January 18, 2022

Jeffrey Gove
Director of Compliance and Enforcement
Bay Area Air Quality Management District
375 Beale St. St. 600
San Francisco, CA 94105

1. ☐ RECEIVED IN ENFORCEMENT: 01/18/2022

ATTN: TITLE V REPORTS

RE: Semi-Annual Monitoring Report: July through December 2021 for City of Santa Rosa Wastewater Treatment Plant, Permit for Facility #A1403

Dear Mr. Gove:

In accordance with Permit Standard Conditions Section F, this letter is provided to fulfill semi-annual monitoring reporting required for the City of Santa Rosa Wastewater Treatment Facility during the period July 1, 2021 – December 31, 2021. Pursuant to the monitoring requirements specified in the Permit, please note the following items regarding monthly and annual emissions testing:

Monthly Emission Testing and Annual Source Tests (Condition #24751)
During this period, monthly portable tests were conducted by Blue Sky Environmental for emissions from digester/natural gas fueled internal combustion engines S-200, S-201, and S-202 on July 22, Aug 19, September 23, October 8, November 19, and December 6. Testing results are attached in Appendix A. Please note the following exceptions regarding engine testing:

- S-203 Engine 4 has been out of service since July 2021 and therefore has not had the required monthly or annual testing.

Per the City of Santa Rosa's Title V permit, annual source testing is required to be conducted no later than 12 calendar months after the previous source test. The most recent source test dates and upcoming due dates are listed in the table below:

Source	Test Date	Next Due
S-200 Engine 1	October 8, 2021	October 7, 2022
S-201 Engine 2	June 17, 2021	June 16, 2022
S-202 Engine 3	May 18, 2021	May 17, 2022
S-203 Engine 4	November 19, 2020	November 18, 2021

Anaerobic Digesters Gas Conditioning (Condition #18871)
Weekly H_2S monitoring is conducted on the digester gas upstream of the iron sponge abatement device (A-200) for compliance with the sulfur limit of 1500 ppm and downstream of A-200 for compliance with the H_2S content limit of 50 ppm. Results of these tests are attached with this report in Appendix B.

Emergency Generators (Condition #22820)
During the reporting period, reliability-related activities performed on the emergency standby diesel generators (S-33 and S-34) were in compliance with the limitation of less than 20 hours/year.

Thank you for your consideration of this matter. Please contact Sean McNeil, Deputy Director of Environmental Services, at (707) 543-3938 for any information related to this report.

I certify that based on information and belief formed after reasonable inquiry, the statements and information in this letter are true, accurate, and complete.

Sincerely,

Jennifer Burke

Jennifer Burke
Director of Santa Rosa Water

Enclosure:
Appendix A - Monthly Emission Testing Results
Appendix B - Digester Gas Quality Results

cc. BAAQMD File

APPENDIX A

Monthly Emission Testing Results

TABLE #1

BAAQMD FACILITY # 1403
LAGUNA - Monthly-July
Engines #1, #2 & #3

ENGINE	Eng-1	Eng-2	*ACTION LIMITS*	Eng-3	*ACTION LIMITS*
Test Date	7/22/21	7/22/21	NG/DG	7/22/21	NG/DG
Test Time	1043-1058	1018-1034		0912-0927	
Standard Temp., °F	70	70		70	
Engine kW	840	851		849	
Engine Bhp	1,126	1,140		1,138	
Fuel:					
Total Fuel Flow Rate, DSCFM (nat gas) NG	81	94		69	
Total Fuel Flow Rate, DSCFM (dig gas) DG	329	311		345	
Engine Blended DSCFM	202	203		207	
Stack Gas:					
Stack Flow Rate, DSCFM (Method 19)	2,357	2,343		2,335	
Oxygen, O_2, %	9.2	8.9		9.0	
NO_X Emissions:					
NOx, ppm	95.7	62.7		7.4	
NOx, ppm @ 15% O_2	48.3	30.7	*65/70*	3.6	
NOx, lbs/hr	1.61	1.05		0.123	
NOx, lbs/day	38.7	25.1		2.9	
NOx, g/Bhp-hr	0.65	0.42	*0.75*	0.049	*0.12*
CO Emissions:					
CO, ppm	536.0	399.1		0.3	
CO, ppm @ 15% O_2	270.3	195.8	*348*	0.2	
CO, lbs/hr	5.49	4.06		0.003	
CO, lbs/day	131.7	97.5		0.08	
CO, g/Bhp-hr	2.21	1.62	*3.10*	0.001	*0.12*

* g/BHP-hr based on Digester gas analysis dated 7/22/2021

WHERE,

ppm = Parts Per Million Concentration
Lbs/hr = Pound Per Hour Emission Rate
Tstd. = Standard Temp. (°R = °F+460)
MW = Molecular Weight
DSCFM = Dry Standard Cubic Feet Per Minute
NOx = Oxides of Nitrogen as NO_2 (MW = 46)
CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9 / (20.9 - %O_2)
PPM @ 3% O_2 = ppm * 17.9 / (20.9 - %O_2)
Lbs/hr = ppm x 8.223 E-05 x DSCFM x MW / Tstd. °R
Lbs/day = Lbs/hr * 24
g/BHp-hr = Lbs/hr * 453.6 / BHp
Engine BHp = Engine kW * 1.34

TABLE #1

BAAQMD FACILITY # 1403

LAGUNA - Monthly-August

Engines #1, #2 & #3

Parameters	Eng-1	Eng-2	ACTION LIMITS	Eng-3	ACTION LIMITS
Test Date	8/19/21	8/19/21	NG/DG	8/19/21	NG/DG
Test Time	1013-1028	0947-1002		0847-0902	
Standard Temp., °F	70	70		70	
Engine kW	852	845		850	
Engine Bhp	1,142	1,132		1,139	
Fuel:					
Total Fuel Flow Rate, DSCFM (nat gas) NG	92	94		81	
Total Fuel Flow Rate, DSCFM (dig gas) DG	311	316		335	
Engine Blended DSCFM	201	205		209	
Stack Gas:					
Stack Flow Rate, DSCFM (Method 19)	2,364	2,312		2,339	
Oxygen, O_2, %	9.2	8.7		8.9	
NOx Emissions:					
NOx, ppm	94.2	65.6		3.9	
NOx, ppm @ 15% O_2	47.5	31.8	65/70	1.9	
NOx, lbs/hr	1.59	1.08		0.064	
NOx, lbs/day	38.2	26.0		1.5	
NOx, g/Bhp-hr	0.63	0.43	0.75	0.026	0.12
CO Emissions:					
CO, ppm	543.6	415.2		0.6	
CO, ppm @ 15% O_2	274.1	201.1	348	0.3	
CO, lbs/hr	5.58	4.17		0.007	
CO, lbs/day	134.0	100.1		0.16	
CO, g/Bhp-hr	2.22	1.67	3.10	0.003	0.12

* g/BHP-hr based on Digester gas analysis dated 8/19/2021

WHERE,

ppm = Parts Per Million Concentration

Lbs/hr = Pound Per Hour Emission Rate

Tstd. = Standard Temp. (°R = °F+460)

MW = Molecular Weight

DSCFM = Dry Standard Cubic Feet Per Minute

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9 / (20.9 - %O_2)

PPM @ 3% O_2 = ppm * 17.9 / (20.9 - %O_2)

Lbs/hr = ppm x 8.223 E-05 x DSCFM x MW / Tstd. °R

Lbs/day = Lbs/hr * 24

g/BHp-hr = Lbs/hr * 453.6 / BHp

Engine BHp = Engine kW * 1.34

TABLE #1

BAAQMD FACILITY # 1403

LAGUNA - Monthly-September

Engines #1, #2 & #3

Parameters	Eng-1	Eng-2	ACTION LIMITS	Eng-3	ACTION LIMITS
Test Date	9/23/21	9/23/21	NG/DG	9/23/21	NG/DG
Test Time	0934-0949	1005-1020		0744-0759	
Standard Temp., °F	70	70		70	
Engine kW	851	859		853	
Engine Bhp	1,140	1,151		1,143	
Fuel:					
Total Fuel Flow Rate, DSCFM (nat gas) NG	79	82		81	
Total Fuel Flow Rate, DSCFM (dig gas) DG	350	335		336	
Engine Blended DSCFM	215	211		209	
Stack Gas:					
Stack Flow Rate, DSCFM (Method 19)	2,417	2,310		2,357	
Oxygen, O_2, %	9.0	8.6		8.9	
NOx Emissions:					
NOx, ppm	108.3	81.1		10.3	
NOx, ppm @ 15% O_2	53.6	38.8	65/70	5.0	
NOx, lbs/hr	1.87	1.34		0.172	
NOx, lbs/day	44.8	32.1		4.1	
NOx, g/Bhp-hr	0.74	0.53	0.75	0.068	0.12
CO Emissions:					
CO, ppm	573.8	419.6		1.5	
CO, ppm @ 15% O_2	283.8	200.5	348	0.7	
CO, lbs/hr	6.03	4.21		0.015	
CO, lbs/day	144.6	101.0		0.36	
CO, g/Bhp-hr	2.40	1.66	3.10	0.006	0.12

* g/BHP-hr based on Digester gas analysis dated 9/23/2021

WHERE,

ppm = Parts Per Million Concentration
Lbs/hr = Pound Per Hour Emission Rate
Tstd. = Standard Temp. (°R = °F+460)
MW = Molecular Weight
DSCFM = Dry Standard Cubic Feet Per Minute
NOx = Oxides of Nitrogen as NO_2 (MW = 46)
CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9 / (20.9 - %O_2)
PPM @ 3% O_2 = ppm * 17.9 / (20.9 - %O_2)
Lbs/hr = ppm x 8.223 E-05 x DSCFM x MW / Tstd. °R
Lbs/day = Lbs/hr * 24
g/BHp-hr = Lbs/hr * 453.6 / BHp
Engine BHp = Engine kW * 1.34

TABLE #1

BAAQMD FACILITY # 1403

LAGUNA - Monthly-October

Engines #1, #2 & #3

Parameters	Eng-1	Eng-2	ACTION LIMITS	Eng-3	ACTION LIMITS
Test Date	10/8/21	10/8/21	NG/DG	10/8/21	NG/DG
Test Time	1036-1051	1006-1021		0853-0908	
Standard Temp., °F	70	70		70	
Engine kW	845	891		849	
Engine Bhp	1,132	1,194		1,138	
Fuel:					
Total Fuel Flow Rate, DSCFM (nat gas) NG	53	65		63	
Total Fuel Flow Rate, DSCFM (dig gas) DG	392	376		367	
Engine Blended DSCFM	221	226		215	
Stack Gas:					
Stack Flow Rate, DSCFM (Method 19)	2,399	2,401		2,279	
Oxygen, O_2, %	9.1	8.7		8.7	
NOx Emissions:					
NOx, ppm	93.3	80.6		11.0	
NOx, ppm @ 15% O_2	46.8	39.1	65/70	5.3	
NOx, lbs/hr	1.60	1.38		0.179	
NOx, lbs/day	38.3	33.2		4.3	
NOx, g/Bhp-hr	0.64	0.52	0.75	0.071	0.12
CO Emissions:					
CO, ppm	526.8	406.2		0.7	
CO, ppm @ 15% O_2	264.1	197.0	348	0.3	
CO, lbs/hr	5.49	4.24		0.007	
CO, lbs/day	131.7	101.7		0.16	
CO, g/Bhp-hr	2.20	1.61	3.10	0.003	0.12

* g/BHP-hr based on Digester gas analysis dated 10/8/2021

WHERE,

ppm = Parts Per Million Concentration

Lbs/hr = Pound Per Hour Emission Rate

Tstd. = Standard Temp. (°R = °F+460)

MW = Molecular Weight

DSCFM = Dry Standard Cubic Feet Per Minute

NOx = Oxides of Nitrogen as NO_2 (MW = 46)

CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9 / (20.9 - %O_2)

PPM @ 3% O_2 = ppm * 17.9 / (20.9 - %O_2)

Lbs/hr = ppm x 8.223 E-05 x DSCFM x MW / Tstd. °R

Lbs/day = Lbs/hr * 24

g/BHp-hr = Lbs/hr * 453.6 / BHp

Engine BHp = Engine kW * 1.34

TABLE #1

BAAQMD FACILITY # 1403

LAGUNA - Monthly-November

Engines #1, #2 & #3

Parameters	Eng-1	Eng-2	ACTION LIMITS	Eng-3	ACTION LIMITS
Test Date	11/19/21	11/19/21	NG/DG	11/19/21	NG/DG
Test Time	0957-1012	0931-0946		0838-0853	
Standard Temp., °F	70	70		70	
Engine kW	785	813		792	
Engine Bhp	1,052	1,089		1,061	
Fuel:					
Total Fuel Flow Rate, DSCFM (nat gas) NG	22	50		51	
Total Fuel Flow Rate, DSCFM (dig gas) DG	449	391		370	
Engine Blended DSCFM	229	224		211	
Stack Gas:					
Stack Flow Rate, DSCFM (Method 19)	2,299	2,240		2,182	
Oxygen, O_2, %	8.7	8.2		8.6	
NOx Emissions:					
NOx, ppm	85.8	76.7		7.3	
NOx, ppm @ 15% O_2	41.6	35.6	65/70	3.5	
NOx, lbs/hr	1.41	1.23		0.113	
NOx, lbs/day	33.8	29.4		2.7	
NOx, g/Bhp-hr	0.61	0.51	0.75	0.048	0.12
CO Emissions:					
CO, ppm	536.3	426.7		0.6	
CO, ppm @ 15% O_2	259.9	198.2	348	0.3	
CO, lbs/hr	5.36	4.15		0.005	
CO, lbs/day	128.6	99.7		0.13	
CO, g/Bhp-hr	2.31	1.73	3.10	0.002	0.12

* g/BHP-hr based on Digester gas analysis dated 11/19/2021

WHERE,

ppm = Parts Per Million Concentration
Lbs/hr = Pound Per Hour Emission Rate
Tstd. = Standard Temp. (°R = °F+460)
MW = Molecular Weight
DSCFM = Dry Standard Cubic Feet Per Minute
NOx = Oxides of Nitrogen as NO_2 (MW = 46)
CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9 / (20.9 - %O_2)
PPM @ 3% O_2 = ppm * 17.9 / (20.9 - %O_2)
Lbs/hr = ppm x 8.223 E-05 x DSCFM x MW / Tstd. °R
Lbs/day = Lbs/hr * 24
g/BHp-hr = Lbs/hr * 453.6 / BHp
Engine BHp = Engine kW * 1.34

TABLE #1

BAAQMD FACILITY # 1403

LAGUNA - Monthly-December

Engines #1, #2 & #3

Parameters	Eng-1	Eng-2	ACTION LIMITS	Eng-3	ACTION LIMITS
Test Date	12/6/21	12/6/21	NG/DG	12/6/21	NG/DG
Test Time	1430-1445	1405-1420		1241-1256	
Standard Temp., °F	70	70		70	
Engine kW	791	797		789	
Engine Bhp	1,060	1,068		1,057	
Fuel:					
Total Fuel Flow Rate, DSCFM (nat gas) NG	67	70		75	
Total Fuel Flow Rate, DSCFM (dig gas) DG	356	345		332	
Engine Blended DSCFM	207	209		202	
Stack Gas:					
Stack Flow Rate, DSCFM (Method 19)	2,177	2,143		2,127	
Oxygen, O_2, %	8.9	8.6		8.7	
NOx Emissions:					
NOx, ppm	80.4	61.7		13.0	
NOx, ppm @ 15% O_2	39.7	29.5	65/70	6.3	
NOx, lbs/hr	1.25	0.94		0.198	
NOx, lbs/day	30.0	22.7		4.7	
NOx, g/Bhp-hr	0.53	0.40	0.75	0.085	0.12
CO Emissions:					
CO, ppm	535.2	414.3		1.2	
CO, ppm @ 15% O_2	264.1	198.2	348	0.6	
CO, lbs/hr	5.06	3.86		0.011	
CO, lbs/day	121.5	92.5		0.27	
CO, g/Bhp-hr	2.17	1.64	3.10	0.005	0.12

* g/BHP-hr based on Digester gas analysis dated 12/6/2021

WHERE,

ppm = Parts Per Million Concentration
Lbs/hr = Pound Per Hour Emission Rate
Tstd. = Standard Temp. (°R = °F+460)
MW = Molecular Weight
DSCFM = Dry Standard Cubic Feet Per Minute
NOx = Oxides of Nitrogen as NO_2 (MW = 46)
CO = Carbon Monoxide (MW = 28)

CALCULATIONS,

PPM @ 15% O_2 = ppm * 5.9 / (20.9 - %O_2)
PPM @ 3% O_2 = ppm * 17.9 / (20.9 - %O_2)
Lbs/hr = ppm x 8.223 E-05 x DSCFM x MW / Tstd. °R
Lbs/day = Lbs/hr * 24
g/BHp-hr = Lbs/hr * 453.6 / BHp
Engine BHp = Engine kW * 1.34

APPENDIX B

Digester Gas Quality Results

Digester Gas Quality
07/01/2021 - 12/31/2021

	Hydrogen Sulfide
	mg/l
Date	Gas Skid
7/5/21	0
7/12/21	0
7/19/21	0
7/26/21	1
8/1/21	0
8/9/21	0
8/16/21	0
8/23/21	2
8/30/21	24
9/6/21	5
9/13/21	1
9/20/21	9
9/27/21	10
10/4/21	1
10/11/21	1
10/18/21	1
11/1/21	1
11/8/21	3
11/15/21	1
11/22/21	4
11/29/21	1
12/6/21	1
12/13/21	2
12/20/21	3
12/27/21	0
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AVG	3
MIN	0
MAX	24

FaciltiyA1403 Semi Annual Monitoring Report July - December 2021_Final

Final Audit Report 2022-01-18

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