NORTH CAROLINA DIVISION OF AIR QUALITY

Application Review

Issue Date: TBD

Region: Washington Regional Office
County: Craven
NC Facility ID: 2500197
Inspector's Name: Kurt Tidd
Date of Last Inspection: 03/01/2023
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Tuscarora Long-Term Regional Landfill

Facility Address:
Tuscarora Long-Term Regional Landfill
7400 Old Hwy 70 West
New Bern, NC 28562

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 .0516, 02D .0521, 02D .0524, 02D .1100, 02D .1110, 02D .1111, 02D .1806
NSPS: Subparts XXX, and IIII
NESHAP: 40 CFR 61 Subpart M, 40 CFR 63 Subparts AAAA, ZZZZ, and CCCCCC
PSD: N/A
PSD Avoidance: N/A
NC Toxics: Permit limitations for various TAPs
112(r): N/A
Other: N/A

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Bobby Darden Executive Director (252) 633-1564 PO Box 128 Cove City, NC 28523 BDarden@crswma.com	Bobby Darden Executive Director (252) 633-1564 PO Box 128 Cove City, NC 28523 BDarden@crswma.com	Bobby Darden Executive Director (252) 633-1564 PO Box 128 Cove City, NC 28523 BDarden@crswma.com

Application Data

Application Number: 2500197.21A
Date Received: 10/22/2021
Application Type: Modification
Application Schedule: TV-Reopen for Cause

Existing Permit Data
Existing Permit Number: 09755/T02
Existing Permit Issue Date: 02/05/2020
Existing Permit Expiration Date: 01/31/2025

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2021	1.22	6.15	6.29	4.50	1.27	3.40	1.04 [Toluene]
2020	0.4800	4.28	5.01	13.25	0.5500	2.41	0.8201 [Toluene]
2019	0.9000	11.72	5.03	10.60	0.9600	1.94	0.6692 [Toluene]
2018	0.7900	11.44	5.18	5.08	0.8400	1.95	0.6911 [Toluene]
2017	0.7600	11.36	5.79	3.78	0.8100	2.22	0.7963 [Toluene]

Review Engineer: Massoud M. Eslambolchi

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

Comments / Recommendations:
Issue: 09755T03
Permit Issue Date: TBD
Permit Expiration Date: 01/31/2025

1. Purpose of Application

Tuscarora Long-Term Regional Landfill is an active Municipal Solid Waste (MSW) landfill located in New Bern, Craven County. The landfill has submitted application 2500197.21A in accordance with 15A NCAC 02D .0517 "Reopen For Cause" in order to update the existing MACT AAAA conditions in the Title V permit to include the changes in the February 14, 2022 Federal Register, Volume 87, Issue 30 for this Subpart.

In the February 14, 2022 Federal Register, the U.S. Environmental Protection Agency (EPA) finalized technical revisions and clarifications for the National Standards for Hazard Air Pollutants (NESHAP, Subpart AAAA) for MSW Landfills established in the March 26, 2020, final rule.

- This final rule also amended the MSW Landfill's NSPS regulations in 40 CFR Part 60, Subpart XXX, to clarify and align the timing of compliance for certain requirements involving the installation of a gas collection and control systems (GCCS) under related MSW landfill rules.
- Additionally, the EPA revised the definition of Administrator in the MSW Landfills Federal Plan that was promulgated on May 21, 2021 to clarify who has the authority to implement and enforce the applicable requirements. The final rule was effective February 14, 2022.

2. Facility Description

The Tuscarora Long-Term Regional Landfill is a municipal solid waste (MSW) landfill located in New Bern, Craven County. The landfill is a lined Subtitle-D landfill comprised of six areas: the Interim Regional Landfill (closed), Phase 1 (closed), Phase 2 (temporarily closed), Phase 3 (active), Phase 4 (under construction), and Phase 5 (future planned). With the recently issued Solid Waste Permit (Permit No. 2509) the final buildout plan was changed such that the remainder of the previously planned Phases were consolidated into Phases 4 and 5, and roughly 8 additional acres of waste disposal area were permitted. Phase 5 will consist of a lateral expansion, and a vertical expansion over portions of Phases 1-4 of the landfill to reach the final elevations.

The landfill's permitted design capacity is 15,500,000 cubic yards, or 11,625,000 tons based on a waste density of 1,500 pounds per cubic yard. These values are greater than the Title V thresholds of (2.5 million cubic meters and 2.5 million Megagrams). The final closeout is anticipated to be in CY2043, with the assumption that the waste disposal rate will increase 2.5% each year above the CY2018 rate. The landfill accepts both MSW and construction and demolition (C&D) wastes, which are commingled and disposed of within the same areas. The landfill estimates that MSW accounts for approximately 73% of the total waste accepted based on past acceptance rates and uses this assumption in the projections for future disposal.

The landfill is currently subject to NSPS XXX as well as MACT AAAA, has an active gas collection and control system (GCCS) since the landfill's NMOC emission rates exceed the 50 Mg/yr applicable threshold. LFG is collected and is either routed to an installed utility flare for incineration or is routed through a treatment system and sent to INGENCO Wholesale Power, LLC – New Bern (Facility ID 2500196) for electricity generation; INGENCO's generators are permitted under a separate Title V air permit (Permit No. 09616). INGENCO owns and operates the treatment system, however, the landfill is ultimately responsible for compliance with the NSPS XXX requirements for LFG treatment.

3. Application Chronology

02/05/2020	Last TV Renewal Permit issued as Permit No. 09755T02.
10/22/2021	Division of Air Quality (DAQ), received Application No. 2500197.21A (Re-Open for Cause) for alteration to the current Title V air permit. The application contained the required forms, and there was no request for confidentiality.
11/04/2021	RCO sent facility the complete application acknowledgement letter.
05/24/2023	Pre-draft submitted for Supervisory review.

10//05/2023 Draft permit sent to the Applicant.

10/05/2023 Drafts sent to SSCB, and WaRO

xx/xx/2023 Draft permit and review sent to notice for Public comment and EPA review.

xx/xx/2023 30-Day Public comment period ends.

xx/xx/2023 45-Day EPA Review period ends.

xx/xx/2023 Permit issuance date.

4. Table of Changes to Existing Permit No. 09755T02

Existing Permit	New Permit Section	Description of Changes
------	Cover letter	● Updated letterhead and permit using new permit shell ● Updated permit revision numbers and dates throughout
------	Cover letter	● Revised PSD increment tracking statement.
------	Cover letter	● Added page containing "Notice Regarding The Right to Contest A Division Of Air Quality Permit"
------	Cover letter	● Revised the Summary of Changes to the Permit page
------	1st Page of Permit	● Changed number, changed "Replaces Permit" number ● Changed effective date and issue date of the Permit ● Revised the application number and complete application date
------	List of Acronyms	● Added list to the front of the permit
Page 6	Section 2.1 A.3.i and ii	● Removed past applicability dates for NSPS XXX
-------	Section 2.1 A.5 Pages 17-28	● Updated MACT AAAA requirements
-------	Section 3 Page 31	● Moved Insignificant Activities to new Section 3.
-------	Section 4 Pages 32	● Added new Section 4 for General Conditions (version 7.0, 08/21/2023)

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

- **NSPS** –

  ✓ The MSW landfill (ID No. ES-01) is subject to 40 CFR 60, Subpart XXX, "Municipal Solid Waste Landfills that Commenced Construction, Reconstruction or Modification after July 17, 2014." The Solid Waste Section issued a permit-to-construct for the Phase 4 lateral expansion on December 21, 2018, which increased the permitted design capacity and triggered the modification provisions of NSPS XXX. Construction on that expansion commenced on February 13, 2019, triggering applicability of NSPS XXX.

  ✓ The MSW landfill (ID No. ES-01) is NOT subject to 40 CFR 60, Subpart WWW, "Municipal Solid Waste Landfills," since Subpart WWW is superseded by Subpart XXX.

- ✓ The diesel-fired emergency generators (ID Nos. IES-07 and IES-08) are subject to 40 CFR 60, Subpart IIII, "Stationary Compression Ignition Internal Combustion Engines," because the dates, 2018 and 2007 respectively for IES-07 and IES-08, are after the applicability date of the NSPS regulation.

- **NESHAP** –

  - ✓ The MSW landfill (ID No. ES-01) is subject to 40 CFR 63, Subpart AAAA "Municipal Solid Waste Landfills," because it has a design capacity equal to or greater than 2.5 million Mg and 2.5 million m^3, and has estimated uncontrolled NMOC emissions equal to or greater than 50 Mg/yr. This is a category MACT and not because the emissions are greater than the 10 tpy or 25 tpy total HAP emissions.

  - ✓ The MSW landfill (ID No. ES-01) 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 diesel-fired emergency generators (ID Nos. IES-07 and IES-08) are subject to 40 CFR 63, Subpart ZZZZ, "Reciprocating Internal Combustion Engines," and are considered as new emergency engines under this regulation. These generators are listed as insignificant activities in the permit (Section 3). Compliance with this subpart is achieved by complying with the requirements of NSPS Subpart IIII.

  - ✓ The gasoline storage tank (ID No. IES-04B) is subject to 40 CFR 63, Subpart CCCCCC "Gasoline Dispensing Facilities" since the facility is an area source of HAPs, and the facility meets the definition of a gasoline dispensing facility as any stationary facility which dispenses gasoline into the tank of a motor vehicle, motor vehicle engine, nonroad vehicle, or nonroad engine, including a nonroad vehicle or nonroad engine used solely for competition. Gasoline storage tanks are listed as affected sources under 40 CFR 63.11111(a), and there are no size distinctions.

    Since IES-04B is an insignificant activity, there is no permit condition, however the facility is still required to comply with Subpart CCCCCC. The facility has the general duty to minimize emissions by operating and maintaining affected sources, and their associated air pollution control and monitoring equipment, in a manner consistent with safety and good air pollution practices for minimizing emissions. In addition, since the facility's throughput is expected to be less than 10,000 gallons per month based on throughput reported on the facility's annual AQEI, the facility is subject to the requirements of 40 CFR 63.11116.
    This section states that the facility must handle the gasoline in a manner which will not result in vapor release to the atmosphere for an extended period of time. Measures to be taken include, but are not limited to:

    - Minimize gasoline spills;
    - Clean up spills as expeditiously as practicable;
    - Cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use; and
    - Minimize gasoline sent to open waste collection systems that collect and transport gasoline to reclamation and recycling devices.

    There are no notification or reporting requirements for facilities with a throughput of less than 10,000 gallons per month, however, the facility shall supply records of gasoline throughput within 24 hours of a request by DAQ.

    Additionally, should the facility's monthly gasoline throughput exceed 10,000 gallons, the facility will be subject to the requirements of 40 CFR 63.11117 for facilities with a monthly throughput of 10,000 gallons of gasoline or more, or 40 CFR 63.11118 for facilities with a monthly throughput of 100,000 gallons of gasoline or more, whichever is applicable, and must meet the applicable notification, testing, monitoring, recordkeeping, and reporting requirements.

If an affected source's throughput ever exceeds an applicable throughput threshold, the affected source will remain subject to the requirements for sources above the threshold, even if the affected source throughput later falls below the applicable source threshold. [40 CFR 63.11111(i)]

- **PSD –** The facility's potential emissions do not exceed PSD permitting thresholds. This Application proposes no change in permitted emission rates.

- **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 –** Compliance Assurance Monitoring (CAM) does NOT apply since the sources are regulated by NSPS and MACT regulations which were proposed after November 15, 1990 and control the pollutants which would be subject to CAM.

- **Attainment status** – Craven County is in attainment for all criteria pollutants.

6. Regulatory Review

The facility is subject to the following air quality regulations in addition to the General Conditions:
- 15A NCAC 02D .0516: Sulfur Dioxide Emissions from Combustion Sources
- 15A NCAC 02D .0521: Control of Visible Emissions
- 15A NCAC 02D .0524: New Source Performance Standards, 40 CFR 60, Subpart XXX
- 15A NCAC 02D .1100: Control of Toxic Air Pollutants
- 15A NCAC 02D .1110: National Emission Standards for Hazardous Air Pollutants, 40 CFR 61, Subpart M
- 15A NCAC 02D .1111: Maximum Achievable Control Technology, 40 CFR 63, Subpart AAAA
- 15A NCAC 02D .1806: Control and Prohibition of Odorous Emissions
- 15A NCAC 02Q .0711: Emission Rates Requiring a Permit

The following permit conditions are being removed as part of this permit application:
- 15A NCAC 02D .0524: New Source Performance Standards, 40 CFR 60, Subpart WWW

15A NCAC 02D .0516: Sulfur Dioxide from Combustion Sources

Sulfur dioxide emissions from the facility's combustion sources shall be no more than 2.3 pounds per million Btu heat input. Sulfur dioxide emissions associated with diesel fuel combustion in reciprocating internal combustion engines are dependent upon the sulfur content of the fuel combusted. Using fuel with a sulfur content of 15 ppm and AP-42 Ch. 3 emission factors, the SO_2 emission rate on a per mmBtu basis is 0.002 lb/mmBtu.

For LFG combustion in the utility flare, using AP-42 Ch. 2.4, Equations 3, 4, and 7, the SO_2 emission rate was determined to be 0.015 pounds per million Btu. Continued compliance is expected.

15A NCAC 02D .0521: Control of Visible Emissions

Visible emissions from the facility's LFG-fired utility flare (ID No. CD-01) shall not exceed 20% opacity when averaged over a six-minute period. DAQ inspectors have not observed visible emissions in excess of the limit during any site visit. Additionally, DAQ has not received any complaints of visible emissions from nearby residents. Continued compliance is expected.

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

Construction commenced on the Phase 4 expansion in February 13, 2019, triggering applicability of NSPS Subpart XXX. The facility is subject to the requirement to install and operate a GCCS, and has an existing system installed since the landfill was previously also required to operate a GCCS when it was subject to NSPS Subpart WWW. As such, new conditions will be included in the permit to include the monitoring, operation,

recordkeeping, and reporting requirements of NSPS Subpart XXX as they apply to a landfill which operates an active GCCS.

On May 13, 2019 the landfill submitted a revised GCCS design plan to include the expansion which was not covered under the previous plan. The updated design plan is under review for approval, and DAQ is awaiting additional information necessary to complete that review. The design plan submittal appeared to also meet the requirements of the initial Design Capacity and NMOC Emission Rate reports.

The treatment system (CD-Treatment) is listed on the permit for this landfill even though it is owned and operated by the gas-to-energy facility (INGENCO Wholesale Power, LLC-New Bern) located on adjacent property. NSPS Subpart XXX requires monitoring, recordkeeping and reporting requirements for landfill gas treatment systems when the facility uses the treatment system to comply with 40 CFR 60.762(b)(2)(iii). Compliance is expected.

15A NCAC 02D .1110: National 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 facility's current Solid Waste permit contains a requirement for the facility to comply with the requirements of 40 CFR 61, Subpart M, and continued compliance is expected.

15A NCAC 02D .1111, Maximum Achievable Control Technology, 40 CFR 63, Subpart AAAA

The MSW landfill (ID No. ES-01) is subject to 40 CFR 63, Subpart AAAA "Municipal Solid Waste Landfills," because it has a design capacity equal to or greater than 2.5 million Mg & 2.5 million m^3 and has estimated uncontrolled NMOC emissions equal to or greater than 50 Mg/yr. Compliance with MACT Subpart AAAA is achieved by complying with the requirements of NSPS Subpart XXX. The condition has been updated to include the specific requirements of NSPS Subpart XXX. Continued compliance is expected.

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

The owner or operator of a facility subject to this Rule shall not operate the facility without implementing management practices or installing and operating odor control equipment sufficient to prevent odorous emissions from the facility from causing or contributing to objectionable odors beyond the facility's boundary. 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.

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

The facility is subject to both 40 CFR 61, Subpart M and 40 CFR 63, Subpart AAAA. Pursuant to 15A NCAC 02Q .0702(a)(27)(A). Facilities subject to such regulations are exempt from air permitting for toxic air pollutants, however the facility has requested to keep the toxics conditions in the permit. This application does not result in any increase in emissions of toxic air pollutants from the landfill and flare beyond those already evaluated. The landfill facility submitted emission rate calculations through CY2030.

The following parameters were used to determine the LFG generation rate in LandGEM:

Parameter	Value
Waste Acceptance Rate (TPY)	Historical, plus projected 2.5% increase in waste acceptance each year
Methane Generation Rate (k, $year^{-1}$)	0.050

Potential Methane Generation Capacity (L_o, m^3/Mg)	170
NMOC Concentration (ppmv)	717
Methane Content (%)	50
LFG Generation Rate (m^3/yr)	3.988×10^7 (through CY2030)

The following example calculation is for the emission of hydrochloric acid (HCl) created from the combustion of the chlorine compounds in the landfill gas-fired flare. The best methods to estimate emission are mass balance methods using site-specific data on total chloride [expressed in ppmv as the chloride ion (Cl^-)]. [AP-42, Section 2.4.4.2 (November 1998) – Controlled Emissions]

- Flare design rating = 2,000 ft^3/minute (or 56.63 m^3/min = 3,398 m^3/hour)
- Methane is only 50% of this gas stream (1,699 m^3/hour)
- Q_{Cl^-} = Emission rate of chloride ions, m^3/hour
- C_{Cl^-} = Concentration of chloride ions (42.0 ppmv, AP-42 default value)
- Multiplication factor for 50% methane concentration in landfill gas = 2.0
- Molecular weight of chloride ions = 35.45 g/gmole

$$Q_{Cl^-} = 2.0 \times Q_{CH_4} \times \left(\frac{C_{Cl^-}}{1\times10^6}\right) \text{ (AP-42, Equation 3)}$$

$$Q_{Cl^-} = 2.0 \times 1{,}699 \ \frac{m^3}{hour} \times \left(\frac{42.0 \text{ parts}}{1\times10^6}\right) = 0.143 \ \frac{m^3}{hour}$$

The mass of the pre-combustion chloride ions present in the methane were found using Equation 4 of AP-42, Section 2.4.4.2. The landfill assumes that the landfill gas temperature is 27°C:

$$UM_{Cl^-} = 0.143 \ \frac{m^3}{hour} \times \left[\frac{35.45 \text{ g/gmol} \times 1 \text{ atm}}{8.205 \times 10^{-5} \ \frac{m^3 - atm}{gmol - K} \times 1000 \ \frac{g}{kg} \times (273 + 27℃) \text{ K}}\right] \times 2.2 \ \frac{pounds}{kg}$$

$$UM_{Cl^-} = 0.453 \ \frac{pounds}{hour}$$

To calculate HCl formation, Equation 10 of Section 2.4-8 was used.

$$HCl_{emissions} = UM_{Cl^-} \times \frac{\eta_{col}}{100} \times 1.03 \times \frac{\eta_{cnt}}{100}$$

Where:

UM_{cl} = Uncontrolled mass emission of Cl^- ions

η_{col} = Collection efficiency of the landfill gas collection system, percent (100%) *

η_{cnt} = Control efficiency of the landfill gas control flare (100%) *

* To calculate worst-case HCl emissions, the facility assumes that 100% of the generated Cl^- ions are collected and converted to HCl.

$$HCl_{emissions} = 0.453 \ \frac{lb \ Cl^-}{hour} \times \frac{100}{100} \times 1.03 \times \frac{100}{100} = 0.47 \ \frac{lb \ HCl}{hour}$$

The total emission rates of other pollutants from the landfill and flare were calculated using AP-42 Section 2.4-6 Equation 5:

$$CM_P = \left[UM_P \times \left(1 - \frac{\eta_{col}}{100}\right)\right] + \left[UM_P \times \frac{\eta_{col}}{100} \times \left(1 - \frac{\eta_{cnt}}{100}\right)\right]$$

Where:

CM_p = Controlled mass emissions of pollutant

UM_p = Uncontrolled mass emission of pollutant
η_{col} = Collection efficiency of the landfill gas collection system, percent (75%)
η_{cnt} = Control efficiency of the landfill gas control flare (98%)

Example calculation for toxic air pollutant benzene (lb/yr through CY2030):
Using Equations 3 & 4, benzene emissions from the landfill equal 531.76 lb/year:

$$CM = \left[531.76\ \frac{lb}{yr} \times \left(1 - \frac{75}{100}\right)\right] + \left[531.76\ \frac{lb}{yr} \times \frac{75}{100} \times \left(1 - \frac{98}{100}\right)\right] = 140.92\ \frac{\text{lb Benzene}}{\text{year}}$$

The emission rate above is slightly different than the emission rate used to evaluate the landfill's total projected emissions since the comparison is made using emission rates through the flare that are based on the flare's maximum capacity. The same is true for other pollutants evaluated.

Toxic emissions from the emergency generators were calculated using emission factors from AP-42 Ch. 3.3-2. The following example represent the benzene emission rate assuming a maximum potential of 500 hours of operation per year for both engines:

$$348\ \text{hp (total)} \times 9.33 \times 10^{-4}\ \frac{\text{lb Benzene}}{\text{mmBtu}} \times 7000\ \frac{\text{Btu}}{\text{hp} - \text{hr}} \times 10^{-6}\ \frac{\text{mmBtu}}{\text{Btu}} \times 500\frac{\text{hr}}{\text{yr}} = 1.14\ \frac{\text{lb Benzene}}{\text{yr}}$$

The following toxic emission rates through CY2030 were compared to their respective TPERs:

Toxic Air Pollutant	Averaging Period	Landfill Volume Emissions	Flare Emissions	Emergency Generator Emissions	Total	TPER	Modeling Required?
1,1,1-Trichloroethane (methyl chloroform)	lb/day	0.16	9.40×10^{-3}	-----	0.17	250	No
	lb/hr	6.51×10^{-3}	3.92×10^{-4}	-----	6.90×10^{-3}	64	No
1,1,2,2-Tetrechloroethane	lb/yr	166.02	9.98	-----	176	430	No
1,1-Dichloroethene (vinylidene chloride)	lb/day	4.73×10^{-2}	2.85×10^{-3}	-----	5.02×10^{-2}	2.5	No
1,2-Dibromoethane	lb/yr	0.17	1.01×10^{-2}	-----	0.18	27	No
1,2-Dicholoroethane	lb/yr	36.15	2.17	-----	38.32	260	No
1,3 Butadiene	lb/yr	-----	-----	0.048	0.048	11	No
2-Butanone (MEK)	lb/day	1.25	7.51×10^{-2}	-----	1.33	78	No
	lb/hr	5.20×10^{-2}	3.13×10^{-3}	-----	5.51×10^{-2}	22.4	No
4-Methyl-2-pentanone (MIBK)	lb/day	0.46	2.75×10^{-2}	-----	0.49	52	No
	lb/hr	1.91×10^{-2}	1.15×10^{-3}	-----	2.03×10^{-2}	7.6	No
Acetaldehyde	lb/hr	-----	-----	1.87×10^{-3}	1.87×10^{-3}	6.8	No
Acrolein	lb/hr	-----	-----	2.25×10^{-4}	2.25×10^{-4}	0.02	No
Acrylonitrile	lb/day	0.82	4.93×10^{-2}	-----	0.87	0.4	**YES**
	lb/hr	3.42×10^{-2}	2.05×10^{-3}	-----	3.63×10^{-2}	0.22	No
Arsenic	lb/yr	-----	-----	4.87×10^{-3}	4.87×10^{-3}	0.053	No
Benzene	lb/yr	132.94	7.99	1.14	142.07	8.1	**YES**
Benzo(a)pyrene	lb/yr	-----	-----	2.29×10^{-4}	2.29×10^{-4}	2.2	No
Beryllium metal	lb/yr	-----	-----	3.65×10^{-3}	3.65×10^{-3}	0.28	No
Cadmium metal	lb/yr	-----	-----	3.65×10^{-3}	3.65×10^{-3}	0.37	No
Carbon disulfide	lb/day	0.11	6.48×10^{-3}	-----	0.12	3.9	No
Carbon tetrachloride	lb/yr	0.55	3.30×10^{-2}	-----	0.58	460	No
Chlorobenzene	lb/day	6.87×10^{-2}	4.13×10^{-3}	-----	7.28×10^{-2}	46	No
Chloroform	lb/yr	3.19	0.19	-----	3.38	290	No
Chromic acid	lb/day	-----	-----	1.75×10^{-4}	1.75×10^{-4}	0.13	No
p-Dichlorobenzene	lb/hr	3.14×10^{-3}	1.89×10^{-4}	-----	3.33×10^{-3}	16.8	No
Dichloromethane (methylene chloride)	lb/yr	1082.35	65.06	-----	1147.41	1600	No
	lb/hr	0.12	7.43×10^{-3}	-----	0.13	0.39	No
Ethyl mercaptan	lb/hr	1.44×10^{-2}	8.66×10^{-4}	-----	1.53×10^{-2}	0.025	No

Formaldehyde	lb/hr	-----	-----	2.87×10^{-3}	2.87×10^{-3}	0.04	No
n-Hexane	lb/day	1.38	8.31×10^{-2}	-----	1.46	23	No
Hydrogen chloride	lb/hr	-----	0.47	-----	0.47	0.18	**YES**
Hydrogen sulfide	lb/day	2.95	0.18	-----	3.13	1.7	**YES**
Manganese and compounds	lb/day	-----	-----	3.51×10^{-4}	3.51×10^{-4}	0.63	No
Mercury vapor	lb/day	1.43×10^{-4}	8.60×10^{-6}	1.75×10^{-4}	3.27×10^{-4}	0.013	No
Methanethiol (methyl mercaptan)	lb/hr	1.22×10^{-2}	7.33×10^{-4}	-----	1.29×10^{-2}	0.013	**YES**
Nickel metal	lb/day	-----	-----	1.75×10^{-4}	1.75×10^{-4}	0.13	No
Tetrachloroethylene (Perchloroethylene)	lb/yr	551.18	33.13	-----	584.31	13000	No
Toluene	lb/day	8.84	0.53	2.39×10^{-2}	9.39	98	No
	lb/hr	0.37	2.21×10^{-2}	9.96×10^{-4}	0.39	14.4	No
Trichloroethylene	lb/yr	330.16	19.85	-----	350.01	4000	No
Vinyl chloride	lb/yr	408.78	24.57	-----	433.35	26	**YES**
Xylene	lb/day	3.14	0.19	1.67×10^{-2}	3.35	57	No
	lb/hr	0.13	7.85×10^{-3}	6.94×10^{-4}	0.14	16.4	No

The landfill's toxic emission rates were evaluated in 2008, and the permit contains emission rate limits for acrylonitrile, benzene, hydrogen sulfide, hydrogen chloride, methyl mercaptan, methylene chloride, and vinyl chloride in accordance with 15A NCAC 02D .1100. In a memo dated September 10, 2008, the AQAB determined that the landfill parameters were found to be consistent with those facilities in the landfill-modeling database that have demonstrated compliance with the applicable pollutant AALs, the Tuscarora Long-Term Regional Landfill would also be expected to model in compliance, and no further analysis was required.

Determinations of specific impacts at the Tuscarora Landfill's property line were not made as part of the 2008 analysis. The facility's emission rates were compared to the worst cases within the database used by AQAB, including the emission rates for the emergency generator. The following impacts resulted:

Toxic Air Pollutant	Modeled Emission Rates*			Period	% AAL
	Landfill	Flare	Emergency Generators		
Acrylonitrile	429.76	25.785	-----	lb/yr	26.0%
Benzene	190.80	11.45	1.14	lb/yr	75.4%
Hydrogen chloride	-----	0.652	-----	lb/hr	32.0%
Hydrogen sulfide	4.32	0.259	-----	lb/day	4.4%
Methyl mercaptan	0.0177	0.001	-----	lb/hr	1.9%
Methylene chloride	1,528.81	91.73	-----	lb/yr	0.1%
Vinyl chloride	586.57	35.19	-----	lb/yr	86.7%

* Specific emission rates for the landfill and flare were taken from the review for the T00 permit revision.

The emission rate limits are listed below as they appear in the permit:

Emission Sources	Toxic Air Pollutants	Emission Limits
Municipal Solid Waste Landfill (ES-01) and Flare (CD-01)	Acrylonitrile	455.54 lb/yr
	Benzene	202.25 lb/yr
	Hydrogen chloride	0.652 lb/hr
	Hydrogen sulfide	4.58 lb/day
	Methyl mercaptan	0.0187 lb/hr
	Methylene chloride (Dichloromethane)	1620.54 lb/yr

	Vinyl chloride	621.76 lb/yr

Since the emergency generators (ID Nos. IES-07 and 08) are insignificant sources and are subject to MACT regulations, they do not appear in the table. However, the emission rates through the next renewal, including the emission rates from the emergency generators, are not expected to exceed any of the TPERs or the permitted emission rates that have been previously evaluated. Therefore, DAQ has determined that there is not an unacceptable risk to human health.

7. Other Regulatory Requirements

- A Zoning Consistency Determination is NOT required for this type of permit application.
- There are no application fees required for this Re-Open for Cause application, since it was submitted due to a change in regulation.
- 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. Moreover, per EPA, the removal of these provisions is also consistent with other recent EPA actions involving affirmative defenses 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.

8. Emissions Review

Pollutant	Potential After Controls / Limitations tons/yr	Potential Before Controls / Limitations tons/yr
PM (TSP)	3.99	0.19
PM_{10}	3.99	0.19
$PM_{2.5}$	3.99	0.19
SO_2	4.01	-----
NOx	12.58	2.70
CO	12.23	0.58
VOC	11.61	43.22

The facility's actual emissions as reported on the annual AQEI can be seen in the table on page one of this document.

MSW Landfill Emissions:

The potential volume emissions, before and after controls, 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 LFG generation rate of 3.988×10^7 m^3/year, through CY2030, as determined using the LandGEM output, and default values for pollutant concentrations, VOC content, collection efficiency, and control efficiency. An example of these calculations is available in the air toxics review in Section 6 above.

In the application, the landfill included calculations for CO as a pollutant emitted from the landfill surface, however CO emissions from the landfill itself are typically associated with subsurface combustion. As such, AP-42 advises that the default value for CO should be used with caution [AP-42, Table 2.4-1 note "b"]. For the purposes of this review, CO emissions reported from the landfill surface have been disregarded since it does not appear that DAQ has received any reports of a subsurface fire at this facility.

Flare Emissions:
VOC emissions for the flare were calculated as above but are based on the maximum capacity of the flare, regardless of LFG generation rate from the landfill, and assume a 98% control efficiency.

Particulate, NOx, and CO emissions were calculated using the following emission factors from AP-42, Table 2.4-4:

PM: 15 lb PM/10^6 dry ft^3 CH_4
NOx: 39 lb NOx/10^6 dry ft^3 CH_4
CO: 46 lb /10^6 dry ft^3 CH_4

The facility assumes that the LFG has a moisture content of 3.6% and that it consists of 50% methane.

$$\frac{2000\ ft^3}{minute} \times \frac{1\ million}{1 \times 10^6} \frac{60\ minutes}{hour} \times \frac{8{,}760\ hours}{year} \times \frac{(100-3.6\%\ moisture)}{100} \times \frac{50\%\ CH_4}{100} = \frac{506.7\ million\ dry\ ft^3\ CH_4}{year}$$

Examples:

$$\frac{506.7\ million\ dry\ ft^3\ CH_4}{year} \times \frac{15\ lb\ PM}{million\ ft^3\ CH_4} \times \frac{1\ ton}{2000\ lb} = 3.80\ \frac{tons\ PM}{year}$$

$$\frac{506.7\ million\ dry\ ft^3\ CH_4}{year} \times \frac{39\ lb\ NOx}{million\ ft^3\ CH_4} \times \frac{1\ ton}{2000\ lb} = 9.88\ \frac{tons\ NOx}{year}$$

$$\frac{506.7\ million\ dry\ ft^3\ CH_4}{year} \times \frac{46\ lb\ CO}{million\ ft^3\ CH_4} \times \frac{1\ ton}{2000\ lb} = 11.65\ \frac{tons\ CO}{year}$$

All particulate emissions from the combustion of landfill gas are considered $PM_{2.5}$.

To calculate potential SO_2 emissions, AP-42 Chapter 2.4 was used:

- Flare design rating = 2,000 ft^3/minute (or 56.63 m^3/min = 3,398 m^3/hour)
- Methane is only 50% of this gas stream (1,699 m^3/hour)
- Q_S = Emission rate of reduced sulfur compounds, m^3/hour
- C_S = Concentration of reduced sulfur compounds (46.9 ppmv, AP-42)
- Multiplication factor for 50% methane concentration in landfill gas = 2.0
- Molecular weight of sulfur = 32.06 g/mole

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

$$Q_s = 2.0 \times 1{,}699\ \frac{m^3}{hour} \times \left(\frac{46.9\ parts}{1 \times 10^6}\right) = 0.16\ \frac{m^3}{hour}$$

The mass of the pre-combustion sulfur compounds present in the methane were found using Equation 4 of AP-42, Section 2.4.4.2.:

$$UM_s = 0.16\ \frac{m^3}{hour} \times \left[\frac{32.06\ g/gmol \times 1\ atm}{8.205 \times 10^{-5}\ \frac{m^3 - atm}{gmol - K} \times 1000\ \frac{g}{kg} \times (273 + 27°C)\ K}\right] \times 2.2\ \frac{lb}{kg}$$

$$UM_s = 0.458\ \frac{lb\ S}{hour}$$

To calculate SO_2 emitted from the combustion of sulfur compounds, Equation 10 of Section 2.4-8 was used:

$$SO_2 \text{ emitted} = UM_s \times \frac{\eta_{col}}{100} \times 2.0$$

Where:
UM_{cl} = Uncontrolled mass emission rate of sulfur compounds (0.458 lb sulfur/hour)
η_{col} = Collection efficiency of the landfill gas collection system, percent (assumed 100% by facility)
2.0 = Ratio of the molecular weight of SO_2 to the molecular weight of Sulfur

$$SO_2 \text{ emitted} = 0.458 \frac{\text{lb}}{\text{hour}} \times \frac{100}{100} \times 2.0 \times 8760 \frac{\text{hours}}{\text{year}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 4.01 \frac{\text{tons } SO_2}{\text{year}}$$

Diesel-Fired Emergency Generators:
The increase in the facility-wide potential emissions from the uncontrolled diesel-fired emergency generators (ID Nos. IES-07 and IES-08) were calculated using emission factors for diesel fuel combustion in stationary reciprocating internal combustion engines found in AP-42. The number of operating hours for calculating potential emissions is limited to 500 hours per year for emergency engines.

The following emission factors were used:
PM: 2.20×10^{-3} lb/hp-hr (all particulate matter emitted is assumed to be as $PM_{2.5}$)
NOx: 0.031 lb/hp-hr
CO: 6.68×10^{-3} lb/hp-hr
VOC: 2.51×10^{-3} lb/hp-hr (as TOC exhaust + crankcase)
[AP-42 Ch. 3.3]

SO_2: $8.09 \times 10^{-3} \cdot S$ lb/hp-hr (Where S = fuel sulfur content in percent)
[AP-42 Ch. 3.4]

The following are example calculations for PM, NOx and SO_2 emissions from the engines based on the total power rating of 348 horsepower, and a fuel sulfur content of 15 ppm:

PM:

$$348 \text{ hp} \times 2.20 \times 10^{-3} \frac{\text{lb PM}}{\text{hp} - \text{hr}} = 0.77 \frac{\text{lb PM}}{\text{hour}}$$

$$0.77 \frac{\text{lb PM}}{\text{hour}} \times 500 \frac{\text{hours}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lb}} = 0.19 \frac{\text{tons PM}}{\text{year}}$$

NOx:

$$348 \text{ hp} \times 0.031 \frac{\text{lb NOx}}{\text{hp} - \text{hr}} = 10.79 \frac{\text{lb NOx}}{\text{hour}}$$

$$10.79 \frac{\text{lb NOx}}{\text{hour}} \times 500 \frac{\text{hours}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lb}} = 2.70 \frac{\text{tons NOx}}{\text{year}}$$

SO_2:

$$348 \text{ hp} \times 8.09 \times 10^{-3} \frac{\text{lb } SO_2}{\text{hp} - \text{hr} - \%S} \times \frac{15 \text{ parts Sulfur}}{10^6} \times 100\% = 4.22 \times 10^{-3} \frac{\text{lb } SO_2}{\text{hour}}$$

$$0.77 \frac{\text{lb } SO_2}{\text{hour}} \times 500 \frac{\text{hours}}{\text{year}} \times \frac{\text{ton}}{2000 \text{ lb}} = 1.06 \times 10^{-3} \frac{\text{tons } SO_2}{\text{year}}$$

9. Statement of Compliance

The Tuscarora Long-Term Regional Landfill has no negative compliance history. Mr. Kurt Tidd of WaRO DAQ, conducted the latest compliance inspection on March 1, 2023; the landfill was found to be in apparent compliance at that time.

10. 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 xx, xx, 2023 through xx, xx, 2023.

The EPA 45-day review period was from xx, xx, 2023 through xx, xx, 2023.

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 (GC) 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.

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 the 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).

11. Comments and Recommendations

This Reopen for Cause Permit modification for the Tuscarora Long-Term Regional Landfill located in New Bern, Craven 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. 09755T03.