

Godwin, Carla (DNREC)

From: Murphy, Alexa (DNREC)
Sent: Monday, July 19, 2021 8:39 AM
To: Sapone, Nicholas Robert
Cc: Godwin, Carla (DNREC); Mattson, Tracy M. (DNREC); Mattio, Karen (DNREC)
Subject: DNREC Division of Air Quality Draft/Proposed Permit Notice For Rohm and Haas Electronic Materials CMP,LLC
Attachments: AJM21024 Rohm and Haas Boiler Permit C FE.pdf; AJM21030 Ad R&H Boiler FE.doc

Hello Nick,

Attached you will find a copy of "**Draft/Proposed**" Permit: **APC-2021/0099-CONSTRUCTION(MNSR)(FE)** for the 500 HP Burnham Boiler. This permit is being made federally enforceable so its terms and conditions can be transferred to your facility's Title V Operating Permit (**Permit: AQM-003/00033-(Renewal 3)(Revision 2)**) via the administrative permit amendment process. Please reference 7 **DE Admin. Code** 1102 Sections 11.2.10, 12.4 and 12.5 for the requirements of this process.

In order to make the terms and conditions of this **Permit: APC-2021/0099-CONSTRUCTION(MNSR)(FE)** federally enforceable, notice has been sent to EPA and affected states, and a Public Notice was advertised in the *Sunday News Journal* and *Delaware State News* on Sunday, July 18, 2021 to commence a thirty (30) day comment period. The public comment period will be no less than thirty (30) days in accordance with 7 **DE Admin Code** 1130. The public comment period ends August 17, 2021. Any comments should be brought to the Department's attention on or before August 17, 2021 and mailed to the following address:

State of Delaware - DNREC
Division of Air Quality
State Street Commons
100 W. Water Street, Suite 6A
Dover, DE 19904
ATTN: David Fees, Division Director

The Department requests that you mail the original and one (1) copy if you submit comments.

The "Draft/Proposed" permit is being submitted to EPA for concurrent processing. Please note that the EPA can comment during the 30 day public notice period and can approve or deny the permit during the entire 45 day EPA review period.

If the Department receives significant comments on the "Draft/Proposed" permit, comments will be evaluated, responses will be prepared, and the permit will be revised as necessary. The permit will then be submitted to you and the EPA as "Proposed" as a standard consecutive forty-five (45) day review period.

Any questions concerning the attached "Draft/Proposed" permit may be directed to Alexa Murphy at 302-232-4542.

Sincerely,




Alexa Murphy

Engineer

 302-323-4542

 alexa.murphy@delaware.gov

 715 Grantham Lane, New Castle DE 19720

 dnrec.delaware.gov





STATE OF DELAWARE
**DEPARTMENT OF NATURAL RESOURCES AND
ENVIRONMENTAL CONTROL**

DIVISION OF AIR QUALITY
STATE STREET COMMONS
100 W. WATER STREET, SUITE 6A
DOVER, DELAWARE 19904

ENGINEERING &
COMPLIANCE

PHONE
(302) 739-9402

Hard Date – Not Date Code

Draft/Proposed Permit: APC-2021/0099-CONSTRUCTION(MNSR)(FE)

Rohm and Haas Electronic Materials CMP, LLC
Building 2- Natural Gas Fired 500 HP Burnham Boiler

451 Bellevue Road
Newark, DE 19713

ATTENTION: Leslie Croskey
Site Manufacturing Leader

Dear Ms. Croskey:

Pursuant to 7 **DE Admin. Code** 1102 Section 2 and Section 11, approval by the Department of Natural Resources and Environmental Control (the Department) is hereby granted for the construction of a natural gas fired 500 HP Burnham Boiler equipped with low NO_x burners and flue gas recirculation located at the 451 Bellevue Road, Building 2, facility in Newark, Delaware, in accordance with the application submitted on Form Nos. AQM-1, AQM-2, AQM-3.2, and AQM-5, dated March 8, 2021, signed by Leslie Croskey, Site Manufacturing Leader, with letter, dated March 8, 2021, signed by Nicholas Sapone, EHS Specialist, and additional corrected AQM-5 and supporting data, dated March 22, 2021, signed by Nicholas Sapone, and revised application submitted on June 10, 2021, signed by Leslie Croskey, Site Manufacturing Leader, with letter, dated June 8, 2021, signed by Nicholas Sapone, EHS Specialist.

This permit is issued subject to the following conditions all of which are federally enforceable except Condition 6.1 and 2.3:

1. General Provisions

- 1.1 This permit expires on **<insert date>**. If the equipment covered by this permit will not be constructed by **<insert date>**, an application for renewal of this construction permit must be submitted by **<insert date minus 180 days>**.

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Rohm and Haas Electronic Materials CMP,LLC

Building 2- 500 HP Burnham Boiler (Emission Unit 2-11)

Date <Month, day, year (4 digit)>

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- 1.2 The project shall be constructed in accordance with the information described above. If changes are necessary, revised plans must be submitted and a supplemental approval issued prior to actual construction.
- 1.3 Upon presentation of identification, the Company shall authorize officials of the Department to:
 - 1.3.1 Enter upon the Company's premises where a source is located or an emissions-related activity is conducted, or where records that must be kept under the terms and conditions of this permit are located.
 - 1.3.2 Have access to and copy, at reasonable times, any record(s) that must be kept under the terms and conditions of this permit.
 - 1.3.3 Inspect, at reasonable times, any record(s) that must be kept under the terms and conditions of this permit.
 - 1.3.4 Sample or monitor, at reasonable times, any substance or parameter for the purposes of assuring compliance with this permit or any applicable requirement.
- 1.4 This permit may not be transferred to another location or to another piece of equipment or process.
- 1.5 This permit may not be transferred to another person, owner, or operator unless the transfer has been approved in advance by the Department. Approval (or disapproval) of the permit transfer will be provided by the Department in writing. A request for a permit transfer shall be received by the Department at least thirty (30) days before the date of the requested permit transfer. This request shall include:
 - 1.5.1 Signed letters from each person stating the permit transfer is agreeable to each person; and
 - 1.5.2 An Applicant Background Information Questionnaire pursuant to 7 Del. C., Chapter 79 if the person receiving the permit has not been issued any permits by the Department in the previous five (5) years.
- 1.6 The Company shall, upon completion of the construction, installation, or alteration of each emission unit, request in writing that the Department transfer the terms and conditions of this construction permit into the 7 **DE Admin. Code** 1130 operating permit.
- 1.7 The request shall contain the following information, and shall contain the following language from the responsible official: "I certify, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."
 - 1.7.1 A description of the compliance status, a complete schedule, and a certification of compliance for the equipment, facility, or air contaminant control device with respect to all applicable requirements, in accordance with 7 **DE Admin. Code** 1130 Section 5.4.8 and 5.4.9; and

- 1.7.2 A statement of the methods used to determine compliance, including a description of the monitoring, record keeping, and reporting requirements and test methods.
- 1.8 Upon satisfactory demonstration that the equipment, facility, or air contaminant control device complies with all applicable requirements and all terms and conditions of the construction permit, and not prior to the expiration of the EPA review period provided for in 7 **DE Admin. Code** 1102, Section 12.5, the Department shall transfer the specified terms and conditions to the 7 **DE Admin. Code** 1130 permit via the administrative amendment process specified in 7 **DE Admin. Code** 1130.
- 1.9 The provisions of 7 **DE Admin. Code** 1102 Sections 2.1, 11.3, and 11.5 shall not apply to the operation of equipment or processes for the purpose of initially demonstrating satisfactory performance to the Department following construction, installation, modification, or alteration of the equipment or processes. The Company shall notify the Department sufficiently in advance of the demonstration and shall obtain the Department's prior concurrence of the operating factors, time period, and other pertinent details relating to the demonstration.
- 1.10 The owner or operator shall not initiate construction, install, or alter any equipment or facility or air contaminant control device which will emit or prevent the emission of an air contaminant prior to submitting an application to the Department pursuant to 7 **DE Admin. Code** 1102, and, when applicable, 7 **DE Admin. Code** 1125, and receiving approval of such application from the Department; except as exempted in 7 **DE Admin. Code** 1102 Section 2.2.

2. Emission Limitations

- 2.1 Air contaminant emission levels shall not exceed those specified in 7 **DE Admin. Code** 1100 and the following:
 - 2.1.1 Volatile Organic Compound (VOC) Emissions
VOC emissions shall not exceed 0.13 pounds per hour and 0.57 tons per twelve (12) month rolling period;
 - 2.1.2 Nitrogen Oxide (NO_x) Emissions
 - 2.1.2.1 NO_x emissions shall not exceed 1.25 pounds per hour and 5.49 tons per twelve (12) month rolling period;
 - 2.1.2.2 The maximum emission rate for nitrogen oxides shall not exceed that achieved through an annual tune-up performed by qualified personnel.
 - 2.1.3 Carbon Monoxide (CO) Emissions
CO emissions shall not exceed 1.27 pounds per hour and 5.57 tons per twelve (12) month rolling period;
 - 2.1.4 Particulate Matter (PM₁₀) Emissions
 - 2.1.4.1 PM₁₀ emissions shall not exceed 0.18 pounds per hour and 0.79 tons per twelve (12) month rolling period;

2.1.4.2 The Company shall not cause or allow the emission of particulate matter in excess of 0.3 lb/MMBTU heat input, maximum two (2) hour average.

2.1.5 Sulfur Dioxide (SO₂) Emissions

SO₂ emissions shall not exceed 0.014 pounds per hour and 0.062 tons per twelve (12) month rolling period;

2.2 No person shall cause or allow the emission of visible air contaminants and/or smoke from a stationary or mobile source, the shade or appearance of which is greater than twenty percent (20%) opacity for an aggregate of more than three (3) minutes in any one (1) hour or more than fifteen (15) minutes in any twenty-four (24) hour period.

2.3 Odors from this source shall not be detectable beyond the plant property line in sufficient quantities such as to cause a condition of air pollution.

3. Operational Limitations

3.1 The owner or operator shall comply with the following operational limits:

3.1.1 The Company shall combust only natural gas in the boiler.

3.1.2 Natural gas consumption shall not exceed 207 MMscf per twelve (12) month rolling period.

3.1.3 The heat input capacity of the boiler shall not exceed 24.8 MMBtu/hr.

3.1.4 The boiler shall be equipped with low NO_x burner(s) and over-fire air or flue gas recirculation.

3.1.5 The boiler shall be equipped with a fuel flow meter.

3.1.6 Operation of the boiler shall be optimized by having qualified personnel perform a tune-up within seven (7) days of boiler startup.

3.1.7 Annual tune ups must be performed.

3.2 At all times, including periods of startup, shutdown, and malfunction, the owner or operator shall, to the extent practicable, maintain and operate the facility including associated air pollution control equipment in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating procedures are being used will be based on information available to the Department which may include, but is not limited to, monitoring results, opacity observations, review of operating and maintenance procedures, and inspection of the source.

3.3 All structural and mechanical components of the equipment or process covered by this Permit shall be maintained in proper operating condition.

4. Testing and Monitoring Requirements

- 4.1 The Department reserves the right to require that the owner or operator perform emission tests using methods approved in advance by the Department.
- 4.2 The Company shall monitor the following:
 - 4.2.1 The daily natural gas usage.
 - 4.2.2 The daily hours of operation of the boiler.
 - 4.2.3 All periods of startup, shutdown, and malfunction of the boiler.
 - 4.2.4 The tune-up shall be performed in accordance with the manufacturer's recommendations. The tune up is not considered complete until any necessary repairs and adjustments have been made to ensure efficient operation.
- 4.3 Once each week, the exhaust stack shall be observed for visible emissions for at least five (5) minutes while the boiler is operating. If no visible emissions are observed, no further action is necessary. If visible emissions are observed, the owner or operator shall either:
 - 4.3.1 Cease activities until corrective actions can be taken to eliminate the visible emissions; or
 - 4.3.2 Conduct visual observations at fifteen second intervals, in accordance with Subsection 1.5.3 of 7 **DE Admin. Code** 1120, for a period of not less than one (1) hour except that the observations may be discontinued whenever a violation of Condition 2.2 is recorded.

5. Record Keeping Requirements

- 5.1 The Company shall maintain, at a minimum, all of the information required by this permit for a minimum of five (5) years from such information's date of record.
- 5.2 The following information shall be recorded, initialed and maintained in log form:
 - 5.2.1 The quantity of natural gas combusted each day and month.
 - 5.2.2 The Company shall calculate the 12 month rolling natural gas usage within 15 days of the end of each month.
 - 5.2.3 The daily hours of operation of the boiler.
 - 5.2.4 The Company shall calculate the 12 month rolling hours of operation within 15 days of the end of each month.
 - 5.2.5 The maintenance performed on the boiler.
 - 5.2.6 Any start-up, shut-down or malfunction of the boiler including the date and time and any corrective actions required.

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Rohm and Haas Electronic Materials CMP, LLC

Building 2- 500 HP Burnham Boiler (Emission Unit 2-11)

Date <Month, day, year (4 digit)>

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- 5.2.7 A log of all tune-ups performed on the boiler to include the dates of the tune-up, adjustment to the equipment, and as-found and as-left conditions.
 - 5.2.7.1 The qualification of personnel performing the annual tune-ups. Minimum qualifications shall include manufacturer, supplier, or technical training.
- 5.2.8 The visible emissions monitoring of Condition No. 4.3.
- 5.3 The Company shall maintain records of the following:
 - 5.3.1 The boiler heat capacity for the boiler.
 - 5.3.2 The boiler specifications for the boiler that demonstrate it is equipped with low NOx burner(s) with over-fire air or flue gas recirculation.
 - 5.3.3 The fuel flow meter installation for the boiler.
- 5.4 A rolling monthly total emissions shall be calculated and recorded within 15 days of the end of each month in a log for each of the following pollutants.
 - 5.4.1 Volatile Organic Compound Oxides (VOC) Emissions
 - 5.4.2 Nitrogen Oxides (NO_x) Emissions
 - 5.4.3 Carbon Monoxide (CO) Emissions
 - 5.4.4 Particulate Matter (PM₁₀) Emissions
 - 5.4.5 Sulfur Dioxide (SO₂) Emissions

6. Reporting Requirements

- 6.1 Emission in excess of any permit condition or emissions which create a condition of air pollution shall be reported to the Department:
 - 6.1.1 Immediately upon discovery and after activating the appropriate site emergency plan to the Department's 24-hour complaint line (1-800-662-8802) any deviation that poses an imminent and substantial danger to public health, safety, or the environment.
 - 6.1.2 Immediately upon discovery by calling the Environmental Emergency Notification and Complaint number, (800) 662-8802. (State Enforceable Only)
- 6.2 Discharges to the atmosphere in excess of any quantity specified 7 **DE Admin. Code** 1203 "**Reporting of a Discharge of a Pollutant or an Air Contaminant**" shall be reported, immediately upon discovery and after activating the appropriate site emergency plan, either in person or to the Department's 24-hour complaint line (1-800-662-8802). Discharges in compliance with this permit and excess emissions previously reported under Condition 6.1 of this permit are exempt from this reporting requirement.

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Rohm and Haas Electronic Materials CMP,LLC

Building 2- 500 HP Burnham Boiler (Emission Unit 2-11)

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- 6.3 In addition to complying with Condition 6.1 and 6.2 of this permit, any reporting required by 7 DE Admin. Code 1203 "**Reporting of a Discharge of a Pollutant or an Air Contaminant**" and any other reporting requirements mandated by the State of Delaware, the owner or operator shall for each occurrence of excess emissions, within thirty (30) calendar days of becoming aware of such occurrence, supply the Department in writing with the following information:
- 6.3.1 The name and location of the facility;
 - 6.3.2 The subject source(s) that caused the excess emissions;
 - 6.3.3 The time and date of first observation of the excess emissions;
 - 6.3.4 The cause and expected duration of the excess emissions;
 - 6.3.5 For sources subject to numerical emission limitations, the estimated rate of emissions (expressed in the units of the applicable emission limitation) and the operating data and calculations used in determining the magnitude of the excess emissions; and
 - 6.3.6 The proposed corrective actions and schedule to correct the conditions causing the excess emissions.
- 6.4 Each document submitted to the Department/EPA pursuant to this permit shall be certified by a Responsible Official as to truth, accuracy, and completeness. Such certification shall be signed by a Responsible Official and shall contain the language: "I certify, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete."
- 6.5 Each document submitted to the Department/EPA pursuant to this permit shall be sent to the following addresses:

State of Delaware – DNREC Division of Air Quality State Street Commons 100 W. Water Street, Suite 6A Dover, DE 19904 ATTN: Division Director	United States Environmental Protection Agency Office of Air Enforcement and Compliance Assurance (3AP20) 1650 Arch Street Philadelphia, PA 19103-2029
No. of Originals: 1	No. of Copies: 1

- 6.6 A notification of the actual date of initial startup of the boiler shall be submitted to the Department and the EPA, postmarked within 15 days of the startup date. The notification shall include the design heat input of the unit and identification of fuel to be combusted in the unit.

7. Compliance Certification

- 7.1 Compliance with the terms and conditions of this permit shall be certified to the Department not later than the first day of February of each year unless the terms and

Draft/Proposed Permit: APC-2021/0099-CONSTRUCTION(MNSR)(FE)

Rohm and Haas Electronic Materials CMP,LLC

Building 2- 500 HP Burnham Boiler (Emission Unit 2-11)

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conditions require Compliance Certifications to be submitted more frequently. Such certifications shall cover the previous calendar year and shall be submitted on Form AQM-1001BB. The Compliance Certification shall include the following information:

- 7.1.1 The identification of each term or condition of the permit that is the basis of the certification.
 - 7.1.2 The Company's current compliance status, as shown by monitoring data and other information reasonably available to the Company.
 - 7.1.3 Such certification shall indicate whether compliance was continuous or intermittent during the covered period.
 - 7.1.4 The method(s) used for determining the compliance status of the Company, currently and over the reporting period as required by the monitoring, record keeping, and reporting required under Conditions 4, 5, and 6.
 - 7.1.5 Such other facts that the Department may require to determine the compliance status of the source.
- 7.2 Each compliance certification shall be submitted to the Department and EPA and shall be certified in accordance with Condition 6.4 of this permit.
- 7.3 Any additional information possessed by the Company that demonstrates noncompliance with any applicable requirement must also be used as the basis for Compliance Certifications.

8. Administrative Conditions

- 8.1 The Company shall have available at the facility at all times a copy of this permit and shall provide a copy of this permit to the Department upon request.
- 8.2 Failure to comply with the provisions of this permit may be grounds for suspension or revocation.

Sincerely,

Joanna L. French, P.E.
Acting Program Administrator
Engineering & Compliance Section

JLF:KAM:AJM
F:\EngAndCompliance\AJM\AJM21024.doc

pc: Dover Title V File
Karen A. Mattio, P.E.
Alexa Murphy



DNREC – Division of Air Quality

LEGAL NOTICE

Federally Enforceable 7 DE Admin. Code 1102 Applications

Notice is hereby given that Rohm and Haas Electronic Materials CMP, LLC having a facility at 451 Bellevue Road, Newark, Delaware, has requested a federally enforceable 7 DE Admin. Code 1102 construction permit (Permit: APC-2021/0099-CONSTRUCTION(MNSR)(FE)) for a natural gas fired, 500 hp, Burnham boiler, equipped with low NOX burners and flue gas recirculation, that will be permitted to emit 5.49 tons per twelve (12) month rolling period of nitrogen oxides (NOX), 5.57 tons per twelve (12) month rolling period of carbon monoxide (CO), 0.79 tons per twelve (12) month rolling period of particulate matter (PM-10), 0.062 tons per twelve (12) month rolling period of sulfur dioxide (SO₂), and 0.57 tons per twelve (12) month rolling period of volatile organic compounds (VOC). This boiler will replace the facility's current boiler. Additionally, a small 200 hp Burnham boiler will also be installed. This unit is exempt from a construction permit under 7 DE Admin. Code 1102.

Upon completion of construction, the Department will incorporate the operating conditions and limits of the 7 DE Admin. Code 1102 Construction permit into the facility's existing Title V permit (Permit: AQM-003/00033-Renewal 3-Revision 3) via an Administrative Amendment.

The application, the "draft/proposed" construction permit, all materials that the applicant has submitted (other than those granted confidential treatment under DNREC rules), and a copy of summary of other materials, if any, considered in preparing the "draft/proposed" permit is posted at <https://de.gov/dnrecnotices>. To submit comments, for additional information or for information regarding how you can inspect the application, please contact Tracy Mattson at (302) 739-9402.

The "draft/proposed" construction permit is being submitted to EPA for concurrent processing. If there are no significant comments, the "draft/proposed" construction permit will be issued as a final permit after the expiration of the EPA review period.

A public hearing on any of the above applications will NOT be held unless the Secretary of DNREC receives a request for a hearing regarding that application within 30 days from the date of this notice, ending August 17, 2021. A request for a hearing shall be in writing. The request must also show a familiarity with the application and a reasoned statement of the permit's probable impact.

All comments and public hearing requests should be mailed to the following address:

DIVISION OF AIR QUALITY
STATE STREET COMMONS
100 W. WATER STREET, SUITE 6A
DOVER, DE 19904
(302) 739-9402

Publication instructions:

Please publish in the DELAWARE STATE NEWS as a two-column display ad on the following date: **SUNDAY, July 18, 2021**

Invoice coding: 400402

Account No.: 119125

Please send affidavits with newspaper clippings to: **Tracy Mattson, Division of Air Quality, State Street Commons, 100 W. Water Street, Suite 6A, Dover, Delaware 19904.**

Publication instructions:

Please publish in the SUNDAY NEWS JOURNAL as a two-column display ad on the following date: **SUNDAY, July 18, 2021**

Invoice coding: 400402

Account No.: SD0111

Please send affidavits with newspaper clippings to: **Tracy Mattson, Division of Air Quality, State Street Commons, 100 W. Water Street, Suite 6A, Dover, Delaware 19904.**

MEMORANDUM

TO: Joanna L. French, P.E. JLF

THROUGH: Karen A. Mattio, P.E. KAM

FROM: Alexa Murphy AJM

SUBJECT: Rohm and Haas Electronic Materials CMP, LLC
Draft/Proposed Permit: APC-2021/0099-CONSTRUCTION(MNSR)(FE)
Building 2- Natural Gas Fired 500 HP Burnham Boiler

DATE: June 23, 2021

BACKGROUND INFORMATION

Rohm and Haas Electronic Materials CMP, LLC requested a construction permit for a natural gas fired, 500 hp, Burnham boiler, equipped with low nitrogen oxide (NO_x) burners and flue gas recirculation. The 500 hp boiler is a part of the boiler replacement project and will replace the Kewanee boiler, which is at the end of its operation life. The facility currently holds a construction permit for a limited term trailered boiler to use during this boiler replacement project.

The contents of this permit will be made federally enforceable through a 30-day advertisement period and EPA review. Once a successful construction to operation inspection is completed, the facility wide Title V operating permit (**Permit: AQM-003/00033-Renewal 3-Revision 3**) will be administratively amended to include the requirements of **Permit: APC-2021/0099-CONSTRUCTION(MNSR)(FE)**.

During this boiler replacement project, a small boiler, 4.2 MMBtu/hr Cleaver Brooks boiler, listed in insignificant activities, will be replaced with a natural gas fired, 200 hp, 10.5 MMBtu/hr, Burnham boiler, equipped with low NO_x burners. This replacement boiler is exempt due to 7 **DE Admin. Code** 1102 Appendix A 2.2, which states units are exempt if it meets the following:

2.2 *"Uses only natural gas, LP gas, or other desulfurized fuel gas and has a rated heat input of less than 15 million British-Thermal Units (BTUs) per hour."*

The 200 hp Burnham boiler only burns natural gas and has a heat input rating of 10.5 MMBtu/hr, which meets the less than 15 MMBtu/hr requirement.

The Facility is not in the Coastal Zone and all applicable fees were provided with the permit application. The Company did not indicate any information was confidential. An applicant background statement is on file with the Department.

TECHNICAL INFORMATION

The 500 hp, Burnham boiler, equipped with low NO_x burners and flue gas recirculation was manufactured by Burnham in February 2021 and the model number is LN3P-500-50-G-RLO. The boiler has a rated heat input of 24.8 MMBtu/hr and burns only natural gas.

MEMORANDUM**Draft/Proposed Permit: APC-2021/0099-CONSTRUCTION(MNSR)(FE)****Rohm and Haas Electronic Materials CMP,LLC**

Building 2- 500 HP Burnham Boiler

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Emission Unit ID	Emission Unit Description	Impacted By Project?	How Impacted?
2-11	20.6 MMBtu/hr Kewanee boiler, natural gas fired. (Building 2)	Yes	Will be removed from the site.
GIA-203	4.2 MMBtu/hr Cleaver Brooks boiler Insignificant Activities: 1102 "Exempt"	Yes	Will be removed from the site.
	24.8 MMBtu/hr (500 hp) Burnham boiler, natural gas fired. (Building 2)	Yes	New
	10.5 MMBtu/hr, (200 hp) Burnham boiler, natural gas fired. Insignificant Activities: 1102 "Exempt" (Building 2)	Yes	New

Emission Estimates:

Emissions for the 500 hp boiler were calculated based on the manufacturer's emissions factors for natural gas, which were submitted with the application.

The boiler combustion 207 MMCF of natural gas annually.

$$24.807 \frac{\text{MMBtu}}{\text{hr}} \left(\frac{8,760 \text{ hrs}}{\text{year}} \right) \left(\frac{\text{MMscf}}{1,050 \text{ MMBtu}} \right) = 207 \text{ MMCF natural gas per year}$$

	Exhaust (CFM)	NO _x (PPM)	CO (PPM)	NO _x Molar Mass (g/mol)	CO Molar Mass (g/mol)	NO _x Emission Rate (lbs/hr)	NO _x PTE (TPY)	CO Emission Rate (lbs/hr)	CO PTE (TPY)
500 hp Boiler	5,825	30	50	46.005	28.01	1.25	5.49	1.27	5.57

Pollutants	Emission Factor (lbs/10 ⁶ SCF)	Emission Rate (lb/hr)	PTE (TPY)
VOC	5.5	0.13	0.57
PM_{total}	7.6	0.18	0.79
SO₂	0.6	0.014	0.062
CO₂	120,000	2836	12,420

MEMORANDUM

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Building 2- 500 HP Burnham Boiler

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Sample Calculations:

$$5.5 \frac{lbs}{10^6 scf} \left(\frac{207 \cdot 10^6 scf}{year} \right) \left(\frac{ton}{2,000 lbs} \right) = 0.57 \text{ tons VOC per year}$$

Table 4. Permitted emissions.		
Pollutants	Emission Rate (lb/hr)	Permitted Emissions (TPY)
NO _x	1.25	5.49
CO	1.27	5.57
VOC	0.13	0.57
PM _{total}	0.18	0.79
SO ₂	0.014	0.062
CO ₂	2,836	12,420

AERSCREEN Model:

The Department’s criteria for acceptable conditions for public health and safety for the criteria air pollutants is to compare the maximum downwind concentration (MDC) to the significant impact level (SIL). The criteria assume no adverse effect when the MDC at the property boundary line and beyond is less than the SIL. The EPA publishes SILs in 40 CFR 51 Appendix S.

The Department’s additional air toxics criteria for acceptable conditions for public health and safety include a threshold limit value (TLV): MDC ratio of at least 100:1. The threshold limit values come from the *2020 TLVs and BEIs* published by ACGIH. If this ratio does not pass these first steps in the Department’s criteria, the next step is to compare the MDC to the total incremental and total hazard index. For carcinogens, the MDC cannot be greater than 1 x10⁻⁶ mg/m³ and, for noncarcinogens, the MDC cannot be greater than 1 mg/m³ without taking additional refined modeling steps.

AERSCREEN modeling program is used to predict the worst case scenario downwind concentration based on a variety of parameters like stack height and pollutant emission rate. The rural option was used for the model because a 3 km area surrounding the site has developed medium intensity and developed high intensity areas that account for less than 50% of that total area, according to the National Land Cover Database.

Table 5. Stack parameters from application.	
Stack Diameter	28 inches
Stack Height	32 feet
Exit Gas Flow Rate	5,825 ACFM
Exit Temperature	300°F
Distance to Property Line	30 feet

MEMORANDUM

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Rohm and Haas Electronic Materials CMP,LLC

Building 2- 500 HP Burnham Boiler

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Below is the MDC summary provided by AERSCREEN using the parameters.

***** AERSCREEN MAXIMUM IMPACT SUMMARY *****

CALCULATION PROCEDURE	MAXIMUM 1-HOUR CONC (ug/m3)	SCALED 3-HOUR CONC (ug/m3)	SCALED 8-HOUR CONC (ug/m3)	SCALED 24-HOUR CONC (ug/m3)	SCALED ANNUAL CONC (ug/m3)
FLAT TERRAIN	16.04	16.04	14.44	9.624	1.604
DISTANCE FROM SOURCE		49.00 meters			

Table 6. AERSCREEN results for maximum downwind concentration and results of the Department criteria for the TLV: MDC. MDC located 49 meters from the stack.

Pollutant	Emission Rate (lb/hr)	MDC (ug/m ³)	MDC (mg/m ³)	TLV (mg/m ³)	TLV:MDC	Department Criteria ≥100
VOC	0.13	1.87	0.00187	1.6 ^[1]	852	YES

[1] Modeled conservatively as benzene.

The TLV/MDC ratio for the air toxics listed above is greater than the 100:1 criteria established by the Department. As such, the public health, safety, and welfare are presumed to not be adversely impacted.

Table 7. AERSCREEN results for maximum downwind concentration and results of the Department criteria for comparing against the SIL. MDC located 49 meters from the stack.

Pollutant	Emission Rate (lb/hr)	Averaging Period	MDC (ug/m ³)	SIL (ug/m ³)	MDC < SIL?
NO _x ^[1]	1.25	1-hour	16.1	7.5	NO
		Annual	1.6	1	NO
CO	1.27	1-hour	20.37	2,000	YES
		8-hour	18.34	500	YES
SO ₂	0.02	1-hour	0.32	7.9	YES
		3-hour	0.32	25	YES
		24-hour	0.19	5	YES
		Annual	0.03	1	YES
PM ₁₀	0.18	24-hour	1.73	5	YES
		Annual	0.29	1	YES

[1] Conservatively assumes 80% of NO_x emissions are NO₂.

When a project's maximum downwind concentration exceeds the SIL, a cumulative impact assessment should be completed to determine whether the project will cause or contribute to any modeled violations of the NAAQS. The memorandum issued by EPA on June 29, 2010, indicated that a "first tier" assumption for a uniform monitored background contribution that may be applied without further justification is to add the overall highest hourly background NO₂ concentration (across the most recent three years) from a

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representative monitor to the modeled design value for comparison to the NAAQS. The same memorandum allows the use of data from regional monitors when there are no monitors located at the vicinity of the source. The data collected from the MLK monitoring station (the only one in New Castle County) showed that the highest recorded concentration since Jan 2017 was 66 ppb. The concentrations collected at MLK represent the worse-case NO₂ background concentrations in the state of Delaware. This is a conservative approach to ensure that the project will not cause or contribute to a violation of NAAQS.

Pollutant	Emission Rate (lb/hr)	Averaging Period	MDC (µg/m ³)	Background Concentration (µg/m ³)	Cumulative Impact (µg/m ³)	NAAQS (µg/m ³)	Cumulative Impact < NAAQS?
NO _x ^[1]	1.25	1-hr	16.1	124.1 ^[2]	140.2	188	YES
		Annual	1.6	20.02 ^[3]	21.6	100	YES

[1] Conservatively assumes 80% of NO_x emissions are NO₂.

[2] The highest hourly NO₂ concentrations since January 2017

[3] The highest annual mean (2017, 2018, and 2019)

The cumulative impact analysis for NO₂ is below the NAAQS for the same pollutant and averaging periods and the Department believes the boiler will not hinder the safety and health of the surrounding areas. The impacts for PM₁₀, CO, and SO₂ are below the SIL for the respective pollutants and the Department believes the boiler will not hinder the safety and health of the surrounding areas.

REGULATORY REVIEW

- × 7 DE Admin. Code 1102: Permits
 - × 7 DE Admin. Code 1104: Particulate Emissions from Fuel Burning Equipment
 - × 7 DE Admin. Code 1114: Visible Emissions
 - × 7 DE Admin. Code 1119: Control of Odorous Air Contaminants
 - 7 DE Admin. Code 1120: New Source Performance Standards
 - 7 DE Admin. Code 1124: Control of Volatile Organic Compound Emissions
 - 7 DE Admin. Code 1125: Requirements for Preconstruction Review
 - 7 DE Admin. Code 1130: Title V State Operating Permit Program
 - 7 DE Admin. Code 1138: Emission Standards for Hazardous Air Pollutants for Source Categories
- × 40 CFR Part 60 Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*
- × 40 CFR Part 63 Subpart JJJJJ, *National Emissions Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*

7 DE Admin. Code 1102, *Permits*

The Company is subject to the following requirement, "..., no person shall initiate construction, install, alter or initiate operation of any equipment or facility or air contaminant control device which will emit or prevent the emission of an air contaminant prior to receiving approval of his application from the Department ..." With this, the Company is to obtain a 7 DE Admin. Code 1102 construction permit prior to construction.

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7 DE Admin. Code 1104, *Particulate Emissions from Fuel Burning Equipment*

The boiler is subject to the following particulate emissions limit from fuel burning equipment, "No person shall cause or allow the emission of particulate matter in excess of 0.3 pound per million BTU heat input, maximum 2-hour average, from any fuel burning equipment." This emission limitation was placed in the permit under Condition 2.1.4.2. Compliance with 7 **DE Admin. Code** 1104 shall be consistently demonstrated as long as the boiler combusts natural gas.

The PM_{total} emission factor for natural gas is 0.18 lb/hr the heat input is rated at 24.8 MMBtu/hr;
 $0.18\text{lb/hr} \div 24.8 \text{ MMBtu/hr} = 0.0073 \text{ lb/MMBtu}$.

7 DE Admin. Code 1112, *Control of Nitrogen Oxide Emissions*

This regulation applies to major sources of nitrogen oxide emissions. Since the facility is a major source of NO_x , the boiler must comply with this regulation. For a natural gas fired boiler below 50 MMBtu/hr the only requirement is that NO_x emissions shall not exceed those achieved through an annual tune up performed by qualified personnel. The emission limitation requested to avoid MNSR is more stringent and has been placed in the permit. The owner shall maintain a log of the tune ups performed.

7 DE Admin. Code 1114, *Visible Emissions*

The boiler is subject to the following visible emissions requirement "No person shall cause or allow the emission of visible air contaminants and/or smoke from a stationary or mobile source, the shade or appearance of which is greater than twenty (20%) percent opacity for an aggregate of more than three (3) minutes in any one (1) hour or more than fifteen (15) minutes in any twenty-four (24) hour period." Particulate emissions from the boiler while operating on natural gas are 0.006 lb/MMBtu. This level of particulate should not have a significant potential to cause an opacity violation. Therefore, compliance with the visible emissions standard while operating on natural gas is demonstrated based upon records showing the type of fuel combusted and proper operation of the boiler. The Company will perform weekly observations as described in Condition 4.3. Record keeping requirements have been placed in the permit as Condition 5.2.8.

7 DE Admin. Code 1119, *Control of Odorous Air Contaminants*

The boiler is subject to the following control of odorous air contaminants requirement, "No person shall cause or allow the emission of an odorous air contaminant such as to cause a condition of air pollution." This requirement has been placed in the permit as Condition 2.3. Compliance is demonstrated through the Company having no contradictory knowledge of any citizen odor complaint and through a satisfactory review of complaint history by the Department.

7 DE Admin. Code 1120, *New Source Performance Standards*

The boiler is not subject to the provisions of this regulation since its heat input is below 250 MMBtu/hr.

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7 DE Admin. Code 1125, Requirements for Preconstruction Review

Table 9. Project Summary for the Past 5 Years.			
Project	Pollutant	Emissions Decrease (TPY)	Emission Increase (TPY)
Pilot Line Removal	PM ₁₀	3.65	
	HAPs	0.06	
B5 ACT and modification	PM ₁₀		4.3
	VOCs		0.9
Limited Term Boiler	NO _x		4.26
	VOC		0.48
	CO		4.35
New 500 hp Burnham Boiler with 200 hp Burnham Boiler	NO _x		7.64
	VOC		0.81
	CO		7.75

The new 500 hp boiler will have a potential to emit and permitted emissions of 5.49 tons per year. This project does not exceed the NSR threshold of 25 tons per year of NO_x emissions to be considered a major source on its own. No other air pollutant emissions exceed the 100 ton per year threshold to be considered a major stationary source. In the last 5 years, new projects at the facility, include the limited term boiler, building 5 ACT process, and a modification to the building 5 ACT process. NSR will not be applicable for this project since the project by itself does not exceed 25 TPY and the net increase and decrease at the facility for the 5 year period does not exceed 25 TPY. PSD is not applicable for the facility since no pollutant exceeds 100 tons per year.

The Kewanee boiler and Cleaver Brooks boiler that are being replaced have not been removed from the site as of issuance of this construction permit. Therefore, the removal of these units was not used in the NSR/PSD analysis.

According to Section 4.0, the requirements of Section 4.3 of this Regulation shall apply to any person responsible for any proposed new stationary source, the construction of which:

- 1) was applied for, pursuant to 11.0 of 7 **DE Admin. Code** 1102, after August 11, 2005 and
- 2) is subject to the construction, installation, or alteration requirements of 2.1.3 of 7 **DE Admin. Code** 1102, and
- 3) is not subject to the requirements of 2.0 and 3.0 of this Regulation, and
- 4) has a potential to emit of equal to or greater than 5 TPY of VOCs or, NO_x, or SO₂ or SO₃ or both [also termed SO_x] or, PM_{2.5}, or, the PTE of equal to or greater than 5 TPY, in the aggregate of any HAPs.

The PTE for NO_x is 5.49 TPY, which exceeds the 5 TPY limit. On June 10, 2021, the facility submitted an emission control technology analysis using the process listed under Section 4.3.1.4.

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The top-down BACT methodology consists of the following five steps:

Step 1: Identify all control technologies.

Step 2: Eliminate technically infeasible options.

Step 3: Rank remaining control technologies by control effectiveness.

Step 4: Evaluate most effective controls and document results.

Step 5: Select as BACT the most effective control technology that is not rejected based on adverse economic, environmental, and/or energy impacts.

Step 1: Identify all NO_x control technologies.

The BACT options listed by the Company are as follows:

- 1) Existing Flue Gas Recirculation and Low NO_x Boilers.
- 2) Selective Non-catalytic Reduction technology (SNCR).
- 3) Selective Catalytic Reduction (SCR).

Step 2: Eliminate Technically Infeasible Options

The following is a list of technically feasible control technologies.

Existing Flue Gas Recirculation and Low NO_x Boilers: Flue Gas Recirculation (FGR)

When natural gas is burned in the presence of air, the resulting mixture of flue gases includes nitric oxide, which then reacts with air to produce nitrogen dioxide. Reducing the flame temperature lessens nitrogen oxide production by adding non-reactive gases into the burner (flue gas recirculation). By adding inert flue gases, the flame temperature is reduced by approximately 7%. This cooler flame reduces NO_x production.

Low NO_x burners

A low velocity vortex generator, internal to the burner, is used to thoroughly mix the fuel gas and combustion air prior to ignition. This results in more efficient combustion and reduced NO_x emissions. A larger flame is formed, and flame temperature is reduced. When low NO_x burners and flue gas recirculation are used in combination, NO_x emissions can be reduced by 60% to 90%.

Selective Non-Catalytic Reduction (SNCR):

SNCR is based on the chemical reduction of NO_x into N₂ and water vapor. A nitrogen-based reducing reagent, such as ammonia or urea, is injected into the post combustion flue gas. NO_x reduction levels range from 30% to 50%. The NO_x reduction reaction occurs at temperatures between 1,600°F and 2,100°F. The operating temperatures which are required for optimal SNCR reaction are often not the temperatures which are ideal for boiler steam generation. SNCR can reduce NO_x emissions by 30% to 70%.

Selective Catalytic Reduction (SCR):

SCR is based on the chemical reduction of NO_x into N₂ and water vapor. A nitrogen-based reducing reagent, such as ammonia or urea, is injected into the ductwork, downstream of the combustion unit. The waste gas mixes with the reagent and enters a reactor module containing catalyst. The reagent reacts selectively with the NO_x within a specific temperature range in the presence of the catalyst and Oxygen.

The use of a catalyst results in two primary advantages of the SCR process over the SNCR: higher NO_x control efficiency and reactions within a lower and broader temperature range. SCR is capable of NO_x reduction efficiencies in the range of 70% to 90%. Optimum temperatures vary from 480°F to 800°F. The benefits are accompanied by a significant increase in capital and operating costs.

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Step 3: Ranking of Remaining NO_x Control Technologies by Control Effectiveness

The feasible control technologies were then ranked from most effective to least effective:

- 1) SCR.
- 2) Low NO_x burners and FGR.
- 3) SNCR.

Step 4: Evaluate Most Effective Controls and Document Results

Baseline:

The proposed boiler is designed to use FGR and low NO_x burners to control NO_x emissions. Without these control technologies, NO_x emissions would be approximately 30-50% higher.

An analysis was performed to demonstrate the affect of additional controls, SCR and SNCR, to further reduce emissions. The following assumptions were used:

1. Cost, including design, installations and testing are based on the EPA Air Pollution Control Cost Manual EPA/452/B-02-001.
2. Equipment cost ere adjusted by an inflation factor of 33%, which is the adjustment provided by the Bureau of Labor Statistics Producer Price Index from 2008 to 2016. Furthermore a 14% increase since 2016 was then used in the evaluation.
3. Electric and natural gas cost were based on \$0.15 per kW hour and \$9 per thousand cubic feet of gas.
4. A 15 year, 10% interest depreciation factor was used for the analysis.

Option 1: SCR with Ammonia Injections

Capital cost: \$465,325

Option 2: SNCR with Ammonia Injections

Capital cost: \$151,604

Table 10. SNCR and SCR Operating Cost			
		SNCR	SCR
Labor			
	Operator ^[1]	\$4,160	\$4,160
	Supervisor ^[2]	\$624	\$624
Maintenance			
	Labor ^[3]	\$3,900	\$3,900
	Catalyst Replacement ^[4]		\$1,200
Utilities			
	Electricity ^[5]		\$250
	SUM	\$8,684	\$10,134
Indirect Cost			
	Overhead ^[6]	\$5,210	\$6,080
	Admin ^[7]	\$3,032	\$9,307
	Property Tax ^[8]	\$1,516	\$4,653
	Insurance ^[9]	\$1,516	\$4,653
	Capital Recovery	\$22,741	\$69,799

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	SNCR	SCR
Total Operating Cost	\$42,699	\$104,626
[1] 4 hr/week \$20/ hr	[6] 60% of sum of operating cost.	
[2] 15% of Operator.	[7] 2% installed cost.	
[3] 3 hr/week \$25/ hr	[8] 1% installed cost.	
[4] 4 ft ³ , \$650 ft ³	[9] 1% installed cost.	
[5] \$0.15/ kWh		

SNCR technology can provide further NO_x reduction with a removal efficiency of 70% and NO_x emissions would be reduced by 3.84 TPY. SCR technology can provide further NO_x reduction with a removal efficiency of 90% and NO_x emissions would be further reduced by 4.94 TPY. The cost for these reductions can be seen in the table below.

	Overall Annualized Cost	Cost per Ton NO _x Reduction
SNCR	\$42,699	\$11,120
SCR	\$104,626	\$21,179

Step 5: Proposed BACT Limits and Control Options

Table 12 below summarizes recent BACT determinations for similar size natural gas-fired boilers from the EPA RACT/BACT/LAER Clearinghouse (RBLC). Rohm and Haas provided additional heaters and furnaces in their analysis since the Clearinghouse categorizes these types of units together. Only boilers were included in this memo.

RBLC ID	COMPANY	DATE	BOILER RATING (MMBTU/HR)	NO _x LIMIT(S)	CONTROL OPTION	BASIS
AL-0307	Alloy's Plant-Constellium	10/09/2015	24.59 Boiler	0.9 lb/hr 30.0 ppmvd at 3% Oxygen	Low NO _x burner with FGR. Good combustion practices.	BACT-PSD
AR-0140	Big River Steel LLC	9/18/2013	24.5 Boiler	0.035 lb/MMBTU	Low NO _x burner. Combustion of clean fuel. Good combustion practices.	BACT-PSD

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Table 12. Summary of recent BACT determinations for similar size natural gas-fired boilers from the EPA RBLC database.

RBLC ID	COMPANY	DATE	BOILER RATING (MMBTU/HR)	NO _x LIMIT(S)	CONTROL OPTION	BASIS
AR-0140	Big River Steel LLC	9/18/2013	24.5 Boiler	0.0002 lb/MMBTU	Good operation practices. Minimum boiler efficiency of 75%.	BACT-PSD
LA-0240	Flopam Inc.	6/14/2010	25.1 Boiler	0.38lb/hr 9 PPMV	Ultra Low NO _x burner	LEAR
MI-0423	Indeck Niles LLC	01/04/2017	27	2.65 lb/hr	Good combustion practice.	BACT-PSD
OH-0375	Long Ridge Energy Generation LLC- Hannibal Power	11/07/2017	26.8 Boiler	0.29 lb/hr 0.74 TPY	Low NO _x burner with FGR.	BACT-PSD
WY-0075	Cheyenne Prairie Generating Station	07/16/2014	25.06 Boiler	0.0175 lb/MMBTU 0.4lb/hr	Ultra low NO _x burner with FGR.	BACT-PSD

In South Carolina, the use of low NO_x burners or equivalent technology capable of achieving 30 ppmvd at 3% Oxygen (0.036 lb/MMBTU) is considered presumptive BACT for natural gas-fired boilers rated between 10 and less than 100 MMBTU/hr [Reference: *South Carolina DHEC Regulation 61-62.5 Standard No. 5.2*].

BACT for the boiler was determined to be the use of low NO_x burners and FGR. This control technology will limit NO_x emissions to 30 ppmvd corrected to 3% oxygen (vendor guarantee). The 0.05 lb NO_x /MMBTu emissions rate is within emission range of similar sources (less than 100 MMBtu/hr heat input).

$$\left(\frac{1.25 \text{ lbs NO}_x}{\text{hr}}\right)\left(\frac{\text{hr}}{24.8 \text{ MMBtu}}\right) = 0.05 \text{ lb NO}_x/\text{MMBtu}$$

40 CFR Part 60 Subpart Dc, *Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units*, is applicable because the boiler is 24.8 MMBtu/hr which is greater than the applicability threshold of 10 MMBtu/hr. This makes the requirements of 40 CFR Part 60 Subpart A, *General Provisions*, and Dc applicable to the boiler.

For gas fired units the only requirements are reporting and recordkeeping requirements.

The Company shall submit to the Administrator (EPA) and the Department written notifications as provided by 40 CFR Part 60.7. This notification shall include the design heat input of the unit and identification of fuel to be combusted in the unit. The following notifications shall be submitted:

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A notification of the actual date of initial startup of the boiler postmarked within 15 days after such date.

A notification of any physical or operational change to an existing facility which may increase the emission rate of any air pollutant to which a standard applies, unless that change is specifically exempted under an applicable subpart or in Subpart 60.14(e).

The Company is also required to maintain records of the amount of fuel consumed by the boiler during each operating day.

40 CFR Part 63 Subpart JJJJJJ, *National Emissions Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources*, is not applicable because the unit only operates using natural gas. Rohm and Haas has a potential to emit greater than 10 tons per year for the HAP dimethylformamide (DMF), but they have federally enforceable limits in their Title V operation permit limiting DMF emissions to be 8.9 tons per year, keeping them below the major source threshold.

§63.11195 Are any boilers not subject to this subpart?

(e) A gas-fired boiler as defined in this subpart.

§63.11237 What definitions apply to this subpart?

Gas-fired boiler includes any boiler that burns gaseous fuels not combined with any solid fuels and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or for periodic testing, maintenance, or operator training on liquid fuel. Periodic testing, maintenance, or operator training on liquid fuel shall not exceed a combined total of 48 hours during any calendar year.

RECOMMENDATIONS

It is recommended that the attached Draft Permit be advertised and sent to EPA and affected states pursuant to the requirements of 7 **DE Admin. Code** 1102 Section 12.4 on July 18, 2021.

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pc: Dover File

Documents			
	Dated	File Number	DNREctory Document Handle
Application	10/14/2020		63277
Revision	6/10/2021		912218
Permit: <u>AQM-003/00033-Renewal (3)Revision(3)</u>	10/30/2020	AJM20084	64533