EMAILED
7/20/2020

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

DATE

Draft/Proposed **Permit: APC-2020/0182-CONSTRUCTION(VOC RACT)(FE)**
Draft/Proposed **Permit: APC-2020/0183-CONSTRUCTION(VOC RACT)(FE)**
Draft/Proposed **Permit: APC-2020/0184-CONSTRUCTION(VOC RACT)(FE)**
Draft/Proposed **Permit: APC-2020/0185-CONSTRUCTION(VOC RACT)(FE)**

Air Liquide USA, LLC
Coaters J, K, L, and M and IMS Black Spin

Air Liquide Advanced Separations, Newport Plant
305 Water Street
Newport, Delaware 10804

ATTENTION: Sarang Gadre
General Manager

Dear Mr. Gadre:

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 High Bay coaters J, K, L, and M and associated IMS "Black" Spin located at 305 Water Street in Newport, Delaware, in accordance with the application submitted on Form Nos. AQM-1, AQM-2, AQM-3.1, AQM-3.4, AQM-4.1 and AQM-5 dated June 9, 2020 signed by Sarang Gadre, General Manager and letters dated June 9, 2020 signed by Harrison Abinteh, HSES, Senior Manager.

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> a request to extend this construction permit must be submitted by <insert date minus 45 days>>.

1.2 The operational limitations of Condition 3.3 and Condition 3.4 are voluntary restrictions to limit volatile organic compound emissions to below the five (5) ton per year applicability threshold of 7 **DE Admin. Code** 1125, Section 4, *Minor New Source Review*. The owner and/or operator shall meet the control technology requirements of **7 DE Admin. Code** 1125, Section 4, *Minor New Source Review* if an increase in the operational limitations of Condition 3.3 and Condition 3.4 that results in an increase in volatile organic compound potential to emit above five tons per year.

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 Each Coater (Coater J, K, L, M)

2.1.1.1 Volatile Organic Compound (VOC) Emissions
VOC emissions from each coater shall not exceed 1.51 pounds per day and 0.275 tons per twelve (12) month rolling period; and

2.1.2 Facility Wide

2.1.2.1 Volatile Organic Compound (VOC) Emissions
Facility wide VOC emissions shall not exceed 37.25 pounds per day and 6.79 tons per twelve (12) month rolling period; and

2.1.2.2 Hazardous Air Pollutant (HAP) Emissions
Facility wide HAP emissions shall not exceed 10.36 pounds per day and 1.89 tons per twelve (12) month rolling period.

2.1.2.3 Nitrogen Oxide (NO_x) Emissions
Facility wide NO_x emissions shall not exceed 1.86 pounds per hour and 8.139 tons per twelve (12) month rolling period.

2.1.2.4 Particulate Matter (PM) Emissions
Facility wide PM emissions shall not exceed 0.146 pounds per hour and 0.64 tons per twelve (12) month rolling period.

2.1.2.5 Sulfur Dioxide (SO_2) Emissions
Facility wide SO_2 emissions shall not exceed 0.034 pounds per hour and 0.15 tons per twelve (12) month rolling period.

2.1.2.6 Carbon Monoxide (CO) Emissions
Facility wide CO emissions shall not exceed 1.60 pounds per hour and 7.015 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 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. Determinations 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.

3.2 All structural and mechanical components of the equipment covered by this permit and in use shall be maintained in proper operating condition.

3.3 Each coater (coater J, K, L, and M) shall be limited to 24,090 pounds of fiber per year.

3.4 All emissions from the coaters (coater J, K, L, and M) shall be directed to the regenerative thermal oxidizer (RTO)(EU-9).

3.5 The RTO (EU-9) serving coaters J, K, L, and M shall be employed at all times when any of the emissions unit(s) is/are in operation.

3.6 The owner or operator shall not:

3.6.1 Cause, allow, or permit the disposal of more than five kilograms (11 pounds) of any VOC, or of any material containing more than five kilograms (11 pounds) of any VOCs, at the facility in any one day in a manner that would permit the evaporation of VOC into the ambient air. This includes, but is not limited to, the disposal of VOC from VOC control devices. This provision does not apply to:

3.6.1.1 Any VOC or material containing VOC emitted from a regulated entity that is subject to a VOC standard under this permit, or any other permit issued by the Department;

3.6.1.2 Any VOC or materials containing VOCs used during process maintenance turnarounds for cleaning purposed, provided that the provisions of Conditions 3.6.2 through 3.6.5 are followed.

3.6.2 Use open containers for the storage or disposal of cloth or paper impregnated with VOCs that are used for surface preparation, cleanup, or coating removal;

3.6.3 Use open containers for the storage or disposal of cloth or paper impregnated with VOCs, except when adding or removing material;

3.6.4 Store in open containers spent or fresh VOC to be used for surface preparations, cleanup, or coating removal. Containers for the storage of spent or fresh VOCs shall be kept closed, except when adding or removing material; and

3.6.5 Use VOC for the cleanup of spray equipment unless equipment is used to collect the cleaning compounds and to minimize their evaporation to the atmosphere.

3.7 The owner or operator shall not exceed the fiber production limit of 288,930 pounds of fiber per year.

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 Shall monitor daily operation of the RTO and associated coating operations and the VOC usage.

5. Record Keeping Requirements

5.1 The owner or operator shall maintain all records necessary for determining compliance with this permit in a readily accessible location for five (5) years and shall make these records available to the Department upon written or verbal request.

5.2 The following information shall be collected and recorded each day:

5.2.1 The owner or operator shall record each day the pounds of fiber that each High Bay coater produced.

5.2.2 The owner or operator shall maintain a log of the daily hours of operation of the manufacturing equipment.

5.2.3 Daily VOC emissions, in pounds, from the coaters.

5.2.3 The maximum VOC content or daily-weighted averaged VOC content of the coating used each day on each coating unit, line, or operation.

5.2.4 The owner or operator shall maintain a maintenance log for the manufacturing equipment detailing all routine and non-routine maintenance performed, including dates and duration of any outages.

5.2.5 The source and quantity in pounds of disposed VOCs that were disposed of in a manner that would permit the evaporation of VOCs into the ambient air; and

5.2.6 The method used to dispose of the VOCs.

5.3 The rolling twelve (12) month total emissions shall be calculated and recorded each month in a log for each of the following pollutants:

5.3.1 Volatile Organic Compound (VOC) emission from Coaters J, K, L, and M.

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 immediately upon discovery by calling the Environmental Emergency Notification and Complaint number, (800) 662-8802. (State Enforceable Only)

6.2 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:

6.2.1 The name and location of the facility;

6.2.2 The subject source(s) that caused the excess emissions;

6.2.3 The time and date of first observation of the excess emissions;

6.2.4 The cause and expected duration of the excess emissions;

6.2.5 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

6.2.6 The proposed corrective actions and schedule to correct the conditions causing the excess emissions.

6.3 Within 30 calendar days of the end of each quarter, the owner or operator shall submit the total annual facility wide VOC and HAP emissions on a 12 month rolling basis.

6.4 One original and one copy of all required reports shall be sent to the address below:

Division of Air Quality
State Street Commons
100 W. Water Street, Suite 6A
Dover, DE 19904

7. Administrative Conditions

7.1 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.

7.2 Failure to comply with the provisions of this permit may be grounds for suspension or revocation.

Sincerely,

Angela D. Marconi, P.E., BCEE
Program Manager
Engineering & Compliance Branch

ADM:KAM:AJM
F:\EngAndCompliance\AJM\AJM20035.doc

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

Appendix A

Manufacturing Equipment Directed to the Thermal Oxidizer (EU-8).

Unit ID	Unit Name
EU-1	ERE
EU-2	IDE
EU-3	Post Treatment
EU-6	Tank Farm

Manufacturing Equipment Directed to the Regenerative Thermal Oxidizer (EU-9).

Unit ID	Unit Name
EU-4	High Bay Coaters A, B, C, D, E, F, and P J, K, L, M

MEMORANDUM

TO: Angela D. Marconi, P.E., BCEE

THROUGH: Karen A. Mattio, P.E.

FROM: Alexa Murphy

SUBJECT: **Air Liquide USA, LLC**
Air Liquide Advanced Separations, Newport Plant
***Draft/Proposed* Permit: APC-2020/0182-CONSTRUCTION(VOC RACT)(FE)**
***Draft/Proposed* Permit: APC-2020/0183-CONSTRUCTION(VOC RACT)(FE)**
***Draft/Proposed* Permit: APC-2020/0184-CONSTRUCTION(VOC RACT)(FE)**
***Draft/Proposed* Permit: APC-2020/0185-CONSTRUCTION(VOC RACT)(FE)**
Coaters J, K, L, and M and associated IMS "Black" Spin

DATE: July 19, 2020

BACKGROUND INFORMATION

Air Liquide USA, LLC- Advanced Separations of Newport, Delaware requested a construction permit on June 11, 2020 for coaters J, K, L, and M and associated IMS Black Spin vessel. This will expand their current High Bay coater process. Please note there will be 2 separate spin vessels at the facility, IMS Spin and IMS "Black" Spin. Emissions from the coaters will be directed to the existing regenerative thermal oxidizer (RTO)(EU-9) that is currently operating at the facility. This will control emissions by 98%. The emissions from the IMS "Black" Spin are not directed to a control device.

The Company produces synthetic fibers that are combined into bundles. These bundles have unique separations abilities. The bundles are sold to industries that produce high purity specialty gases and to the aerospace industry to separate nitrogen from air to use as an inert gas in fuel tanks.

The facility is a synthetic minor source. The facility uses the federally enforceable constraints of control devices and limitations to production to keep actual emissions below the major source threshold for volatile organic compounds (VOCs) and hazardous air pollutants (HAPs).

After a successful construction to operation inspection, the conditions of this construction permit will be added to the facility wide permit (**Permit: APC-96/0911-OPERATION (AMENDMENT 10)(VOC RACT) (SM)**) via an administrative amendment.

Confidentiality Statement: The Company has not requested confidentiality.

Coastal Zone Statement: The Company is not located within the Coastal Zone.

Fee Statement: The Company is current with their annual fees and has paid the appropriate construction permit application fees.

Local Zoning: The Company has permits with the Department. Proof of local zoning was not required with this application.

Applicant Background Information: The Company has had permits with the Department. An Applicant Background Information Questionnaire was not required with this application.

TECHNICAL INFORMATION

The coaters produce VOC emissions in the form of isopropyl alcohol and cyclohexane. These emissions are directed to the existing RTO (EU-9) with 98% control. The associated IMS "Black" Spin is a low emitting unit, with VOC and HAP emissions being at a registration level. There is no associated control device for the spin unit.

The emission factors for these units are derived from in house material balances, based on fiber production, and can be seen in Table 1.

Table 1. VOC and HAP emission factors for the additional High Bay coaters and the associated IMS "Black Spin.

Process Area	Total VOC (lbs VOC/ lbs Fiber)	Total HAP (lbs HAP/ lbs Fiber)
Coater J	1.14	0
Coater K	1.14	0
Coater L	1.14	0
Coater M	1.14	0
IMS "Black" Spin	0.005	0.001

Air Liquide's potential emissions for the new coaters are limited by the inherent constraint of maximum fiber production for each process area per year. Fiber production limitations, VOC potential to emit, and controlled emission rates for VOC emissions are shown in the table below.

Table 2. Summary of VOC emissions for the expansion of the High Bay coaters process.

Process Area	Maximum Fiber Production (Pounds of fiber per year)	VOC Emission Factor (lbs VOC/ lbs fiber)	Uncontrolled Emissions (Tons per year) (PTE)	Control Device	Reduction from Control Device. TO:99% RTO:98%	Controlled VOC Emissions (Tons per year)	Controlled VOC Emissions (Pounds per day)
Coater J	24,090	1.14	13.73	RTO	0.98	0.275	1.505
Coater K	24,090	1.14	13.73	RTO	0.98	0.275	1.505
Coater L	24,090	1.14	13.73	RTO	0.98	0.275	1.505
Coater M	24,090	1.14	13.73	RTO	0.98	0.275	1.505

Process Area	Maximum Fiber Production (Pounds of fiber per year)	VOC Emission Factor (lbs VOC/ lbs fiber)	Uncontrolled Emissions (Tons per year) (PTE)	Control Device	Reduction from Control Device. TO:99% RTO:98%	Controlled VOC Emissions (Tons per year)	Controlled VOC Emissions (Pounds per day)
IMS "Black" Spin	40,150	0.005	0.10	No Control	No control	0.10	0.55
TOTAL			**55.02**			**1.2**	**6.57**

Facility wide fiber production limitations, VOC potential to emit, and controlled emission rates for VOC emissions are shown in the table below.

Table 3. Summary of facility wide VOC emissions including the data for the new High Bay coater expansion.

Process Area	Maximum Fiber Production (Pounds of fiber per year)	VOC Emission Factor (lbs VOC/ lbs fiber)	Uncontrolled Emissions (Tons per year) (PTE)	Control Device	Reduction from Control Device. TO:99% RTO:98%	Controlled VOC Emissions (Tons per year)	Controlled VOC Emissions (Pounds per day)
ERE	64,570	3.02	97.50	TO	0.99	0.975	5.34
IDE	142,888	0.0044	0.31	TO	0.99	0.003	0.016
Post Treatment	156,756	1.040	81.51	TO	0.99	0.815	4.466
Coater A	16,000	0.86	6.88	RTO	0.98	0.138	0.756
Coater B	16,000	0.86	6.88	RTO	0.98	0.138	0.756
Coater C	16,000	1.52	12.16	RTO	0.98	0.243	1.332
Coater D	16,000	1.52	12.16	RTO	0.98	0.243	1.332
Coater E	24,000	1.140	13.68	RTO	0.98	0.274	1.49

Process Area	Maximum Fiber Production (Pounds of fiber per year)	VOC Emission Factor (lbs VOC/ lbs fiber)	Uncontrolled Emissions (Tons per year) (PTE)	Control Device	Reduction from Control Device. TO:99% RTO:98%	Controlled VOC Emissions (Tons per year)	Controlled VOC Emissions (Pounds per day)
Coater F	24,000	1.140	13.68	RTO	0.98	0.274	1.49
Coater P	16,000	1.140	9.12	RTO	0.98	0.182	0.997
Coater J	24,090	1.14	13.73	RTO	0.98	0.275	1.505
Coater K	24,090	1.14	13.73	RTO	0.98	0.275	1.505
Coater L	24,090	1.14	13.73	RTO	0.98	0.275	1.505
Coater M	24,090	1.14	13.73	RTO	0.98	0.275	1.505
MEDAL Spin	80,354	0.034	1.38	No Control	No control	1.38	7.58
IMS Spin	142,888	0.005	0.357	No Control	No control	0.357	1.96
IMS "Black" Spin	40,150	0.005	0.10	No Control	No control	0.10	0.55
Tank Farm			0.57	TO	0.99	0.006	0.033
TOTAL			**311.22**			**6.228**	**34.118**

Sample calculations:

Coater C: $\left(\frac{16000\ lbs\ fiber}{year}\right)\left(\frac{1.52\ lbs\ VOC}{\frac{lbs}{fiber}}\right)\left(\frac{ton}{2000\ lbs}\right) = 12.16\ TPY\ VOC$

$$12.16\ TPY\ VOC(1 - 0.98) = 0.243\ TPY\ VOC$$

$$0.243\ TPY\ VOC\left(\frac{2000\ lbs}{ton}\right)\left(\frac{year}{365\ days}\right) = 1.3315\ \frac{lbs\ VOC}{day}$$

HAP emissions from the IMS "Black" Spin include emissions from dimethylformamide (DMF). Fiber production limitations, HAP potential to emit, and controlled emission rates for HAP emissions are shown below.

Table 4. Summary of HAP emissions for the expansion of the High Bay coaters process. HAP emissions from the IMS "Black" Spin are dimethylformamide (DMF).

Process Area	**Maximum Fiber Production (Pounds of fiber per year)**	**HAP Emission Factor (lbs HAP/ lbs fiber)**	**Uncontrolled Emissions (Tons per year) (PTE)**	**Controlled Emissions (Tons per year)**	**Controlled Emissions (Pounds per day)**
Coater J	24,090	0	0	0	0
Coater K	24,090	0	0	0	0
Coater L	24,090	0	0	0	0
Coater M	24,090	0	0	0	0
IMS "Black" Spin	40,150	0.001	0.020	0.020	0.11
TOTAL			**0.020**	**0.020**	**0.11**

Facility wide fiber production limitations, HAP potential to emit, and controlled emission rates for HAP emissions can be seen in the table below.

Table 5. Summary of facility wide HAP emissions including the data for the new High Bay coater expansion.

Process Area	**Maximum Fiber Production (Pounds of fiber per year)**	**HAP Emission Factor (lbs HAP/ lbs fiber)**	**Uncontrolled Emissions (Tons per year) (PTE)**	**Controlled Emissions (Tons per year)**	**Controlled Emissions (Pounds per day)**
ERE	64,570	3.02	97.50	0.975	5.34
IDE	142,888	0	0	0	0
Post Treatment	156,756	1.040	81.51	0.815	4.466
Coater A	16,000	0	0	0	0
Coater B	16,000	0	0	0	0
Coater C	16,000	0	0	0	0
Coater D	16,000	0	0	0	0
Coater E	24,000	0	0	0	0
Coater F	24,000	0	0	0	0
Coater P	16,000	0	0	0	0
Coater J	24,090	0	0	0	0

Process Area	Maximum Fiber Production (Pounds of fiber per year)	HAP Emission Factor (lbs HAP/ lbs fiber)	Uncontrolled Emissions (Tons per year) (PTE)	Controlled Emissions (Tons per year)	Controlled Emissions (Pounds per day)
Coater K	24,090	0	0	0	0
Coater L	24,090	0	0	0	0
Coater M	24,090	0	0	0	0
MEDAL Spin	80,354	0	0	0	0
IMS Spin	142,888	0.001	0.0714	0.0714	0.39
IMS "Black" Spin	40,150	0.001	0.020	0.020	0.11
Tank Farm			0.57	0.006	0.3287
TOTAL			**179.67**	**1.89**	**10.53**

Sample calculations:

ERE Process Area: $\left(\frac{64570\ lbs\ fiber}{year}\right)\left(\frac{3.02\ lbs\ HAP}{\frac{lbs}{fiber}}\right)\left(\frac{ton}{2000\ lbs}\right) = 97.50\ TPY\ VOC$

$$97.50\ TPY\ VOC(1 - 0.99) = 0.975\ TPY\ VOC$$

$$0.975\ TPY\ VOC\left(\frac{2000\ lbs}{ton}\right)\left(\frac{year}{365\ days}\right) = 5.34$$

Regenerative Thermal Oxidizer (EU-9)

The new coaters, coaters J, K, L, and M, will use the facility's existing RTO (EU-9) as a control device. The Catalytic Products International model Triton 2.97 RTO (EU-9) was installed in 2019 to control VOC emissions from the High Bay Coaters. The RTO operates on natural gas. The destruction efficiency is 98%. The summary of emissions from the combustion of natural gas to power the RTO is seen below in Table 6.

Table 6. PTE for the 1.2 MMBtu/hr Regenerative Thermal Oxidizer.

Pollutant	Emission Factor (lbs/MMBtu)[1]	Emission Rate (lbs/hr)	Emission Rate (TPY)
NO_x	0.098	0.12	0.515
CO	0.082	0.098	0.431
VOC	0.005	0.006	0.028
SO_2	0.001	0.00068	0.003
PM_{10}	0.008	0.009	0.039

[1] Emission factor is from AP-42 Table 1.4-1

Table 7: Total emissions from the coaters process areas that are controlled by the RTO. VOC emissions are speciated into IPA and Cyclohexane.

Process area Emissions controlled by RTO	**Controlled Emissions (lbs/hr)**	**Controlled Emissions (tons/year)**
VOC	0.60	2.59
IPA	0.286	1.255
Cyclohexane	0.304	1.333

The controlled hourly emission rate from the coaters will be added to the RTO's hourly emission rate that occur from the combustion of natural gas; the sum will be use in the AERSCREEN model to determine the maximum downwind concentration from this emission point.

AERSCREEN Dispersion Model

An air dispersion model was performed for the RTO using the program AERSCREEN and the stack parameters listed below.

Table 8. Stack Parameters given in the application that were used in the AERSCREEN model. Please note the stack exit flow rate needed to be modified to account for the increased flow to the RTO.

Stack Height	46 feet
Stack Diameter	14.04 inches
Stack Exit Velocity	39.75 ft/sec
Stack Exit Gas Temperature	150 °F
Ambient Air Temperature	70 °F

The Department's criteria for acceptable conditions for public health and safety include a TLV (Threshold Limit Value): MDC (Maximum Downwind Concentration) ratio of at least 100:1. The 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 threshold limit values come from the *2020 TLVs and BEIs* published by ACGIH.

The AERSCREEN program was ran with a few options to determine which scenario would produce the maximum downwind concentration. This was a conservative approach due to the location of the facility. The facility is north of the Christiana River with marsh land and industrial facilities, but also just south of neighborhoods and the town of Newport. Both the rural option and the urban option produced similar results that met the Department's minimum requirement. VOC emissions were conservatively modeled as hexane. Hexane has the lowest TLV of all the components that make up the emissions from the RTO's VOC emissions from the combustion of fuel. Therefore, assuming all the emissions from the RTO are hexane gives the worst-case scenario. VOC's were also speciated between isopropyl alcohol and cyclohexane, which are the specific VOC emissions from the High Bay coaters.

Table 9: RTO AERSCREEN results.

Maximum 8-hr Concentration (µg/m³) @ 1 lb/hr	15.07
Distance (feet)	75

Pollutant	**Emission rate (lb/hr)**	**TLV (mg/m³)**	**MDC (mg/m³)**	**TLV:MDC**	**≥ 100**
NO_x	0.12	0.376[1]	0.0018084	207	YES
CO	0.0984	28.64	0.0014823	19,313	YES
VOC[1]	0.628	176.23	0.009464	18,621	YES
IPA	0.286	491.29	0.00431002	113,988	YES
Cyclohexane	0.304	1,007.85	0.00458128	219,993	YES
SO_2	0.0007	5	0.00001055	473,979	YES
PM	0.009	10	0.0001356	73,730	YES

[1] Modeled as hexane to conservatively assume the VOC emissions from the combustion of natural gas to operate the RTO were hexane. The other VOC emissions from the process area are speciated out below.

The MDC given by the model is at AERSCREEN's standard 75 feet from the source and the property line is 80 feet from the RTO. All emissions pass AERSCREEN modeling at the emission rates written into the permit. The public health, safety, and welfare are recognized to not be adversely impacted by the RTO.

Facility Wide Emissions including High Bay Coater Expansion

A summary of the facility wide emissions is described in the table below. The facility will limit VOC and HAP emissions to 37.25 pounds per day and 6.79 TPY of VOCs and 10.36 total pounds per day and 1.89 TPY of HAP emissions. The facility limits fiber production and uses the thermal oxidizer TO(EU-8) and RTO(EU-9) control technologies to reduce these emissions.

Table 10. Summary of Facility Wide Emissions including potential to emit and actual (permitted) emissions. Summary includes all permitted units under **Permit: APC-96/0911-OPERATION (AMENDMENT 10)(VOC RACT) (SM)** and the High Bay coater expansion (coater J, K, L, M and associated IMS "Black" Spin).

Pollutant	**Facility Wide Emissions (TPY)(PTE)**	**Controlled Facility Wide Emissions (ACTUAL) (TPY)**	**Controlled Facility Wide Emissions (ACTUAL) (lb/day)**	**Controlled Facility Wide Emissions (ACTUAL) (lb/hr)**
NO_x	8.139	8.139		1.86
CO	7.015	7.015		1.60
VOC	312.09	6.79	37.25	
SO_2	0.15	0.15		0.034
PM	0.64	0.64		0.146
HAP	179.67	1.89	10.36	

REGULATORY REVIEW

× 7 **DE Admin. Code** 1102: Permits
× 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
□ 7 **DE Admin. Code** 1144: Control of Stationary Generator Emissions

7 **DE Admin. Code** 1102, *Permits,* requires equipment that have actual emissions to the atmosphere of any air contaminant(s) in the quantity of ten (10) pounds per day or more to be permitted. Emissions from each coater, before controls, are greater than 10 pounds of pollutants per day and a permit is required.

7 **DE Admin. Code** 1114, *Visible Emissions*, Section 2.1 states "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." This appears as condition 2.2 of the attached permit. Compliance with the requirement can be demonstrated by inspection.

7 **DE Admin. Code** 1119, *Control of Odorous Air Contaminants*, states "No person shall cause or allow the emission of an odorous air contaminant such as to cause a condition of air pollution." The following is included as condition 2.3 of the attached permit: "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." Compliance is based upon the Company having no contradictory knowledge of any odor complaint.

7 **DE Admin. Code** 1120, *New Source Performance Standards*: The facility is not subject to this regulation as it does not meet any of the categories listed.

7 **DE Admin. Code** 1124, *Control of Volatile Organic Compound Emissions*, applies, the facility wide emissions are 37.25 pounds per day of VOCs after the use of controls. Sections 8 and 50 apply.

7 **DE Admin. Code** 1124, Section 8, *Handling, Storage, and Disposal of Volatile Organic Compounds*, covers work practice standards for the handling, storage, and disposal of VOCs. These requirements are covered by operational limitation 3.6 and its subsections. A record keeping requirement 5.2.5 and 5.2.6 were added to demonstrate compliance with the operation limitations. Compliance with these requirements can be demonstrated by inspection and record review.

7 **DE Admin. Code** 1124, Section 50, *Other Facilities that Emit Volatile Organic Compounds*: The facility is only subject to paragraph (d) of this Section, as it uses controls to reduce facility wide VOC emissions more that 81 % by weight and to not emit more than twenty-five (25) tons of VOC per calendar year. Paragraph

(d) requires that the facility submit records proving that emissions are below twenty-five (25) tons per year within thirty (30) days of the Department's request. No special conditions were added to this permit in support of this requirement, as the existing record keeping already proves that the facility is below the twenty-five (25) ton per year applicability threshold.

7 **DE Admin. Code** 1125, *Requirements for Preconstruction Review*:
Section 2.0 (Emission Offset Provisions) of this standard does not apply because the application does not meet or exceed major source threshold.

Section 3.0 (Prevention of Significant Deterioration of Air Quality) of this standard does not apply because the application is not a major source.

Section 4.0 (Minor New Source Review) of this standard does not apply. The facility uses controls to keep emissions for individual sources below the 5 ton threshold. The operational limitations of Condition 3.3 and 3.4 were placed into the permit to keep VOC emissions from each coater below the 5 ton threshold.

7 **DE Admin. Code** 1130, *Title V State Operating Permit Program*: The facility is not subject to these requirements. The facility is a synthetic minor source and has taken restrictions in order to be below major source thresholds.

7 **DE Admin. Code** 1138, *Emission Standards for Hazardous Air Pollutants for Source Categories*:
The facility is not subject to these requirements as it has taken federally enforceable emission limitations to reduce emissions to below major source thresholds. Additionally, the Facility is not listed as one of the source categories in 7 **DE Admin Code** 1138.

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 19, 2020.

Documents				
	Dated	**File Number**	**DNRECtory DEN Permit I.D.**	**DNRECtory Document Handle**
Application	6/9/2020			52279
Permit: APC-96/0911-OPERATION (AMENDMENT 10)(VOC RACT) (SM)	6/2/2020	AJM20028		52149

ADM:KAM:AJM
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pc: Dover (Title V) File