949	155	9.8	53.7	134.1	33.6	0.36	0.54	929
3/4/21									152	9.2	74.3	127.9	21	0.04	1.04	947	155	10.1	57.2	132.7	32.9	0.25	0.58	927
3/5/21									154	8.9	76.2	129.4	18	0.04	1.51	945	155	10	54.9	132.9	37.8	0.50	0.56	920
3/6/21	157	10	77.9	129.3	22.6	0.28	0.89	932	154	9.3	79.4	129.8	21.4	0.06	2.32	935	157	9.7	71.1	132.5	34.5	0.19	0.54	928
3/7/21	158	9.9	96.4	130.3	22.7	0.39	0.91	952	153	9.9	98.9	128.6	25.4	0.05	1.40	919	156	9.4	72	135.2	26.8	0.23	0.58	930
3/8/21	159	10.1	73.3	131.5	21.5	0.30	0.95	952	153	9.5	80.2	129.3	23.5	0.07	0.46	927	157	10.1	57.8	132.8	33	0.27	0.54	900
3/9/21									151	9.1	83	128.9	17.5	0.04	0.56	951	155	9.8	67.6	137.9	32.1	0.23	0.56	930
3/10/21									151	9.2	82.1	129.1	21.5	0.06	1.00	947	153	9.8	62.8	132.9	25	0.21	0.66	929
3/11/21	159	10	94	132.5	20.4	0.34	1.04	953	152	9.4	85.3	129.2	20.5	0.08	0.97	955								
3/12/21	160	9.9	80.3	130	24.4	0.43	1.02	967	152	8.9	70.9	129.2	21	0.05	0.76	966	160	10.1	76.1	132.7	30.8	0.21	0.59	909
3/13/21	158	9.7	86	130.6	21.4	0.34	0.98	962	154	9	88.7	127	17.6	0.04	0.73	975	160	9.7	85.8	136.2	30.2	0.33	0.58	937
3/14/21	158	10	73.5	130.3	19	0.34	0.88	965	151	8.8	78.1	127.9	13.2	0.05	0.26	979	157	9.8	69.9	134.8	28.8	0.45	0.59	927
3/15/21	159	10	64.5	130.4	16.7	0.27	0.94	963	153	9.3	68.4	130.7	13.1	0.06	0.84	949	158	10.1	58.3	134.9	24.2	0.43	0.60	914
3/16/21	159	10.3	66.8	131.9	21	0.44	1.04	939	153	9	84.1	128.5	14.9	0.07	1.15	956	158	10.1	68.5	135.6	29.4	0.49	0.63	910
3/17/21	159	10.4	66.2	130.2	20	0.40	1.02	934	152	9.2	70.6	129.8	13.6	0.03	1.14	963	157	10	59.6	135	24.2	0.42	0.61	927
3/18/21	159	10.2	54.2	129.7	20	0.34	0.94	943	152	8.9	68.3	127.9	18.8	0.05	0.95	964	156	9.9	61.5	136	26.4	0.37	0.58	942
3/19/21	160	10.5	54.2	129.4	27.5	0.60	0.90	934	155	9.3	77.9	135.3	26	0.03	0.39	947	159	9.7	59.6	135.3	25.8	0.39	0.53	938
3/20/21	160	10.6	80.6	130.2	23.7	0.47	0.93	940	154	9.3	94	130.8	22.9	0.07	0.46	941	158	9.8	71.8	134.7	25	0.36	0.55	914
3/21/21	161	10.5	70.9	131.4	24.8	0.34	0.94	929	153	9	84.4	133.3	19.1	0.06	0.96	946	158	10	62.4	135.5	26.3	0.35	0.59	911
3/22/21									153	9.2	75.4	128.1	23.7	0.08	0.41	940	155	9.9	68.3	133.3	30.6	0.42	0.53	906
3/23/21									152	9	95.1	125.8	24.4	0.09	1.05	961	156	10	113.4	133.1	30.1	0.35	0.53	915
3/24/21									152	9.2	67.7	127.3	31	0.08	0.90	943	154	10	50.2	132.4	37	0.44	0.65	918
3/25/21	151	9.5	79.6	133.1	18.6	0.31	0.91	875	152	9.6	51.4	129	26.1	0.08	0.71	924	154	9.7	36.8	134.5	28.4	0.46	0.55	899
3/26/21	153	9.6	90.9	130.9	31.1	0.48	0.94	893	153	9.7	64.7	127.8	20.5	0.06	0.47	936	158	9.9	53.5	134.4	30.5	0.41	0.62	913
3/27/21	157	9.9	133.2	133.1	18.1	0.26	0.94	926	155	9.3	101.2	128.1	16.3	0.04	0.38	966	157	9.9	78.5	134.6	21	0.32	0.60	916
3/28/21	157	10.2	133.4	133.8	17.5	0.20	0.93	934	156	9.3	92.8	130.2	16.7	0.05	0.43	961	157	10	68.5	133.9	24.8	0.33	0.60	911
3/29/21	154	10	121.9	130.9	37.9	0.14	1.01	919	154	9	85.6	127.6	15.6	0.03	0.82	963	158	10.2	66.5	133.1	26.2	0.36	0.62	908
3/30/21	157	10.5	94.1	131.1	43.6	0.21	1.03	925	155	9.6	60	129.3	25.3	0.06	1.60	949	158	10.2	59.8	134.2	28.9	0.35	0.66	907
3/31/21	154	9.8	70.5	129.7	32.8	0.13	1.07	948	154	9.7	57.9	127.7	32.1	0.06	1.48	940	156	9.8	59.9	133.3	28.8	0.30	0.65	933
Average	157	10.1	80.0	131.1	24.3	0.34	0.97	939	152.9	9.2	78.2	129.0	20.4	0.05	0.87	950.7	156.6	9.9	64.1	134.2	29.3	0.37	0.58	920.4
Min	151	9.5	43.4	129.3	16.7	0.13	0.88	875	151.0	8.8	51.4	125.8	13.1	0.01	0.19	919.0	153.0	9.4	36.8	132.4	21.0	0.19	0.52	899.0
Max	161	10.6	133.4	133.8	43.6	0.60	1.07	967	156.0	9.9	101.2	135.3	32.1	0.09	2.32	979.0	160.0	10.2	113.4	137.9	38.0	0.90	0.66	942.0
St Dev	2.5	0.29	23.70	1.29	6.58	0.11	0.05	21.5	1.29	0.27	12.25	1.79	4.85	0.02	0.46	14.32	1.71	0.18	13.81	1.35	4.23	0.13	0.04	11.78

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.