RACT III PROPOSAL

Sewage Sludge Incinerators #1 and #2 Case-by-Case RACT

Delaware County Regional Water Quality Control Authority (DELCORA) / DELCORA Western Regional Treatment Plant
Chester, PA

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1. INTRODUCTION

Delaware County Regional Water Quality Control Authority (DELCORA) operates the wastewater treatment facility known as the Western Regional Treatment Plant (WRTP), located in the City of Chester, Delaware County, Pennsylvania. The facility currently operates under Title V Permit #23-00038, issued on December 17, 2018 and revised on May 2, 2022. DELCORA is a major nitrogen oxide (NO_x) emitting facility. Note that DELCORA submitted a Title V renewal application six months prior to the current permit's expiration date, which is now being reviewed by the PADEP. Because of this, they are covered by the permit shield of their current permit.

DELCORA WRTP is permitted to accept 44 million gallons per day of municipal and industrial wastewater from connected sources within the county as well as additional wastewater deliveries via tank truck from contracted wastewater sources. The wastewater treatment plant is a continuous once-through process that begins with wastewater entering and passing sequentially through the process tanks until treated water is discharged to the Delaware River. Influent wastewater enters two (2) aerated grit chambers for removal of heavy, mostly inorganic materials. The de-gritted wastewater is conveyed to eight (8) rectangular primary clarifiers for suspended solids removal. Primary effluent is conveyed to four (4) square activated sludge aeration basins for aerobic biological treatment, and the aeration basin mixed liquor is then conveyed and distributed to a total of six (6) circular final clarifiers. Clarified effluent flows to two (2) chlorine contact tanks for disinfection utilizing chlorine gas followed by sodium bisulfite for dechlorination before final discharge into the Delaware River. The tanks are uncovered, and fugitive volatile organic compounds (VOCs) are emitted if the influent wastewater contains VOC.

Solids removed from the primary clarifiers is blended with thickened solids from the final clarifiers and solids received via truck from contracted wastewater sources and stored in four (4) covered sludge holding tanks that vent through a bioscrubber for odor control. Sludge from the sludge holding tanks is dewatered by four (4) belt filter press contained in a building which vents to a packed tower chemical odor scrubber located in the same building. The packed tower chemical scrubber controls reduced sulfur and nitrogen compounds in addition to hydrogen sulfide.

Dewatered sludge solids are incinerated in two (2) multiple hearth sewage sludge incinerators which emit NOx, CO, VOC and HAPs. Incinerator emissions are controlled by venturi and impingement scrubbers followed by wet electrostatic precipitators (WESP) and then regenerative thermal oxidizers (RTO). The incinerator controls were installed in 2016 and are addressed under plan approval 23.0038F. DELCORA also operates four (4) gas-fired small boilers less than 2 MMBtu/hr for building heat.

The Pennsylvania Department of Environmental Protection (PADEP) published 25 Pa. Code, Chapter 129: Additional RACT Requirements for Major Sources of NOX and VOCs for the 2015 Ozone NAAQS (the "RACT III Rule") in the Pa Bulletin on November 12, 2022 (52 Pa. Bulletin 6960). On July 30, 2024, Delaware County, Pennsylvania, was reclassified as a serious nonattainment area for the 2015 Ozone National Ambient Air Quality Standards (NAAQS). Following the email received on November 5, 2024, DELCORA is submitting this proposal to comply with the regulations under 25 Pa. Code § 129.114(b), which covers alternative Reasonably Available Technology (RACT) proposals and petition for alternative compliance schedules.

This proposal contains the alternative RACT requirement, specified in 25 Pa. Code 129.114(d), and provides case-by-case NO_x RACT determinations for the facilities Nos. 1 and 2 Sewage Sludge Incinerators (SSIs), Source ID Nos. 001 and 002.

1.1 RACT Requirements

The RACT III Rule applies to existing major facilities of NOX and/or VOC throughout Pennsylvania. Existing major facilities are those facilities which are a major source of NOX and/or VOC that exist on or before August 3, 2018 and existing minor facilities which become a major source of NOX and/or VOC after August 3, 2018. DELCORA is located in Delaware County, where the NO_X and VOC major sources thresholds are 50 and 50 tons per year (tpy), NOx and VOC due to Delaware County now being classified as serious for ozone. DELCORA now meets the definition of an existing major source NO_X due to having a Plant Wide Applicability Limit (PAL) of 82.56 tpy per Section C, Condition #003 of the TVOP As such, the Facility is subject to NO_x RACT requirements.

RACT is defined in 25 Pa Code 121.1 as "the lowest emission limit for VOC or NOX that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility." For sources subject to RACT, under Pennsylvania's regulations, there are three options for compliance:

- Compliance Option 1: Presumptive RACT[1].
- Compliance Option 2: System-wide averaging[2]; and
- Compliance Option 3: Case-by-case RACT determination[3].

Below is a list of all sources subject to NO_x RACT requirements, as well as the compliance option applicable to each source:

- Source ID #030, Five (5) Natural Gas Fired Boilers – Exempt per initial Section 129.115(a) submittal
- Source ID #001, SSI #1 – Case-by-case RACT Proposal, included in this document
- Source ID #002, SSI #2 – Case-by-case RACT Proposal, included in this document

This RACT proposal consists of the following sections:

- Section 1: Executive Summary
- Section 2: Notification Summary
- Section 3: Case-by-Case RACT Analysis
- Section 4: RACT Proposal

The following attachments are enclosed with this application:

- Appendix A. RBLC Results
- Appendix B. Title V Permit Application Forms
  - Title V Permit Application Form
  - Compliance Review Form
- Appendix C. Potential and Actual NOx Emissions
- Appendix D. CY2024 Subpart LLL Operating Limitations

[1] 25 Pa Code 129.112

[2] 25 Pa Code 129.113

[3] 25 Pa Code 129.114

2. 129.115 NOTIFICATION SUMMARY

This section of the report serves as the written notification, specified in 25 Pa Code §129.115(a), that describes how DELCORA proposes to comply with the requirements of 25 Pa Code §129.111-129.115, for Case-by-Case RACT review per Section 129.114(d) for Source ID 001 and 002.

2.1 Emissions Unit and RACT III Compliance Strategy

The proposed RACT III compliance strategy for each emission unit at DELCORA is provided in Tables 2-1 and 2-2. These tables serve to identify the air contamination sources at DELCORA and identify the applicable RACT requirements or exemption status as specified in 25 Pa Code §129.115(a).

DELCORA is submitting the following information as part of the RACT III initial notification requirements:

- 25 Pa Code §129.115(a)(1) – Submit the initial notification by February 28th, 2025.
  - This initial notification has been submitted via PADEP OnBase on January 24, 2025.
- 25 Pa Code §129.115(a)(2) – Identify the air contamination sources in 25 Pa Code §129.111(a) as subject to a RACT requirement or exempt
  - See Table 2-1 below.
- 25 Pa Code §129.115(a)(3) – Identify the air contamination sources in 25 Pa Code §129.111(b) as subject to a RACT requirement or exempt
  - Not applicable, the Facility is an existing major source of NO_x.
- 25 Pa Code §129.115(a)(4) – Identify the air contamination sources in 25 Pa Code §129.111(c) which are exempt
  - See Table 2-1 below.
- 25 Pa Code §129.115(a)(5) – Provide a description of each air contamination source listed in 25 Pa Code §129.115(a)(2) including, description, make, model and location, applicable RACT requirement, how the unit will comply with RACT III, and reason for exemption (if applicable).
  - See Table 2-1 below and the source descriptions in Section 2.2.
- 25 Pa Code §129.115(a)(6) – Provide a description of each air contamination source listed in 25 Pa Code §129.115(a)(3) including, description, make, model and location, applicable RACT requirement, how the unit will comply with RACT III, and reason for exemption (if applicable).
  - Not applicable, the Facility is an existing major source of NO_x and is not subject to (a)(3).
- 25 Pa Code §129.115(a)(7) – Provide a description of each air contamination source listed in (a)(4) including, description, make, model and location and information sufficient to demonstrate that the source has a PTE less than 1 tpy of NOX or 1 tpy of VOC, as applicable.

- RACT III Exemption memo for Source ID 030 Submitted via PADEP OnBase January 24, 2025.
- See the source descriptions in Section 2.2.

Table 2-1: NO_x Sources Subject to RACT III

Emissions Source ID	Source Description	NO_x RACT Compliance Strategy
030	Five Natural Gas Fired Boilers	Exempt from RACT III – 25 Pa Code 129.111(c) (Initial Notification submitted to PADEP on January 24, 2025)
001	Sewage Sludge Incinerator #01	Case-By-Case – 25 Pa Code 129.114(d)
002	Sewage Sludge Incinerator #02	Case-By-Case – 25 Pa Code 129.114(d)

2.2 Source Description and Applicable Limits

The following section provides source descriptions for each unit at DELCORA as well as the applicable Presumptive RACT III emission limits. The information provided in this section is required under 25 Pa Code §129.115(a)(5) and 25 Pa Code §129.115(a)(7).

2.2.1 Source ID 030, B-2 & B-3 Boilers (5 Total)

Table 2-2: Source ID 030 Specification Information

Location/Boiler Name	Heat Input Rating (MMBTU/hr)	Manufacturer	Model Number
Building 2, Boiler #1	1.26	Cyclonetic	JB1G-030RM7897C-M.12-UL/CSD-1
Building 2, Boiler #2	1.26	Cyclonetic	JB1G-030RM7897C-M.12-UL/CSD-1
Building 3, Boiler #1	1.50	Lochinvar	FBN1501
Building 3, Boiler #2	1.50	Lochinvar	FBN1501
Building 3, Boiler #3	1.50	Lochinvar	FBN1501

As per 25 Pa. Code § 129.111(c), 25 Pa. Code sections §§ 129.112-129.114 do not apply to the owner or operator of an air contamination source that has the potential to emit less than 1 TPY of NO_X. Potential to emit calculations for Source ID 030 were submitted with the initial notification letter in January of 2024. The PTE calculations show each of the five (5) boilers has the potential to emit less than 1 tpy of NO_x. Therefore, the five (5) boilers operated by DELCORA are not subject to RACT III requirements.

2.2.2 Source ID 001 & 002, Sewage Sludge Incinerators 1 & 2

Table 2-3: Source ID 001 and 002 Specification information

Unit Name	Total Heat Input Rating (MMBTU/hr)	Fuel Type	Material Processed	Material Load (tpy)	Manufacturer	Model Number
SSI 1	30.4	Natural Gas	Sewage Sludge	>290	Nichols-Herrshoff	22'3'O.D. X 8 HEARTH
SSI 2	30.4	Natural Gas	Sewage Sludge	>290	Nichols-Herrshoff	22'3'O.D. X 8 HEARTH

DELCORA operates two (2) Sewage Sludge Incinerators (SSI) (Source IDs 001 and 002) located near the sludge processing building. There are no presumptive NOx RACT emissions limits specified in section 129.112 that are applicable to the SSIs. Under TVOP 23-00038 DELCORA has accepted a plant applicability limit (PAL) of 82.56 tpy NO_x on a 12-month rolling total basis (12MRT). This PAL will be used as a potential to emit value for each of the SSIs. Therefore, these two sources will be subject to Case-by-Case RACT review for which a proposal per Section 114(d) will be submitted by February 28, 2025.

3. CASE-BY-CASE RACT ANALYSIS

As an existing major source of both NO_x, the Facility is subject to Pennsylvania's RACT regulations. As discussed above, SSIs No. 1 & 2 are not included in the source categories for which the regulations include presumptive RACT NO_x limits. Therefore, these sources are subject to a case-by-case RACT determination per Section 129.114(b).

3.1 Case-by-Case RACT Determination

For sources which are unable to meet presumptive RACT limits and don't participate in system-wide averaging, and sources which do not qualify for one of the source categories that have presumptive RACT limits, the third option for RACT compliance applies. Under this third option, facilities must propose an alternative RACT emission limitation (i.e., a "case-by-case RACT limit") and apply for a case-by-case RACT limit or requirement via a Plan Approval (if RACT compliance requires the installation of controls) or operating permit modification from PADEP. SSIs No. 1 & 2 are subject to a case-by-case NO_x RACT determination. Pursuant to 25 Pa Code 129.114(b) and 25 Pa. Code 129.114(d), the case-by-case RACT limit proposal must include each of the elements required under 25 Pa Code 129.92(a)(1)-(5), (7)-(10). Table 3-1 includes a cross reference for the location of these requirements in this RACT proposal DELCORA.

Table 3-1

Regulatory Requirement		Location in Proposal
25 Pa Code 129.92 (a)(1)	A list of each source subject to the RACT requirements	Section 1.1
25 Pa Code 129.92 (a)(2)	The size or capacity of each affected source and types of fuel combusted or the types and quantities of materials processed or produced in each source.	Submitted in January 2025 initial notification, Table 2-2 and 2-3
25 Pa Code 129.92 (a)(3)	A physical description of each source and its operating characteristics.	Section 1
25 Pa Code 129.92 (a)(4)	Estimates of the potential and actual NOX emissions from each source and associated supporting documentation.	Appendix C
25 Pa Code 129.92 (a)(5)	A RACT analysis which meets the requirements of subsection (b), including technical and economic support documentation for each affected source.	Section 3
25 Pa Code 129.114(d)(6)	The testing, monitoring, recordkeeping and reporting procedures proposed to demonstrate compliance with RACT.	Section 4
25 Pa Code 129.114(d)(2)	An application for an operating permit amendment or application to incorporate the provisions of the RACT proposal.	Appendix B

3.2 Top-Down Methodology

Case-by-case RACT determinations are traditionally based on a top-down methodology. PADEP has outlined the required elements of a RACT analysis and determination in 25 Pa Code 129.92(b). Presented below are the five basic steps of the top-down RACT review as identified by PADEP.

3.2.1 Step 1: Identify All Control Technologies

Under Step 1, all available control technologies are identified for each emission unit in question. The following methods may be used to identify potential technologies:

- Researching the RACT/BACT/LAER Clearinghouse (RBLC) database;
- Surveying regulatory agencies;
- Drawing from previous engineering experience;
- Surveying air pollution control equipment vendors; and
- Surveying available literature.

Once identified, the control technologies are ranked in descending order of expected control effectiveness.

3.2.2 Step 2: Eliminate Technically Infeasible Options

After control technologies are identified under Step 1, an analysis is conducted to eliminate technically infeasible options. A control option is eliminated from consideration if there are process-specific conditions that prohibit the implementation of the control technology or if the highest control efficiency of the option would result in an emission level that is higher than any applicable regulatory limits, such as a New Source Performance Standard (NSPS) or National Emission Standard for Hazardous Air Pollutants (NESHAP).

3.2.3 Step 3: Rank Remaining Control Technologies by Control Effectiveness

In Step 3, remaining control technology options are ranked based on their control effectiveness, from highest to lowest control efficiency. This list must identify, at a minimum, the baseline emissions of VOCs and NO_X before implementation of each control option, the estimated reduction potential or control efficiency of each control option, the estimated emissions after the application of each control option and the economic impacts.

3.2.4 Step 4: Evaluate Most Effective Controls and Document Results

Beginning with the highest-ranked control technology option from Step 3, detailed economic, energy, and environmental impact evaluations are performed in Step 4. If a control option is determined to be economically feasible without adverse energy or environmental impacts, it is not necessary to evaluate the remaining options with lower control efficiencies.

The economic evaluation centers on the cost effectives of the control option. Costs of installing and operation control technologies are estimated and annualized following the methodologies outlined in the U.S. EPA's Office of Air Quality Planning and Standards (OAQPS) Control Cost Manual (CCM) and other industry resources.[4]

3.2.5 3.2.5 Step 5: Select RACT

Using the result of the prior steps to determine the appropriate control technology, the final step is to determine the emission limit that represents the RACT limit

[4] OAQPS, U.S. EPA Air Pollution Control Cost Manual , Sixth Edition, EPA 452-02-001 (https://www3.epa.gov/ttn/ecas/cost_manual.html), Daniel C. Mussatti & William M. Vatavuk, January 2002. Note that Section 4 of the CCM was updated (Seventh Edition) in May 2016. However, the remainder of the CCM has not yet been updated and the Sixth Edition is still the most recent.

3.3 NO_x RACT Assessment for SSIs

This section addresses NO_x RACT requirements for SSI #001 and SSI #002. Natural gas and municipal waste sludge combustion in the SSIs produce NO_x emissions from these sources. The combustion of natural gas and municipal waste sludge in these SSIs results in NO_x emissions. The NOX emissions from these chemical mechanisms are referred to as: 1) thermal NO_X, 2) fuel NO_X, and 3) prompt NO_X.

Thermal NOX is generated by the oxidation of molecular nitrogen (N2) in the combustion air as it passes through the flame in the incinerator. This reaction requires high temperatures, hence the name thermal NO_X. The formation of nitrogen oxide (NO) from oxygen (O2) and N2 in air at high temperatures is described by the well-known Zeldovich mechanism. Fuel NO_X is the result of the conversion of nitrogen compounds contained in fuels to NO_X during fuel combustion. For all practical purposes, prompt NO_X, which can be significant in low-temperature, fuel-rich conditions where residence times are short, is not important in the sewage sludge incineration process. In a SSI due the presence of natural gas and municipal waste solids acting as fuel sources, fuel NO_x is the predominate mechanism for NO_x formation.[5]

The RACT evaluation review of NO_X from the incinerators at DELCORA focuses on verifying that the technologies for NO_X control on the furnaces meet RACT and not on attempting to compare emission rates themselves.

3.3.1 Step 1 – Identify All Control Technologies for NO_X

Step 1 in a top-down analysis is to identify all available control technologies. The evaluation of potential controls for NO_X emissions from the SSIs involves an investigation of end-of-pipe (post-combustion) and combustion modifications/optimization that reduce the formation of fuel NO_X. The complicating factor in efforts to reduce fuel NO_X is the basics municipal waste solids combustion. Reducing fuel input, while maintaining the current regulated feed rate of municipal waste solids would greatly reduce the effectiveness of waste destruction. Therefore, only end-of-pipe NO_X reduction control technologies will be investigated.

The RBLC database was reviewed to identify potential add-on control technologies for processes similar to the sewage sludge incineration process. Results of the RBLC search for municipal waste combustion (Process Type 21-400) are provided in Appendix A. It should be noted that the RBLC search results presented include RACT determinations as well as any BACT and LAER determinations, which may be more stringent than RACT. Table 3-2 contains a list of the various technologies that have been identified for control of NO_X emissions from the sludge incineration process.

Table 3-2 Potentially Available NO_X Control Technologies for Incinerators

Potentially Applicable NO_x Control Technologies
Selective Catalytic Reduction (SCR)
Selective Non-Catalytic Reduction (SNCR)
Flue Gas Recirculation (FGR)
Good Combustion Practices / Proper Incinerator Operation
Low NO_X Burners (LNBs)

Other general NO_X control technologies exist in addition to those listed in Table 3-2 that are widely used for NO_X control on traditional large combustion sources. However, several of these have been identified as not

[5] U.S. EPA, "Summary of NOx Control Technologies and their Availability and Extent of Application." File Number EPA 450/3-92-004. February 1992.

applicable for use on incinerators and therefore have not been considered for this top down RACT assessment for NO_X. These technologies include, but are not limited to:

- NOx Scrubber
- Staged air combustion, and
- Reburn,

Based on our research, none of the technologies listed above apply to sewage sludge incineration or have been commercially demonstrated on incinerators (as they are more likely applicable to traditional combustion units such as boilers or turbines) and therefore are deemed technically infeasible in our case and have been eliminated as potential RACT technologies.

3.3.2 Review of Potentially Applicable NO_X Control Technologies

The following section provides a discussion of each potentially applicable technology identified above as it might be applied to the incinerators at DELCORA.

3.3.2.1 Selective Catalytic Reduction (SCR)

SCR is a post-combustion gas treatment process in which NH_3 is injected into the exhaust gas upstream of a catalyst bed. On the catalyst surface, ammonia and NO_X react to form elemental nitrogen and water. The primary chemical reactions can be expressed as follows:

$$4\,NH_3 + 4NO + O_2 \rightarrow 4N_2 + 6H_2O$$
$$4\,NH_3 + 4NO_2 + 2O_2 \rightarrow 3N_2 + 6H_2O$$

When operated within the optimum temperature range of 480 to 800°F, the reaction can result in removal efficiencies between 70 and 90 percent.[6] Operation outside the optimum temperature range can result in increased ammonia slips or increased NO_X emissions.

SCR units have the ability to function effectively under fluctuating temperature conditions (usually ±50°F), although fluctuation in exhaust gas temperature reduces removal efficiency slightly by disturbing the kinetics (speed) of the NO_X removal reaction.

3.3.2.2 Selective Non-Catalytic Reduction (SNCR)

SNCR is a post-combustion NO_X control technology based on the reaction of urea or ammonia with NO_X. In the SNCR chemical reaction, urea [$CO(NH_2)_2$] or ammonia (NH_3) is injected into the combustion gas path to reduce the NO_X to nitrogen and water. The overall reaction schemes for both urea and ammonia systems can be expressed as follows:

$$CO(NH_2)_2 + 2NO + \frac{1}{2}\,O_2 \rightarrow 2N_2 + CO_2 + 2H_2O$$
$$4\,NH_3 + 6NO_2 \rightarrow 5N_2 + 6H_2O$$

Typical removal efficiencies for SNCR range from 25 to 65 percent. An important consideration for

[6] U.S. EPA, Office of Air Quality Planning and Standards. *OAQPS Control Cost Manual Section 4 Chapter 2, 7th edition*. Research Triangle Park, NC. May 2016.

implementing SNCR is the operating temperature range. The optimum temperature range is approximately 1,550 to 1,950°F.[7] Operation at temperatures below this range results in ammonia slip. Operation above this range results in oxidation of ammonia, forming additional NO_X.

3.3.2.3 Flue Gas Recirculation (FGR)

FGR involves recirculation of a portion of flue gas from the upper (top hearth) section of the incinerator—where the gas is relatively cooler—back to a point below the primary combustion zone. The recirculated flue gas lowers the temperature and oxygen concentration in the combustion zone, thereby inhibiting the thermal formation of nitrogen oxides (NOx). Additionally, since the flue gas passes through the combustion chamber a second time, unburned organics are more completely oxidized, resulting in cleaner and more efficient combustion.

By adjusting the flue gas recirculation rate, operators can modulate the temperature distribution within the incinerator and control the vertical position of the combustion front, optimizing both thermal efficiency and the destruction of combustible materials.

As stated in a memo received by DELCORA in March 2022, from Chavond-Barry Engineering Corp. (CBE) FGR could reduce NOx emissions by about 20-40%.

3.3.2.4 Good Combustion Practices / Proper Incinerator Operation

The formation of NO_X is minimized by proper furnace design and operation. Generally, emissions are minimized when the furnace temperature is kept at the lower end of the desired range and when the distribution of air at the air and fuel injection zones is controlled. Ideally, maintaining a low-oxygen condition near fuel injection points approaches an off-stoichiometric staged combustion process.

A certain amount of air is required to provide sufficient oxygen to burn all of the fuel. However, any excess air contributes to increased NO_X emissions in two ways: 1) Excess air effectively increases the amount of air that must be heated, resulting in decreased fuel efficiency and higher NO_X emissions, and 2) Excess air provides greater amounts of oxygen in the combustion zone that will lead to greater amounts of thermal NO_X formation. By minimizing the amount of air used in the combustion process while maintaining proper furnace operation, the formation of NOX can be reduced.

3.3.2.5 Low NO_X Burners (LNBs)

The principle of all LNBs is the same: stepwise or staged combustion and localized exhaust gas recirculation at the flame. LNBs are designed to control fuel and air mixing to create larger and more branched flames. Peak flame temperatures are reduced, resulting in less NO_X formation. LNBs eliminate the need for steam or water injection, which was formerly the traditional method of NO_X control. In addition to traditional LNB regenerative burners are low NO_X design but also utilize a pair of burners which cycle to alternately heat the combustion air or recover and store the heat from the furnace exhaust gases to improve burner efficiency.

3.3.3 Step 2 – Eliminate Technically Infeasible Options for NO_x Control

Step 2 in a RACT top-down analysis is to eliminate the control options identified in Step 1 which are technically infeasible. The remaining technologies are then carried into Step 3.

[7] U.S. EPA, Office of Air Quality Planning and Standards. *OAQPS Control Cost Manual Section 4 Chapter 1*, 7th edition. Research Triangle Park, NC. May 2016.

3.3.3.1 Selective Catalytic Reduction (SCR)

The SCR process is temperature sensitive. Any exhaust gas temperature fluctuations reduce removal efficiency and upsets the NH_3/NO_X molar ratio. SCR also requires an optimum temperature range of 575°F to 750°F and fairly constant temperatures, or NO_X removal efficiency will decrease. Below this temperature range, the reaction rate drops sharply, and effective reduction of NOx is no longer feasible. Above this temperature, conventional reduction catalysts break down and are unable to perform their desired functions. Additionally, streams with high volumes of particulate matter (PM) can require additional control measures to reduce PM deposition into the catalyst.[8]

Due to the large volumes of PM emissions from the SSI process DELCORA has installed an electrostatic precipitator and a venturi scrubber to control PM emissions from the SSIs. These PM controls reduce the exhaust temperature of the SSIs to 105°F, well below the effective range of a SCR.

The SCR could not be installed prior to the PM control equipment. This would lead to significantly greater construction costs as well as significant PM deposition into the catalytic medium, leading to catalytic deactivation, and completely removing the control efficiency of the SCR.

DELCORA operates their SSI's in accordance with operating parameters determined through the procedures in 40 CFR Subpart LLL §62.15985 b-h, which establishes a minimum afterburner operating temperature based off each incinerators 4-hour block average operating conditions. A summary of these operating parameters is attached in Appendix D. SSI #1 and #2 are both required by regulation to operate at temperatures greater than 1,450°F, which is significantly higher than the optimum temperature range for an SCR.

Therefore, SCR is deemed infeasible for DELCORAs SSIs and will not be discussed further in this section.

3.3.3.2 Selective Non-Catalytic Reduction (SNCR)

SNCR requires a high but very specific temperature range (generally between 1,550 °F and 1,950 °F) and sufficient residence time at this temperature to be effective. The operating temperature minimum is established for each incinerator at 1,488°F, and 1,513°F. While these values place DELCORA SSIs operating temperatures within the SNCR threshold operating temperature, PM control equipment installed at DELCORA greatly reduces the exhaust temperature to 105°F. The variable temperature range due to the nature of sewage sludge incineration as well as already in place PM control measures would likely reduce exhaust temperatures well below the 1,550°F SCNR threshold operating temperature, leading to ammonia slip and increasing harmful ammonia emissions.

Therefore, SNCR is deemed infeasible for DELCORAs SSIs and will not be discussed further in this section.

3.3.3.3 Flue Gas Recirculation (FGR)

FGR is a technically feasible option for each of the DELCORA SSIs. This technology has been researched and pursued by DELCORA through CBE, the company that owns the patent on this technology for MHIs. A memo was received by DELCORA in 2022 discussing NOx emissions reduction technologies. This memo directly states:

> "On facilities this technology has been utilized, it was primarily implemented to

[8] U.S. EPA, Technology Transfer Network, Clean Air Technology Center. "Air Pollution Control Technology Fact Sheet – Selective Catalytic Reduction." File number EPA-452/F-03-032. July 2003. http://www.epa.gov/ttn/catc/dir1/fscr.pdf (26 Nov. 2014).

reduce slagging within the incinerator, as such, we have limited data on the effectiveness of NOx reduction. Few studies available suggest that FGR could reduce the NOx emission by about 20% to 40%."

This statement by CBE directly states the uncertainty of FGR as a NOx emissions reduction technology. While this technology is uncertain, it is technically feasible and will be discussed further in Step 3.

3.3.3.4 Good combustion Practices/ Proper Incinerator Operation

The formation of NO_X can be minimized by proper furnace operation. Generally, emissions are minimized when the furnace temperature is kept at the lower end of the desired range and when the distribution of air at the air and fuel injection zones is controlled. Ideally, maintaining a low-oxygen condition near fuel injection points approach an off-stoichiometric staged combustion process. Completing combustion in a low-oxygen condition is impossible within a SSI, as 50-100% excess air is required to ensure the complete combustion of the sewage sludge.[9]

A high thermal efficiency would lead to less consumption of heat and fuel and would produce less NO_X emissions. General improvement in thermal efficiency is one design method of reducing NO_X formation, since less fuel is used. Steady sludge feed rates, and continuous high temperature combustion will ensure that the SSI does not require excess fuel for complete sludge combustion.

Good combustion practices and proper incinerator design is a technically feasible method for controlling NO_X emissions from the incinerators. This method has been cited in the RBLC as BACT for NO_X for other similar processes.

3.3.3.5 Low NO_X Burners (LNBs)

Incinerators are traditionally direct fired which limits the various forms of LNB to burner design. As previously discussed, LNBs differ from traditional burners in that the flames produced are larger with more branched flames (i.e., longer, lazier flame shapes) and therefore the peak flame temperature is usually lower. Burner flame properties in a SSI are critical to ensure complete combustion of fuel gas as well as solid waste.

A publication from the Industrial Furnace Company Inc. (IFCO) provides a case study of multiple hearth furnaces (MFHs) that were able to achieve reduced NOx emissions rates through the use of LNBs in tandem with additional control technologies. This publication is not being considered as evidence that LNBs could reduce NOx emissions from DELCORA SSIs because the facilities studied completed a full overhaul of their incinerators before achieving lower NOx emissions rates. This overhaul includes the installation of a FGR system which is deemed infeasible in step 4 of this review.

Low NO_x burners are a technically infeasible option for SSIs, this is due to the 50-100% excess air required to ensure complete combustion of the sewage sludge. This excess air disrupts the ideal flue-to-gas ratio necessary for LNBs to operate effectively. Additionally, a review of the EPA's RBLC database indicates that LNBs have not been commercially demonstrated on SSIs in the U.S.

Therefore, LNBs are deemed infeasible for DELCORA's SSIs and will not be discussed further in this section.

[9] U.S. EPA, "Second Review of Standards of Performance for Sewage Sludge Incinerators." File Number EPA-450/3-84-010. March 1984.

3.3.4 Step 3 – Rank Remaining Control Technologies by Control Effectiveness

In step 3, the remaining control technology options are ranked based on their control effectiveness, from highest to lowest control efficiency. There are (2) control technologies that are considered technically feasible, Good Combustion Practices/Proper Incinerator Operation, and FGR. Since DELCORA is already operating utilizing good combustion practices and proper incinerator operation, FGR will be ranked as the top technically feasible NOx emissions control technology and will be discussed in Step 4.

3.3.5 Step 4 – Evaluate Most Cost-Effective Controls and Document Results

Through DELCORs diligence in reducing their NOx emissions the memo received from CBE in March, 2022 states that the installation of an FGR on each incinerator would cost approximately $1.3 million, with a maximum estimated NOx emissions reduction of 40%.

Table 3-3 FGR Cost Analysis

Project Cost (USD)	Current NOx Emissions, Facility Total (tpy)	NOx Emissions, with FGR (tpy)	Total NOx Reduction (tpy)	Cost Per Ton NOx (USD)
$1,300,000.00	53.27	37.289	15.98	$81,346.60

As shown in Table 3-3, a 40% reduction in NOx emissions along with the estimated cost of $1.3 million for both incinerators would lead to a $81,346.60 cost per ton of NOx removed. This is significantly higher than $7,500 per ton of NOx emissions reduced, which is considered reasonable in accordance with 25 Pa. Code 129.114(i)(1)(i).

FGR will not be considered as RACT for DELCORA SSI #001 and #002.

An additional cost analysis was not conducted for the case-by-case RACT determination since DELCORA is already operating utilizing good combustion practices and proper incinerator operation.

3.3.6 Step 5 – Select RACT

For Step 5, DELCORA will maintain good combustion practices and proper incinerator operation. For SSIs #001 and #002, a NO_x emissions limit of 65.7 tons per year (TPY) (15 lb/hour per incinerator) has been established as RACT in Title V Operating Permit (TVOP) No. 23-00038. Additionally, DELCORA has been granted a Plant-wide Applicability Limit (PAL) of 82.56 TPY for NO_x. By adhering to current combustion and SSI operation practices, DELCORA will continue to comply with the emissions limitations specified in their TVOP and the PAL, ensuring adherence to RACT requirements.

4. RACT PROPOSAL

As detailed in Section 3, there are no technically or economically feasible NO_x control technologies for the sewage sludge incinerators #001 and #002 which are not already utilized. As such, DELCORA is proposing to utilize good combustion and proper incinerator practices on SSIs. The proposed RACT requirements for each SSI is provided in the table below.

Table 4-1 Proposed RACT for SSI #001 & #002

Emissions Source ID(s):	- Sewage Sludge Incinerator #001, Title V Source ID 001 - Sewage Sludge Incinerator #002, Title V Source ID 002
Source Description(s):	Dewatered sludge solids are incinerated in two (2) multiple hearth sewage sludge incinerators which emit NO_X, CO, VOC and HAPs. Incinerator emissions are controlled by venturi and impingement scrubbers followed by regenerative thermal oxidizers (RTO).
Description of RACT:	Case-by-case
	Good combustion practices and proper incinerator operation
Proposed Emissions Restriction: • 67.7 TPY NO_X (per incinerator) • 15 lb/hour NO_X (per incinerator) • 82.56 TPY NO_X, facility wide **Proposed Work Practices:** **Proposed Monitoring:** Per Section E, Source Group #01, Condition #008: • Temperature of hearths 1-6 per incinerator, continuously • Fuel combusted on a daily and monthly basis, • Quantity of sewage sludge incinerated on a continuous basis **Proposed Testing:** Per Section D, Source ID 001 and 002, Condition #001: • Perform stack tests once every five (5) calendar years **Proposed Recordkeeping:** Per Section E, Source Group #01, Condition #0012, DELCORA will maintain the following records for a minimum of five (5) years: • Temperature of hearths 1-6 per incinerator, continuously • Fuel combusted on a daily and monthly basis, 12MRT • Quantity of sewage sludge incinerated on a dry basis, daily • Dates, times and reason for any cessation of charging of sewage sludge to the incinerator other than for routing maintenance or planned outages • Continuous oxygen content of the incinerator exhaust gas • Manufacturers specifications for the instillation, maintenance and operation of burners • Stack testing protocols • Instrument calibration checks and maintenance reports **Proposed Reporting:** Compliance with work practices reported annually via Title V Compliance Certification	

APPENDIX A. RBLC DATABASE SEARCH

RBCL Search Results for NOx, 21.400 - Municipal Waste Combustion							
RBLC ID	**Facility Name**	**Permit Date**	**Source**	**Primary Fuel**	**Pollutant**	**Type of Requirement**	**Pollution Prevention / Add-on Control Description**
AK-0084	DONLIN GOLD PROJECT	6/30/2017	Incinerator (Sewage Sludge)		Nitrogen Oxides (NOx)	BACT-PSD	Good Combustion Practices
FL-0324	PALM BEACH RENEWABLE ENERGY PARK	12/23/2010	Three Municipal Solid Waste Combustors (MSW)	MSW	Nitrogen Oxides (NOx)	BACT-PSD	Seelctive Catalytic Reduction (SCR)
PR-0009	ENERGY ANSWERS ARECIBO PUERTO RICO RENEWABLE ENERGY PROJECT	4/10/2014	Two Identical Municipal Solid Waste Combustors Units	municipal solid waste	Nitrogen Oxides (NOx)	BACT-PSD	Regenerative Selective Catalytic Reduction System
VA-0329	COVANTA ALEXANDRIA/ARLINGTON INC	2/8/2019	three (3) municipal waste combusters		Nitrogen Oxides (NOx)	RACT	Emissions will be controlled by furnace design, proper operation, good combustion practices, ammonia injection (selective non-catalytic reduction (SNCR), and the Covanta proprietary low NOX combustion system (LNTM).
VA-0330	COVANTA FAIRFAX, INC.	2/8/2019	Four (4) municipal waste combustors		Nitrogen Oxides (NOx)	RACT	Controlled by furnace design, proper operation, ammonia injection (selective non-catalytic reduction (SNCR)), and the Covanta proprietary low NOX combustion system (LNTM).

APPENDIX B. TITLE V APPLICATION FORMS

*DELCORA submitted a TVOP Renewal Application in May of 2023, a new permit has yet to be issued from this renewal application. There will be no changes to DELCORA's permit application forms as a result of this RACT III proposal.

- Title V Application Forms
- Compliance Review Form

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR POLLUTION CONTROL ACT COMPLIANCE REVIEW FORM

Fully and accurately provide the following information, as specified. Attach additional sheets as necessary.

Type of Compliance Review Form Submittal (check all that apply)

☐ Original Filing — Date of Last Compliance Review Form
☒ Amended Filing — Filing: 09/06/2024

Type of Submittal

☒ New Plan Approval ☐ New Operating Permit ☐ Renewal of Operating Permit
☐ Extension of Plan Approval ☐ Change of Ownership ☐ Periodic Submission (@ 6 mos)
☐ Other: _____

SECTION A. GENERAL APPLICATION INFORMATION

Name of Applicant/Permittee/("applicant")
(non-corporations-attach documentation of legal name)
Delaware County Regional Water Quality Control Authority (DELCORA)

Address PO Box 999, 100 East Fifth Street
Chester, PA 19016-0999

Telephone (610) 876-5523 **Taxpayer ID#** 237182698

Permit, Plan Approval or Application ID# 23-00038

Identify the form of management under which the applicant conducts its business (check appropriate box)

☐ Individual ☐ Syndicate ☐ Government Agency
☐ Municipality ☒ Municipal Authority ☐ Joint Venture
☐ Proprietorship ☐ Fictitious Name ☐ Association
☐ Public Corporation ☐ Partnership ☐ Other Type of Business, specify below:
☐ Private Corporation ☐ Limited Partnership

Describe below the type(s) of business activities performed.

The Delaware County Regional Water Quality Control Authority (DELCORA) owns and operates the Western Regional Treatment Plant (WRTP) in Chester City, Delaware County and provides sewer service to Chester City and surrounding municipalities. The DELCORA WRTP uses two (2) multiple hearth incinerators to process the sewage sludge. The incinerators are classified as air contaminant sources and are permitted by DEP under a Title V permit. Other permitted air contamination sources include the wastewater treatment process and sludge holding tanks.

SECTION B. GENERAL INFORMATION REGARDING "APPLICANT"

If applicant is a corporation or a division or other unit of a corporation, provide the names, principal places of business, state of incorporation, and taxpayer ID numbers of all domestic and foreign parent corporations (including the ultimate parent corporation), and all domestic and foreign subsidiary corporations of the ultimate parent corporation with operations in Pennsylvania. Please include all corporate divisions or units, (whether incorporated or unincorporated) and privately held corporations. (A diagram of corporate relationships may be provided to illustrate corporate relationships.) Attach additional sheets as necessary.

Unit Name	Principal Places of Business	State of Incorporation	Taxpayer ID	Relationship to Applicant
Delaware County Regional Water Quality Control Authority (DELCORA)	PO Box 999 100 East Fifth Street Chester, PA 19013	Pennsylvania	237182698	Owner/Operator

SECTION C. SPECIFIC INFORMATION REGARDING APPLICANT AND ITS "RELATED PARTIES"

Pennsylvania Facilities. List the name and location (mailing address, municipality, county), telephone number, and relationship to applicant (parent, subsidiary or general partner) of applicant and all Related Parties' places of business, and facilities in Pennsylvania. Attach additional sheets as necessary.

Unit Name	Street Address	County and Municipality	Telephone No.	Relationship to Applicant
DELCORA Western Regional Treatment Plant (WRTP)	3201 West Front Street Chester, PA 19013	Delaware County Chester City	(610) 876-5523	Owner/Operator

Provide the names and business addresses of all general partners of the applicant and parent and subsidiary corporations, if any.

Name	Business Address
James R. Kern – Chairman	PO Box 999, 100 East Fifth Street, Chester, PA 19016
Paul Mullen – Secretary	PO Box 999, 100 East Fifth Street, Chester, PA 19016
Kenneth Schuster – Board Member	PO Box 999, 100 East Fifth Street, Chester, PA 19016
William Martin – Board Member	PO Box 999, 100 East Fifth Street, Chester, PA 19016
James J. Knapp – Board Member	PO Box 999, 100 East Fifth Street, Chester, PA 19016
John Nagle – Vice Chairman	PO Box 999, 100 East Fifth Street, Chester, PA 19016
Jane Billings– Assist. Secretary/Treasurer	PO Box 999, 100 East Fifth Street, Chester, PA 19016
Anthony Moss Sr. – Treasurer	PO Box 999, 100 East Fifth Street, Chester, PA 19016
Ieasa A. Nichols – Board Member	PO Box 999, 100 East Fifth Street, Chester, PA 19016

List the names and business address of persons with overall management responsibility for the process being permitted (i.e. plant manager).

Name	Business Address
Michael J. DiSantis –Director of Operations & Maintenance	PO Box 999, 100 East Fifth Street, Chester, PA 19016

Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time 5 years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.

Air Contamination Source	Plan Approval/ Operating Permit#	Location	Issuance Date	Expiration Date
Sludge Holding Tanks	Plan Approval 23-00038E	3201 West Front Street Chester, PA 19013	10/07/2013	04/21/2014
Sewage Sludge Incinerator 1 & 2; WWT Process; Sludge Holding Tanks	TVOP No. 23-00038 Amendment	3201 West Front Street Chester, PA 19013	05/21/2013	02/21/2018
Sewage Sludge Incinerator 1 & 2; WWT Process; Sludge Holding Tanks	TVOP No. 23-00038 Renewal	3201 West Front Street Chester, PA 19013	2/21/2013	02/21/2018
Sewage Sludge Incinerator 1 & 2; WWT Process; Sludge Holding Tanks	TVOP No. 23-00038 Renewal	3201 West Front Street Chester, PA 19013	12/17/2018	12/17/2023
Sewage Sludge Incinerator 1 & 2 Boiler Mact .	Plan Approval 23-0038C	3201 West Front Street Chester, PA 19013	01/22/2015	07/22/2016
Sewage Sludge Incinerator 1 & 2 Boiler Mact .	Plan Approval 23-0038C Amended 4/18/2017	3201 West Front Street Chester, PA 19013	07/22/2016	1/22/2017
Sewage Sludge Incinerator 1& 2 PAL	Plan Approval Extension 23-0038D	3201 West Front Street Chester, PA 19013	11/28/2012	05/28/2013
Sewage Sludge Incinerator 1 & 2 PAL	Plan Approval 23-0038D	3201 West Front Street Chester, PA 19013	08/24/2011	02/24/2012
Sewage Sludge Incinerator 1 & 2 PAL	Plan Approval 23-0038D	3201 West Front Street Chester, PA 19013	08/24/2011	8/24/2021
Sewage Sludge Incinerator 1 & 2 Bio Filter	Plan Approval 23-0038E	3201 West Front Street Chester, PA 19013	1/21/2015	7/20/2015

Sewage Sludge Incinerator 1 & 2 Bio Filter	Plan Approval 23-0038E	3201 West Front Street Chester, PA 19013	7/21/2015	1/20/2016
Sewage Sludge Incinerator 1 & 2	Plan Approval 23-0038E	3201 West Front Street Chester, PA 19013	1/21/2016	7/21/2016
Sewage Sludge Incinerator 1 & 2	Plan Approval 23-0038E Amended 4/18/2017	3201 West Front Street Chester, PA 19013	7/21/2016	1/22/2017
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	04/01/2015	10/01/2016
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	10/02/2016	4/2/2017
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	03/024/2017	10/03/2017
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	010/03/2017	04/01/2018
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	04/01/2018	09/28/2018
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	09/27/2018	3/27/2019
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	3/27/2019	9/27/2019
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	3/27/2020	9/27/2020
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	9/27/2020	3/27/2021
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	3/27/2021	9/27/2021
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	9/27/2021	3/27/2022
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	3/27/2022	9/27/2022
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	9/27/2022	3/27/2023
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	3/27/2023	9/27/2023
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	8/8/2023	2/8/2024
Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	2/8/2024	8/8/2024

Sewage Sludge Incinerator 1 & 2 (Wet Esp-RTO)	Plan Approval 23-0038F	3201 West Front Street Chester, PA 19013	8/8/2024	2/8/2025
BFP Scrubber differential pressure	Plan Approval 23-0038G Amended	3201 West Front Street Chester, PA 19013	9/21/2018	3/27/2020

Compliance Background. (Note: Copies of specific documents, if applicable, must be made available to the Department upon its request.) List all documented conduct of violations or enforcement actions identified by the Department pursuant to the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. Attach additional sheets as necessary. See the definition of "documented conduct" for further clarification. Unless specifically directed by the Department, deviations which have been previously reported to the Department in writing, relating to monitoring and reporting, need not be reported. – Ordered Chronologically by date received.

Date	Location	Plan Approval/ Operating Permit#	Nature of Documented Conduct	Type of Department Action	Status: Litigation Existing/ Continuing or Corrected/Date	Dollar Amount Penalty
CACP EMAIL DATED 6/21/2024 (various source testing dates 2023)	WRTP	TVOP-23-00038	1/26/2022-FAILURE TO SUBMIT STACK TEST RESULTS WHEN DUE / VARIOUS DATES 2023 STACK TESTING VIOLATIONS / HCI EMISSIONS VIOLATIONS	CACP	Consent Assessment of civil penalty	$10,350.00
NOV DATED 4/26/2023	WRTP	TVOP-23-00038	HCI SOURCE TESTING & EMISSIONS (FEBRUARY 2023)	NOV	WRITTEN RESPONSE BY MJD ON 5/17/2023 VIA EMAIL ONLY TO HEATHER HENRY	None
Various Source testing Dates (2016-2021)	DELCORA WRTP	TVOP 23-00038	FAILURE TO SUBMIT VARIOUS SOURCE TESTING RESULTS WHEN DUE / FAILURE TO FOLLOW STACK TEST PROTOCOLS (various 2016-2021)	CACP	Consent Assessment of civil penalty	$31,650.00
NOV DATED 4/4/2022	DELCORA WRTP	TVOP-23-00038	Failure to follow HCI SOURCE TESTING PROTOCOL (FEBRUARY 2021)	NOV	WRITTEN RESPONSE BY MJD ON 4/12/2022 VIA EMAIL ONLY TO HEATHER HENRY	None
NOV DATED 3/1/2022	DELCORA WRTP	TVOP-23-0038	FAILURE TO SUBMIT VARIOUS SOURCE TESTING RESULTS WHEN DUE / FAILURE TO FOLLOW STACK TEST PROTOCOLS (various 2016-2021)	NOV	WRITTEN RESPONSE BY MJD ON 3/30/2022 VIA EMAIL ONLY TO HEATHER HENRY	None
Nov Dated 10/13/2021	DELCORA WRTP	TVOP-23-0038	Failure to submit various TITLE V SEMI-ANNUAL REPORTS (FOR JAN-JUNE2021)	NOV	Written response by MJD ON 10/25/2021 VIA EMAIL ONLY TO HEATHER HENRY	None
Nov 2020-April 2021	DELCORA WRTP	TVOP-23-0038	Bypass incidents& Emissions Violations	CACP	Consent Assessment of civil penalty	$20,075.00

Compliance review on 8/20/2021 of 2/2021 stack test	DELCORA WRTP	TVOP-23-0038	Fugitive Emissions - ASH	NOV	No response Due send notice to Heather Henry within 15 days of ash system upgrade	None
Inspection on 8/9/2021	DELCORA WRTP	TVOP-23-00038	Nov dated 8/13/2021 received by MJD via email	NOV	Installation without a Plan Approval or Operating permit	None
Comp. inspection 3/26 & 3/30 and 4/15/21	DELCORA WRTP	TVOP-23-0038	VOC Emissions/Operator Training /Fugitive Emissions/ Failure to submit Annual Compliance Reports 2018-2020	NOV	Written response by MJD on 5/14/2021 via email to Heather Henry.	None
Various-1/1-6/30/2020 PAL Emissions/ Monitoring Report & 16 Inc. Bypasses	DELCORA WRTP	TVOP-23-0038	PADEP Review of 1/1-6/30/2020 PAL Emissions /Monitoring Report & 16 Incinerator bypass events from 7/31-10/21/2020	NOV	Written response by MJD on 11/17/2020 via email to Heather Henry.	None
Inc. #1 &2 12/24/2017 through 10/31/2019	DELCORA WRTP	23-00038 PA23-00038F	Incinerator exhausted in series to a Quench and Multiple Venturi Scrubber, WESP and RTO , Bypass open when charging sludge.	CACP	Consent Assessment of civil penalty signed & fine paid 1/9/2020	$7770.00
5/10 & 5/28/2017-INC.#1 &#2 (DEP. Results review of Semi-Annual Comp. Report)	DELCORA WRTP	TVOP-23-00038	Daily Throughput Exceedances	NOV (dated 5/29/2018)	Consent Assessment of civil penalty	$1320.00
VARIOUS dates 3/21/2019-7/17/2019	DELCORA WRTP	TVOP-23-0038& Plan Approval 23-0038F	Sewage sludge Incinerator Bypass Incidents	NOV (dated 7/24/2019)	Written Response Sent on 9/19/2019 with update	None
VARIOUS dates April 2018 -March 2019	DELCORA WRTP	TVOP-23-0038& Plan Approval 23-0038F	Bypass incidents & emission violations	NOV (dated 4/1/2019)	Written Response of 4/25/2019 Requesting meeting	None
Inc. #1 August 2016 & Inc.#2 August 2017	DELCORA WRTP	TVOP-23-00038	Exceedance of HC1 emission limit SUBPART MMMM	CACP	Consent Assessment of civil penalty	$9925.00

5/10 & 5/28/2017-INC.#1 &#2 (DEP. Results review of Semi-Annual Comp. Report)	DELCORA WRTP	TVOP-23-00038	Daily Throughput Exceedances	NOV	NO RESPONSE REQUESTED AT THIS TIME – Consent Assessment received at later date.	None
8/23-24/2017 source testing performed-DEP results review 11/20/2017	DELCORA WRTP	23-00038 PA23-00038F	Exceedance of HC1 emission limit	NOV	Written Response of 12/19/2017	None
6/14-15/2017 Air Emission Inspection	DELCORA WRTP	TVOP-23-00038	BFP Room Process Scrubber- Pressure Drop Below Permitted Range From 2/216 To 6/2017	NOV	Written Response of 7/12/2017 Requesting Meeting / 2nd Written response mailed 9/22/2017	None
8/17-19/2016 source testing performed-DEP results review on 3/2/2017	DELCORA WRTP	23-00038 PA23-00038F	Exceedance of HC1 Emission limit/Failure to provide test report within 60 Days of source testing	NOV	No Response Requested	None
Operating Permit/3rd Qtr. 2016	DELCORA WRTP	23-00038 PA23-00038E	Operating Permit & CEMS violations 3RD Qtr 2016 (Oder /Late Report)	CACP	Consent Assessment of civil penalty	$9900.00
8/26/2016 Inspection	DELCORA WRTP	23-00038 PA23-00038E	ODOR COMPLIANT	NOV	Comply/Closed (written response 9/19/2016)	None
3rd & 4th Qtr. 2015 & 1ST Qtr. 2016	DECORA WRTP	23-00038 PA23-00038E	CEMS violations- Dry solids exceedances & temperature limitations	CACP	Consent Assessment of civil penalty	$3900.00
various dates 2015	DELCORA WRTP	23-00038 PA23-00038E	For several sludge generators /B4 scrubber water flow rate not monitored for 47 days.	NOV	Corrective Actions included in TVOP compliance certification	None
various dates 2013-2014	DELCORA WRTP	23-00038 PA23-00038E	Dry solids exceedances & air emissions violations & failure to timely submit SOP-Prev Maint schedules	CACP	Comply/Closed (12/24/2015)	$6270.00
6/17/2015 Various	DELCORA WRTP	23-00038	CEMS violation – temperature limitations for incinerator #1 & #2	CACP	Comply/Closed	$600.00

2nd QTR (2015) temp exc.	DELCORA WRTP	23-00038	CEMS violation – temperature limitations for incinerator #1 & #2	CACP	Comply/Closed	$1200.00
6/5 -6/8 2015	DELCORA WRTP	23-00038	Dry solids feed exceedances INC #2	NOV	Comply/Closed (written response)	None
4/2015	DELCORA WRTP	23-00038	Dry solids feed exceedances INC #1 & #2	NOV	Comply/Closed	None
4TH QTR 2014 & 1st QTR 2015	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 2	CACP	Comply/Closed	$1000.00
11/4/2014	DELCORA WRTP	23-00038	CEMS violation – temperature limitations for incinerator #1 & #2	CACP	Comply/Closed	$400.00
08/26/2014	DELCORA WRTP	23-00038	CEM Failure	CACP	Comply/Closed	$200.00
06/02/2014	DELCORA WRTP	23-00038	CEM Failure	CACP	Comply/Closed	$800.00
03/07/2014	DELCORA WRTP	23-00038	CEM Failure	CACP	Comply/Closed	$2,400.00
01/14/2014	DELCORA WRTP	23-00038	CEM Failure	CACP	Comply/Closed	$600.00
11/01/2013	DELCORA WRTP	23-00038	Maximum heat release condition	CACP	Comply/Closed	$4,500.00
09/25/2013	DELCORA WRTP	23-00038	CEM Failure	CACP	Comply/Closed	$400.00
07/12/2013	DELCORA WRTP	23-00038	CEM Failure	CACP	Comply/Closed	$200.00
06/20/2013	DELCORA WRTP	23-00038	Inconsistent with good operating practice (2)	NOV	—	None
04/02/2013	DELCORA WRTP	23-00038	NOx emission exceedances & VOC rolling totals not maintained	CACP	Comply/Closed	$4,430.00
03/13/2013	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 2	CACP	Comply/Closed	$1,000.00
12/27/2012	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 1 & 2	CACP	Comply/Closed	$400.00
09/14/2012	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 1 & 2	CACP	Comply/Closed	$800.00
06/21/2012	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 1 & 2	CACP	Comply/Closed	$600.00
04/06/2012	DELCORA WRTP	23-00038	Maximum heat release & NOx exceedances	NOV	Comply/Closed	None
12/20/2011	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 1	CACP	Comply/Closed	$200.00
11/23/2011	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 1 & 2	CACP	Comply/Closed	$1,000.00

11/02/2011	DELCORA WRTP	23-00038	Dry solids throughputs and maximum heat release exceedances	CACP	Comply/Closed	$11,275.00
04/21/2011	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 1 & 2	CACP	Comply/Closed	$2,000.00
02/08/2011	DELCORA WRTP	23-00038	Maximum heat release exceedances and fuel oil sulfur content certification	NOV	Comply/Closed	None
10/01/2010	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 1 & 2	CACP	Comply/Closed	$400.00
06/30/2010	DELCORA WRTP	23-00038	CEMs – temperature, THC & O_2 limitations for SSI 1 & 2; stack thermocouple not certified	CACP	Comply/Closed	$14,950.00
05/08/2009	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 1 & 2	NOV	Comply/Closed	None
04/20/2009	DELCORA WRTP	23-00038	CEMs - temperature limitations for SSI 1	CACP	Comply/Closed	$600.00

List all incidents of deviations of the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. This list must include items both currently known and unknown to the Department. Attach additional sheets as necessary. See the definition of "deviations" for further clarification.

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Litigation Existing/Continuing Or Corrected/Date
No incidents or deviations other than those documented in previous section.				

<u>CONTINUING OBLIGATION</u>. Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional deviations occur between the date of submission and Department action on the application.

VERIFICATION STATEMENT
Subject to the penalties of Title 18 Pa.C.S. Section 4904 and 35 P.S. Section 4009(b)(2), I verify under penalty of law that I am authorized to make this verification on behalf of the Applicant/Permittee. I further verify that the information contained in this Compliance Review Form is true and complete to the best of my belief formed after reasonable inquiry. I further verify that reasonable procedures are in place to ensure that "documented conduct" and "deviations" as defined in 25 Pa Code Section 121.1 are identified and included in the information set forth in this Compliance Review Form.
Signature — Date: 9/6/2024
Michael J. DiSantis Name (Print or Type)
Director of Operations & Maintenance Title

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

FOR OFFICIAL USE ONLY

OP #: _____

Date: _____

OPERATING PERMIT MODIFICATION APPLICATION

Section 1 – General Information

1.1 Application Type

Type of permit for which application is made:

☐ Minor Modification ☐ State-Only Operating Permit

☒ Significant Modification ☐ Title V Operating Permit

Existing Operating Permit No: 23-00038

1.2 Facility Information

Firm Name: DELAWARE CNTY REG WA/DELCORA WESTERN REG TRMT PLT

Federal Tax ID: 23-7182698-1

Facility Name: WESTERN REGIONAL TREATMENT PLANT (WRTP)

Plant Code:

NAICS Code: 221320

SIC Code: 4952

Description of NAICS Code: Sewage Treatment Facilities

Description of SIC Code: Trasn. & Utilities- Sewage Systems

County: Delaware

Municipality: Chester

Latitude: 39 49 31.8900

Longitude: -75 23 38.3700

Horizontal Reference Datum: NAD 1983

Horizontal Collection Method: DGPS

Reference Point: Plant Enterance

1.3 Permit Contact Information

Name: Irene Fitzgerald

Title: ENV Programs Manager

Address: PO BOX 999, 100 E 5th Streer

City: Chester

State: PA

ZIP: 19016-0999

Telephone: (610) 876-5523 ext. 213

Email: fitzgeraldi@delcora.org

1.4 Small Business Question

Are you a small business as defined by the Pennsylvania Air Pollution Control Act? ☐ Yes ☒ No

Are you a small business as defined by the U.S. Small Business Administration? ☐ Yes ☒ No

1.5 Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No

Place confidential information on separate page(s) marked "Confidential".

In order to request confidential treatment for information in any document, you must submit a redacted version of the relevant document with the confidential information blacked out (and thus suitable for public disclosure), along with a letter of request containing a table identifying the page and line number of each redaction, along with a justification for each redacted item as to why it should be deemed confidential under the specific criteria allowed under 25 Pa. Code §127.12(d) and Section 13.2 of the APCA.

1.6 Certification of Truth, Accuracy and Completeness by a Responsible Official

I certify that, subject to the penalties of Title 18 Pa. C.S.A. Section 4904 and 35 P.S. Section 4009(b)(2), I am the responsible official having primary responsibility for the design and operation of the facilities to which this application applies and that the information provided in this application is true, accurate, and complete to the best of my knowledge, information, and belief formed after reasonable inquiry.

(Signed)  Date: June 25, 2025

Name (Typed): Michael J. DiSantis Title: Director of Operations and Maintenance

Telephone: 610-876-5523, ext. 264

Email: disantism@delcora.org

Section 2 – Inventory of Units Being Modified		
Unit ID No.	Unit Name	Unit Type
N/A		

Section 3 – Facility Changes

Complete this section ONLY if the changes are for the entire facility. If changes are for a source or sources, skip this Section and complete Section 4 for each Source in which a change is proposed.

3.1 Describe all proposed changes to this facility: DELCORA is already operating utilizing good combustion practices and proper incinerator operation.

3.2 If the proposed facility changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

3.3 Anticipated date on which proposed change is scheduled to occur: _____

3.4 List the proposed revision language for the operating permit conditions. This includes all changes to the emissions, monitoring, testing, record-keeping, reporting requirements and work practice standard requirements. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

3.5 Provide a listing of all changes in chronological order (additions and subtractions) made at a facility since the last submittal and attach it to this application. For example:

- March 2016 - Added shot blast booth 5, exempted by the attached Request for Determination.
- Dec 2017 - Installed new paint line in accordance with Plan Approval XX-XXXXX

3.6 For renewals, please review the current operating permit. If you are proposing any changes to the conditions of the permit, please provide the condition number, the requested change, and justification for the requested change.

Section 4 – Unit Information (duplicate this section for each unit as needed) N/A

4.1 Unit Type: ☐ Combustion ☐ Incinerator ☐ Process ☐ Control Device

4.2 General Source Information (Combustion/Incinerator/Process)

a. Source ID: _____ b. Source Name: _____

c. Manufacturer: _____ d. Model No.: _____

e. Source Description: _____

f. Rated Capacity (for engines use BHP): _____ g. Installation Date: _____

h. Rated Power/Electric Output: _____

i. Exhaust Temperature: _____ Units: _____ j. Exhaust % Moisture: _____ k. Exhaust Flow Volume: _____ SCFM

4.3 General Control Device Information

a. Unit ID: _____ b. Unit Name: _____

c Used by Sources: _____

d. Type: _____

e. Pressure Drop (in. H_2O): _____ f. Capture Efficiency: _____

g. Flow Rate (specify unit): _____

h. Manufacturer: _____ i. Model No.: _____

j. Installation Date: _____

4.4 Proposed Changes to Unit

a. Describe all proposed changes to this unit:

b. If the proposed unit changes involve any changes in actual emissions, please complete the following table. Attach another table if needed.

Pollutant Name	CAS Number	Change in Actual Emissions (+ or -)

c. Anticipated date on which proposed change is scheduled to occur: _____

d. List the proposed revision language for the operating permit condition. This includes all changes to the emission, monitoring, testing, record-keeping, reporting requirements and work practice standard requirement. Write in the type of applicable requirements in the column provided. Attach another table if needed.

Citation Number	Type of Applicable Requirement	Existing Operating Permit Condition or Condition Number	Proposed Language for Permit Condition

Section 5 – Compliance Plan for the Facility			
		Yes	No
5.1	Will your facility be in compliance with all applicable requirements at the time of permit issuance and continue to comply with these requirements during the permit duration?	☒	☐
5.2	Will your facility be in compliance with all applicable requirements presently scheduled to take effect during the term of the permit?	☒	☐

APPENDIX C. POTENTIAL AND ACTUAL EMISSIONS

DELCORA, Chester PA
Emissions Summary

2024 Actual Emissions

Month	Incinerator #1 (Source ID 001) Sludge Processed (tons)	Incinerator #2 (Source ID 002) Sludge Processed (tons)	Total Sludge Processed (tons)	Incinerator #1 (Source ID 001) Natural Gas Usage (scf)	Incinerator #2 (Source ID 002) Natral Gas Usage (scf)	Incinerator #1 (Source ID 001) NOx Emissions (tons)	Incinerator #2 (Source ID 002) NOx Emissions (tons)	Incinerator #1 Emissions Rate (lb NOx/ton Sludge)	Incinerator #2 Emissions Rate (lb NOx/ton Sludge)
1/1/2024	853.80	652.80	1506.60	7797424.15	7212598.58	2.90	2.35	6.79	7.20
2/1/2024	629.50	933.50	1563.00	6915946.60	7761906.69	2.14	3.36	6.80	7.20
3/1/2024	713.70	1017.50	1731.20	6937540.29	7472652.19	2.43	3.66	6.81	7.19
4/1/2024	848.30	821.00	1669.30	8363288.47	5906905.19	2.88	2.96	6.79	7.21
5/1/2024	691.20	985.30	1676.50	8883490.09	7339197.35	2.35	3.55	6.80	7.21
6/1/2024	536.30	704.30	1240.60	5819370.00	6071450.00	1.82	2.54	6.79	7.21
7/1/2024	755.10	782.30	1537.40	8717874.64	8441500.00	1.52	2.32	4.03	5.93
8/1/2024	733.20	680.80	1414.00	6566046.00	5008939.94	1.10	1.92	3.00	5.64
9/1/2024	744.00	760.20	1504.20	6173371.27	8706967.23	1.12	2.15	3.01	5.66
10/1/2024	511.60	827.60	1339.20	6727444.76	8668119.87	0.83	2.34	3.24	5.65
11/1/2024	807.90	808.40	1616.30	8561479.88	9057045.49	1.21	2.28	3.00	5.64
12/1/2024	841.50	808.70	1650.20	10113899.02	9675177.66	1.26	2.28	2.99	5.64
Totals:	**8666.10**	**9782.40**	**18448.50**	**91577175.18**	**91322460.19**	**21.56**	**31.71**	**--**	**--**
							Average:	**4.98**	**6.48**

Potential Emissions

Month	Incinerator #1 (Source ID 001) Operating Hours (hr)	Incinerator #2 (Source ID 002) Operating Hours (hr)	Incinerator #2 (Source ID 002) NOx Emissions[1] (tons)	Incinerator #1 (Source ID 001) NOx Emissions[1] (tons)
1/1/2024	744.00	744.00	5.58	5.58
2/1/2024	696.00	696.00	5.22	5.22
3/1/2024	744.00	744.00	5.58	5.58
4/1/2024	720.00	720.00	5.40	5.40
5/1/2024	744.00	744.00	5.58	5.58
6/1/2024	720.00	720.00	5.40	5.40
7/1/2024	744.00	744.00	5.58	5.58
8/1/2024	744.00	744.00	5.58	5.58
9/1/2024	720.00	720.00	5.40	5.40
10/1/2024	744.00	744.00	5.58	5.58
11/1/2024	720.00	720.00	5.40	5.40
12/1/2024	744.00	744.00	5.58	5.58
Totals[2]:	**8784.00**	**8784.00**	**65.88**	**65.88**

1. Potential NOx emissions based on Title V Operating Permit No. 23-00038 Incinerator NOx Emissions limitation of 15.0 lbNOx/hr
2. DELCORA is currently subject to a NOx Plant Wide Applicability Limit (PAL) of 82.560 tpy, and does not exceed this limit.

APPENDIX D. CY2024 SUBPART LLL OPERATING LIMITATION

DELCORA, Chester PA

Subpart LLL Operating Parameters

Incinerator #1 (Source ID 001) Operating Parameters

Total Scrubber DP ('"w.c.)	Scrubber Liquid Flow Rate (GPM)	Scrubber pH --	Afterburner Temperature (°F)	WESP Power (kVA)	WESP Effluent Flow Rate (gpm)
-20.9	913.0	5.3	1488.0	10.0	0.4

1. Values established as 4-hour run averages per 40 CFR Subpart LLL §62.15985 b h during July 2024 Stack Tests

Incinerator #2 (Source ID 002) Operating Parameters

Total Scrubber DP ('"w.c.)	Scrubber Liquid Flow Rate (GPM)	Scrubber pH --	Afterburner Temperature (°F)	WESP Power (kVA)	WESP Effluent Flow Rate (gpm)
-20.6	915.0	5.4	1513.0	8.8	0.0

1. Values established as 4-hour run averages per 40 CFR Subpart LLL §62.15985 b h during July 2024 Stack Tests