



May 1, 2020

Director of Compliance and Enforcement
Bay Area Air Quality Management District
375 Beale Street, Suite 600
San Francisco, CA 94105
Attn: Title V Reports

Director of the Air Division
USEPA, Region IX
75 Hawthorne Street
San Francisco, CA 94105
Attn: Air-3

Re: Addendum to Combined Title V Semi-Annual and Partial 8-34 Annual Reports
40 CFR 63 Subpart AAAA Semi-Annual Report
Sonoma County Central Landfill
500 Mecham Road, Petaluma, California, 94952
Facility Number 22987

Dear Sir or Madam:

Tetra Tech submitted two Semi-Annual Reports (SAR) and Partial 8-34 Annual Reports for the periods of February 1, 2019 through July 31, 2019 and August 1, 2019 through January 31, 2020 on behalf of Sonoma County Central Landfill (Sonoma Central) to the Bay Area Air Quality Management District (BAAQMD) and United States Environmental Protection Agency (USEPA) on August 31, 2019 and February 28, 2020, respectively. Since the submittal of the reports, a discrepancy was noted in Appendices O and R of both reports, regarding the A-4 Flare flow. Appendices O and R have been revised to correct the discrepancy for both reports are attached for your review and records.

If you have any questions, please contact Kendra Kent at (520) 526-7270 or kendra.kent@tetrattech.com.

Sincerely,

TETRA TECH

A handwritten signature in black ink, appearing to read 'Nat Israel'.

Nat Israel
Environmental Scientist

A handwritten signature in black ink, appearing to read 'Kendra M. Kent'.

Kendra Kent
Project Manager

Enclosure: Attachment A Revised Appendices O and R for February 1, 2019 through July 31, 2019 SAR
Attachment B Revised Appendices O and R for August 1, 2019 through January 31, 2020 SAR

cc: Derek Cheney, Sonoma Central
Lochlin Caffey, Republic Services

**ATTACHMENT A
REVISED APPENDICES O AND R FOR FEBRUARY 1, 2019 THROUGH JULY
31, 2019 SAR**

MONTHLY LFG Input to Flare (A-4)
SONOMA COUNTY CENTRAL LANDFILL - PETALUMA, CALIFORNIA

Month	Total Available Runtime (hours)	Total Downtime (hours)	Total Runtime (hours)	CH ₄ (%) [*]	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Total Heat Input (MMBTU)
February-19	672.00	343.13	400.87	50.2	648.2	15,548,240.0	7,805,216.5	7,906.7
March-19 ^{**}	743.00	3.93	740.07	50.2	542.8	24,094,350.0	12,071,269.4	12,228.2
April-19	720.00	83.60	660.40	50.1	505.0	20,061,494.0	10,050,808.5	10,201.8
May-19	744.00	36.60	707.40	50.1	669.6	27,621,566.0	13,838,404.6	14,018.3
June-19	720.00	46.77	673.23	50.1	932.98	37,537,372.5	18,806,223.6	19,050.7
July-19	744.00	7.43	736.57	50.1	636.06	28,105,076.0	14,080,643.1	14,263.7
TOTALS:	4,343.00	521.47	3,918.53			152,968,098.5	76,652,565.6	77,669.4
AVERAGES:				50.1	655.8			

¹ - A-4 Flare was brought online in December 2017.

*Methane content for January through March 2019 based on the reported average methane content as observed and reported by the engine plant operations in their End of Month (EOM) report submitted to Cornerstone from December 2018 through February 2019. Methane content for March 2019 through December 2019 derived from 2019 A-4 Flare Source Test.

**There were 743.00 hours in March 2019 due to Daylight Saving Time.

Pursuant to Title V Condition 4044, Part 13, the heat input to the A-4 Flare shall not exceed 547,680 MMBTU per year.

scfm= standard cubic feet per minute

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: February-19

Date	Runtime (hours)	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
2/1/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/2/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/3/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/4/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/5/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/6/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/7/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/8/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/9/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/10/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/11/2019	0.0	50.2	0.0	0.0	0.0	1,013.0	0.0
2/12/2019	16.9	50.2	744.3	753,229.0	378,121.0	1,013.0	383.0
2/13/2019	24.0	50.2	741.3	1,067,423.0	535,846.3	1,013.0	542.8
2/14/2019	24.0	50.2	670.4	965,413.0	484,637.3	1,013.0	490.9
2/15/2019	24.0	50.2	632.8	911,261.0	457,453.0	1,013.0	463.4
2/16/2019	24.0	50.2	633.9	912,834.0	458,242.7	1,013.0	464.2
2/17/2019	24.0	50.2	633.8	912,617.0	458,133.7	1,013.0	464.1
2/18/2019	24.0	50.2	649.2	934,782.0	469,260.6	1,013.0	475.4
2/19/2019	24.0	50.2	775.0	1,116,009.0	560,236.5	1,013.0	567.5
2/20/2019	24.0	50.2	801.5	1,154,157.0	579,386.8	1,013.0	586.9
2/21/2019	24.0	50.2	679.2	978,105.0	491,008.7	1,013.0	497.4
2/22/2019	24.0	50.2	566.9	816,361.0	409,813.2	1,013.0	415.1
2/23/2019	24.0	50.2	562.8	810,475.0	406,858.5	1,013.0	412.1
2/24/2019	24.0	50.2	584.6	841,854.0	422,610.7	1,013.0	428.1
2/25/2019	24.0	50.2	592.6	853,335.0	428,374.2	1,013.0	433.9
2/26/2019	24.0	50.2	620.4	893,359.0	448,466.2	1,013.0	454.3
2/27/2019	24.0	50.2	603.3	868,792.0	436,133.6	1,013.0	441.8
2/28/2019	24.0	50.2	526.6	758,234.0	380,633.5	1,013.0	385.6
Monthly Total:	400.87			15,548,240.0	7,805,216.5		7,906.7
Monthly Average:		50.2	648.2			1,013.0	465.1
						Maximum	586.9

NOTES:

**Methane content derived from the 2018 A-4 Flare Source Test conducted on January 29, 2018.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: March-19

Date	Runtime (hours)	CH ₄ (%)**	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
3/1/2019	24.0	50.1	507.9	731,440.0	366,451.4	1,013.0	371.2
3/2/2019	24.0	50.1	508.3	731,948.0	366,705.9	1,013.0	371.5
3/3/2019	24.0	50.1	491.4	707,653.0	354,534.2	1,013.0	359.1
3/4/2019	23.9	50.1	494.9	708,701.0	355,059.2	1,013.0	359.7
3/5/2019	24.0	50.1	517.4	745,026.0	373,258.0	1,013.0	378.1
3/6/2019	24.0	50.1	501.0	721,449.0	361,445.9	1,013.0	366.1
3/7/2019	24.0	50.1	445.5	641,549.0	321,416.0	1,013.0	325.6
3/8/2019	24.0	50.1	363.2	523,059.0	262,052.6	1,013.0	265.5
3/9/2019	24.0	50.1	440.9	634,843.0	318,056.3	1,013.0	322.2
3/10/2019*	23.0	50.1	570.0	786,664.0	394,118.7	1,013.0	399.2
3/11/2019	24.0	50.1	563.5	811,436.0	406,529.4	1,013.0	411.8
3/12/2019	21.3	50.1	573.0	732,310.0	366,887.3	1,013.0	371.7
3/13/2019	24.0	50.1	592.4	853,079.0	427,392.6	1,013.0	432.9
3/14/2019	24.0	50.1	523.3	753,594.0	377,550.6	1,013.0	382.5
3/15/2019	24.0	50.1	539.6	777,083.0	389,318.6	1,013.0	394.4
3/16/2019	24.0	50.1	629.1	905,941.0	453,876.4	1,013.0	459.8
3/17/2019	24.0	50.1	671.2	966,568.0	484,250.6	1,013.0	490.5
3/18/2019	23.9	50.1	894.4	1,282,524.0	642,544.5	1,013.0	650.9
3/19/2019	24.0	50.1	1,033.0	1,487,534.0	745,254.5	1,013.0	754.9
3/20/2019	24.0	50.1	695.8	1,001,903.0	501,953.4	1,013.0	508.5
3/21/2019	24.0	50.1	493.3	710,307.0	355,863.8	1,013.0	360.5
3/22/2019	24.0	50.1	479.3	690,255.0	345,817.8	1,013.0	350.3
3/23/2019	24.0	50.1	485.7	699,380.0	350,389.4	1,013.0	354.9
3/24/2019	24.0	50.1	486.0	699,886.0	350,642.9	1,013.0	355.2
3/25/2019	24.0	50.1	485.0	698,370.0	349,883.4	1,013.0	354.4
3/26/2019	24.0	50.1	489.4	704,666.0	353,037.7	1,013.0	357.6
3/27/2019	24.0	50.1	478.4	688,932.0	345,154.9	1,013.0	349.6
3/28/2019	24.0	50.1	457.7	659,098.0	330,208.1	1,013.0	334.5
3/29/2019	24.0	50.1	449.0	646,497.0	323,895.0	1,013.0	328.1
3/30/2019	24.0	50.1	481.1	692,839.0	347,112.3	1,013.0	351.6
3/31/2019	24.0	50.1	486.0	699,816.0	350,607.8	1,013.0	355.2
Monthly Total:	740.07			24,094,350.0	12,071,269.4		12,228.2
Monthly Average:		50.1	542.8			1,013.0	394.5
						Maximum	754.9

NOTES:

*There are 743.00 hours available in March 2019 due to Daylight Saving Time.

**Methane content derived from the most recent A-4 Flare Source Test.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: April-19

Date	Runtime (hours)	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
4/1/2019	21.4	50.1	490.8	630,142.0	315,701.1	1,013.0	320.4
4/2/2019	23.7	50.1	467.5	663,835.0	332,581.3	1,013.0	337.6
4/3/2019	8.3	50.1	465.6	230,936.0	115,698.9	1,013.0	117.4
4/4/2019	0.0	50.1	0.0	0.0	0.0	1,013.0	0.0
4/5/2019	13.9	50.1	476.4	398,254.0	199,525.3	1,013.0	202.5
4/6/2019	24.0	50.1	481.2	692,913.0	347,149.4	1,013.0	352.4
4/7/2019	24.0	50.1	491.0	707,071.0	354,242.6	1,013.0	359.6
4/8/2019	19.5	50.1	500.8	584,918.0	293,043.9	1,013.0	297.4
4/9/2019	24.0	50.1	526.9	758,775.0	380,146.3	1,013.0	385.9
4/10/2019	21.8	50.1	545.2	714,238.0	357,833.2	1,013.0	363.2
4/11/2019	23.8	50.1	670.0	958,155.0	480,035.7	1,013.0	487.2
4/12/2019	24.0	50.1	521.5	750,995.0	376,248.5	1,013.0	381.9
4/13/2019	24.0	50.1	478.7	689,373.0	345,375.9	1,013.0	350.6
4/14/2019	24.0	50.1	485.4	699,011.0	350,204.5	1,013.0	355.5
4/15/2019	24.0	50.1	483.2	695,874.0	348,632.9	1,013.0	353.9
4/16/2019	24.0	50.1	621.8	895,373.0	448,581.9	1,013.0	455.3
4/17/2019	24.0	50.1	468.6	674,840.0	338,094.8	1,013.0	343.2
4/18/2019	24.0	50.1	479.7	690,718.0	346,049.7	1,013.0	351.2
4/19/2019	24.0	50.1	464.9	669,466.0	335,402.5	1,013.0	340.4
4/20/2019	24.0	50.1	445.2	641,142.0	321,212.1	1,013.0	326.0
4/21/2019	24.0	50.1	427.5	615,576.0	308,403.6	1,013.0	313.0
4/22/2019	24.0	50.1	569.7	820,407.0	411,023.9	1,013.0	417.2
4/23/2019	24.0	50.1	637.1	917,396.0	459,615.4	1,013.0	466.5
4/24/2019	24.0	50.1	604.1	869,889.0	435,814.4	1,013.0	442.4
4/25/2019	24.0	50.1	546.8	787,422.0	394,498.4	1,013.0	400.4
4/26/2019	24.0	50.1	456.2	656,983.0	329,148.5	1,013.0	334.1
4/27/2019	24.0	50.1	451.5	650,220.0	325,760.2	1,013.0	330.7
4/28/2019	24.0	50.1	445.9	642,036.0	321,660.0	1,013.0	326.5
4/29/2019	24.0	50.1	440.6	634,511.0	317,890.0	1,013.0	322.7
4/30/2019	24.0	50.1	500.7	721,025.0	361,233.5	1,013.0	366.7
Monthly Total:	660.40			20,061,494.0	10,050,808.5		10,201.8
Monthly Average:		50.1	505.0			1,013.0	351.8
						Maximum	487.2

NOTES:

*There are 743.00 hours available in March 2017 due to Daylight Saving Time.

**Methane content derived from the 2019 A-4 Flare Source Test conducted on March 13, 2019.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: May-19

Date	Runtime (hours)	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
5/1/2019	24.00	50.1	728.3	1,048,738.0	525,417.7	1,013.0	532.2
5/2/2019	24.00	50.1	538.4	775,328.0	388,439.3	1,013.0	393.5
5/3/2019	24.00	50.1	394.0	567,366.0	284,250.4	1,013.0	287.9
5/4/2019	24.00	50.1	377.1	543,051.0	272,068.6	1,013.0	275.6
5/5/2019	24.00	50.1	374.0	538,582.0	269,829.6	1,013.0	273.3
5/6/2019	24.00	50.1	417.0	600,522.0	300,861.5	1,013.0	304.8
5/7/2019	24.00	50.1	411.6	592,647.0	296,916.1	1,013.0	300.8
5/8/2019	24.00	50.1	434.7	625,970.0	313,611.0	1,013.0	317.7
5/9/2019	24.00	50.1	434.1	625,047.0	313,148.5	1,013.0	317.2
5/10/2019	24.00	50.1	422.8	608,805.0	305,011.3	1,013.0	309.0
5/11/2019	24.00	50.1	381.1	548,753.0	274,925.3	1,013.0	278.5
5/12/2019	24.00	50.1	382.9	551,318.0	276,210.3	1,013.0	279.8
5/13/2019	24.00	50.1	385.2	554,683.0	277,896.2	1,013.0	281.5
5/14/2019	24.00	50.1	387.9	558,595.0	279,856.1	1,013.0	283.5
5/15/2019	21.33	50.1	604.1	773,304.0	387,425.3	1,013.0	392.5
5/16/2019	24.00	50.1	589.5	848,934.0	425,315.9	1,013.0	430.8
5/17/2019	23.97	50.1	497.3	715,121.0	358,275.6	1,013.0	362.9
5/18/2019	24.00	50.1	564.8	813,276.0	407,451.3	1,013.0	412.7
5/19/2019	24.00	50.1	561.6	808,753.0	405,185.3	1,013.0	410.5
5/20/2019	24.00	50.1	613.5	883,402.0	442,584.4	1,013.0	448.3
5/21/2019	24.00	50.1	600.5	864,690.0	433,209.7	1,013.0	438.8
5/22/2019	20.30	50.1	931.6	1,134,707.0	568,488.2	1,013.0	575.9
5/23/2019	24.00	50.1	1,154.2	1,662,015.0	832,669.5	1,013.0	843.5
5/24/2019	23.73	50.1	1,190.5	1,695,292.0	849,341.3	1,013.0	860.4
5/25/2019	24.00	50.1	1,021.5	1,470,948.0	736,944.9	1,013.0	746.5
5/26/2019	24.00	50.1	1,069.3	1,539,844.0	771,461.8	1,013.0	781.5
5/27/2019	20.80	50.1	1,059.8	1,322,623.0	662,634.1	1,013.0	671.2
5/28/2019	10.93	50.1	1,088.8	714,220.0	357,824.2	1,013.0	362.5
5/29/2019	10.57	50.1	1,083.2	686,778.0	344,075.8	1,013.0	348.5
5/30/2019	24.00	50.1	1,025.5	1,476,746.0	739,849.7	1,013.0	749.5
5/31/2019	23.77	50.1	1,031.9	1,471,508.0	737,225.5	1,013.0	746.8
Monthly Total:	707.40			27,621,566.0	13,838,404.6		14,018.3
Monthly Average:		50.1	669.6			1,013.0	452.2
						Maximum	860.4

NOTES:

*There are 743.00 hours available in March 2017 due to Daylight Saving Time.

*Methane content derived from the 2019 A-4 Flare Source Test conducted on March 13, 2019.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: June-19

Date	Runtime (hours)	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
6/1/2019	24.0	50.1	1,019.7	1,468,391.0	735,663.9	1,013.0	745.2
6/2/2019	24.0	50.1	1,009.6	1,453,803.0	728,355.3	1,013.0	737.8
6/3/2019	24.0	50.1	1,003.3	1,444,811.0	723,850.3	1,013.0	733.3
6/4/2019	24.0	50.1	1,010.8	1,455,534.0	729,222.5	1,013.0	738.7
6/5/2019	24.0	50.1	1,026.2	1,477,671.0	740,313.2	1,013.0	749.9
6/6/2019	15.8	50.1	1,036.9	980,922.0	491,441.9	1,013.0	497.8
6/7/2019	15.3	50.1	1,141.1	1,045,204.0	523,647.2	1,013.0	530.5
6/8/2019	24.0	50.1	1,104.4	1,590,362.0	796,771.4	1,013.0	807.1
6/9/2019	24.0	50.1	1,107.1	1,594,209.0	798,698.7	1,013.0	809.1
6/10/2019	20.8	50.1	1,142.3	1,427,844.5	715,350.1	1,013.0	724.6
6/11/2019	24.0	50.1	1,180.2	1,699,435.0	851,416.9	1,013.0	862.5
6/12/2019	24.0	50.1	1,180.1	1,699,395.0	851,396.9	1,013.0	862.5
6/13/2019	24.0	50.1	915.2	1,317,864.0	660,249.9	1,013.0	668.8
6/14/2019	23.6	50.1	646.6	916,859.0	459,346.4	1,013.0	465.3
6/15/2019	24.0	50.1	567.1	816,565.0	409,099.1	1,013.0	414.4
6/16/2019	24.0	50.1	556.7	801,659.0	401,631.2	1,013.0	406.9
6/17/2019	22.2	50.1	572.1	762,080.0	381,802.1	1,013.0	386.8
6/18/2019	24.0	50.1	602.6	867,745.0	434,740.2	1,013.0	440.4
6/19/2019	20.8	50.1	863.4	1,079,212.0	540,685.2	1,013.0	547.7
6/20/2019	24.0	50.1	1,078.6	1,553,123.0	778,114.6	1,013.0	788.2
6/21/2019	23.5	50.1	908.8	1,279,599.0	641,079.1	1,013.0	649.4
6/22/2019	24.0	50.1	1,102.6	1,587,814.0	795,494.8	1,013.0	805.8
6/23/2019	24.0	50.1	1,118.3	1,610,365.0	806,792.9	1,013.0	817.3
6/24/2019	24.0	50.1	1,052.6	1,515,686.0	759,358.7	1,013.0	769.2
6/25/2019	13.4	50.1	1,048.8	841,151.0	421,416.7	1,013.0	426.9
6/26/2019	14.9	50.1	829.7	741,766.0	371,624.8	1,013.0	376.5
6/27/2019	24.0	50.1	781.7	1,125,577.0	563,914.1	1,013.0	571.2
6/28/2019	23.0	50.1	787.4	1,085,061.0	543,615.6	1,013.0	550.7
6/29/2019	24.0	50.1	801.0	1,153,431.0	577,868.9	1,013.0	585.4
6/30/2019	24.0	50.1	794.6	1,144,234.0	573,261.2	1,013.0	580.7
Monthly Total:	673.23			37,537,372.5	18,806,223.6		19,050.7
Monthly Average:		50.1	933.0			1,013.0	635.0
						Maximum	862.5

NOTES:

*There are 743.00 hours available in March 2017 due to Daylight Saving Time.

*Methane content derived from the 2019 A-4 Flare Source Test conducted on March 13, 2019.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: July-19

Date	Runtime (hours)	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
7/1/2019	24.0	50.1	760.8	1,095,571.0	548,881.1	1,013.0	556.0
7/2/2019	24.0	50.1	984.9	1,418,197.0	710,516.7	1,013.0	719.8
7/3/2019	24.0	50.1	599.8	863,727.0	432,727.2	1,013.0	438.4
7/4/2019	24.0	50.1	552.8	796,100.0	398,846.1	1,013.0	404.0
7/5/2019	24.0	50.1	539.8	777,250.0	389,402.3	1,013.0	394.5
7/6/2019	24.0	50.1	548.8	790,335.0	395,957.8	1,013.0	401.1
7/7/2019	24.0	50.1	591.1	851,195.0	426,448.7	1,013.0	432.0
7/8/2019	24.0	50.1	593.7	854,915.0	428,312.4	1,013.0	433.9
7/9/2019	24.0	50.1	547.0	787,636.0	394,605.6	1,013.0	399.7
7/10/2019	24.0	50.1	739.9	1,065,483.0	533,807.0	1,013.0	540.7
7/11/2019	24.0	50.1	738.7	1,063,723.0	532,925.2	1,013.0	539.9
7/12/2019	24.0	50.1	793.9	1,143,266.0	572,776.3	1,013.0	580.2
7/13/2019	24.0	50.1	878.5	1,264,977.0	633,753.5	1,013.0	642.0
7/14/2019	24.0	50.1	868.7	1,250,946.0	626,723.9	1,013.0	634.9
7/15/2019	22.1	50.1	884.4	1,170,922.5	586,632.2	1,013.0	594.3
7/16/2019	24.0	50.1	703.4	1,012,907.0	507,466.4	1,013.0	514.1
7/17/2019	24.0	50.1	602.8	867,987.0	434,861.5	1,013.0	440.5
7/18/2019	21.2	50.1	562.5	716,634.0	359,033.6	1,013.0	363.7
7/19/2019	23.6	50.1	585.2	829,770.0	415,714.8	1,013.0	421.1
7/20/2019	24.0	50.1	585.1	842,590.0	422,137.6	1,013.0	427.6
7/21/2019	24.0	50.1	626.5	902,137.0	451,970.6	1,013.0	457.8
7/22/2019	24.0	50.1	603.5	869,058.0	435,398.1	1,013.0	441.1
7/23/2019	23.6	50.1	533.1	755,910.0	378,710.9	1,013.0	383.6
7/24/2019	22.0	50.1	567.9	749,605.5	375,552.4	1,013.0	380.4
7/25/2019	24.0	50.1	549.8	791,753.0	396,668.3	1,013.0	401.8
7/26/2019	24.0	50.1	510.1	734,588.0	368,028.6	1,013.0	372.8
7/27/2019	24.0	50.1	524.4	755,071.0	378,290.6	1,013.0	383.2
7/28/2019	24.0	50.1	539.4	776,743.0	389,148.2	1,013.0	394.2
7/29/2019	24.0	50.1	534.7	769,992.0	385,766.0	1,013.0	390.8
7/30/2019	24.0	50.1	543.4	782,486.0	392,025.5	1,013.0	397.1
7/31/2019	24.0	50.1	523.3	753,601.0	377,554.1	1,013.0	382.5
Monthly Total:	736.57			28,105,076.0	14,080,643.1		14,263.7
Monthly Average:		50.1	636.1			1,013.0	460.1
						Maximum	719.8

NOTES:

*There are 743.00 hours available in March 2017 due to Daylight Saving Time.

*Methane content derived from the 2019 A-4 Flare Source Test conducted on March 13, 2019.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

MONTHLY LFG Input to Internal Combustion (IC) Engines
SONOMA COUNTY CENTRAL LANDFILL - PETALUMA, CALIFORNIA

Month ¹	IC Engines Phase 1 Volume (scf) ²	IC Engines Phase 2 Volume (scf)	IC Engines Phase 3 Volume (scf) ³	A-4 Flare Volume (scf)	Total Monthly LFG Volume (scf)	IC Engines Phase 1 Heat Input (mmBTU)	IC Engines Phase 2 Heat Input (mmBTU)	IC Engines Phase 3 Heat Input (mmBTU)	A-4 Flare Heat Input (mmBTU)	Total Monthly Heat Input All Control Devices (mmBTU)
Feb-19	31,288,498.3	25,644,413.0	0.0	15,548,240.0	72,481,151.3	16,227.8	13,301.0	0.0	7,906.7	37,435.5
Mar-19	34,005,290.0	27,911,837.3	0.0	24,094,350.0	86,011,477.3	17,120.3	14,052.5	0.0	12,228.2	43,401.1
Apr-19	35,976,766.4	30,528,641.7	0.0	20,061,494.0	86,566,902.1	18,222.2	15,462.8	0.0	10,201.8	43,886.9
May-19	23,450,534.6	30,346,823.6	0.0	27,621,566.0	81,418,924.2	11,877.7	15,370.7	0.0	14,018.3	41,266.7
Jun-19	12,151,917.5	30,085,681.9	0.0	37,537,372.5	79,774,971.9	6,191.9	15,329.8	0.0	19,050.7	40,572.4
Jul-19	34,507,270.0	31,242,029.0	0.0	28,105,076.0	93,854,375.0	17,512.9	15,849.1	0.0	14,263.7	47,625.6
TOTALS:	171,380,276.8	175,759,426.5	0.0	152,968,098.5	500,107,801.8	87,152.8	89,365.9	0.0	77,669.4	254,188.1

NOTES:

¹There were 743.00 hours in March 2019 due to Daylight Savings Time.

²IC Engine S-13 was brought back online as of January 17, 2017 is reported with the Phase I engine group.

³Phase 3 consists of IC Engine 10 (S-14), which is in long-term standby mode and no did not operate.

*Methane content per monthly report as provided by Aria Energy/Landfill Energy Systems (LES) end of month (EOM) report.

scfm= standard cubic feet per minute

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

MONTHLY CO EMISSIONS
SONOMA COUNTY CENTRAL LANDFILL - PETALUMA, CALIFORNIA

Emission Units	A-3 Flare ¹		A-4 Flare ¹		Flares Combined CO (tons)	Engine 1 (S-4)		Engine 2 (S-5)		Engine 3 (S-6)		Engine 4 (S-7) ²		Engine 9 (S-13) ¹		Engine 5 (S-9)		Engine 6 (S-10)		Engine 7 (S-11)		Engine 8 (S-12)		S-24 Portable Engine	
	MMBTU	CO (tons)	MMBTU	CO (tons)		Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)
August-18	N/A ¹	N/A ¹	14,763.96	0.672	0.67	470.08	1.24	567.95	1.50	0.00	0.00	0.00	0.00	521.08	1.37	666.77	1.76	702.67	1.85	642.75	1.69	0.00	0.00	228.60	0.10
September-18	N/A ¹	N/A ¹	12,987.24	0.591	0.59	718.57	1.89	719.83	1.90	717.07	1.89	0.00	0.00	51.00	0.13	688.97	1.82	708.70	1.87	565.57	1.49	58.50	0.15	228.60	0.10
October-18	N/A ¹	N/A ¹	15,749.57	0.717	0.72	537.87	1.42	533.90	1.41	402.03	1.06	0.00	0.00	175.20	0.46	501.00	1.32	477.83	1.26	428.57	1.13	103.20	0.27	216.00	0.09
November-18	N/A ¹	N/A ¹	4,131.20	0.188	0.19	691.27	1.82	705.80	1.86	663.60	1.75	0.00	0.00	49.77	0.13	697.60	1.84	710.17	1.87	100.20	0.26	646.40	1.70	208.20	0.09
December-18	N/A ¹	N/A ¹	10,413.52	0.474	0.47	706.10	1.86	697.87	1.84	581.73	1.53	0.00	0.00	557.93	1.47	521.40	1.37	732.43	1.93	0.00	0.00	742.97	1.96	216.30	0.09
January-19	N/A ¹	N/A ¹	9,274.40	0.422	0.42	260.80	0.69	678.10	1.79	723.77	1.91	0.00	0.00	526.07	1.39	728.90	1.92	644.70	1.70	13.50	0.04	720.00	1.90	249.90	0.11
February-19	N/A ¹	N/A ¹	7,906.68	0.360	0.36	595.87	1.57	594.07	1.57	619.73	1.63	0.00	0.00	239.10	0.63	176.03	0.46	671.97	1.77	306.20	0.81	662.87	1.75	192.20	0.08
March-19	N/A ¹	N/A ¹	12,228.20	0.556	0.56	611.77	1.61	693.53	1.83	693.27	1.83	0.00	0.00	138.83	0.37	0.00	0.00	643.20	1.69	694.20	1.83	648.90	1.71	202.70	0.09
April-19	N/A ¹	N/A ¹	10,201.79	0.464	0.46	707.93	1.87	708.07	1.87	708.20	1.87	0.00	0.00	35.37	0.09	0.00	0.00	679.87	1.79	667.43	1.76	653.37	1.72	221.20	0.10
May-19	N/A ¹	N/A ¹	14,018.30	0.638	0.64	480.63	1.27	486.30	1.28	450.87	1.19	0.00	0.00	6.10	0.02	0.00	0.00	653.60	1.72	677.93	1.79	684.10	1.80	229.50	0.10
June-19	N/A ¹	N/A ¹	19,050.70	0.867	0.43	145.33	0.38	286.30	0.75	296.40	0.78	3.17	0.01	2.07	0.01	0.00	0.00	663.27	1.75	701.03	1.85	686.70	1.81	212.50	0.09
July-19	N/A ¹	N/A ¹	14,263.69	0.649	0.65	181.63	0.48	559.60	1.47	607.10	1.60	711.53	1.87	0.00	0.00	394.70	1.04	242.50	0.64	736.03	1.94	706.17	1.86	229.50	0.10
12-Month Rolling Totals:					8.40		22.10		25.49		17.03		1.88		14.39		20.03		30.42		22.85		23.11		1.73

NOTES:
¹ The A-3 Flare was permanently decommissioned in November 2017 and replaced with the A-4 Flare in December 2017.
² Per Republic, the S-24 Engine is operational during all landfill operation hours. For the hours by month compliance requirement for the S-24 Engine hours are tracked based on the 8 hour day, six days a week operation for the landfill minus major holidays and maintenance hours. Operational hours are provided by Republic.
³ Per Republic, the S-6 Engine was offline in October 2018.
Pursuant to AN 28326, Condition 26507, Parts 1, the flares shall not exceed a combined total of 54,768 tons of CO per year and 23,076 tons of CO per year for each IC Engine, during any consecutive rolling 12-month period.

Site-wide Totals	
Month	CO (tons)
August-18	10.18
September-18	11.83
October-18	9.14
November-18	11.52
December-18	12.53
January-19	11.85
February-19	10.63
March-19	11.51
April-19	11.52
May-19	9.80
June-19	7.86
July-19	11.65
TOTALS:	130.02

**ATTACHMENT B
REVISED APPENDICES O AND R FOR AUGUST 1, 2019 THROUGH
JANUARY 31, 2019 SAR**

MONTHLY LFG Input to Flare (A-4)
SONOMA COUNTY CENTRAL LANDFILL - PETALUMA, CALIFORNIA

Month	Total Available Runtime (hours)	Total Downtime (hours)	Total Runtime (hours)	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Total Heat Input (MMBTU)
August-19	744.00	58.33	685.67	50.1	480.35	19,864,252.5	9,951,990.5	10,081.4
September-19	720.00	59.00	661.00	50.1	1,087.12	43,058,169.0	21,572,142.7	21,852.6
October-19	744.00	24.87	719.13	50.1	737.28	31,147,146.5	15,604,720.4	15,807.6
November-19 ¹	721.00	90.07	630.93	50.1	319.34	23,767,059.5	11,907,296.8	12,062.1
December-19	744.00	0.00	744.00	50.1	533.58	23,819,149.0	11,933,393.6	12,088.5
January-20	744.00	2.53	741.47	50.1	646.09	28,761,592.0	14,409,557.6	14,596.9
TOTALS:	4,417.00	234.80	4,182.20			170,417,368.5	85,379,101.6	86,489.0
AVERAGES:				50.1	634.0			

Methane content for August 2019 through January 2020 derived from the March 2019 A-4 Flare Source Test.

¹There were 741.00 hours in November 2019 due to Daylight Saving Time.

Pursuant to Title V Condition 4044, Part 13, the heat input to the A-4 Flare shall not exceed 547,680 MMBTU per year.

scfm= standard cubic feet per minute

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: August-19

Date	Runtime (hours)	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
8/1/2019	21.67	50.1	565.6	735,257.0	368,363.8	1,013.0	373.2
8/2/2019	24.00	50.1	542.6	781,288.5	391,425.5	1,013.0	396.5
8/3/2019	24.00	50.1	536.4	772,475.0	387,010.0	1,013.0	392.0
8/4/2019	24.00	50.1	582.2	838,317.0	419,996.8	1,013.0	425.5
8/5/2019	24.00	50.1	574.9	827,804.0	414,729.8	1,013.0	420.1
8/6/2019	24.00	50.1	530.1	763,328.5	382,427.6	1,013.0	387.4
8/7/2019	24.00	50.1	533.7	768,523.0	385,030.0	1,013.0	390.0
8/8/2019	24.00	50.1	528.0	760,258.0	380,889.3	1,013.0	385.8
8/9/2019	24.00	50.1	529.8	762,944.0	382,234.9	1,013.0	387.2
8/10/2019	24.00	50.1	523.3	753,559.0	377,533.1	1,013.0	382.4
8/11/2019	24.00	50.1	538.3	775,085.0	388,317.6	1,013.0	393.4
8/12/2019	24.00	50.1	617.9	889,825.0	445,802.3	1,013.0	451.6
8/13/2019	24.00	50.1	599.5	863,213.0	432,469.7	1,013.0	438.1
8/14/2019	24.00	50.1	641.7	923,982.0	462,915.0	1,013.0	468.9
8/15/2019	10.73	50.1	667.2	429,688.0	215,273.7	1,013.0	218.1
8/16/2019	12.17	50.1	455.7	332,625.0	166,645.1	1,013.0	168.8
8/17/2019	24.00	50.1	374.9	539,909.0	270,494.4	1,013.0	274.0
8/18/2019	24.00	50.1	336.4	484,387.0	242,677.9	1,013.0	245.8
8/19/2019	21.43	50.1	373.6	480,493.0	240,727.0	1,013.0	243.9
8/20/2019	23.57	50.1	395.9	559,869.0	280,494.4	1,013.0	284.1
8/21/2019	24.00	50.1	517.1	744,591.0	373,040.1	1,013.0	377.9
8/22/2019	24.00	50.1	420.5	605,529.0	303,370.0	1,013.0	307.3
8/23/2019	24.00	50.1	410.2	590,741.0	295,961.2	1,013.0	299.8
8/24/2019	24.00	50.1	403.2	580,619.0	290,890.1	1,013.0	294.7
8/25/2019	24.00	50.1	399.6	575,380.0	288,265.4	1,013.0	292.0
8/26/2019	24.00	50.1	416.1	599,134.0	300,166.1	1,013.0	304.1
8/27/2019	24.00	50.1	421.9	607,528.0	304,371.5	1,013.0	308.3
8/28/2019	20.60	50.1	379.4	468,888.0	234,912.9	1,013.0	238.0
8/29/2019	17.57	50.1	376.7	397,072.0	198,933.1	1,013.0	201.5
8/30/2019	22.30	50.1	377.2	504,679.5	252,844.4	1,013.0	256.1
8/31/2019	7.63	50.1	321.5	147,261.0	73,777.8	1,013.0	74.7
Monthly Total:	685.67			19,864,252.5	9,951,990.5		10,081.4
Monthly Average:		50.1	480.4			1,013.0	325.2
						Maximum	468.9

NOTES:

*Methane content derived from the 2019 A-4 Flare Source Test conducted on March 13, 2019.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: September-19

Date	Runtime (hours)	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
9/1/2019	0.00	50.1	0.0	0.0	0.0	1,013.0	0.0
9/2/2019	0.00	50.1	0.0	0.0	0.0	1,013.0	0.0
9/3/2019	13.03	50.1	1,173.3	917,549.0	459,692.0	1,013.0	465.7
9/4/2019	24.00	50.1	1,104.8	1,590,903.0	797,042.4	1,013.0	807.4
9/5/2019	24.00	50.1	1,059.2	1,525,290.0	764,170.3	1,013.0	774.1
9/6/2019	24.00	50.1	975.4	1,404,607.0	703,708.1	1,013.0	712.9
9/7/2019	24.00	50.1	1,033.5	1,488,286.0	745,631.3	1,013.0	755.3
9/8/2019	24.00	50.1	1,038.7	1,495,706.0	749,348.7	1,013.0	759.1
9/9/2019	23.97	50.1	1,224.1	1,760,279.0	881,899.8	1,013.0	893.4
9/10/2019	24.00	50.1	1,434.3	2,065,371.0	1,034,750.9	1,013.0	1048.2
9/11/2019	24.00	50.1	1,458.8	2,100,661.0	1,052,431.2	1,013.0	1066.1
9/12/2019	24.00	50.1	1,326.3	1,909,859.0	956,839.4	1,013.0	969.3
9/13/2019	24.00	50.1	1,079.9	1,555,054.0	779,082.1	1,013.0	789.2
9/14/2019	24.00	50.1	1,057.8	1,523,227.0	763,136.7	1,013.0	773.1
9/15/2019	24.00	50.1	1,033.6	1,488,362.0	745,669.4	1,013.0	755.4
9/16/2019	24.00	50.1	1,022.7	1,472,728.0	737,836.7	1,013.0	747.4
9/17/2019	24.00	50.1	1,095.1	1,576,886.0	790,019.9	1,013.0	800.3
9/18/2019	24.00	50.1	1,098.9	1,582,416.0	792,790.4	1,013.0	803.1
9/19/2019	24.00	50.1	1,319.5	1,900,022.0	951,911.0	1,013.0	964.3
9/20/2019	24.00	50.1	1,114.7	1,605,149.0	804,179.6	1,013.0	814.6
9/21/2019	24.00	50.1	801.2	1,153,756.0	578,031.8	1,013.0	585.5
9/22/2019	24.00	50.1	943.6	1,358,741.0	680,729.2	1,013.0	689.6
9/23/2019	24.00	50.1	846.6	1,219,121.0	610,779.6	1,013.0	618.7
9/24/2019	24.00	50.1	757.2	1,090,298.0	546,239.3	1,013.0	553.3
9/25/2019	24.00	50.1	807.6	1,163,012.0	582,669.0	1,013.0	590.2
9/26/2019	24.00	50.1	944.8	1,360,551.0	681,636.1	1,013.0	690.5
9/27/2019	24.00	50.1	1,221.1	1,758,379.0	880,947.9	1,013.0	892.4
9/28/2019	24.00	50.1	1,223.7	1,762,182.0	882,853.2	1,013.0	894.3
9/29/2019	24.00	50.1	1,240.9	1,786,840.0	895,206.8	1,013.0	906.8
9/30/2019	24.00	50.1	1,002.0	1,442,934.0	722,909.9	1,013.0	732.3
Monthly Total:	661.00			43,058,169.0	21,572,142.7		21,852.6
Monthly Average:		50.1	1,087.1			1,013.0	780.4
						Maximum	1,066.1

NOTES:

*Methane content derived from the 2019 A-4 Flare Source Test conducted on March 13, 2019.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: October-19

Date	Runtime (hours)	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
10/1/2019	24.00	50.1	712.2	1,025,607.0	513,829.1	1,013.0	520.5
10/2/2019	24.00	50.1	650.2	936,282.0	469,077.3	1,013.0	475.2
10/3/2019	24.00	50.1	610.2	878,716.0	440,236.7	1,013.0	446.0
10/4/2019	24.00	50.1	671.8	967,437.0	484,685.9	1,013.0	491.0
10/5/2019	24.00	50.1	716.2	1,031,379.0	516,720.9	1,013.0	523.4
10/6/2019	24.00	50.1	811.6	1,168,646.0	585,491.6	1,013.0	593.1
10/7/2019	24.00	50.1	714.5	1,028,829.0	515,443.3	1,013.0	522.1
10/8/2019	24.00	50.1	611.8	880,965.5	441,363.7	1,013.0	447.1
10/9/2019	24.00	50.1	584.1	841,102.5	421,392.4	1,013.0	426.9
10/10/2019	23.20	50.1	604.6	841,556.0	421,619.6	1,013.0	427.1
10/11/2019	24.00	50.1	586.3	844,256.0	422,972.3	1,013.0	428.5
10/12/2019	24.00	50.1	597.0	859,749.0	430,734.2	1,013.0	436.3
10/13/2019	24.00	50.1	568.5	818,594.0	410,115.6	1,013.0	415.4
10/14/2019	24.00	50.1	593.0	853,952.0	427,830.0	1,013.0	433.4
10/15/2019	24.00	50.1	757.1	1,090,262.0	546,221.3	1,013.0	553.3
10/16/2019	24.00	50.1	712.2	1,025,527.5	513,789.3	1,013.0	520.5
10/17/2019	24.00	50.1	614.8	885,285.0	443,527.8	1,013.0	449.3
10/18/2019	24.00	50.1	600.0	863,946.0	432,836.9	1,013.0	438.5
10/19/2019	24.00	50.1	601.3	865,835.0	433,783.3	1,013.0	439.4
10/20/2019	24.00	50.1	601.1	865,573.0	433,652.1	1,013.0	439.3
10/21/2019	23.33	50.1	649.4	909,169.0	455,493.7	1,013.0	461.4
10/22/2019	24.00	50.1	621.1	894,385.5	448,087.1	1,013.0	453.9
10/23/2019	24.00	50.1	668.7	962,900.0	482,412.9	1,013.0	488.7
10/24/2019	24.00	50.1	699.1	1,006,765.0	504,389.3	1,013.0	510.9
10/25/2019	24.00	50.1	708.1	1,019,640.0	510,839.6	1,013.0	517.5
10/26/2019	18.03	50.1	964.7	1,043,830.0	522,958.8	1,013.0	529.8
10/27/2019	17.00	50.1	1,290.4	1,316,175.0	659,403.7	1,013.0	668.0
10/28/2019	15.37	50.1	1,324.3	1,220,975.0	611,708.5	1,013.0	619.7
10/29/2019	22.20	50.1	1,264.4	1,684,224.0	843,796.2	1,013.0	854.8
10/30/2019	24.00	50.1	957.1	1,378,169.5	690,462.9	1,013.0	699.4
10/31/2019	24.00	50.1	789.9	1,137,414.0	569,844.4	1,013.0	577.3
Monthly Total:	719.13			31,147,146.5	15,604,720.4		15,807.6
Monthly Average:		50.1	737.3			1,013.0	509.9
						Maximum	854.8

NOTES:

*Methane content derived from the 2019 A-4 Flare Source Test conducted on March 13, 2019.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: November-19

Date	Runtime (hours)*	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
11/1/2019	24.00	50.1	680.2	979,525.0	490,742.0	1,013.0	497.1
11/2/2019	24.00	50.1	622.8	896,892.0	449,342.9	1,013.0	455.2
11/3/2019	25.00	50.1	676.0	1,014,004.0	508,016.0	1,013.0	514.6
11/4/2019	23.43	50.1	614.4	863,877.5	432,802.6	1,013.0	438.4
11/5/2019	24.00	50.1	565.6	814,502.0	408,065.5	1,013.0	413.4
11/6/2019	24.00	50.1	538.7	775,766.5	388,659.0	1,013.0	393.7
11/7/2019	24.00	50.1	526.2	757,762.0	379,638.8	1,013.0	384.6
11/8/2019	24.00	50.1	505.5	727,865.0	364,660.4	1,013.0	369.4
11/9/2019	24.00	50.1	678.2	976,567.0	489,260.1	1,013.0	495.6
11/10/2019	24.00	50.1	709.4	1,021,474.0	511,758.5	1,013.0	518.4
11/11/2019	24.00	50.1	598.0	861,105.0	431,413.6	1,013.0	437.0
11/12/2019	24.00	50.1	569.2	819,649.0	410,644.1	1,013.0	416.0
11/13/2019	23.67	50.1	511.9	726,928.0	364,190.9	1,013.0	368.9
11/14/2019	7.20	50.1	455.3	196,678.0	98,535.7	1,013.0	99.8
11/15/2019	8.33	50.1	1,234.1	617,059.0	309,146.6	1,013.0	313.2
11/16/2019	0.00	50.1	0.0	0.0	0.0	1,013.0	0.0
11/17/2019	0.00	50.1	0.0	0.0	0.0	1,013.0	0.0
11/18/2019	15.30	50.1	717.8	658,903.5	330,110.7	1,013.0	334.4
11/19/2019	24.00	50.1	688.8	991,844.0	496,913.8	1,013.0	503.4
11/20/2019	24.00	50.1	639.3	920,589.0	461,215.1	1,013.0	467.2
11/21/2019	24.00	50.1	521.4	750,816.0	376,158.8	1,013.0	381.0
11/22/2019	24.00	50.1	522.6	752,536.0	377,020.5	1,013.0	381.9
11/23/2019	24.00	50.1	601.3	865,859.0	433,795.4	1,013.0	439.4
11/24/2019	24.00	50.1	606.2	872,919.0	437,332.4	1,013.0	443.0
11/25/2019	24.00	50.1	601.8	866,570.0	434,151.6	1,013.0	439.8
11/26/2019	24.00	50.1	639.7	921,195.0	461,518.7	1,013.0	467.5
11/27/2019	24.00	50.1	667.6	961,358.0	481,640.4	1,013.0	487.9
11/28/2019	24.00	50.1	746.9	1,075,515.0	538,833.0	1,013.0	545.8
11/29/2019	24.00	50.1	714.3	1,028,663.0	515,360.2	1,013.0	522.1
11/30/2019	24.00	50.1	729.6	1,050,638.0	526,369.6	1,013.0	533.2
Monthly Total:	630.93			23,767,059.5	11,907,296.8		12,062.1
Monthly Average:		50.1	638.7			1,013.0	430.8
						Maximum	545.8

NOTES:

*There are 721.00 hours available in November 2019 due to Daylight Saving Time.

*Methane content derived from the 2019 A-4 Flare Source Test conducted on March 13, 2019.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: December-19

Date	Runtime (hours)	CH ₄ (%) [*]	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
12/1/2019	24.00	50.1	842.4	1,213,078.0	607,752.1	1,013.0	615.7
12/2/2019	24.00	50.1	668.2	962,175.0	482,049.7	1,013.0	488.3
12/3/2019	24.00	50.1	574.8	827,665.0	414,660.2	1,013.0	420.1
12/4/2019	24.00	50.1	576.3	829,867.0	415,763.4	1,013.0	421.2
12/5/2019	24.00	50.1	561.9	809,150.0	405,384.2	1,013.0	410.7
12/6/2019	24.00	50.1	584.5	841,674.0	421,678.7	1,013.0	427.2
12/7/2019	24.00	50.1	596.0	858,306.0	430,011.3	1,013.0	435.6
12/8/2019	24.00	50.1	589.6	849,003.0	425,350.5	1,013.0	430.9
12/9/2019	24.00	50.1	646.4	930,810.0	466,335.8	1,013.0	472.4
12/10/2019	24.00	50.1	628.7	905,260.0	453,535.3	1,013.0	459.4
12/11/2019	24.00	50.1	641.5	923,756.0	462,801.8	1,013.0	468.8
12/12/2019	24.00	50.1	659.2	949,294.0	475,596.3	1,013.0	481.8
12/13/2019	24.00	50.1	572.4	824,285.0	412,966.8	1,013.0	418.3
12/14/2019	24.00	50.1	416.2	599,258.0	300,228.3	1,013.0	304.1
12/15/2019	24.00	50.1	487.1	701,408.0	351,405.4	1,013.0	356.0
12/16/2019	24.00	50.1	479.2	690,087.0	345,733.6	1,013.0	350.2
12/17/2019	24.00	50.1	401.5	578,135.0	289,645.6	1,013.0	293.4
12/18/2019	24.00	50.1	391.1	563,138.0	282,132.1	1,013.0	285.8
12/19/2019	24.00	50.1	403.7	581,393.0	291,277.9	1,013.0	295.1
12/20/2019	24.00	50.1	422.2	608,016.0	304,616.0	1,013.0	308.6
12/21/2019	24.00	50.1	547.9	788,971.0	395,274.5	1,013.0	400.4
12/22/2019	24.00	50.1	525.2	756,331.0	378,921.8	1,013.0	383.8
12/23/2019	24.00	50.1	447.8	644,761.0	323,025.3	1,013.0	327.2
12/24/2019	24.00	50.1	439.5	632,914.0	317,089.9	1,013.0	321.2
12/25/2019	24.00	50.1	479.8	690,909.0	346,145.4	1,013.0	350.6
12/26/2019	24.00	50.1	455.7	656,195.0	328,753.7	1,013.0	333.0
12/27/2019	24.00	50.1	439.9	633,482.0	317,374.5	1,013.0	321.5
12/28/2019	24.00	50.1	511.1	736,011.0	368,741.5	1,013.0	373.5
12/29/2019	24.00	50.1	590.1	849,771.0	425,735.3	1,013.0	431.3
12/30/2019	24.00	50.1	478.1	688,392.0	344,884.4	1,013.0	349.4
12/31/2019	24.00	50.1	483.1	695,654.0	348,522.7	1,013.0	353.1
Monthly Total:	744.00			23,819,149.0	11,933,393.6		12,088.5
Monthly Average:		50.1	533.6			1,013.0	390.0
						Maximum	615.7

NOTES:

*Methane content derived from the 2019 A-4 Flare Source Test conducted on March 13, 2019.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

SONOMA COUNTY CENTRAL LANDFILL
Petaluma, California

Heat Input Rate

A-4 Flare

MONTH: January-20

Date	Runtime (hours)	CH ₄ (%)*	Average Flow (scfm)	Total LFG Volume (scf)	Total CH ₄ Volume (scf)	Heating Value of CH ₄ (BTU/scf)	Heat Input (MMBTU)/Day
1/1/2020	24.00	50.1	592.5	853,265.0	427,485.8	1,013.0	433.0
1/2/2020	24.00	50.1	597.8	860,825.0	431,273.3	1,013.0	436.9
1/3/2020	24.00	50.1	583.6	840,420.0	421,050.4	1,013.0	426.5
1/4/2020	24.00	50.1	559.3	805,407.0	403,508.9	1,013.0	408.8
1/5/2020	24.00	50.1	625.0	900,020.0	450,910.0	1,013.0	456.8
1/6/2020	23.97	50.1	625.8	899,964.0	450,882.0	1,013.0	456.7
1/7/2020	24.00	50.1	550.1	792,074.0	396,829.1	1,013.0	402.0
1/8/2020	24.00	50.1	499.1	718,646.0	360,041.6	1,013.0	364.7
1/9/2020	24.00	50.1	473.8	682,280.0	341,822.3	1,013.0	346.3
1/10/2020	22.47	50.1	572.3	771,435.0	386,488.9	1,013.0	391.5
1/11/2020	24.00	50.1	638.8	919,838.0	460,838.8	1,013.0	466.8
1/12/2020	24.00	50.1	577.4	831,453.0	416,558.0	1,013.0	422.0
1/13/2020	24.00	50.1	493.9	711,234.0	356,328.2	1,013.0	361.0
1/14/2020	23.40	50.1	453.0	635,956.0	318,614.0	1,013.0	322.8
1/15/2020	24.00	50.1	461.2	664,128.0	332,728.1	1,013.0	337.1
1/16/2020	23.63	50.1	447.9	635,058.0	318,164.1	1,013.0	322.3
1/17/2020	24.00	50.1	413.7	595,716.0	298,453.7	1,013.0	302.3
1/18/2020	24.00	50.1	1,115.4	1,606,229.0	804,720.7	1,013.0	815.2
1/19/2020	24.00	50.1	1,268.1	1,826,020.0	914,836.0	1,013.0	926.7
1/20/2020	24.00	50.1	946.4	1,362,769.0	682,747.3	1,013.0	691.6
1/21/2020	24.00	50.1	631.6	909,523.0	455,671.0	1,013.0	461.6
1/22/2020	24.00	50.1	599.9	863,839.0	432,783.3	1,013.0	438.4
1/23/2020	24.00	50.1	812.9	1,170,526.0	586,433.5	1,013.0	594.1
1/24/2020	24.00	50.1	697.4	1,004,278.0	503,143.3	1,013.0	509.7
1/25/2020	24.00	50.1	626.9	902,688.0	452,246.7	1,013.0	458.1
1/26/2020	24.00	50.1	629.6	906,598.0	454,205.6	1,013.0	460.1
1/27/2020	24.00	50.1	622.5	896,374.0	449,083.4	1,013.0	454.9
1/28/2020	24.00	50.1	680.0	979,201.0	490,579.7	1,013.0	497.0
1/29/2020	24.00	50.1	736.9	1,061,070.0	531,596.1	1,013.0	538.5
1/30/2020	24.00	50.1	745.6	1,073,625.0	537,886.1	1,013.0	544.9
1/31/2020	24.00	50.1	750.8	1,081,133.0	541,647.6	1,013.0	548.7
Monthly Total:	741.47			28,761,592.0	14,409,557.6		14,596.9
Monthly Average:		50.1	646.1			1,013.0	470.9
						Maximum	926.7

NOTES:

*Methane content derived from the 2019 A-4 Flare Source Test conducted on March 13, 2019.

scfm= standard cubic feet per minute

BTU/scf= British thermal unit per square cubic feet

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

%= percent

MONTHLY LFG Input to Internal Combustion (IC) Engines
SONOMA COUNTY CENTRAL LANDFILL - PETALUMA, CALIFORNIA

Month ¹	IC Engines Phase 1 Volume (scf) ²	IC Engines Phase 2 Volume (scf)	IC Engines Phase 3 Volume (scf) ²	A-4 Flare Volume (scf)	Total Monthly LFG Volume (scf)	IC Engines Phase 1 Heat Input (mmBTU)	IC Engines Phase 2 Heat Input (mmBTU)	IC Engines Phase 3 Heat Input (mmBTU)	A-4 Flare Heat Input (mmBTU)	Total Monthly Heat Input All Control Devices (mmBTU)
Aug-19	42,997,376.3	32,247,159.3	0.0	19,864,252.5	95,108,788.1	21,603.9	16,202.5	0.0	10,081.4	47,887.8
Sep-19	26,099,611.1	6,307,919.9	0.0	43,058,169.0	75,465,700.0	12,981.5	3,137.5	0.0	21,852.6	37,971.5
Oct-19	26,856,438.0	25,966,530.2	0.0	31,147,146.5	83,970,114.6	13,602.8	13,152.0	0.0	15,807.6	42,562.4
Nov-19	28,978,620.0	30,440,728.7	0.0	23,767,059.5	83,186,408.1	14,619.0	15,356.6	0.0	12,062.1	42,037.6
Dec-19	36,597,218.1	28,999,883.7	0.0	23,819,149.0	89,416,250.8	18,684.8	14,805.9	0.0	12,088.5	45,579.3
Jan-20	34,712,483.3	20,754,851.2	0.0	28,761,592.0	84,228,926.5	18,320.3	10,953.9	0.0	14,596.9	43,871.0
TOTALS:	196,241,746.7	144,717,073.0	0.0	170,417,368.5	511,376,188.2	99,812.3	73,608.4	0.0	86,489.0	259,909.7

NOTES:

¹There were 741.00 hours in November 2019 due to Daylight Savings Time.

²Phase 3 consists of IC Engine 10 (S-14), which is in long-term standby mode and did not operate.

*Methane content per monthly report as provided by Aria Energy/Landfill Energy Systems (LES) end of month (EOM) report.

scfm= standard cubic feet per minute

scf= standard cubic feet

MMBTU= million British thermal units

LFG= landfill gas

CH₄= methane

MONTHLY CO EMISSIONS
SONOMA COUNTY CENTRAL LANDFILL - PETALUMA, CALIFORNIA

Emission Units	A-3 Flare ¹		A-4 Flare ¹		Flares Combined CO (tons)	Engine 1 (S-4)		Engine 2 (S-5)		Engine 3 (S-6)		Engine 4 (S-7) ²		Engine 9 (S-13) ¹		Engine 5 (S-9)		Engine 6 (S-10)		Engine 7 (S-11)		Engine 8 (S-12)		S-24 Portable Engine	
	MMBTU	CO (tons)	MMBTU	CO (tons)		Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)	Hours of Operation	CO (tons)
February-19	N/A ¹	N/A ¹	7,906.68	0.360	0.36	595.87	1.57	594.07	1.57	619.73	1.63	0.00	0.00	239.10	0.63	176.03	0.46	671.97	1.77	306.20	0.81	662.87	1.75	192.20	0.08
March-19	N/A ¹	N/A ¹	12,252.60	0.557	0.00	611.77	1.61	693.53	1.83	693.27	1.83	0.00	0.00	138.83	0.37	0.00	0.00	643.20	1.69	694.20	1.83	648.90	1.71	202.70	0.09
April-19	N/A ¹	N/A ¹	10,201.79	0.464	0.46	707.93	1.87	708.07	1.87	708.20	1.87	0.00	0.00	35.37	0.09	0.00	0.00	679.87	1.79	667.43	1.76	653.37	1.72	221.20	0.10
May-19	N/A ¹	N/A ¹	14,018.30	0.638	0.64	480.63	1.27	486.30	1.28	450.87	1.19	0.00	0.00	6.10	0.02	0.00	0.00	653.60	1.72	677.93	1.79	684.10	1.80	229.50	0.10
June-19	N/A ¹	N/A ¹	19,050.70	0.867	0.87	145.33	0.38	286.30	0.75	296.50	0.78	3.17	0.01	1.20	0.00	0.00	0.00	663.27	1.75	701.03	1.85	686.70	1.81	212.50	0.09
July-19	N/A ¹	N/A ¹	14,263.69	0.649	0.65	181.63	0.48	559.60	1.47	607.10	1.60	711.53	1.87	0.00	0.00	394.70	1.04	242.50	0.64	736.03	1.94	706.17	1.86	229.50	0.10
August-19	N/A ¹	N/A ¹	10,081.37	0.459	0.46	711.93	1.88	394.57	1.04	741.40	1.95	743.10	1.96	0.00	0.00	743.93	1.96	0.00	0.00	742.10	1.96	696.97	1.84	229.00	0.10
September-19	N/A ¹	N/A ¹	21,852.58	0.994	0.99	465.97	1.23	18.23	0.05	619.17	1.63	604.90	1.59	0.00	0.00	206.13	0.54	0.00	0.00	177.43	0.47	86.03	0.23	557.97	0.24
October-19	N/A ¹	N/A ¹	15,807.58	0.719	0.72	562.17	1.48	0.00	0.00	648.27	1.71	631.07	1.66	0.00	0.00	668.60	1.76	2.20	0.01	669.10	1.76	640.17	1.69	242.00	0.10
November-19	N/A ¹	N/A ¹	12,062.09	0.549	0.55	570.50	1.50	0.00	0.00	709.37	1.87	696.27	1.83	0.00	0.00	507.93	1.34	418.77	1.10	690.40	1.82	658.27	1.73	213.00	0.09
December-19	N/A ¹	N/A ¹	12,088.53	0.550	0.55	676.63	1.78	456.83	1.20	743.43	1.96	664.80	1.75	0.00	0.00	0.00	0.00	742.00	1.96	685.17	1.81	682.17	1.80	234.00	0.10
January-20	N/A ¹	N/A ¹	14,596.88	0.664	0.66	616.77	1.63	585.10	1.54	663.20	1.75	639.03	1.68	0.00	0.00	0.00	0.00	668.57	1.76	435.40	1.15	552.87	1.46	237.00	0.10
12-Month Rolling Totals:					4.48		16.67		12.60		19.76		12.37		1.11		7.11		14.19		18.93		19.39		1.29

NOTES:
¹ The A-3 Flare was permanently decommissioned in November 2017 and replaced with the A-4 Flare in December 2017.
² Per Sonoma, the S-24 Engine is operational during all landfill operation hours. For the hours by month compliance requirement for the S-24 Engine hours are tracked based on the 8 hour day, six days a week operation for the landfill minus major holidays and maintenance hours. Operational hours are provided by Sonoma. Pursuant to AN 28326, Condition 26507, Parts 1, the flares shall not exceed a combined total of 54,768 tons of CO per year and 23,076 tons of CO per year for each IC Engine, during any consecutive rolling 12-month period.

Sitewide Totals	
Month	CO (tons)
February-19	10.63
March-19	11.51
April-19	11.52
May-19	9.80
June-19	8.29
July-19	11.65
August-19	13.14
September-19	6.97
October-19	10.89
November-19	11.84
December-19	12.91
January-20	11.73
TOTALS:	127.90