

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Application Review

Issue Date: April **xx/2022**

Region: Winston-Salem Regional Office
County: Guilford
NC Facility ID: 4101253
Inspector's Name: Robert Barker
Date of Last Inspection: 01/20/2022
Compliance Code: W / Violation - procedures

<p style="text-align: center;">Facility Data</p> <p>Applicant (Facility's Name): Kersey Valley Landfill</p> <p>Facility Address: Kersey Valley Landfill 3940 East Kivett Drive High Point, NC 27261</p> <p>SIC: 4953 / Refuse Systems NAICS: 562212 / Solid Waste Landfill</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>	<p style="text-align: center;">Permit Applicability (this application only)</p> <p>SIP: 15A NCAC 02D .0524, .1110, .1806 NSPS: Subpart XXX NESHAP: 40 CFR 61, Subpart M; GACT, Subpart ZZZZ PSD: N/A PSD Avoidance: N/A NC Toxics: 112(r): N/A Other: N/A</p>
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Contact Data			Application Data
<p style="text-align: center;">Facility Contact</p> <p>Mike Spencer Landfill Superintendent (336) 883-3433 City of High Point Dept. of Public Svcs. High Point, NC 27261 mike.spencer@highpointnc.gov</p>	<p style="text-align: center;">Authorized Contact</p> <p>Robby Stone Assistant Director (336) 883-3215 PO Box 230 High Point, NC 27261 robby.stone@highpointnc.gov</p>	<p style="text-align: center;">Technical Contact</p> <p>Robby Stone Assistant Director (336) 883-3215 PO Box 230 High Point, NC 27261 robby.stone@highpointnc.gov</p>	<p>Application Number: 4101253.21A Date Received: 08/25/2021 Application Type: Modification Application Schedule: TV-Significant Existing Permit Data Existing Permit Number: 10517/T00 Existing Permit Issue Date: 04/11/2018 Existing Permit Expiration Date: 03/31/2023</p>

Total Actual emissions in TONS/YEAR:							
CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
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 **Contacts:** Matt Crowley matthew@smithgardnerinc.com Matt Lamb: matt@smithgardnerinc.com
Phone: 919-828-0577 x 121

<p>Review Engineer: Joshua L. Harris/Booker T. Pullen</p> <p>Review Engineer's Signature: _____ Date: _____</p>	<p style="text-align: center;">Comments / Recommendations:</p> <p>Issue: 10517/T01 Permit Issue Date: 04/xx/2022 Permit Expiration Date: 03/31/2023</p>
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1. Purpose of Application

The Kersey Valley Landfill is an active municipal solid waste (MSW) landfill located in High Point, Guilford County, North Carolina. The landfill is submitting Application No. 4101253.21A for a Significant Modification to their Title V air permit in response to a Notice of Violation that was issued as a result of toxic emission rate information submitted as part of the annual air quality emission inventory (AQEI).

The landfill is also requesting removal of the 15A NCAC 02D .1100 and 02Q .0711 toxics provisions based on the 02Q .0702(a)(27)(A) allowance for facilities subject to standards under 40 CFR 61 to be exempted from permitting for toxic air pollutants. The application states that the landfill is subject to the requirements of 40 CFR 61, Subpart M for Asbestos as an active disposal site.

This application will be processed as a Significant Modification to include the requirements of 40 CFR 61, Subpart M, and remove the requirements of 15A NCAC 02D .1100 and 02Q .0711. The application is required to go through the 30-day public notice and 45-day EPA review periods prior to issuance.

The facility contact for this application is Robby Stone, Assistant Director, (phone: 336-883-3215). A consultant Smith Gardner, Inc. (S+G) was used to prepare this application. The contact at S+G is Matthew Crowley, Staff Engineer, (phone: 919-828-0577 ext. 171).

2. 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 m³ mass and volume thresholds which require landfills to obtain a Title V air permit. The landfill has demonstrated that the NMOC emission rate is below the NSPS Subpart XXX threshold (34 Mg/yr) through Tier 2 testing and does not have a landfill gas collection and control system installed. Based on Tier 2 testing, the landfill, which is scheduled for closure in 2025, will not become equal to or cross over the 34 Mg/yr NSPS threshold before closure. The only other emission sources at this facility are a small diesel-fired emergency generator located at the leachate pump station, and a mobile tub grinder that the City of High Point brings on-site periodically to grind wood waste.

3. Permit History

Revision No.	Issue Date	Description
T00	05/11/2018	Initial permit issued.

4. Application Chronology

- 05/18/21 The Divisions of Air Quality (DAQ), Winston-Salem Regional Office (WSRO), received the Kersey Valley Landfill's AQEI for review.
- 07/07/21 The WSRO issued a Notice of Violation (NOV) to the Kersey Valley Landfill for exceeding the 15A NCAC 02Q .0711 toxic pollutant emission rate (TPER) threshold for acrylonitrile and required the landfill to submit a permit application to modify the permit to include modeled limits. The submittal was also required to include a dispersion modeling demonstration and the required application fee.
- 07/16/21 Joshua Harris spoke with Matt Lamb of S+G. Mr. Lamb had questions regarding the NOV, and what would be required for the application submittal. Mr. Harris stated that the application could be processed as a "State-Only" application if the application only included changes to the toxic provisions in the permit, and that such applications are not required to go through the public notice or EPA review periods. Mr. Harris pointed Mr. Lamb to the application matrix on the DAQ website for the required permit application forms and stated that since the "State-Only" category does not appear, the "Minor Modification" category can be used as a guide.

Mr. Lamb asked if the application can be combined with a renewal. Mr. Harris stated that it may be too far from permit expiration to consider renewal, and if the applications can be combined, they would need to go through the public notice/EPA review periods.

Mr. Harris followed-up with an email to Mr. Lamb stating that after speaking with his supervisor, Booker Pullen, it was decided that the expiration date of the permit was too far away to be considered for renewal.

08/17/21 The WSRO received a check for the application fee. The enclosed letter stated that an application for a modification was being submitted separately.

08/25/21 The WSRO received the permit modification application, Application No. 4101253.21A, and forwarded a copy to the Raleigh Central Office (RCO). There was no request for confidentiality. The application appeared complete, with the exception of the E5 form, however the application appeared to be otherwise administratively complete for processing.

As a departure from the previous conversations, the application requested exemption from the toxics provisions per 15A NCAC 02Q .0702(a)(27)(A), which allows facilities subject to NESHAP requirements to be exempted from permitting for toxics, claiming that the landfill is subject 40 CFR 61, Subpart M for asbestos. Since the permit does not currently contain such conditions, this application will not be treated as a "State-Only" modification and will instead be treated as a "Significant Modification" to include permit conditions for these Federal requirements, and to remove the State toxics requirements.

08/27/21 RCO sent the facility a letter acknowledging receipt of the administratively complete permit application.

09/10/21 Joshua Harris sent an email to Matthew Crowley regarding additional information being requested to fulfill the NOV requirement for the facility to submit dispersion modeling with the application. Mr. Harris also included an explanation that the application could not be processed as a "Minor Modification" and that additional information/forms will need to be submitted in order for the application to be considered completed. Mr. Harris also requested that an E5 form be submitted, which is required regardless of the application type, but was not submitted with the original application package.

Matt Lamb replied asking for clarification regarding the dispersion modeling requirement. Mr. Harris explained that since the NOV required dispersion modeling to be submitted as part of the application, the included D3 forms requesting that DAQ perform modeling was not sufficient to meet the NOV requirement.

09/13/21 Joshua Harris sent a follow-up email to Matt Lamb, indicating that, in addition to other previously discussed pollutants, methyl mercaptan also appeared to exceed its 02Q .0711 threshold, and would need to be included in the dispersion modeling demonstration.

10/21/21 Joshua Harris sent Matt Lamb an email regarding DAQ's decision to conduct toxics modeling for the facility, as initially requested. Mr. Harris reiterated that an E5 form still needed to be submitted and asked whether the applicant preferred to have the application processed as a Minor Modification. Mr. Harris also stated that if a Minor Modification is requested, that additional forms/documents will be required.

2/1/22 TV Equipment Editor updated.

2/15/22 Booker Pullen sent electronic copies of the draft permit and review documents to DAQ Technical Services (Samir Parekh) and the WSRO (Ray Stewart) for comments.

2/16 & 17 /22 Comments received on 02/16 and 2/17/2022, all comments will be incorporated in the engineering review and permit as appropriate.

2/17/22 Booker Pullen sent electronic copies of the draft permit and review documents to Robby Stone for comments.

Xx/xx/22 Comments received...

Xx/xx/22 30-day public notice and 45-day EPA review periods begin.

Xx/xx/22 Public notice period ends, [comments received].

Xx/xx/22 EPA review period ends, [comments received].

Xx/xx/22 Air Quality Permit No. 10517T01 issued.

5. Table of Changes to Existing Permit No. 10517T00

The following changes were made to Air Permit No. 10517T00*

Page No.	Section	Description of Changes
Cover Page	Cover Page	Updated letterhead Updated Permit revision numbers and dates throughout Updated PSD increment tracking statement
Page 1 of Permit	Body of Permit	Changed Permit number Changed Replaces Permit number Revised effective date of Permit Revised application number Revised complete application date
Page 2 of Permit	Table of Contents	Revised Table of Contents
Page 3 of Permit	List of Acronyms	List relocated to this section of the Permit
Page 4 of Permit	Permitted Sources Table	Added citation for applicability of 40 CFR 61, Subpart M
Pages 4-8	Section 2.1	Added Subpart XXX regulations to permit
Pages 8-9	Section 2.1	Added 40 CFR 61, Subpart M
Page 10	Section 2.1	Added Odor regulation
	Section 2.3	Added Insignificant Activities table
	Section 2.4	Added Permit Shield Section
Pages 11-19	General Conditions	Added Version 6.0, revised 01/07/2022

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

6. Changes in Equipment

There are no changes in the facility's permitted equipment, or the insignificant activities. The description of the municipal solid waste landfill (ID No. ES-1) was updated to include a citation for 40 CFR 61 Subpart M as an applicable Federal regulation.

The facility's permitted emission sources are as follows:

Emission Source ID No.	Emission Source Description	Control Device ID No.	Control Device Description
ES-1 NSPS XXX 40 CFR 61 Subpart M	One municipal solid waste landfill consisting of Areas 1 and 2 with a permitted design capacity of 3,325,030 Mg	None	None

The facility's insignificant/exempt activities are as follows:

Emission Source ID No.	Emission Source Description
IES-2 NSPS IIII, GACT ZZZZ	One Diesel fuel-fired emergency generator (30 kW) located at the leachate pump station
IES-3	Tub grinder (Model: Morbark 1300B)

7. NSPS, NESHAP, PSD, 112(r), CAM & Attainment Status

- **NSPS** –
 - ✓ The MSW landfill (ID No. ES-1) is NOT subject to 40 CFR 60, Subpart WWW “Municipal Solid Waste Landfills” since it is superseded by NSPS Subpart XXX.
 - ✓ The MSW landfill (ID No. ES-1) is subject to 40 CFR 60, Subpart XXX “Municipal Solid Waste Landfills that Commenced Construction, Reconstruction, or Modification After July 17, 2014” since the facility has been modified after July 17, 2014.
 - ✓ 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.
 - ✓ The engine driving the tub grinder (ID No. ES-2) is NOT subject to 40 CFR 60, Subpart IIII “Stationary Compression Ignition Internal Combustion Engines” because it is not a stationary source.
- **NESHAP** –
 - ✓ The MSW landfill (ID No. ES-1) is NOT subject to 40 CFR 63, Subpart AAAA “Municipal Solid Waste Landfills.” Although the landfill’s design capacity exceeds the 2.5 million Mg and 2.5 million m³ thresholds, the uncontrolled NMOC emission rate, determined using the Tier 2 methodology, is less than 50 Mg/yr. Additionally, the landfill is not, nor is it collocated with a major source of HAPs.
 - ✓ The MSW landfill (ID No. ES-1) is subject to 40 CFR 61, Subpart M “National Emission Standard for Asbestos,” since it is an active waste disposal site for asbestos-containing waste.
 - ✓ 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.
- **PSD** – There are no changes to the facility’s potential emission rates associated with this application, therefore PSD is not impacted by this permitting action.
 - ✓ Guilford County has triggered increment tracking under PSD for PM₁₀ and SO₂. This permitting action is neither expected to consume nor expand any increments.

- **112(r)** – The facility does not store any of the listed 112(r) chemicals in amounts that exceed the threshold quantities. Therefore, the facility is not required to maintain a written Risk Management Plan (RMP).
- **CAM** – This facility does not have any control devices that are used to achieve compliance with any emission limitations or standards; therefore, CAM does not apply.
- **Attainment status** – Guilford County is in attainment for all criteria pollutants.

8. Regulatory Review

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

- 15A NCAC 02D .0524: New Source Performance Standard – 40 CFR 60, Subpart XXX
- 15A NCAC 02D .1110: Nation Emission Standards for Hazardous Air Pollutants – 40 CFR 61, Subpart M
- 15A NCAC 02D .1806: Control and Prohibition of Odorous Emissions

15A NCAC 02D .0524: New Source Performance Standards, 40 CFR 60, Subpart XXX

The facility is subject to 40 CFR 60, Subpart XXX since it was modified after July 17, 2014. Tier 2 testing in July 2017 and demonstrated that the NMOC emission rate is expected to remain below the 34 Mg/yr threshold for installation of a required gas collection and control system (GCCS) through the life of the landfill. Therefore, a GCCS is not currently required to be installed.

The Kersey Valley Landfill will continue to conduct Tier 2 testing as required. If at some point in the future the facility cannot demonstrate through Tier 2 testing that the NMOC emission rate is below the NSPS XXX 34 Mg NMOC threshold, then the facility will be required to submit a GCCS design plan, install a GCCS and submit a permit modification to include the appropriate requirements for operation and monitoring, or attempt to demonstrate that the NMOC emission rate is below the threshold via other test Tiers. Continued compliance is expected.

15A NCAC 02D .1110: Nation Emission Standards for Hazardous Air Pollutants – 40 CFR 61, Subpart M

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. The landfill provided a copy of their asbestos waste management plan as part of the Solid Waste Permit applications, and the plan appears to meet the requirements of this Subpart. Compliance is expected.

15A NCAC 02D .1806: Control and Prohibition of Odorous Emissions

This is applicable facility-wide. DAQ inspectors have not noted odors beyond the facility's property boundary, and neither DAQ nor the facility have received any odor complaints from nearby residents. Continued compliance is expected.

The following permit conditions are being removed as part of this permit application in accordance with 15A 02Q .0702(a)(27):

- 15A NCAC 02D .1100: Control of Toxic Air Pollutants
- 15A NCAC 02Q .0711: Emission Rates Requiring a Permit

15A NCAC 02D .1100: Control of Toxic Air Pollutants, and 15A NCAC 02Q .0711: Emission Rates Requiring a Permit

The landfill is an active disposal site for asbestos containing wastes, and is subject to the requirements of 40 CFR 61, Subpart M. The landfill has requested to have the 02Q .0711 and 02D .1100 toxics conditions removed pursuant to 15A NCAC 02Q .0702(a)(27). The landfill submitted information required to update the past modeling that was conducted to now include the entire landfill area through final buildout. The potential volume emissions from the landfill surface (ID No. ES-1) were calculated using the methodology in AP-42 Chapter 2.4 (November 1998) and are based on a peak LFG generation rate of 15,530,892 m³/year (combined rate) for both Areas 1 and 2 projected through the closure year 2025 as determined using LandGEM.

This landfill is not required to install or operate a gas collection and control system by regulation, nor does it have a “voluntary system”. Therefore, all emissions from the landfill are uncontrolled volume emissions from the landfill’s surface. The emission rates of toxics air pollutants from the landfill surface are calculated using the following methodology.

A previous demonstration was made in 2017 for benzene and vinyl chloride. The impacts at the property boundary generally vary proportionally with respect to the emission rate, assuming no changes to the facility. These toxic limitations were previously included in the Air Permit for this facility as shown in Table 1 below.

Table 1: Impacts for benzene and vinyl chloride (both Areas 1 and 2)

Pollutant	Averaging Period	Previously Evaluated Emission Rate	Updated Emission Rate	Previous Impact % AAL
Benzene	lb/yr	193	208.95	58%
Vinyl chloride	lb/yr	594	642.52	55%

The WSRO issued a Notice of Violation (NOV) to the Kersey Valley Landfill for exceeding the 15A NCAC 02Q .0711 toxic pollutant emission rate (TPER) threshold for acrylonitrile and required the landfill to submit a permit application to modify the permit to include modeled limits.

In this review, the potential uncontrolled emissions from the landfill (ES-1) are calculated using the lifetime peak LFG generation rate, which is the sum of LFG generated from Areas 1 and 2. The maximum generation rate is expected to occur in 2025 (the year that Area 2 reaches design capacity) and equals 15.53 million cubic meters per year (m³/yr). There are four other pollutants that will be above their TPER rates (acrylonitrile, methylene chloride, hydrogen sulfide, and methyl mercaptan). In accordance with 15A NCAC 02Q .0702(27)(A), the DAQ will remove all toxic air pollutant limits from the Air Permit and perform the modeling for this facility to assess health risk to the public. Dispersion modeling was conducted by the DAQ for acrylonitrile, methylene chloride, hydrogen sulfide, and methyl mercaptan.

Sample calculation for Toxics (acrylonitrile):

To account for the landfill’s potential volume of emissions through CY2025 (landfill closure year) when the active Area 2 reaches full capacity, toxic pollutants were calculated using the LFG maximum generation rate of 15,530,892 m³/yr from the LandGEM output, and pollutant concentrations from AP-42 Chapter 2.4 [November 1998].

Example:

- CY2025 LFG generation rate from LandGEM = 15,530,892 m³/year
- Methane is 50% of this gas stream (7,765,446 m³/year)
- Qacryl = Emission rate of Acrylonitrile, m³/year
- Cacryl = Concentration of Acrylonitrile (6.33 ppmv, AP-42)
- Multiplication factor for 50% methane concentration in landfill gas = 2.0
- Molecular weight of Acrylonitrile (53.06 g/gmol, AP-42)

$$Q_{acryl} = 2.0 \times Q_{CH_4} \times \left(\frac{C_{NMOC}}{1 \times 10^6} \right) \text{ (AP-42, Equation 3)}$$

$$Q_{acryl} = 2.0 \times 7,765,446 \frac{m^3}{year} \times \left(\frac{6.33 \text{ parts}}{1 \times 10^6} \right) = 98.31 \frac{m^3}{year}$$

The uncontrolled mass emission rate of NMOCs (UM_{NMOC}) was found using Equation 4 of AP-42, Section 2.4.4.2.

$$UM_{acryl} = 98.31 \frac{m^3}{year} \times \left[\frac{53.06 \text{ g/gmol} \times 1 \text{ atm}}{8.205 \times 10^{-5} \frac{m^3 - atm}{gmol - K} \times 1000 \frac{g}{kg} \times (273 + 25^\circ C) K} \right] \times 2.205 \frac{\text{pounds}}{kg}$$

$$UM_{NMOC} = 470 \frac{\text{pounds acrylonitrile}}{year} = 1.29 \frac{\text{lbs acrylonitrile}}{day}$$

The TPER limit for Acrylonitrile is 0.4 lbs per day, therefore this amount (1.29 lbs/day) will be modeled for compliance with the AAL.

Table 2: The comparison of toxic emission rates to their respective TPERs from 02Q .0711(a):

Toxic Air Pollutant	Averaging Period	Landfill Volume Emissions (CY2025)	TPER	Modeling Required?
1,1,1-Trichloroethane (methyl chloroform)	lb/day	0.25	250	No
	lb/hr	0.01	64	No
1,1,2,2-Teterechloroethane	lb/yr	260.95	430	No
1,1-Dichloroethene (vinylidene chloride)	lb/day	0.07	2.5	No
1,2-Dibromoethane (ethylene dibromide)	lb/yr	0.26	27	No
1,2-Dichloroethane (ethylene dichloride)	lb/yr	56.83	260	No
2-Butanone (MEK)	lb/day	1.96	78	No
	lb/hr	0.08	22.4	No
4-Methyl-2-pentanone (MIBK)	lb/day	0.72	52	No
	lb/hr	0.03	7.6	No
Acrylonitrile	lb/day	1.29	0.4	YES
	lb/hr	0.05	0.22	No
Benzene	lb/yr	208.95	8.1	YES
Carbon disulfide	lb/day	0.17	3.9	No
Carbon tetrachloride	lb/yr	0.86	460	No
Chlorobenzene	lb/day	0.11	46	No
Chloroform	lb/yr	5.02	290	No
p-Dichlorobenzene	lb/hr	4.94 x10 ⁻³	16.8	No
Dichloromethane (methylene chloride)	lb/yr	1701.21	1600	YES
	lb/hr	0.19	0.39	No
Ethyl mercaptan	lb/hr	0.023	0.025	No
n-Hexane	lb/day	2.17	23	No
Hydrogen Sulfide	lb/day	4.64	1.7	YES
Mercury vapor	lb/day	2.25 x10 ⁻⁴	0.013	No
Methanethiol (methyl mercaptan)	lb/hr	0.02	0.013	YES

Tetrachloroethylene (Perchloroethylene)	lb/yr	866.33	13000	No
Toluene	lb/day	13.89	98	No
	lb/hr	0.58	14.4	No
Trichloroethylene	lb/yr	518.95	4000	No
Vinyl chloride	lb/yr	642.52	26	YES
Xylene	lb/day	4.93	57	No
	lb/hr	0.21	16.4	No

Dispersion modeling was conducted by the DAQ for toxic air pollutants acrylonitrile, benzene, vinyl chloride, methylene chloride, hydrogen sulfide, and methyl mercaptan. AERMOD (version 21112) using five years (2014-2018) of surface and upper air meteorological data (ADJ U*) compiled from the Piedmont-Triad International Airport was used to evaluate impacts in both simple and complex terrain. The six toxics were modeled from two separate area sources. 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 modeled from the two area sources, with 41% being emitted from Area 1 and 59% being emitted from Area 2. Direction-specific building downwash parameters, calculated using EPA's BPIP-PRIME program (04274), were used as input to AERMOD to determine building downwash effects on plume rise and effects on entrainment of stack emissions into the cavity and turbulent wake zones downwind of existing buildings. Receptors were modeled around the facility's property line at 25-meter intervals. Two nested receptor grids were modeled off property according to the following radial extents and corresponding receptor spacings, respectively: 100 m spacing out to 1 km and 500 m spacing out to 5 km. Source and receptor elevations and receptor dividing streamline heights were calculated from USGS NED terrain data using the AERMOD terrain pre-processor AERMAP. Mr. Mark Yoder, AQAB, performed the modeling and determined that the model was sufficient to demonstrate compliance with the AAL.

Maximum Modeled Toxics Impacts for Kersey Valley Landfill, High Point, NC

Pollutant	Total Emission rates	Averaging Period	AAL ($\mu\text{g}/\text{m}^3$)	Maximum Modeled Impacts % of AAL
Acrylonitrile	1.29 lbs/day	24-hour	30	3 %
Benzene	209 lbs/yr	Annual	0.12	58 %
Hydrogen Sulfide	4.64 lbs/day	24-hour	120	2 %
Methylene Chloride	1,701.21 lbs/yr	Annual	24	2 %
Methyl Mercaptan	0.02 lbs/hr	1-hour	50	2 %
Vinyl Chloride	642.52 lbs/yr	Annual	0.38	56 %

Because all projected maximum emission rates of toxic air pollutants from the two areas of the landfill are all either below their respective TPERs or have been demonstrated to have impacts below their respective AALs by dispersion modeling, the DAQ believes that there does not appear to be an unacceptable health risk to the public.

9. Other Regulatory Requirements

- A Zoning Consistency Determination is NOT required for this permit application.
- The application was sealed by Peter Scheer, who is a registered Professional Engineer in the State of North Carolina (Seal #021666).
- The required permit application fee of \$1002 was received by WSRO.

10. Emissions Review

Landfill emissions Calculations:

The landfill submitted calculations for VOC emission rates which were based on the sum of pollutants listed as VOC in AP-42. However, AP-42 (November 1998) states that VOC emissions are 39% of NMOC emissions. To account for this, the landfill's potential volume emissions through CY2025 were calculated using the LFG generation rate of 15,530,892 m³/yr from the LandGEM output, and pollutant concentrations from AP-42 Chapter 2.4 [November 1998].

Example:

- CY2025 LFG generation rate from LandGEM = 15,530,892 m³/year
- Methane is 50% of this gas stream (7,765,446 m³/year)
- Q_{NMOC} = Emission rate of NMOCs, m³/year
- C_{NMOC} = Concentration of NMOCs (274 ppmv, most recent Tier 2 sample)
- Multiplication factor for 50% methane concentration in landfill gas = 2.0
- Molecular weight of NMOC (as n-hexane) = 86.18 g/gmol

$$Q_{\text{NMOC}} = 2.0 \times Q_{\text{CH}_4} \times \left(\frac{C_{\text{NMOC}}}{1 \times 10^6} \right) \quad (\text{AP-42, Equation 3})$$

$$Q_{\text{NMOC}} = 2.0 \times 7,765,446 \frac{\text{m}^3}{\text{year}} \times \left(\frac{274 \text{ parts}}{1 \times 10^6} \right) = 4,255.46 \frac{\text{m}^3}{\text{year}}$$

The uncontrolled mass emission rate of NMOCs (UM_{NMOC}) was found using Equation 4 of AP-42, Section 2.4.4.2.

$$UM_{\text{NMOC}} = 4,255.46 \frac{\text{m}^3}{\text{year}} \times \left[\frac{86.18 \text{ g/gmol} \times 1 \text{ atm}}{8.205 \times 10^{-5} \frac{\text{m}^3 - \text{atm}}{\text{gmol} - \text{K}} \times 1000 \frac{\text{g}}{\text{kg}} \times (273 + 25^\circ\text{C}) \text{ K}} \right] \\ \times 2.205 \frac{\text{pounds}}{\text{kg}}$$

$$UM_{\text{NMOC}} = \frac{33,072.51 \text{ pounds NMOC}}{\text{year}} \times \frac{1 \text{ ton}}{2000 \text{ lbs}} = 16.54 \frac{\text{tons NMOC}}{\text{year}}$$

To calculate the VOC component of the landfill's uncontrolled surface emissions, AP-42 states in note "c" of Table 2.4-2 that VOC emissions are 39 wt.% of the NMOC emissions, therefore:

$$UM_{\text{VOC}} = 0.39 \times 16.54 \frac{\text{tons}}{\text{year}} = 6.45 \frac{\text{tons VOC}}{\text{year}}$$

These values are projections and may fluctuate over time depending on a number of factors such as waste type, moisture, waste placement rates, etc., which can affect the NMOC concentration and LFG generation rates.

Emergency Generator Emissions calculations:

The potential emissions from the facility's stationary emergency generator (ID No. IES-2) were calculated using emission factors from AP-42, Table 3.3-1. Operation hours for emergency engines were assumed to be a maximum of 500 hours per year in keeping with EPA guidance.

PM: 2.20×10^{-3} lb/hp-hr (all particulate matter emitted is assumed to be as PM_{2.5})
 SO₂: 2.05×10^{-3} lb/hp-hr
 NO_x: 0.031 lb/hp-hr
 CO: 6.68×10^{-3} lb/hp-hr
 VOC: 2.51×10^{-3} lb/hp-hr (sum of crankcase and exhaust)

Examples:

PM:

$$30 \text{ kW} \times \frac{1.34 \text{ hp}}{\text{kW}} \times \frac{2.20 \times 10^{-3} \text{ lb PM}}{\text{hp} - \text{hr}} \times \frac{500 \text{ hours}}{\text{year}} \times \frac{\text{ton}}{2,000 \text{ lb}} = 0.02 \frac{\text{tons PM}}{\text{year}}$$

SO₂:

$$30 \text{ kW} \times \frac{1.34 \text{ hp}}{\text{kW}} \times \frac{2.05 \times 10^{-3} \text{ lb SO}_2}{\text{hp} - \text{hr}} \times \frac{500 \text{ hours}}{\text{year}} \times \frac{\text{ton}}{2,000 \text{ lb}} = 0.02 \frac{\text{tons SO}_2}{\text{year}}$$

NO_x:

$$30 \text{ kW} \times \frac{1.34 \text{ hp}}{\text{kW}} \times \frac{0.031 \text{ lb NO}_x}{\text{hp} - \text{hr}} \times \frac{500 \text{ hours}}{\text{year}} \times \frac{\text{ton}}{2,000 \text{ lb}} = 0.31 \frac{\text{tons NO}_x}{\text{year}}$$

CO:

$$30 \text{ kW} \times \frac{1.34 \text{ hp}}{\text{kW}} \times \frac{6.68 \times 10^{-3} \text{ lb CO}}{\text{hp} - \text{hr}} \times \frac{500 \text{ hours}}{\text{year}} \times \frac{\text{ton}}{2,000 \text{ lb}} = 0.07 \frac{\text{tons CO}}{\text{year}}$$

VOC:

$$30 \text{ kW} \times \frac{1.34 \text{ hp}}{\text{kW}} \times \frac{2.51 \times 10^{-3} \text{ lb VOC}}{\text{hp} - \text{hr}} \times \frac{500 \text{ hours}}{\text{year}} \times \frac{\text{ton}}{2,000 \text{ lb}} = 0.03 \frac{\text{tons VOC}}{\text{year}}$$

Table 3: Facility wide emissions

Pollutant	Total Uncontrolled Emission Rates tons/yr
PM (TSP)	0.02
PM ₁₀	0.02
PM _{2.5}	0.02
SO ₂	0.02
NO _x	0.31
CO	0.07
VOC	6.45 + .03 = 6.48

11. Statement of Compliance

The last facility inspection was completed on January 20, 2022, by Robert Barker, who states that “based on review of the records and visual observations, the facility appeared to be operating in compliance with Air Quality standards and regulations at the time of this inspection. As a result of the 2020 AQEI, the facility was issued a Notice of Violation (NOV) on July 7, 2021, for exceeding the 15A NCAC 02Q .0711 threshold for acrylonitrile. This application resolves that violation.

12. Public Notice 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.

The 30-day public notice period was from February xx, 2022 through MONTH XX, 2022.

The EPA 45-day review period was from February XX, 2022 through MONTH XX, 2022.

[Number of] comments were received during the public notice period and the EPA review period.

13. Comments and Recommendations

The permit modification application for the Kersey Valley Landfill located in High Point, Guilford County, NC has been reviewed by DAQ to determine compliance with all procedures and requirements. DAQ has determined that this facility is complying or will achieve compliance, as specified in the permit, with all requirements that are applicable to the affected sources. The DAQ recommends the issuance of Air Permit No. 10517T01.