

Response to Public Comments

FOR

Millville City Landfill

Cedarville Road

Cumberland County, New Jersey 08332

Permit Activity Number: BOP 21-0001 Program Interest (PI) Number: 75524

AIR POLLUTION CONTROL OPERATING PERMIT RENEWAL (TITLE V)



Danny Wong

Chief

Bureau of Stationary Sources

10/26/2023

Date

All of the comments listed below were submitted by Bill Wolfe.

COMMENT 1

The commenter asked how the Department calculated total carbon dioxide (CO₂) equivalent emissions and if the total includes all fugitive emissions from the landfill.

RESPONSE TO COMMENT 1:

Below is a Table which outlines how the CO₂ equivalent emissions were calculated.

Unit 1 CO ₂ Emission Rate:	2.86	lb/hr	(average from most recent stack testing event)
Unit 2 CO ₂ Emission Rate:	105.6	lb/hr	(average from most recent stack testing event)
Hours:	8,760		
Total Yearly CO ₂ :	950,110	lbs	
	475	TPY	
Maximum CH ₄ Emission:	2,362	TPY	(based on permit limit)
CH ₄ as CO ₂ :	49,596	TPY	
Facility Total CO₂e:	50,071	TPY	

Note: CH₄ – methane; CO₂e - carbon dioxide equivalent; lbs – pounds; lb/hr – pounds per hour; TPY – tons per year

The methane emitted from the two gas venting exhaust fans are classified as point source emissions.

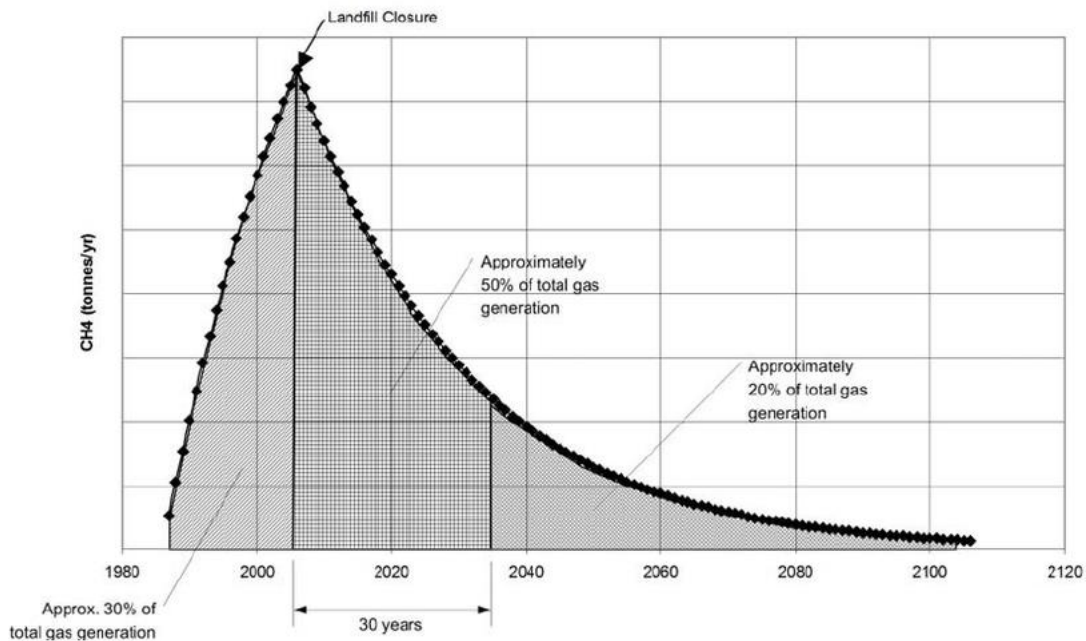
The CO₂ equivalent emissions do not include fugitives from the landfill. The facility was asked to address fugitive methane emissions from the landfill and concluded that the fugitive emissions are negligible. The following is a summary of the supporting documentation provided by the facility:

Exhaust Fan Assemblies 1&2 are currently permitted to emit 2,361.7 tons per year (TPY) of methane. This does not change with the pending permit renewal. The results of the

last three rounds of stack testing data for methane, which are on record with the Department, are as follows: 2012 - 81.7 tons per year (TPY); 2015 - 69.5 TPY, and 2020 - 11.4 TPY. The results show actual emission from Exhaust Fan Assemblies 1&2 are well below permitted limits (approximately 2% on average).

Given the age of the landfill (closed in 1983), the above observations are not surprising and are in line with the precipitous decline in gas generation for a “generic” municipal solid waste landfill after closure, as referenced by USPEA’s LandGem model. In support of a significant decline in methane generation from the Millville Landfill at this time, the graph below shows that 30% of methane gas generation occurs approximately in the first 20 years of landfill operation, 50% of methane gas generation occurs during the 30 years after landfill closure (from 1983 to 2013 in the case of the Millville Landfill), and only 20% of methane gas generation occurs over the next 70 years or so.

The following graph shows how the methane emissions vary over the life of a typical landfill.



Source: University of NSW, School of Civil and Environmental Engineering. *Handbook for the Design, Construction, Operation, Monitoring, and Maintenance of a Passive Landfill Gas Drainage and Biofiltration System*. 2010.

USEPA indicates landfills with active gas collection systems typically have collection efficiencies between 60 to 85 percent (AP-42, Section 2.4.4.2). Even on the lowest end of this gas collection range, one would expect fugitive (and total emissions) to be well

below the current permit's PTE. Note: Source cited is AP-42, Compilation of Air Pollutant Emission Factors, Volume I: Stationary Point and Area Sources, Section 2.4 "Municipal Solid Waste Landfills."

Methane monitoring conducted from August 2011 to February 2013 at 89 stations across the landfill as part of closure requirements (also on file with the Department, Solid and Hazardous Waste Program, submitted March 26, 2013) indicate only three very low detections at station #31 (approximate center of softball field #4) in this time period (August 2011 = 2%, November 2011 = 1%, and May 2012 = 1%, of atmosphere).

Based on the collective information provided above, the current fugitive methane emissions at the Millville Landfill would appear to be negligible.

COMMENT 2:

The commenter asked how the methane emissions were converted to CO₂ equivalent emissions and whether the methane emissions are considered fugitive emissions.

RESPONSE TO COMMENT 2:

The methane emissions were converted to CO₂ equivalent emissions using a factor of 21 for the 100-year Global Warming Potential.

The methane emitted from the two gas venting exhaust fans are classified as point source emissions. The CO₂ equivalent emissions do not include fugitives from the landfill (See Response to Comment 1).

COMMENT 3:

The commenter questioned why the methane emissions were not converted to CO₂ equivalent emissions using a 20-year time horizon. The 20-year time horizon is consistent with N.J.S.A. 26:2C-59, which states:

1. a. Whenever the Department of Environmental Protection, the Board of Public Utilities, or any other State agency calculates a global warming potential for the purposes of assessing the global warming impact of a greenhouse gas, the Department of Environmental Protection, the Board of Public Utilities, or other State agency shall use a 20-year time horizon.

RESPONSE TO COMMENT 3:

For the review of the Operating Permit Renewal application, the methane emissions were converted to CO₂ equivalent emissions to determine whether greenhouse gas emissions (GHG) could be subject to the provisions of 40 Code of Federal Regulations (CFR) Part 52.21 Prevention of Significant Deterioration (PSD). 40 CFR Part 52.21(b)(49) outlines the procedures to be followed to determine if GHG are subject to the PSD regulations. 40 CFR Part 52.21(b)(49)(ii) states the following:

For purposes of [paragraphs \(b\)\(49\)\(iii\)](#) through [\(iv\)](#) of this section, the term *tpy CO₂ equivalent emissions (CO₂e)* shall represent an amount of GHGs emitted, and shall be computed as follows:

(a) Multiplying the mass amount of emissions (tpy), for each of the six greenhouse gases in the pollutant GHGs, by the gas' associated global warming potential published at Table A–1 to [subpart A of part 98 of this chapter](#)—Global Warming Potentials.

(b) Sum the resultant value from [paragraph \(b\)\(49\)\(ii\)\(a\)](#) of this section for each gas to compute a tpy CO₂e.

Table A-1 to Subpart A of 40 CFR Part 98 bases Global Warming Potential on a 100-year time horizon. Consequently, for the Operating Permit Renewal application, CO₂ equivalent emissions must be calculated using a 100-year time horizon and not a 20-year time horizon.

The Department has been delegated the authority by the USEPA to issue Operating Permits, which must comply with all Federal Regulations. The calculation of CO₂ equivalent emissions for the Operating Permit Renewal is done to determine applicability to 40 CFR Part 52.21, and not to assess the global warming impact of a greenhouse gas.

COMMENT 4

The commenter asked if CO₂ equivalent emissions are subject to emission control requirements or any other form of restriction on emission rates or total emissions.

RESPONSE TO COMMENT 4:

The CO₂ equivalent emissions are not subject to emission control requirements or any other form of restriction on emission rates or total emissions since the Millville City Landfill is not subject to 40 CFR Part 52.21.

COMMENT 5

The commenter asked if flaring represented state-of-the-art control for methane and Hazardous Air Pollutants.

RESPONSE TO COMMENT 5:

The installation and operation of a flare represents state-of-art control for methane. This is outlined in the State of the Art Manual for Municipal Solid Waste Landfills, which can be accessed at [State of the Art Manual \(nj.gov\)](#). The installation and operation of a flare would be considered to represent state-of-the-art control for some organic Hazardous Air Pollutants (HAP), but not for non-organic HAP, such as lead, mercury, and hydrogen chloride. A source operation which emits a HAP over the N.J.A.C. 7:27-17.9 State-of-the-Art threshold can meet the provisions of N.J.A.C. 7:27-22.35 “Advances in the Art of Air Pollution Control” if

compliance with an applicable Maximum Achievable Control Technology (MACT) Standard, as listed in 40 CFR Part 63, is achieved.

COMMENT 6

The commenter asked if HAP emissions are considered in the CO₂ equivalents.

RESPONSE TO COMMENT 6

Estimates of HAP emissions from this permit BOP 210001 are not included in the CO₂ equivalents because HAPs are not identified as greenhouse gases.

COMMENT 7

The commenter asked if reporting requirements include CO₂ equivalent emissions and if these emissions are included in the Department's greenhouse gas emission inventory.

RESPONSE TO COMMENT 7

The stack tests for the landfill methane emissions must be conducted every five years and the test results are submitted to the Department. During these tests, carbon dioxide emissions are measured and included in the stack test report submitted to the Department.

Estimates of greenhouse gas emissions from New Jersey (NJ) landfills in the NJ Greenhouse Gas Inventory Reports are based on waste quantities reported to the Department by permitted solid waste facilities pursuant to N.J.A.C. 7:26. Historical records are also used to establish past disposal quantities (see <https://www.nj.gov/dep/dshw/resource/rules.html>).

A standard method developed by the USEPA is then applied to estimate methane emissions from the combined total mass of waste landfilled in the state.

<https://www.epa.gov/statelocalenergy/state-inventory-and-projection-tool>

The method to calculate emissions from solid waste landfills is summarized in Appendix B.5 of the 2022 NJ GHG Inventory Report (1990-2019), available at

<https://dep.nj.gov/ghg/nj-ghg-inventory/inventory-archive/>

The methane emission estimates in the NJ Greenhouse Gas Inventory Reports are based on total, statewide quantities of landfilled waste and do not rely on individual landfills to report quantities of methane generated.

COMMENT 8

The commenter asked if the Department's air emissions fees are applicable to methane and CO₂ equivalent emissions.

RESPONSE TO COMMENT 8

Pursuant to N.J.A.C. 7:27-22.31, there are no annual emission fees applicable to methane and CO₂ equivalent emissions.

COMMENT 9

The commenter asked if the landfill is required to install alternate control technology to collect and treat LF gas, pursuant to SOTA TM 3.18.2.5 Alternate Control Technologies – Beneficial Uses of Landfill Gas

RESPONSE TO COMMENT 9

Air Permit Application BOP 210001 is an Operating Permit Renewal and was not subject to N.J.A.C. 7:27-22.35 "Advances in the Art of Air Pollution Control."

COMMENT 10

The commenter requested a copy of the Facility Wide Risk Assessment (FWRA) conducted in accordance with Technical Manual 1003.

RESPONSE TO COMMENT 10

On July 19, 2023, the commenter was forwarded the April 28, 2023 FWRA prepared for the Millville City Municipal Landfill.