

## Monthly Operating Reports

February 2021

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The following February 2021 operating report was sent to the Ministry of Environment and Climate Change Strategy on April 13, 2021.



February 2021 - 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
2/1/21	157	10.2	89.8	131.7	27.8	0.43	0.98	932	153	9.6	60.3	131.4	19.7	0.04	0.24	949	150	9.3	71	138.2	30.7	0.79	0.19	937
2/2/21	158	10.4	78.1	131.9	30.6	0.46	0.99	916	155	9.4	68.4	131.7	20.4	0.07	0.38	952	154	9.5	84.6	136	26.7	0.59	0.25	923
2/3/21	158	10.2	78.8	132.8	26.3	0.36	0.95	923	155	9.4	50.8	131	23	0.06	0.73	950	155	9.7	78.2	136.4	28.9	0.54	0.50	929
2/4/21	159	10.3	83.3	129.1	31.1	0.39	0.82	923	155	9.4	51.3	132.3	19.7	0.09	0.95	956	155	9.8	78.6	133.9	26	0.61	0.43	922
2/5/21	156	10	79	127.9	32.1	0.36	0.79	928	155	9.9	51.8	132.5	22.5	0.04	0.56	940	155	9.6	76.8	137	23.9	0.65	0.42	926
2/6/21	156	9.8	83.6	129.5	31.4	0.24	0.80	936	152	9.8	60.4	130.6	21.5	0.08	0.39	941	155	9.6	86.7	135.2	25.5	0.65	0.46	931
2/7/21	155	10.2	79.5	131.5	21.3	0.17	0.87	930	152	9.6	53.7	129.8	23.9	0.07	0.68	956	154	9.6	86.1	139.1	27.5	0.58	0.48	916
2/8/21									152	9.7	44.1	131.5	20	0.09	1.73	942	156	9.9	79.6	134.4	26.7	0.69	0.54	916
2/9/21	153	9.6	100.5	128.6	30.5	0.21	1.03	931									153	9.9	121.6	136.4	28.5	0.42	0.59	920
2/10/21	158	10.6	169.5	131.3	30.4	0.33	1.04	917									154	10.1	121.8	133.3	28.2	0.35	0.59	929
2/11/21	158	10.6	83.3	131.1	27.2	0.24	1.13	942	152	9.1	124.6	143	23.2	0.06	1.16	939	150	10	96.3	134.4	29.7	0.40	0.59	939
2/12/21	159	10.6	76.7	131.5	30	0.31	1.20	933	153	9.4	110.2	139.5	24.6	0.09	1.32	940	151	10.2	113.3	134	31	0.41	0.63	916
2/13/21	159	10.3	76.9	131.2	26	0.56	1.16	942	154	9.3	120	130.1	20.8	0.09	1.20	949	148	10.1	131.1	132.2	33.3	0.45	0.62	901
2/14/21	159	9.7	120.7	129.2	25.7	0.68	1.13	967	155	9.2	155.4	131.1	25	0.10	0.44	960	156	9.9	97	131.3	34.6	0.34	0.60	920
2/15/21	161	10	67.9	131.3	25.3	0.74	1.04	952	154	8.9	101.3	130.1	17.6	0.09	0.20	953	156	9.2	42.6	133.7	27	0.29	0.53	926
2/16/21	161	10.2	118.7	129.8	27.5	0.67	1.01	936	153	9	116.3	130.5	17.3	0.09	0.02	952	155	9.7	66.9	138.6	31.8	0.37	0.52	926
2/17/21	158	10.1	56	130.7	29.6	0.59	1.01	948	155	9	80	131.2	17.4	0.04	0.11	964	154	9.9	50.3	133	35.4	0.37	0.53	916
2/18/21	158	9.9	80.8	129.1	34.2	0.60	1.01	954	154	9.2	103.1	128	19.9	0.04	0.05	954	155	9.9	40.9	134.6	42.2	0.37	0.54	908
2/19/21	158	9.8	71.8	129.5	26.3	0.61	1.02	949	153	8.9	100.8	129.4	15.5	0.18	0.03	947	155	9.9	36.5	135.2	28.3	0.28	0.55	927
2/20/21	159	9.9	72.4	130.4	23.6	0.41	1.02	952	152	9.2	104.2	128.7	13.6	0.02	0.29	976	154	10.1	70.2	132.5	27.2	0.50	0.57	939
2/21/21	158	10.1	87.2	131.1	22.5	0.47	0.99	938	153	9	114.2	128.7	13.8	0.05	0.32	957	157	9.7	83.7	133.9	23.7	0.59	0.54	937
2/22/21	157	10.2	55.3	131.2	23.6	0.35	0.89	942	153	9.1	84	131.5	15.6	0.07	0.66	946	154	9.8	53.4	133.9	28.3	0.48	0.51	936
2/23/21	156	10.6	65.3	131.5	24.4	0.25	0.92	929	150	9	86.1	130.2	11.5	0.02	0.84	964	153	10.3	56.4	132.7	33.5	0.56	0.53	922
2/24/21	157	10.1	47	129.6	31.5	0.32	1.00	944	152	9.1	73	130	19.4	0.03	1.33	959	155	10.5	55.2	133.8	28.7	0.37	0.60	924
2/25/21	158	10.2	63.2	129.3	26.6	0.43	0.94	925	154	9.6	82.8	128.8	22.5	0.09	0.95	923	154	9.9	61.9	133.3	33.1	0.53	0.55	933
2/26/21	157	10	63.8	130.1	30.6	0.25	1.02	933	153	9.1	95.6	128.1	22.9	0.06	0.52	943	156	10.2	59.2	135	32.4	0.69	0.55	912
2/27/21	152	10.3	48.5	128.8	22.4	0.29	1.20	930	154	9.3	86.1	129.3	13.7	0.05	0.60	970	156	10.4	71.1	134.8	26.3	0.31	0.59	929
2/28/21	158	10.2	84.1	131.9	21.8	0.34	1.10	933	154	9.6	107.4	126.7	16.4	0.07	0.00	948	156	10.3	82.3	132.8	31	0.79	0.61	931
<b>Average</b>	158	10.2	80.8	130.4	27.4	0.41	1.00	936	153.3	9.3	87.9	131.0	19.3	0.07	0.60	951.2	154.1	9.9	76.9	134.6	29.6	0.50	0.52	924.7
<b>Min</b>	152	9.6	47.0	127.9	21.3	0.17	0.79	916	150.0	8.9	44.1	126.7	11.5	0.02	0.00	923.0	148.0	9.2	36.5	131.3	23.7	0.28	0.19	901.0
<b>Max</b>	161	10.6	169.5	132.8	34.2	0.74	1.20	967	155.0	9.9	155.4	143.0	25.0	0.18	1.73	976.0	157.0	10.5	131.1	139.1	42.2	0.79	0.63	939.0
<b>St Dev</b>	2.0	0.27	24.88	1.25	3.58	0.16	0.11	12.0	1.29	0.29	27.96	3.37	3.77	0.03	0.47	11.03	2.10	0.31	24.64	1.94	3.97	0.15	0.10	9.47

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.

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

February 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	34.2	25.0	42.2
SO <sub>2</sub>	200	24 hr	169.5	155.4	131.1
NO <sub>x</sub>	190	24 hr	132.8	143.0	139.1
THC	10	24 hr	0.74	0.18	0.79
			Monthly Average (mg/dscm)		
			Unit 1	Unit 2	Unit 3
Opacity (%)			1.00	0.60	0.52
CO			27.4	19.3	29.6
THC			0.41	0.07	0.50
SO <sub>2</sub>			80.8	87.9	76.9
NO <sub>x</sub>			130.4	131.0	134.6

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
2-Feb 15:00	30 min	101.3	Feed chute hang-up, started gas burners, adjusted airflow, modified feed rate.
2-Feb 16:00	30 min	112.8	Started gas burners, adjusted airflow, modified feed rate.
4-Feb 21:30	30 min	130.6	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
12-Feb 15:00	30 min	102.1	Started gas burners, adjusted airflow, modified feed rate.
13-Feb 13:30	30 min	121.6	Feed chute plugged, started gas burners, adjusted airflow, modified feed rate.
22-Feb 22:30	30 min	140.3	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
26-Feb 12:00	30 min	131.3	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.

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

Date / Time	Duration	Exceedance (mg/dscm)	Action Taken
8-Feb 15:30	30 min	107.2	Started gas burners, adjusted airflow, modified feed rate, checked instrumentation.
10-Feb 23:00	30 min	118.8	Started gas burners, adjusted airflow, modified feed rate.
12-Feb 14:30	30 min	102.3	Started gas burners, adjusted airflow, modified feed rate.
14-Feb 15:30	30 min	102.1	Started gas burners, adjusted airflow, modified feed rate.
14-Feb 16:00	30 min	112.4	Started gas burners, adjusted airflow, modified feed rate.
22-Feb 16:30	30 min	153.0	Volatile fuel, started gas burners, adjusted airflow, modified feed rate, checked instrumentation.

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

Date / Time	Duration	Exceedance (mg/dscm)	Action Taken
1-Feb 15:00	30 min	115.6	Feed chute hang-up, started gas burners, adjusted airflow, modified feed rate.
1-Feb 15:30	30 min	120.7	Feed chute hang-up, started gas burners, adjusted airflow, modified feed rate.
13-Feb 16:30	30 min	113.1	Started gas burners, adjusted airflow, modified feed rate.
14-Feb 09:30	30 min	125.9	Started gas burners, adjusted airflow, modified feed rate.
18-Feb 18:30	30 min	337.7	Started gas burners, adjusted airflow, modified feed rate.
22-Feb 17:00	30 min	111.7	Started gas burners, adjusted airflow, modified feed rate.
22-Feb 17:30	30 min	121.1	Started gas burners, adjusted airflow, modified feed rate.
25-Feb 18:00	30 min	109.7	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	18 minutes	2-Feb-21	14:10 - 14:28	
<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 2021-02-02 14:10 following a turbine generator trip. 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 18 minutes between 2021-02-02 14:10 and 2021-02-02 14:28.				
<b>Action Taken to Restore Steady State Conditions</b>				
Covanta restarted the induced draft fan and forced draft fan at 2021-02-02 14:13. The natural gas burners were back online at 2021-02-02 14:28. The shutdown was completed at 2021-02-02 15:00.				
<b>Remedial Action Planned and/or Taken</b>				
Covanta's contractor Spartan Controls investigated the cause of the turbine generator trip and corrected the issue with the turbine generator steam bypass valve.				

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

Unit	Duration	Date	Time	
#3	16 minutes	2-Feb-21	14:10 - 14:26	

**Cause**

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 2021-02-02 14:10 following a turbine generator trip. 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 2021-02-02 14:10 and 2021-02-02 14:26.

**Action Taken to Restore Steady State Conditions**

Covanta restarted the induced draft fan and forced draft fan at 2021-02-02 14:15. The natural gas burners were back online at 2021-02-02 14:26. The shutdown was completed at 2021-02-02 14:39.

**Remedial Action Planned and/or Taken**

Covanta's contractor Spartan Controls investigated the cause of the turbine generator trip and corrected the issue with the turbine generator steam bypass valve.

**Gas burners unavailable during shutdown**

Unit	Duration	Date	Time	
#1	6 minutes	9-Feb-21	03:55-04:01	

**Cause**

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 2021-02-09 3:55 due to low steam drum level trip. The auxiliary burners were unavailable for a period of 6 minutes 2021-02-09 03:55 and 2021-02-09 04:01.

**Action Taken to Restore Steady State Conditions**

Covanta restarted the induced draft fan at 2021-02-09 03:57 and the forced draft fan at 2021-02-09 04:00. A boiler purge was not required. The natural gas burners were back online at 2021-02-09 04:01. The shutdown was completed at 2021-02-09 04:10.

**Remedial Action Planned and/or Taken**

Covanta's operators will monitor the steam drum level closer to try to prevent boiler trips.

### 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	98	99	99
CO	90	Hour	98	99	99
SO <sub>2</sub>	90	Hour	98	99	99
NOx	90	Hour	98	99	99
THC	90	Hour	98	99	99
Stack Flow	90	Hour	97	99	69

Note: The availability for the Unit #3 stack flow meter is projected to be 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
0.33	Turbine trip	February 2
0.13	Inspection of under fire air compartment	February 5
1.88	Volatile fuel	February 7
20.17	Fabric filter bag replacement	February 8-9
0.25	Low steam drum level trip	February 9

#### Unit 2

Duration in Hours	Reason	Date
0.83	Turbine trip	February 2
0.68	Turbine trip	February 7
0.33	Turbine trip	February 8
0.32	Turbine trip	February 8
34.63	Boiler wash	February 9-10

#### Unit 3

Duration in Hours	Reason	Date
0.48	Turbine trip	February 2

### 5. Facility Bypass and Emergency/spill Event Report

Date/Time	Cause	Duration
	Action Taken	

## **6. Other Data**

		<b>UNIT 1</b>	<b>UNIT 2</b>	<b>UNIT 3</b>
Waste Received	tonnes/day	<b>19,297</b>		
Waste Processed	tonnes/day	<b>246</b>	<b>227</b>	<b>240</b>
Maximum Waste Processed	tonnes/day	<b>257</b>	<b>251</b>	<b>250</b>
		<b>Units 1, 2, and 3</b>		
Natural Gas Consumed	m <sup>3</sup> /day	<b>1,778</b>		
	m <sup>3</sup> /month	<b>49,778</b>		
Fly ash disposed	tonnes	<b>777</b>		
Bottom ash disposed	tonnes	<b>3,167</b>		

## **7. Complaints and Responses**

<b>Date/Time</b>	<b>Complaint</b>	<b>Action Taken</b>