NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: xxxx, xx, 2024

Region: Winston-Salem Regional Office
County: Guilford
NC Facility ID: 4101253
Inspector's Name: Dylan Wright
Date of Last Inspection: 11/08/2023
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Kersey Valley Landfill

Facility Address:
Kersey Valley Landfill
3940 Kivett Drive
High Point, NC 27261

SIC: 4953 / Refuse Systems
NAICS: 562212 / Solid Waste Landfill

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 15A NCAC 02D .0524, 02D .1110, and 02D .1806
NSPS: Subpart XXX and IIII
NESHAP/MACT: Subpart M and ZZZZ
PSD: N/A
PSD Avoidance: N/A
NC Toxics: N/A
112(r): N/A
Other:

- State-enforceable only condition for PFAS
- Added 5 utility solar vent flares as insignificant activities.

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Mike Spencer Solid Waste Disposal Superintendent City of High Point Dept. of Public Svcs. High Point, NC 27261 (336) 883-3433 mike.Spencer@highpointnc.gov	Tasha Logan Ford City Manager PO Box 230 High Point, NC 27261 (336) 883-3283 TLoganFord@highpointnc.gov	Melinda King Asst. Director of Public Services PO Box 230 High Point, NC 27261 (336) 883-3218 melinda.king@highpointnc.gov

Application Data

Application Number: 4101253.22A
Date Received: 08/24/2022
Application Type: Renewal
Application Schedule: TV-Renewal

Existing Permit Data
Existing Permit Number: 10517/T01
Existing Permit Issue Date: 04/12/2022
Existing Permit Expiration Date: 03/31/2023

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2022	---	0.0300	9.90	0.0100	---	5.98	2.23 [Toluene]
2021	---	0.0300	9.60	---	---	5.84	2.18 [Toluene]
2020	---	0.0300	9.30	---	---	5.89	2.10 [Toluene]
2019	---	0.1900	8.92	0.0400	0.0100	5.41	2.02 [Toluene]
2018	---	0.0300	6.40	0.0100	---	3.91	1.46 [Toluene]

Consultant: Smith Gardner, Inc. **Contact:** Matthew M. Jones, E.I. **Phone:** 919.828.0577 **email**: mac@smithgardnerinc.com

Review Engineer: Booker Pullen

Review Engineer's Signature: **Date:**

Comments / Recommendations:
Issue: 10517T02
Permit Issue Date:
Permit Expiration Date:

1.0 Facility Description

The Kersey Valley Landfill is an active MSW landfill, owned and operated by the City of High Point, located in High Point, Guilford County, North Carolina. The landfill operates under Solid Waste Permit No. 4104 and consists of two sites, Area 1 (Phases 1-3A) and Area 2 (Phases 3, 5A and 5B), that are split by Kersey Valley Road. The landfill was expanded in 2018, at which point the landfill triggered applicability of NSPS Subpart XXX, and the permitted design capacity exceeded the 2.5 million Mg and 2.5 million m^3 mass and volume thresholds which require landfills to obtain a Title V air permit. The landfill has demonstrated through Tier 2 testing (most recent site-Specific NMOC test on January 27, 2023) that the NMOC emission rate for the current design capacity is below the NSPS Subpart XXX threshold (34 Mg/yr) and does not yet require a gas collection and control system to be installed. The only other emission sources at this facility are a small diesel-fired emergency generator (IES-2) located at the leachate pump station, and a mobile tub grinder (IES-3) that the City of High Point brings on-site periodically to grind wood waste.

2.0 Purpose of Application

Application No. 4101253.22A was submitted to the North Carolina Department of Environmental Quality – Division of Air Quality (DAQ) for the renewal of the existing Title V operating permit for the Kersey Valley Landfill. The renewal application was received in the Raleigh Central Office on August 24, 2022 and was considered complete on that date. The current permit expires on March 31, 2023 and the renewal application was received at least six months prior to the expiration date per Section 3 General Conditions K of the existing permit. Therefore, the existing permit shall not expire until the renewal permit has been issued or denied in accordance with 15A NCAC .0512(b)(1). All terms and conditions of the existing permit shall remain in effect.

This renewal permit is required to go through both a 30-day public notice and a 45-day EPA review period prior to issuance.

The facility contact for this application is Mike Spencer, Solid Waste Disposal Superintendent (ph# 336.883.3433), email is mike.spencer@highpointnc.gov. The consulting firm Smith Gardner, Inc was used to prepare this application and the contact for Smith Gardner is Matthew M. Jones, E.I. (919.828.0577, email: mac@smithgardnerinc.com).

3.0 History/Background/Application Chronology

04/11/2018	1st Time Title V Permit issued (10517T00)
07/07/2021	Notice of Violation issued for exceedance of the acrylonitrile TPER.
08/25/2021	Application 4101253.21A was received in response to the July 7, 2021 NOV. The facility modeled a total of six toxic air pollutants at the maximum generation rate of landfill gas from the facility without any control devices (does not have gas collection and control system). The facility modeled toxic air pollutants in compliance with the AALs. The facility also requested exemption from the toxic air pollutant provisions per 15A NCAC 02Q .0702(a)(27)(A), which allows facilities subject to the requirements of a NESHAP or MACT to be exempted from the permitting of toxic air pollutant emissions. They stated that the landfill is subject to 40 CFR 61 (Subpart M for asbestos). Since the permit did not currently contain the MACT conditions, this application was processed as a Significant Modification instead of a "State-only" toxic modification in order to include the permit conditions for the Federal requirements, and to remove the State toxics requirements. The Title V Permit No. 10517T01 was issued on April 12, 2022.
12/13/2022	Most recent Inspection report stated that the facility appeared to be operating in compliance with permit 10517T01.

Application Chronology

08/24/2022	Renewal application (4101253.22A) was submitted to the Division of Air Quality and considered complete on this date.
08/25/2022	Sent acknowledgment letter indicating that the application for the renewal permit was complete on August 24, 2022.
12/06/2023	Contacted the facility via phone call to obtain the design flow rate of landfill gas into the five individual solar vent flares that are used for odor control. Response was received on 12/06/2023 via phone call for the solar vent flares and subsequently on 12/19/2023 via email.
12/14/2023	Draft permit and review forwarded to Supervisor (Rahul Thaker). Comments were received on 12/15/2023 and incorporated into the review.
12/18/2023	Draft permit and review forwarded to the Stationary Compliance Branch (SSCB) for comments. SSCB responded on 12/21/2023 stating they had no comments.
12/18/2023	Draft permit and review forwarded to the Winston Salem Regional Office for comments. The Regional Office responded on 12/20/2023 with minor comments which were incorporated into the draft permit and engineering review.
12/18/2023	Draft permit forwarded to the applicant for comments. The applicant responded with minor comments on 12/22/2023 and the City Manager wished to have her last name spelled Logan Ford. This was changed in the permit and the DAQ data base in IBEAM.
01/05/2024	Draft permit and permit review forwarded to the 30-day public notice and the 45-day EPA review using the DAQ website.
02/04/2024	Public comment period ends. If comments are received during the comment period, they will be addressed in Item No. 12 of this Review.
XX xx, 2023	EPA comment period ends. If comments are received during the EPA 45-day review period, they will be addressed in Item No. 12 of this Review.

4.0 Table of Permitted Sources

The facility's permitted emission sources as follows:

Emission Source ID No.	Emission Source Description*	Control Device ID No.	Control Device Description
ES-1 **NSPS XXX** **NESHAP M**	Municipal solid waste landfill	N/A	N/A

* No additional equipment is being added in this renewal application, however 5 utility solar vent flares (ID Nos. IES-3.1 through IES.5) will be added as insignificant activities in accordance with 15A NCAC 02Q .0503(8).

Insignificant Activities in accordance with 15A NCAC 02Q .0503(8)

Emission Source ID No.	Emission Source Description
IES-2	One Diesel fuel-fired emergency generator (30 kw) located at the leachate pump station
IES-3	Tub grinder (Model: Morbark 1300B)
IES-3.1 through IES-3.5	Five utility solar vent flares (approximately 90 standard cubic feet per minute flow rate each)

5.0 Changes to the Existing Permit

The following changes were made to Air Permit No. 10517T01 as part of this renewal process: *

Pages	Section	Description of Changes
--	Cover page and throughout permit	Updated all dates and permit revision numbers.
Pg. 3 of cover letter	Summary of Changes to Permit	Added summary of changes made to the permit according to the most recent requirements of the renewed Title V permit.
Pg. 1 of Permit	Cover page of permit	• Updated all dates, application numbers and permit revision numbers.
Pg. 2 of Permit	Table of Contents	• Added Section 3.0 as "Insignificant Activities List". • Added Section 4.0 as "General Permit Conditions".
Pg. 10 of Permit	Section 3	Added Insignificant Activities table as Section 3, added five landfill gas solar vent flares
Pg. 11 of Permit	Section 4	Added most current General Condition (version 7.0, 08/21/2023) as Section 4.

* This list is not intended to be a detailed record of every change made to the permit but a summary of those changes.

6. Regulations Listed in the Current Permit:

The facility is subject to the following air quality regulations in addition to the General Conditions:

- 15A NCAC 02D .0524 "New Source Performance Standards", Subpart XXX
- 15A NCAC 02D .0711 "Emission Rates Requiring a Permit" (Not listed in the permit because the facility is subject to 40 CFR 61, Subpart M)
- 15A NCAC 02D .1100 "Control of Toxic Air Pollutants" (Not listed in the permit because the facility is subject to 40 CFR 61, Subpart M)
- 15A NCAC 02D .1110 "National Emissions Standards for Hazardous Air Pollutants" (40 CFR 61, Subpart M)
- 15A NCAC 02D .1806 "Control and Prohibition of Odorous Emissions"
- 15A NCAC 02Q .0503(8) "Definitions, Insignificant Activities due to size"

7.0 Regulatory Review

The Kersey Valley Landfill is subject to the following regulations. The facility's equipment and operations have not changed since the 1st Time Title V permit issued on April 11, 2018. This renewal permit will contain the updated and revised requirements to reflect the most current stipulations for all applicable regulations, where necessary.

15A NCAC 02D .0524 "New Source Performance Standards"

The Kersey Valley Landfill is subject to NSPS Subpart XXX "Standards of Performance for Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification After July 17, 2014". Sources subject to new source performance standards promulgated in 40 CFR Part 60 shall comply with emission standards, monitoring and reporting requirements, maintenance requirements, notification and record keeping requirements, performance test requirements, test method and procedural provisions, and any other provisions, as required therein. Continued compliance is anticipated. See Section 8.0 below for further evaluation.

15A NCAC 02D .1110 "Emission Standards for Hazardous Air Pollutants"

The Kersey Valley Landfill is subject to NESHAP 61, Subpart M "National Emission Standards for Asbestos". Sources subject to national emission standards for hazardous air pollutants for source categories promulgated in 40 CFR Part 61 shall comply with emission standards, monitoring and reporting requirements, maintenance requirements, notification and record keeping requirements, performance test requirements, test method and procedural provisions, and other provisions, as required therein. Compliance is anticipated. See Section 8 below for further evaluation.

15A NCAC 02D .1806 "Control and Prohibition of Odorous Emissions"
This regulation is State-enforceable only and is applicable facility-wide. DAQ inspectors did not note any objectionable odors beyond the facility's property boundary during the most recent inspection, and neither DAQ nor the facility have received any odor complaints from nearby residents. Continued compliance is expected.

15A NCAC 02Q .0503(8)
The most recent compliance inspection report stated that the facility contained 5 utility solar flares to help control odor at the landfill. Solar vent flares are widely used for odor and emission control at passive outlets, such as cap vents, leachate stations, or from gas outbreaks at the surface of active or closed landfill cells. These flares will be added in the renewal for this Title V facility as insignificant activities in accordance with 15A NCAC 02Q .0503(8). See Section 8 below for further evaluation.

Data:
- Five solar vent flares at 90 standard cubic feet per minute flow rate each (total flow for five = 450 scfm)
- Methane heat content = 1,012 Btu per standard cubic foot (AP-42)
- Landfill gas heat content = 500 Btu per standard cubic foot
- NOx emission factor = 39 lbs NOx/million cubic feet of methane (AP-42, revision 2008)
- CO emission factor = 46 lbs CO/million cubic feet of methane (AP-42, revision 2008)
- PM emission factor = 15 lbs PM/million cubic feet of methane (AP-42, revision 2008)
- SO_2 emission factor = Calculated using equations 3, 4, and 7 of AP-42, Section 2.4, revision 2008
- HCL emission factor = Calculated using equations 3, 4, and 10 of AP-42, Section 2.4, revision 2008

See Attachment "A" of this review for an email from the US EPA inferring that the 2008 draft AP-42 emission factors can be used for Title V air permit applications and renewals because the emission factors for carbon monoxide, nitrogen dioxide, and particulate matter all receive an "A" rating when ranked by EPA based on dataset size and other factors.

Sample calculation of annual NOx emissions from each of the five solar vent flares burning landfill gas at 8760 hours per year and 50% methane:

$$\frac{39\ lbs\ NOx}{10^6\ ft^3\ CH_4} \times \frac{50\ (CH_{4\ content})}{100\ lfg} \times \frac{90\ \text{ft}^3\ \text{lfg}}{\text{minute}} \times \frac{60\ \text{minutes}}{1\ \text{hr(s)}} \times \frac{8760\ \text{hrs}}{\text{yr}} \times \frac{1\ \text{ton NOx}}{2000\ \text{lbs NOx}} = \frac{0.46\ tons\ NOx}{yr}\ each$$

The annual emissions of CO and PM were calculated in a similar fashion using their respective emissions factors listed in the Data section above from AP-42 to be:

NOx = 0.46 tpy each solar vent flare
CO = 0.54 tpy each solar vent flare
PM10 = 0.18 tpy each solar vent flare
VOC = 0.006 tpy
(AP-42, Section 2.4.4 states that NMOC emissions contain approximately 39% VOCs (as hexane). Only a small fraction of the landfill gas will be collected in of the solar vent flares and each flare can obtain 98% control efficiency for VOCs.

Sample calculation of annual SO_2 emissions from each of the five solar flares burning landfill gas at 8760 hours per year:

Calculation of sulfur emissions:

$$Q_{sulfur} = A \times Q_{CH_4} x \left(\frac{C_p}{1\times 10^6}\right)$$ Equation 3, Section 2.4.4.1, revision 2008

Where:
Q_p = Emission rate of pollutants, m^3/yr
Q_{CH4} = Methane generation rate, m^3/yr

C_p = concentration of reduced sulfur compounds (if not known) from AP-42 Section 2.4, 2008 draft (47.0 ppmv)
A = multiplication factor (2.0) for 50% methane (CH_4) and that 50 percent is CO_2, N_2, and other constituents) – This factor used for the calculation of pounds of SO_2 per million Btu
A = multiplication factor (1.82) for 55% methane (CH_4) and that 45 percent is CO_2, N_2, and other constituents)
A = multiplication factor (1.43) for 70% methane (CH_4) and that 45 percent is CO_2, N_2, and other constituents) – This is the factor used for toxic pollutant and HAP calculations.

Calculation of the uncontrolled SO_2 emission rate for the combustion of landfill gas @ 50% methane content and 90 standard cubic feet per minute of flow for 8760 hours.

$$\text{Annual methane emissions} = \frac{90\ ft^3\ lfg}{minute} \times \frac{50\ ft^3\ CH_4}{100\ ft^3\ lfg} \times \frac{60\ minutes}{hour} \times \frac{8760\ hours}{year} \times \frac{1\ m^3}{35.31466\ ft^3\ CH_4} = \frac{669{,}750\ m^3 CH_4}{year}$$

$$Q_{sulfur} = A \times Q_{CH_4} x \left(\frac{C_p}{1\times 10^6}\right) \text{ Equation 3, Section 2.4.4.1}$$

$$Q_{sulfur} = 2.0 \times \frac{669{,}750\ m^3 CH_4}{yr} \times \left(\frac{47\ parts}{1\times 10^6}\right) = \frac{62.96\ m^3}{year}$$

The potential emissions of sulfur that would come from the landfill gas at 47.0 ppmv equates to 62.96 m^3 per year.

$$UM_{sulfur} = \frac{62.96\ m^3\ sulfur}{yr} \quad x \left[\frac{MW\ (g/gmole) \times (1\ atmosphere)}{\left(\frac{8.205\times10^{-5}\ m^3-atmospere}{gmol-\ ^0K}\right) \times \frac{1000\ g}{kg} \times (273+25\ ^0C)\ ^0K}\right] = \frac{kg\ Sulfur}{year}$$

Where:
UM_{sulfur} = Uncontrolled mass emissions of pollutants, kg sulfur/yr
MW_p = Molecular weight of pollutant, 32.065 grams sulfur/gmol
Q_p = Emission rate of pollutant, m^3/yr
T^0 = 25^0 C (77 ^{0}F), recommended by AP-42 for landfill gas temperature if temperature is unknown

$$UM_{sulfur} = \frac{62.96\ m^3}{yr}\ x \left[\frac{32.065\ grams\ sulfur/gmole \times (1\ atmosphere)}{\left(\frac{8.205\times10^{-5}\ m^3-atmospere}{gmol-\ ^0K}\right) \times \frac{1000\ g}{kg} \times (273+25\ ^0C)\ ^0K}\right] = \frac{82.6\ kg\ sulfur}{year}$$

The calculated emissions of SO_2 are twice the emissions of Sulfur (MW ratio).

CM_{SO2} = Controlled mass emissions of SO_2 (kg/yr)
UM = Uncontrolled mass emissions of reduced sulfur compounds as sulfur (kg/yr) (from AP-42 Section 2.4.4.1 equations 3 and 4)
Ƞ = Efficiency of the landfill gas collection system (percent)
2.0 = Ratio of the molecular weight of SO_2 to the molecular weight of S
170.02 = Flare heat input rate

$$CM_{SO2} = UM_S \times \frac{\eta_{col}}{100} \times 2.0 \text{ Equation 7, Section 2.4.4.1}$$

$$= \frac{82.6\ kg\ S}{year} \times \frac{100}{100} \times \frac{2.0}{1} \times \frac{2.205\ lbs\ SO2}{kg\ S} \times \frac{1\ ton\ SO_2}{2000\ lbs\ SO_2} = \frac{0.18\ tons\ SO2}{yr} \text{ each}$$

In accordance with 15A NCAC 02Q.0503(8), each flare emits less than 5 tons per year of a criteria pollutant.

Sample calculation for HAP emissions

Based on the calculations, the largest HAP constituent of the landfill gas is toluene. Calculation of annual HAP (toluene) emissions from each solar flare burning landfill gas at 8760 hours per year and 50% methane. Therefore, if the annual toluene emissions are less than 1000 pounds, then all the other individual HAP emissions will be less than 1000 pounds.

$$Annual\ flare\ flow\ rate = \frac{90\ ft^3\ lfg}{minute} \times \frac{50\ ft^3\ CH_4}{100\ ft^3\ lfg} \times \frac{60\ minutes}{hour} \times \frac{8760\ hours}{year} \times \frac{1\ m^3}{35.31466\ ft^3\ CH_4} = \frac{669{,}750\ m^3 CH_4}{year}$$

$$Q_{toluene} = A \times Q_{CH_4} x \left(\frac{C_p}{1\times 10^6}\right) \quad \text{Equation 3, Section 2.4.4.1}$$

Where:
$Q_{toluene}$ = Emission rate of pollutants, m^3/yr
Q_{CH4} = Methane generation rate, m^3/yr
C_p = concentration of toluene from AP-42 Section 2.4, 2008 draft (29.5 ppmv)
A = multiplication factor (2.0) for 50% methane (CH_4) and that 50 percent is CO_2, N_2, and other constituents) – This factor used for the calculation of pounds of toluene
A = multiplication factor (1.82) for 55% methane (CH_4) and that 45 percent is CO_2, N_2, and other constituents)
A = multiplication factor (1.43) for 70% methane (CH_4) and that 45 percent is CO_2, N_2, and other constituents) – This is the factor used for toxic pollutant and HAP calculations.

$$Q_{toluene} = A \times Q_{CH_4} x \left(\frac{C_p}{1\times 10^6}\right) \quad \text{Equation 3, Section 2.4.4}$$

$$Q_{toluene} = 2.0 \times \frac{669{,}750\ m^3 CH_4}{yr} \times \left(\frac{29.5\ parts}{1\times 10^6}\right) = \frac{39.52\ m^3\ toluene}{year}$$

$$UM_{toluene} = \frac{39.52\ m^3\ toluene}{yr} \quad x \left[\frac{MW\ (g/gmole)\times (1\ atmosphere)}{(\frac{8.205\times 10^{-5}\ m^3-atmospere}{gmol-\ ^0K})\times \frac{1000\ g}{kg} \times (273+ 25\ ^0C)\ ^0K}\right] = \frac{kg\ toluene}{year}$$

Where:
$UM_{toluene}$ = Uncontrolled mass emissions of pollutants, kg toluene/yr
MW_p = Molecular weight of pollutant, 92.14 grams sulfur/gmol
Q_p = Emission rate of pollutant, m^3/yr
T^0 = 25^0 C (77 ^{0}F), recommended by AP-42 for landfill gas temperature if temperature is unknown

$$UM_{toluene} = \frac{39.52\ m^3}{yr}\ x \left[\frac{92.14\ grams\ toluene/gmole\times (1\ atmosphere)}{(\frac{8.205\times 10^{-5}\ m^3-atmospere}{gmol-\ ^0K})\times \frac{1000\ g}{kg} \times (273+ 25\ ^0C)\ ^0K}\right] = \frac{148.93\ kg\ toluene}{year}$$

$$CM_{toluene} = UM_{toluene} \times \frac{\eta_{col}}{100} \quad \text{Equation 7, Section 2.4.4.1}$$

$$= \frac{148.93\ kg\ toluene}{year} \times \frac{100}{100} \times \frac{2.205\ lbs}{kg\ toluene} \times (1-0.98)\ control\ efficiency = \frac{6.6\ pounds\ toluene}{yr}$$

In accordance with 15A NCAC 02Q.0503(8) each flare emits less than 1000 lbs of any one HAP and each flare emits less than 5 tons per year of criteria pollutants (SO_2, CO, PM10, NOx, and VOCs).

The flares will be placed into the renewal permit as insignificant activities (140 scfm each, IES-3.1, I-3.2, I-3.3, I-3.4, and 3.5)

8. NSPS, NESHAPS/MACT, PSD, 112(r), CAM

The landfill (ES-1) is subject to 40 CFR Part 60, Subpart XXX "Standards of Performance for Municipal Solid Waste Landfills That Commenced Construction, Reconstruction, or Modification After July 17, 2014", because the landfill was expanded in 2018. The landfill operates one Diesel fuel-fired emergency generator (IES-2) which is subject to 40 CFR 60, Subpart IIII "NSPS for Stationary Compression Ignition Internal Combustion Engines" and 40 CFR Part 63, Subpart ZZZZ "NESHAP for Reciprocating Internal Combustion Engines." This facility is not subject to 40 CFR Part 63, Subpart AAAA "NESHAP for Municipal Solid Waste Landfills" at this time, because the NMOC emissions are less than the 50 Mg per year threshold. This facility is not required to install a gas collection and control system because the NMOC emissions are also less than the 34 Mg per year threshold to install a collection system. This renewal application with the inclusion of the five solar vent flares does not change the status of this facility.

NSPS Subpart XXX

This facility is subject to 40 CFR 60, Subpart XXX since it was modified after July 17, 2014. A Tier 2 test report was submitted to the Raleigh Central Office and approved by the Stationary Source Compliance Branch in a memo dated June 5, 2023. See the results of the test in the table below.

Table 1: NMOC emissions using the Tier 2 results indicated a value below 34 Megagrams per year.

Emissions Year Modeled	Estimated Annual Waste Acceptance Rate, (Mg/Yr)	As of January 1 Current Solid Waste-in-place, (Mg)	NMOC Emissions Limit, (Mg/Yr)	Modeled Tier 2 NMOC Emissions, (Mg/Yr)	Compliance
2022	111,289 *	2,922,439	< 34	24.9 *	Indicated
2023	181,818 **	3,033,728	< 34	25.4 **	Indicated
2024	181,818 **	3,215,546	< 34	27.0 **	Indicated
2025	181,818 **	3,397,364	< 34	28.5 **	Indicated
2026	181,818 **	3,579,182	< 34	29.9 **	Indicated

* Waste receipts for 2022 and previous years provided in the report.
** Assuming future waste receipts in year 2023 through 2026.

Tier 2 Compliance was indicated for the Kersey Valley Landfill for the next 5 years (beginning 2022) based on the site-specific NMOC concentration and the annual average waste acceptance rate increases to 181,818 Mg/yr. The site-specific NMOC concentration should be retested every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the 5-year estimate, a revised estimate shall be submitted to the Administrator.

The NMOC emission rate shall be calculated using the procedures specified in 40 CFR 60.764(a)(1) until such time as the calculated NMOC emission rate is equal to or greater than 34 megagrams per year.

If the calculated NMOC annual emission rate is equal to or greater than 34 megagrams per year, the owner or operator must either: (a) submit a gas collection and control system design plan within one year of the first annual report showing a total greater than 34 Mg; or (b) calculate the NMOC emissions using the next higher tier in 40 CFR 60.764; or (c) conduct a surface emission monitoring demonstration using the procedures specified in 40 CFR 60.764(a)(6).

NSPS [40 CFR 60, Subpart IIII]

- The emergency generator (ID No. IES-2) is subject to 40 CFR 60, Subpart IIII "Stationary Compression Ignition Internal Combustion Engines" because it was manufactured after April 1, 2006 and is located at an area source.
- The engine driving the tub grinder (ID No. IES-3) is not subject to 40 CFR 60, Subpart IIII "Stationary Compression Ignition Internal Combustion Engines" because it is not a stationary source. It is included on the permit's insignificant activities list for informational purposes.

NESHAP [40 CFR 61, Subpart M]

15A NCAC 02D .1110, 40 CFR 61, Subpart M "Nation Emission Standards for Hazardous Air Pollutants"
The landfill is an active disposal site for asbestos-containing wastes; therefore, it is subject to the requirements of this regulation. To comply, the facility must adhere to a general set of work practices which may include ensuring there are no visible emissions at the disposal site, covering waste daily with at least six inches of compacted non-asbestos material or use another dust suppression agent; the landfill may propose alternative methods for DAQ approval. The facility will be required to post signage and barriers if the method of compliance does not include covering the asbestos-containing waste. Closed portions of the landfill which have previously received asbestos-containing waste are also subject and are required to comply with the requirements of 40 CFR 61.151 for inactive waste disposal sites.

In accordance with 15A NCAC 02Q .0702 (27)(A) "Exemptions", a permit to emit toxic air pollutants shall not be required pursuant to this Section for an air emission source that is subject to an applicable requirement pursuant to 40 CFR Part 61, as amended. Therefore, toxic air pollutant emissions from the landfill and the insignificant activity sources will not be listed in the Title V air permit.

Compliance is expected.

MACT [40 CFR 63, Subpart *ZZZZ*]

- The emergency generator (ID No. IES-2) is subject to 40 CFR 63, Subpart ZZZZ "Reciprocating Internal Combustion Engines" and is considered as a new emergency engine under this regulation. The facility complies with this regulation by complying with the requirements of NSPS Subpart IIII.
- The engine driving the tub grinder (ID No. IES-3) is not subject to 40 CFR 63, Subpart ZZZZ "Reciprocating Internal Combustion Engines" because it is not a stationary source.

MACT [40 CFR 63, Subpart AAAA]

15A NCAC 02D .1111, 40 CFR 63, Subpart AAAA "National Emission Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills". The Kersey Valley Landfill is not subject to this Subpart because:
- The landfill is not a major source as defined in 40 CFR 63.2 of Subpart A.
- The landfill is not collocated with a major source as defined in 40 CFR 63.2 of Subpart A.
- The landfill does not have an NMOC emissions rate equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to 40 CFR 63.1959.

PSD

The Kersey Valley Landfill is not subject to PSD because the potential emissions of each criteria pollutant is below the 250 ton per year threshold. This landfill is considered a minor source under the PSD program as indicated on the cover page of the proposed Title V permit. The renewal of the air permit will not change the current status of this facility.

Guilford County has triggered increment tracking under PSD for PM_{10} and SO_2. However, this permit renewal does not consume or expand increments for any pollutants.

112(r)

The Kersey Valley Landfill is not subject to Section 112(r) of the Clean Air Act requirements because it does not store any of the regulated substances in quantities above the 112(r) thresholds. No change with respect to 112(r) is anticipated under this permit renewal.

CAM

The CAM rule (40 CFR 64; 15A NCAC 02D .0614) applies to each pollutant specific emissions unit (PSEU) at a facility required to hold a Title V permit that meets all three of the following criteria:

- the unit is subject to any (non-exempt: e.g. pre November 15, 1990, Section 111 or Section 112 standard) emission limitation or standard for the applicable regulated pollutant.
- the unit uses any control device to achieve compliance with any such emission limitation or standard.
- The unit has potential pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source (i.e., 100 tons per year for criteria pollutants or 10/25 tons per year for HAPs).

This facility does not currently use any control devices and the landfill is subject to a post November 1990 NSPS standard that regulates the pollutants that would be subject to CAM for this facility. CAM does not apply.

9. Facility Wide Air Toxics

Toxic air pollutants (TAPs) from the Kersey Valley Landfill are subject to NESHAP Subpart M. In accordance with North Carolina's general statute 143-215.107(a) and regulation 15A NCAC 02Q .0702(a)(27), toxic emissions from sources subject to MACT or NESHAP standards exempts them from having to receive a permit to emit air toxic pollutants. As such, the State is required to evaluate the toxic air emissions for this facility to determine if these sources present an unacceptable risk to human health. As part of a previous permit modification, the DAQ conducted a TAP evaluation.

A dispersion modeling analysis for the Kersey Valley Landfill located in High Point, Guilford County, North Carolina was conducted in October 2017. The purpose for modeling was to demonstrate compliance with guidelines specified in ISA NCAC 02D .1104 for Toxic Air Pollutants (TAPs) emitted in excess of the Toxic Permitting Emission Rate (TPER) listed in 15A NCAC 2Q .0711.

The modeling adequately demonstrated compliance on a facility-wide basis, for all toxics pollutants modeled. Two toxic pollutants (benzene and vinyl chloride), were modeled from two separate area sources of the landfill. The emissions used in the modeling were assuming maximum waste disposal at the landfill in the year 2027. The challenge with the facility was determining representative emissions due to Kersey Valley Road splitting the facility in half. Area 1 is to the west of Kersey Valley Road and Area 2 is to the east of Kersey Valley Road. The facility-wide emissions were broken down to 41 % being emitted from Area I and 59% being emitted from Area 2.

AERMOD, (16216r) using five years (2012-2016) of meteorological data from Greensboro (surface and upper air) was used to evaluate impacts in both simple and elevated terrain. EPA's BPIP program (04274), was not run due to the facility not having any point sources interacting with buildings. Along the property boundary, receptors were placed at 25 m intervals. Extending from the property boundary Cartesian grids were established of 100 m spacing to 1 km and 500 m spacing to 5 km. Table 2 below shows the maximum modeled impacts as a percentage of the AAL.

Table 2. Maximum modeled impacts for the Kersey Valley Landfill located in High Point, NC.

Pollutant	Averaging Period	2012 ($\mu g/m^3$)	2013 ($\mu g/m^3$)	2014 ($\mu g/m^3$)	2015 ($\mu g/m^3$)	2016 ($\mu g/m^3$)	AAL ($\mu g/m^3$)	% of AAL
Benzene	Annual	0.07	0.07	0.06	0.06	0.06	0.12	58%
Vinyl Chloride	Annual	0.21	0.20	0.18	0.20	0.18	0.38	55%

Hydrogen Chloride is a North Carolina toxic air pollutant and is created from the combustion of landfill gas (which contains chlorine ions) in the solar vent flares. The landfill had no combustion of landfill gas prior to the solar flares being added.

Calculation for Hydrogen Chloride emission from the combustion process in the 5 solar flares for insignificant activity applicability in accordance with 15A NCAC 02Q .0503(8).

The calculation method used is from AP-42, Section 2.4.4.2 – Controlled Emissions. Hydrochloric acid (HCl) is formed when chlorinated compounds in landfill gas are combusted in control equipment. The best methods to estimate emissions are mass balance methods using site-specific data on total chloride [expressed in ppmv as the chloride ion (Cl^-)].

Since the TPER limit for HCL is in lbs/hour, the units in the equation will be in lbs/hour.

$\frac{90\ ft^3\ lfg}{minute} \times \frac{60\ minutes}{hour} \times \frac{50\ ft^3\ CH_4}{100\ ft^3 lfg} = \frac{2700\ ft^3\ CH_4}{hour}$ per flare (13,500 ft^3/hr CH_4 or 382.3 m^3/hour CH_4 for five solar flares)

$Q_{cl^-} = Q_{CH_4}\left(\frac{C_{cl}}{C_{CH4}\ (1\times 10^6)}\right)$ (Equation 3, AP-42 2008 draft, Section 2.4.4.)

Q_{cl^-} = Emission rate of chloride ions, m^3/hr
Q_{CH4} = 382.3 m^3 (five solar flares at 90 scfm landfill gas at 50% methane)
C_{cl^-} = concentration of chloride ions (42.0 ppmv, AP-42 default value when concentration not known)
C_{CH4} = Concentration of methane (50% landfill gas is methane expressed as 0.5)

$Q_{cl^-} = \frac{382.3\ m^3\ CH_4}{hour} \times \frac{42\ parts\ Cl^-}{0.5 \times (1\ x\ 10^6)} = \frac{0.032\ m^3\ Cl^-}{hour}$ (Equation 3, AP-42 2008 draft, Section 2.4.4.)

The uncontrolled mass emissions of chloride ions present in the methane were found in the following manner using Equation 4, AP-42, Section 2.4.4.2.

Where:
UM_{cl^-} = Uncontrolled mass emissions of chloride ions, kg/hr
MW_{cl^-} = Molecular weight of chloride ions (35.45 g/mol)
Q_{cl^-} = Emission rate of chloride ions, (0.06 m^3/hr)
T^0 = 25^0 C (77 ^{0}F), recommended by AP-42 for landfill gas temperature if temperature is unknown

$$UM_{cl^-} = \frac{0.032\ m^3}{hour} \times \left[\frac{35.45\ g/gmole \times 1\ atmosphere}{\left(\frac{8.205 \times 10^{-5}\ m^3-atmospere}{gmol-\ ^0K}\right) \times \frac{1000\ g}{kg} \times (273 + 25\ ^0C)\ ^0K}\right] = \frac{0.046\ kg\ (Cl^-)}{hour}$$

The mass emissions of hydrochloric acid (HCl) created by the flare combustion of chloride ions is found by using Equation 10, AP-42, Section 2.4.4.2.:

Where:
CM_{HCl} = Controlled mass emissions of hydrogen chloride, kg/hr
UM_{cl^-} = Uncontrolled mass emission of chloride ions (0.046 kg/hr)
η_{col} = Solar vent flare capture efficiency 100%
1.03 = Ratio of molecular weight of HCL to CL^-
η_{col} = Control efficiency of the solar vent flare for chlorinated hydrocarbons (98%)

$$CM_{HCL} = UM_{cl^-} \times \left(\frac{\eta_{col}}{100}\right) \times 1.03 \times \left(\frac{\eta_{cnt}}{100}\right) \times \frac{2.205\ lbs}{1\ kg}$$

$$CM_{HCL} = \frac{0.046\ kg}{hour} \times (1.0) \times 1.03 \times (0.98) \times \frac{2.205\ lbs}{kg} = \frac{0.10\ lbs\ HCL}{hour}\ (for\ five\ flares)$$

The total hydrogen chloride emissions from the five solar vent flares, using a collection efficiency of 100%, a 98% conversion rate and a total flow rate of 90 scfm each flare (13,500 ft^3/hr CH_4 or 382.3 m^3/hour CH_4 for five solar flares) is equal to 0.10 lbs/hour. The TPER limit for HCL emissions using the unobstructed limits in 15A NCAC 02Q .0711(b) is 0.74 lbs/hour. The unobstructed table in 02Q .0711(b) was used because all the emission release points are unobstructed and vertically oriented and the HCL emissions are not common from the landfill. Therefore, the total emissions of HCL from the five solar vent flares emits less than the hourly TPER rate for HCL. No modeling is required.

The addition of the five temporary solar vent flares would not add to the emissions of the five toxic air pollutants that were modeled in 2017, because the landfill was modeled at 100% fugitive emissions. The gas that is being combusted in the solar vent flares will be controlled at a 98% efficiency rate and therefore help to decrease the emissions from the landfill. However, Hydrogen Chloride is being created during the combustion process in the solar vent flares. As noted in the current permit, the landfill did not contain any combustion sources of landfill gas.

The renewal of this permit and the addition of the five insignificant solar vent flares do not change the facility's status with respect to NC Air Toxics, and therefore the sources at the Kersey Valley Landfill are not expected to present an unacceptable risk to human health because the 2017 air toxic modeling evaluation indicated compliance with the Ambient Air Quality levels. As indicated previously in this review, 15A NCAC 02D .1100 and 02Q .0711 will not be listed in the permit because the facility is subject to MACT Subpart 61 and is exempt from permitting in accordance with 15A NCAC 02Q .0702(a)(27).

10. Facility Emissions Review

The facility-wide potential emissions do not change under this TV permit renewal. Actual emissions for criteria pollutants and HAPs for the years 2018 through 2022 are provided in the header of this permit review.

11. Compliance Status

DAQ has reviewed the compliance status of the Kersey Valley Landfill facility. During the most recent inspection, conducted on December 13, 2022 by Dylan Wright of the Winston-Salem Regional Office, the facility appeared to be in compliance with all applicable requirements.

12. Public Notice/EPA and Affected State(s) Review

A notice of the DRAFT Title V Permit shall be made pursuant to 15A NCAC 02Q .0521. The notice will provide for a 30-day comment period, with an opportunity for a public hearing. Consistent with 15A NCAC 02Q .0525, the EPA will have a concurrent 45-day review period. Copies of the public notice shall be sent to persons on the Title V mailing list and EPA. Pursuant to 15A NCAC 02Q .0522, a copy of each permit application, each proposed permit and each final permit shall be provided to EPA. Also pursuant to 02Q .0522, a notice of the DRAFT Title V Permit shall be provided to each affected State at or before the time notice provided to the public under 02Q .0521 above. No affected states or local agencies are within 50 miles of this facility.

- Draft permit and permit review sent to public notice: XXXXX xx, 202X through XXXXXX 202X. …..Comments were received……
- Draft permit and permit review sent to the US EPA for their 45 review: XXXXX xx, 202X through XXXXX xx, 202X …..Comments were received……

13. Other Regulatory Considerations

a. Miscellaneous

- A P.E. seal is not required for this renewal or the addition of the five solar vent flares.
- A zoning consistency determination is not required for this renewal or the addition of the five solar vent flares.
- A permit fee is not required for this renewal or for the addition of the five solar vent flares.

b. <u>Emergency Affirmative Defense:</u>

EPA has promulgated a rule (88 FR 47029, July 21, 2023), with an effective date of August 21, 2023, removing the emergency affirmative defense provisions in operating permits programs, codified in both 40 CFR 70.6(g) and 71.6(g). EPA has concluded that these provisions are inconsistent with the EPA's current interpretation of the enforcement structure of the CAA, in light of prior court decisions[1]. Moreover, per EPA, the removal of these provisions is also consistent with other recent EPA actions involving affirmative defenses[2] and will harmonize the EPA's treatment of affirmative defenses across different CAA programs.

As a consequence of this EPA action to remove these provisions from 40 CFR 70.6(g), it will be necessary for states and local agencies that have adopted similar affirmative defense provisions in their Part 70 operating permit programs to revise their Part 70 programs (regulations) to remove these provisions. In addition, individual operating permits that contain Title V affirmative defenses based on 40 CFR 70.6(g) or similar state regulations will need to be revised.

Regarding NCDAQ, it has not adopted these discretionary affirmative defense provisions in its Title V regulations (15A NCAC 02Q .0500). Instead, DAQ has chosen to include them directly in individual Title V permits as General Condition J.

Per EPA, DAQ is required to promptly remove such impermissible provisions, as stated above, from individual Title V permits, after August 21, 2023, through normal course of permit issuance.

c. <u>PFAS:</u>

The NC DEQ has determined that per- and polyfluoroalkyl substances, also known as PFAS, have been and are being deposited in landfills. PFAS has become a significant concern since 2017. PFAS compounds are commonly used in industrial processes and found in waste streams where they can be emitted into the air, deposited into surface water or soil, and eventually reach groundwater. PFAS are also found in many commercial products that eventually find their way to landfills. In response to the growing concern about PFAS, NC DAQ has developed a list of screening questions that are sent to identified industries to help to identify potential air emission sources of emerging contaminants. These questions will be sent to Landfills that are currently collecting landfill gas and burning the gas onsite in a flare or other type of combustion device and to facilities that receive landfill gas for renewable natural gas.

The Kersey Valley Landfill currently does not have a gas collection and control system, therefore the testing requirement for PFAS will not be placed into the permit. However, the Disclosure statement listed below will be included in the permit.

[1] NRDC v. EPA, 749 F.3d 1055 (D.C. Cir. 2014).

[2] In newly issued and revised New Source Performance Standards (NSPS), emission guidelines for existing sources, and NESHAP regulations, the EPA has either omitted new affirmative defense provisions or removed existing affirmative defense provisions. See, e.g., National Emission Standards for Hazardous Air Pollutants for the Portland Cement Manufacturing Industry and Standards of Performance for Portland Cement Plants; Final Rule, 80 FR 44771 (July 27, 2015); National Emission Standards for Hazardous Air Pollutants for Major Sources:
Industrial, Commercial, and Institutional Boilers and Process Heaters; Final Rule, 80 FR 72789 (November 20, 2015); Standards of Performance for New Stationary Sources and Emission Guidelines for Existing Sources: Commercial and Industrial Solid Waste Incineration Units; Final Rule, 81 FR 40956 (June 23, 2016).

Disclosure of Information Relating to Emissions of Fluorinated Chemicals:
"The Permittee shall have an ongoing duty to disclose the known presence of materials containing fluorinated chemicals at the Facility that have the potential to result in the emission of fluorinated chemicals to the environment. Such disclosures shall be in writing and submitted to the Regional Office Supervisor within thirty days of the Permittee becoming aware of such information, unless such information has already been disclosed to DAQ by the Permittee."

14. Recommendations

The permit renewal application for Kersey Valley Landfill, located at 3940 East Kivett Drive, High Point, Guilford County, North Carolina has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. DAQ recommends the issuance of Air Permit No. 10517T02.

Attachment A

From: Matt Lamb
To: Suparna Chakladar; Bryan Wuester; Eric Hopkins; Gordon McLennan
Cc: John Fearrington; Mac Jones
Subject: Re: Flare emission factors
Date: Friday, September 8, 2023 12:38:47 PM
Attachments: image001.png

On Wed, Aug 9, 2023, 4:10 PM Matt Lamb <matt@smithgardnerinc.com> wrote:
Our email from EPA. Hopefully this will justify our flare emission factors.
Matthew S. Lamb
Senior Scientist
SMITH GARDNER, INC.
14 N. Boylan Avenue
Raleigh, NC 27603
P (919) **828.0577 x121**
C (919) **801.3548** **www.smithgardnerinc.com**

On Wed, Aug 9, 2023 at 1:13 PM
Thorneloe, Susan <Thorneloe.Susan@epa.gov> wrote:

Matt – I agree with your use of the AP42 2008 emission factors as we discussed this morning. The industrial emission factors were not evaluated for landfill gas application whereas the 1998 and 2008 (I was involved in both updates).

The issues that industry raised with the 2008 report had to do with requesting that EPA provide more information on oxidation research that they had funded. My judgement was that the path of least resistance dominates where oxidation is likely. At the time as I recall, the contention for some in the industry (including researchers funded by industry) was that landfills are a sink for carbon and not a source. The Nature 2019 publication put that claim to rest (IMO).

The 2008 report includes the results from work that I led (and EREF funded) to conduct measurements of combustion technology at five landfills - two of which were enclosed flares. The objective was to get more up-to-date data on landfill gas combustion (and byproduct emissions based on differences in technology used) in the AP42 emission factors. We did succeed and I believe that is what most people are now using. Was not aware that some are suggesting the industrial flare factors that are not representative of landfill gas. Regardless, it is the State and Region that have the ultimate oversight on what is ultimately used in calculating emissions factors. As I explained, I agree with your recommendation-

Kind regards- Susan T
Susan Thorneloe
U.S. Environmental Protection Agency
Office of Research and Development (ORD)
Center for Environmental Solutions and Emergency Response
Homeland Security and Materials Management Division
Materials Management and Oil Spills Branch
Research Triangle Park, NC 27711
Office: 919-541-2709 | Mobile: 919-452-8061

Attachment A – Continued

Email: thorneloe.susan@epa.gov
Member of the International Waste Working Group
https://www.tuhh.de/iue/iwwg/welcome.html

From: Matt Lamb <matt@smithgardnerinc.com>
Sent: Wednesday, August 9, 2023 12:58 PM
To: Thorneloe, Susan <Thorneloe.Susan@epa.gov>; John Fearrington <johnf@smithgardnerinc.com>; Mac Jones <mac@smithgardnerinc.com>
Subject: Flare emission factors

Susan:

Thank you for taking the time to meet and talk about landfill gas emission factors today. As we discussed, our client is working with a landfill gas to energy developer to permit a renewable natural gas (RNG) project to collect and treat landfill gas to levels that would allow it to be injected into a natural gas pipeline. After the permit is issued, and while the project is being constructed, as well as during the brief periods when the project is shut down to perform maintenance, landfill gas will be sent to one of two existing open candlestick flares for destruction. EPA has provided emission factors for use in estimating emissions from candlestick flares, including the following:

- AP-42 Chapter 2.4, Municipal Solid Waste Landfills, finalized 1998;
- AP-42 Chapter 13.5, Industrial flares (refinery and other chemical manufacture), finalized 2018; and AP-42 Chapter 2.4, Municipal Solid Waste Landfills, draft 2008.

S+G uses the draft 2008 emission factors to calculate emissions for Title V air permit applications and renewals because the emission factors for carbon monoxide, nitrogen dioxide, and particulate matter all receive an "A" rating when ranked by EPA based on dataset size and other factors. For comparison, the final 1998 factors receive "C" ratings for carbon monoxide and nitrogen dioxide, and a "D" rating for particulate matter. The AP-42 Chapter 13.5 emission factors are similarly not used because these emission factors are based on data collected from flaring of refinery and other chemical manufacture byproducts, not landfill gas. Additionally, EPA rates these factors "Poorly" for representativeness.

S+G recommended that the RNG developer adopt the same draft 2008 flare emission factors to calculate flaring emissions from their project, since the flares are similar in size, capacity, and design. Since you were instrumental in data collection and development of the Background Information Document (BID) for the draft 2008 emission factors, would you be willing to provide your expert opinion on S+G using (and S+G recommending others use) these factors in preference of the other available factors?

I appreciate your feedback, and any comment or clarification you may provide.

Thank you.
Matthew S. Lamb
Senior Scientist
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