NORTH CAROLINA
DIVISION OF AIR QUALITY
Preliminary Determination and Statement of Basis

Issue Date: xx

Region: Mooresville Regional Office
County: Cabarrus
NC Facility ID: 1300117
Inspector's Name: Melinda Wolanin
Date of Last Inspection: 12/5/2019
Compliance Code: 3 / Compliance - inspection

Facility Data

Applicant (Facility's Name): Corning Incorporated

Facility Address:
Corning Incorporated
14556 Highway 601 South
Midland, NC 28107

SIC: 3229 / Pressed And Blown Glass, Nec
NAICS: 327212 / Other Pressed and Blown Glass and Glassware Manufacturing

Facility Classification: Before: Title V **After:** Title V
Fee Classification: Before: Title V **After:** Title V

Permit Applicability (this application only)

SIP: 02D .0503, .0515, .0516, .0521, .0524, .0530, .0614, .0958, .1100, .1407, .1413, and .1806, and 02Q .0317
NSPS: Subparts IIII
NESHAP: Subparts ZZZZ and DDDDD
PSD: PM, PM_{10}, $PM_{2.5}$, NOx (as NO_2), and VOC
PSD Avoidance: N/A
NC Toxics: 02Q .0711 and 02D .1100
112(r): No
Other: N/A

Contact Data

Facility Contact	Authorized Contact	Technical Contact
Tim Haley Environmental Engineer (704) 569-7677 P. O. Box 1700 Concord, NC 28026	Don Hefner Plant Manager (704) 569-6041 P. O. Box 1700 Concord, NC 28026	Tim Haley Environmental Engineer (704) 569-7677 P. O. Box 1700 Concord, NC 28026

Application Data

Application Number: 1300117.19A, 1300117.19B
Date Received: 01/30/2019, 04/01/2019
Application Type: Modification
Application Schedule: PSD

Existing Permit Data

Existing Permit Number: 08436/T20
Existing Permit Issue Date: 09/13/2019
Existing Permit Expiration Date: 05/31/2024

Total Actual emissions in TONS/YEAR:

CY	SO2	NOX	VOC	CO	PM10	Total HAP	Largest HAP
2018	0.1000	377.58	37.50	4.81	103.66	9.24	5.86 [Hydrogen chloride (hydrochlori]
2017	0.0700	362.32	35.98	4.25	91.13	7.73	4.84 [Hydrogen chloride (hydrochlori]
2016	0.0700	342.47	25.15	4.21	85.85	7.34	4.64 [Hydrogen chloride (hydrochlori]
2015	0.0800	317.31	24.36	4.10	70.82	7.36	4.59 [Hydrogen chloride (hydrochlori]
2014	0.0500	300.09	34.65	3.56	66.92	6.58	3.94 [Hydrogen chloride (hydrochlori]
2013	0.0500	307.89	44.16	4.05	65.64	6.35	3.73 [Hydrogen chloride (hydrochlori]

Review Engineer: Rahul Thaker Review Engineer's Signature: Date: March 10, 2020	Comments / Recommendations: Issue 08436/T21 Permit Issue Date: xx Permit Expiration Date: xx

1.0 Purpose of Application

Corning Incorporated, Midland, Cabarrus County, NC (hereinafter Corning or Corning Midland), submitted a Prevention of Significant Deterioration (PSD) application (1300117.19A) for various modifications, previously approved by North Carolina Division of Air Quality (NCDAQ or DAQ hereinafter) under the minor New Source Review program in 15A NCAC 02Q .0300, especially 02Q .0317. Specifically, the facility had requested and obtained PSD avoidance limitations during its more than 20-years of operation for various regulated NSR (New Source Review) pollutants through different applications submittals, as below:

NOx

Less than 250 tons per consecutive 12-month period for emission sources (ID Nos. ES-C-001, ES-C-002, ES-C-005, ES-C-006, ES-C-PG1a, ES-C-PG1b, ES-C-PG2a, ES-C-PG2b, ES-C-PG2c, ES-C-HB1a, ES-C-HB1b, ES-C-HB2a, and ES-C-HB2b)

Less than 193 tons per consecutive 12-month period for emission source (ID No. ES-C-009)

$PM_{10}/PM_{2.5}$

Less than 10 tons per consecutive 12-month period for the modified emission sources (ID Nos. ES-C-003, ES-C-007, and ES-C-010)

Less than 10 tons per consecutive 12-month period for emission source (ID No. ES-C-011)

With this application submittal, the facility wishes to relax all enforceable PSD avoidance limitations listed above; thereby, invoking both the "source obligation" provision in §51.166(r)(2) of 40 CFR and major modification permitting requirements in §51.166(a)(7), as incorporated in NC's State Implementation Plan (SIP)-approved PSD regulations in 15A NCAC 02D .0530 and .0544.

In addition, the subject application includes a request to permit new pieces of equipment as listed below:

One optical waveguide laydown process (ID No. ES- C-012)
One glass drying operation (ID No. ES-C-014)
One emergency generator (ID No. ES-C-PG2d)
One miscellaneous maintenance and cleaning operation (ID No. ES-C-Cleaning)
One house vacuum (ID No. IES-C-14)

With respect to processing of the application, DAQ determined that because this significant modification would contravene or conflict with the existing permit condition(s) (such as PSD avoidance limitations included above), the agency would be required to process the application using a one-step procedure in 15A NCAC 02Q .0501(c)(1); thus, satisfying the permitting requirements in both 02D .0530 (PSD) and 02Q .0500 (Title V) in a single permitting action.

The application has been deemed "complete" for Prevention Significant Deterioration (PSD) with respect to the initial information submitted, effective January 30, 2019.

Separately, Corning submitted another application (1300117.19B) to comply with the significant modification permitting requirement under Title V (i.e., 2^{nd} step of 02Q .0501(b)(2)) for several previously approved changes as below:

Modifications to glass drying operations (ID Nos. ES-C-003, ES-C-007, and ES-C-010)
Modification to optical waveguide laydown process (ID No. ES-C-009)
New glass drying operation (ID No. ES-C-011)
New bagfilter (ID No. CD-C-BH-10)

It needs to be emphasized that this second-step application contains information which is dated as all of these previously approved changes are being superseded with the new information included in the PSD application as above. In brief, no processing of the 2^{nd} step significant modification application (1300117.19B) is required by the by the DAQ and it will simply be consolidated into the PSD application (1300117.19A).

2.0 Facility Operations

2.1 Site Description

Corning is located at 14556 Highway 601 South, Midland, Cabarrus County, NC, at latitude 35^0 12' 54" and longitude 80^0 31' 28" (Universal Transverse Mercator (UTM) coordinates 543.3 km east and 3696.8 km north, Zone 17). The facility is located a few miles southwest of downtown Midland. The topography of the site and the surrounding area are exhibited in Figure 2.1-1 below:

The facility is located in a relatively rural area surrounded by agricultural land. The topography is generally rolling hills, with the terrain below the stack top of the facility within 10 miles.

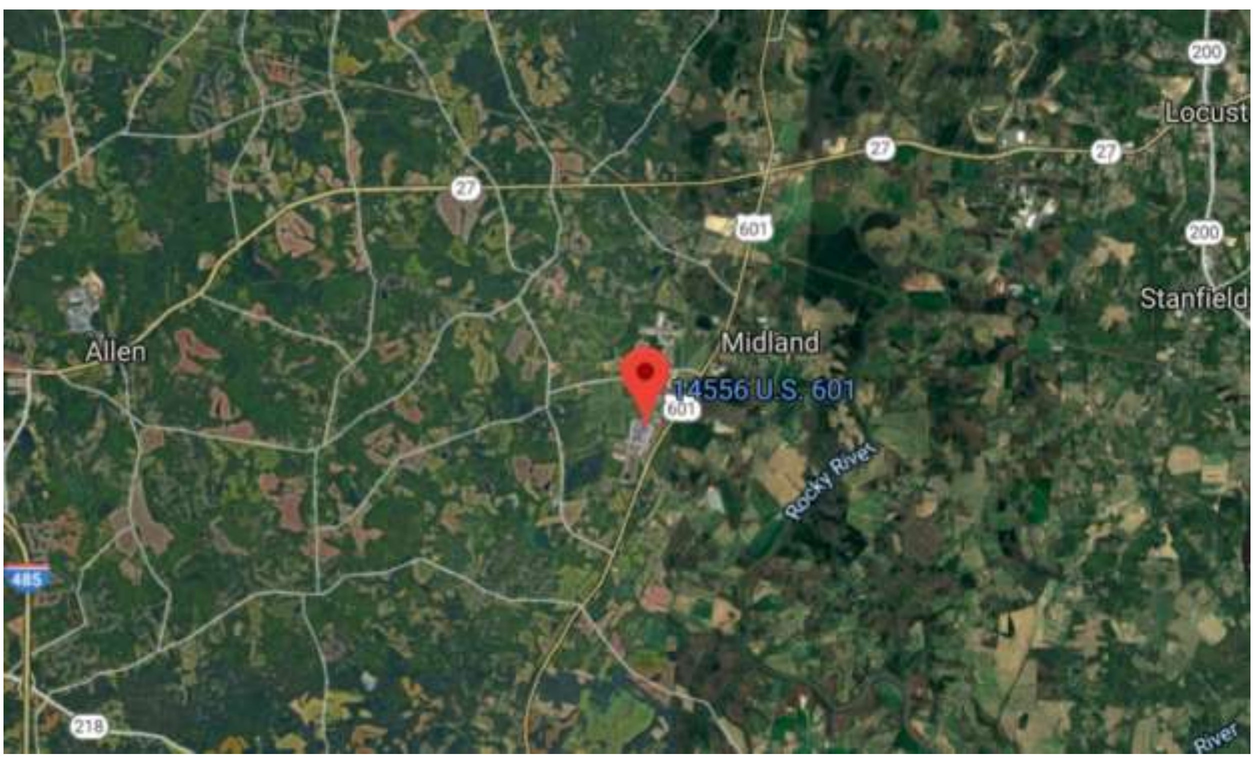

Figure 2.1-1: Aerial Map of Corning Midland Vicinity

Current air quality designations for Cabarrus County with respect to promulgated National Ambient Air Quality Standards (NAAQSs) are described in Table 2.1-1 below in accordance with 40 CFR 81.334 "North Carolina":

Table 2.1-1: Attainment Status Designations for Cabarrus County

Pollutant	NAAQS	Designation
PM_{10}	150 ug/m^3 (24-hour) (1987)[1]	Attainment[2]
$PM_{2.5}$	35 ug/m^3 (24-hour) (2006)[3] 12 ug/m^3 (annual) (2012)	Unclassifiable/Attainment
Sulfur Dioxide	0.03 ppm (annual) (1971)[4] 75 ppb (1-hour) (2010)	Attainment Attainment/Unclassifiable
Nitrogen Dioxide	53 ppb (annual) (1971)[5] 100 ppb (1-hour) (2010)	Attainment Unclassifiable/Attainment
Carbon Monoxide	35 ppm (1-hour) 9 ppm (8-hour) (1971)[6]	Unclassifiable/Attainment
Ozone	75 ppb (8-hour) (2008) 70 ppb (8-hour) (2015)	Attainment Attainment/Unclassifiable
Lead	0.15 ug/m^3 (3-months) (2008)	Unclassifiable/Attainment

In summary, Cabarrus County is either in attainment or attainment/unclassifiable or unclassifiable/attainment of all promulgated NAAQS. Further, this County is considered a Class II area with ambient air increments for PM_{10}, $PM_{2.5}$, SO_2, and NO_2. The closest Class I area from this facility is Linville Gorge, which is located approximately 86 miles (139 kilometers) northwest of the facility.

2.2 Existing Operations

The facility is an optical waveguide manufacturing plant, classified under the Standard Industrial Classification (SIC) Code 3229 "Pressed and Blown Glass and Glassware, Not Elsewhere Classified". It makes optical fibers, which are typically used across the network equipment and semiconductor equipment markets.

The permitted equipment includes the following:

Non-Insignificant Sources

[1] The same PM_{10} NAAQSs (primary and secondary) retained in 1997, 2006, and 2012.
[2] Assumed. Cabarrus County has been designated unclassifiable / attainment for more stringent $PM_{2.5}$ NAAQSs for both 24-hr and annual averaging periods.
[3] The same $PM_{2.5}$ NAAQSs (primary and secondary) retained in 2012.
[4]The annual SO_2 NAAQS is effective in only certain areas of the country as per https://www.epa.gov/criteria-air-pollutants/naaqs-table.
[5] The same 1971 NO_2 NAAQSs (primary and secondary) retained in 1985, 1996, 2010 and 2012.
[6] The same 1971 CO NAAQSs (primary) for both 1-hr and 8-hr averaging periods retained in 1985, 1994 and 2011.

- Five optical waveguide laydown processes (ID Nos. ES-C-001, ES-C-002, ES-C-005, ES-C-006, and ES-C-009)
- Four glass drying operations (ID Nos. ES-C-003, ES-C-007, ES-C-010, and ES-C-011)
- A group of small miscellaneous sources (ID No. ES-C-004)
- Four natural gas-fired humidification boilers (ID Nos. ES-C-HB1a, EC-C-HB1b, ES-C-HB2a, and ES-C-HB2b)
- Five diesel-fired emergency generators (ID Nos. ES-C-PG1a, ES-C-PG1b, ES-C-PG2a, ES-C-PG2b, and ES-C-PG2c)
- An acrylate coating process (ID No. ES-C-ACP)
- Three soot handling systems (ID Nos. ES-C-SHP1, ES-C-SHP2, and ES-C-SHP3).

Insignificant Sources

- Thirteen house vacuums (ID Nos. IES-C-1 through IES-C-13)
- Furnace gas treatment (ID No. IES-CF)
- Five diesel tanks (ID Nos. IES-C-DGT1 through DGT5)
- Flame cut-off exhaust (ID No. IES-C-FC2) [this source to be removed per the application]
- Two fire pump diesel fuel tanks (ID Nos. IES-C-FPDT1; and IES-C-FPDT2)
- Two diesel fuel-fired fire pumps (ID Nos. IES-C-FP1 and IES-C-FP2)
- Six glass cleaning processes (ID Nos. IES-C-GC1 through IES-C-GC6) [source IES-C-GC6 to be removed per the application]
- One maintenance paint spray booth with filter (ID No. IES-C- MFB)
- Three maintenance solvent sinks (ID No. IES-C-MS1 through IES-C-MS3)
- One die cleaning operation (ID No. IES-C-DC)
- Six soot vacuums (ID Nos. IES-C-SV1 through IES-C-SV6) [sources IES-C-SV5 and IES-C-SV6 to be removed per the application]

In addition, the following additional insignificant activities have also been constructed and in operation at the facility:

- One fiber stripper (ID No. IES-FS)
- Five Cooling Water Tower Units (ID No. IES-C-CWT)

3.0 Proposed Modification

3.1 Project Sources / Description

Corning has completed several non-PSD modifications at the facility since it was initially constructed circa 1997-1998. As stated above in Section 1.0, during its more than 20 years of operation, the facility had requested and obtained PSD avoidance limitations for various regulated NSR (New Source Review) pollutants through different application submittals, as below:

NOx

(i) Less than 250 tons per consecutive 12-month period for emission sources (ID Nos. ES-C-001, ES-C-002, ES-C-005, ES-C-006, ES-C-PG1a, ES-C-PG1b, ES-C-PG2a, ES-C-PG2b, ES-C-PG2c, ES-C-HB1a, ES-C-HB1b, ES-C-HB2a, and ES-C-HB2b)

(ii) Less than 193 tons per consecutive 12-month period for emission source (ID No. ES-C-009)

$PM_{10}/PM_{2.5}$

(a) Less than 10 tons per consecutive 12-month period for the modified emission sources (ID Nos. ES-C-003, ES-C-007, and ES-C-010)

(b) Less than 10 tons per consecutive 12-month period for emission source (ID No. ES-C-011)

With this application submittal, the facility wishes to relax (remove) all above enforceable PSD avoidance limitations; thereby, invoking both the "source obligation" provision in 40 CFR §51.166(r)(2) and major modification permitting requirements in §51.166(a)(7), as incorporated in NC's SIP-approved PSD regulations in 15A NCAC 02D .0530 and .0544.

In addition, the subject application includes a request to add new equipment as below:

One optical waveguide laydown process (ID No. ES- C-012)
One glass drying operation (ID No. ES-C-014)
One emergency generator (ID No. ES-C-PG2d)
One diesel tank (ID No. IES-C-DGT6)
One miscellaneous maintenance and cleaning operation (ID No. ES-C-Cleaning)
One house vacuum (ID No. IES-C-14)

3.2 Project Schedule

As noted above in Sections 3.1 above, most of the project equipment has been permitted, installed, and in operation, except the new equipment. The facility is scheduled to commence construction in the future for the new equipment, presuming that the DAQ grants a PSD permit for the proposed modifications. For the permitted equipment, it is expected that the Permittee will be able to emit greater than the above referred PSD avoidance limitations after obtaining a PSD permit (if granted).

3.3 Project Emissions

Emissions of PM, PM_{10}, $PM_{2.5}$, SO_2, NO_x, CO, VOC, lead, GHG, hazardous air pollutants (HAPs), and NC-regulated air toxics, are expected due to the proposed changes. The potential emissions after this expansion, which are discussed in detail and reviewed for regulatory applicability in Section 4.0, are listed below:

- Particulate Matter: 32.8 tons/year (TPY or tpy)
- PM_{10}: 32.8 TPY
- $PM_{2.5}$: 32.7 TPY
- SO_2: 0.4 TPY
- NOx: 917.9 TPY
- CO: 53.5 TPY
- VOC: 61.4 TPY
- Lead: 0.0000919 TPY
- GHG (as CO_2e): 45,813.0 TPY
- Cl_2 (single largest HAP): 17.7 TPY
- Total HAPs: 34.8 TPY

The stack parameters for the main stacks are included in Table 3.3-1 below:

Table 3.3-1: Stack Parameters

Stack ID	Stack Height meter	Stack Temperature ^{0}K	Exit Velocity meter/second	Stack Diameter meter
EPC-01 (ES-C-002, ES-C-003, and ES-C-004)	29.26	315.93	12.54	1.98
EPC-02 (ES-C-001, ES-C-005, ES-C-007, ES-C-010, ES-C-011, and ES-C-014)	29.26	323.87	20.23	2.29
EPC-03 (ES-C-006, ES-C-009, and ES-C-012)	20.73	408.15	18.29	1.40

4.0 Permit Modifications/Changes

4.1 Two optical waveguide laydown processes (ID Nos. ES-C-001 and ES-C-005) with gas-oxy firing with associated bagfilter (ID No. CD-C-BH-6) in series with one of two sieve tray scrubbers operating in parallel (ID Nos. CD-C-HCL-5 or CD-C-HCL-6) in series with one of two sieve tray scrubbers operating in parallel (ID Nos. CD-C-CL-5 or CD-C-CL-6)

One optical waveguide laydown process (ID No. ES-C-002) with gas-oxy firing with associated cartridge filter (ID No. CD-C-BH-2)

One optical waveguide laydown process (ID No. ES-C-006) with gas-oxy firing with associated bagfilter (ID No. CD-C-BH-7)

One optical waveguide laydown process (ID No. ES-C-009) with gas-oxy firing with associated bagfilters (ID Nos. CD-C-BH-7 and CD-C-BH-10) in series with De-NOx system (ID No. CD-C-NOx-9)

One optical waveguide laydown process (ID No. ES-C-012) with gas-oxy firing with associated bagfilter (ID No. CD-C-BH-11)

Emissions of PM, PM_{10}, $PM_{2.5}$, CO, NOx, SO_2, VOC, and various hazardous air pollutants (HAPs) and NC-regulated toxic air pollutants are expected from the laydown processes. The following Table 4.1-1 provides a summary of potential emissions rates for each laydown process:

Table 4.1-1

Pollutant	Emission Rate, Tons/Yr											
	ES-C-001		ES-C-002		ES-C-005		ES-C-006		ES-C-009		ES-C-012	
	U	C	U	C	U	C	U	C	U	C	U	C
PM	124.09	1.01	930.05	3.90	124.09	1.01	558.01	2.34	1860.14	6.96	558.01	1.50
PM_{10}	124.09	1.01	930.05	3.90	124.09	1.01	558.01	2.34	1860.14	6.96	558.01	1.50
$PM_{2.5}$	124.09	1.01	930.05	3.90	124.09	1.01	558.01	2.34	1860.14	6.96	558.01	1.50
SO_2	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.03	0.03	0.01	0.01
CO	1.41	1.41	1.93	1.93	1.41	1.41	1.16	1.16	3.86	3.86	1.16	1.16
VOC	0.09	0.09	0.13	0.13	0.09	0.09	0.08	0.08	0.25	0.25	0.08	0.08
NOx (as NO_2)	32.61	32.61	184.72	184.72	32.61	32.61	110.83	110.83	369.44	369.44	110.83	110.83
GHG (as CO_{2e})	3166.5	3166.5	6539.2	6539.2	3166.5	3166.5	3923.7	3923.7	13078.7	13078.7	3923.7	3923.6
HAP (Cl_2)	47.22	1.51	0	0	47.22	1.51	0	0	0	0	0	0
Single Largest HAP (HCl)	595.82	3.85	0	0	595.82	3.85	0	0	0	0	0	0
Total HAPs	643.07	5.39	0.04	0.04	643.07	5.39	0.03	0.03	0.09	0.09	0.03	0.03

U = Uncontrolled, C = Controlled

In general, particulate emissions (PM, PM_{10}, and $PM_{2.5}$) from waveguide laydown processes are based upon the percent of soot emitted to the control device (in turn, based on deposition rate of dopant), fuel combustion amount, and control devices (baghouses)' vendor guarantee of 0.0018 grain/dscf (filterable only). The NOx emissions are based on existing engineering testing and process modeling for the efficiency improvements, and process enhancements that are proposed for the optical waveguide laydown process. Emissions of Cl_2 and HCl have been based upon uncontrolled emissions rates (measured at a similar facility) and control devices (scrubbers)' efficiencies for each of these pollutants. Finally, combustion byproducts' emissions for the laydown processes have been estimated using EPA's AP-42[7].

These optical waveguide laydown processes are subject to the requirements in 02D .0515, .0516, .0521, .0530, .0614, .1100, and .1413, and 02Q .0504, which are discussed below:

15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes"

This rule sets emissions limits for particulate matter (PM) resulting from any industrial process for which no other emission control standards are applicable according to the following formula for sources with production rates less than or equal to 30 tons per hour (tph):

$$E = 4.1 \text{ x } (P^{0.67})$$

Where:
E = the allowable emission rate in lb/hr
P = process weight rate in tph

The rule also sets emissions limits for PM for process weight rates greater than 30 tph as following:

$$E = 55.0 \text{ x } (P)^{0.11} - 40$$

Where:
E = allowable emission rate in lbs/hr
P = process weight rate in tph

The regulation applies to particulate emissions from waveguide laydown processes. It specifies that solid fuels charged are considered as part of the process weight, but liquid and gaseous fuels and combustion air are not. As per Corning, predetermined amounts of various raw materials[8] are introduced in gaseous form to produce the soot for conversion to glass and final fiber optics product. The Permittee has argued that without these raw materials, there would be no process to make optical fibers; thus, the DAQ had previously allowed the gaseous raw materials to be accounted for in calculating process weight rate.

The following Table 4.1-2 includes information on process weight, allowable emission rate, and potential emission rates, for each waveguide laydown process.

Table 4.1-2

Emission Source	Process Weight Rate ton/hr	Allowable Emission Rate lb/hr	Uncontrolled Potential Emission Rate lb/hr	Controlled Potential Emission Rate lb/hr
ES-C-001	12.88	22.72	28.33	0.23
ES-C-002	22.23	32.75	212.34	0.89
ES-C-005	12.88	22.72	28.33	0.23
ES-C-006	13.34	23.26	127.40	0.53
ES-C-009	44.41	52.07	424.69	1.59
ES-C-012	13.34	23.26	127.40	0.34

Particulate matter emissions from each of the above sources are controlled by either a cartridge filter or bagfilter. As shown above, the potential emission rate, considering operation of an associated control device for each source, is much lower than the respective allowable emission rate. However, without the use of control device, the

[7] Section 1.4 "Natural Gas Combustion", 7/98.
[8] Applicant claimed and DAQ agreed that the type (name) and amount of each of the raw materials as "confidential information" per 02Q .0107.

emissions from each would be much larger, exceeding the allowable emissions rates. The controlled particulate emissions account for emissions due to both natural gas combustion, conversion of dopant to dopant oxides, percent of dopant oxides discharged to baghouse, and baghouse grain loading of 0.0018 grain/$dsft^3$. Combustion particulate emissions have been based upon a maximum heat input rate for each source, an AP-42 emission factor of 1.9 lb/million sft^3[9] and a heating value of 1,033 Btu/sft^3. Process particulates have been based upon a mass balance approach. The DAQ believes that with a proper operation and regular maintenance of each of the control devices, compliance with the requirements in 02D .0515 is expected.

For the existing laydown processes (ES-C-001, ES-C-002, ES-C-005, ES-C-006, and ES-C-009), the current permit in Sections 2.1.A.1.c. and d. include inspection and maintenance requirements per manufacturer's recommendations or established by the Permittee via their operational experience. The permit also includes recordkeeping for each action and inspection. Finally, the permit includes semi-annual reporting for all monitoring including record keeping activities.

The revised permit will include the same monitoring, recordkeeping and reporting requirements, as described above, for the new optical waveguide laydown process (ES-C-012).

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

Sulfur dioxide emissions from waveguide laydown processes are subject to an emission limit of 2.3 lb/million Btu. The estimated emissions from each of the laydown processes are negligible as compared to this limit, as shown below in Table 4.1-3. They are based upon a maximum heat input rate for each, AP-42 emissions factor of 0.6 lb/million sft^3[10], and natural gas heating value of 1,033 Btu/sft^3.

Table 4.1-3

Emission Source	Emission Standard lb/million Btu	Potential Emission Rate lb/million Btu
ES-C-001	2.3	0.000590
ES-C-002	2.3	0.000588
ES-C-005	2.3	0.000590
ES-C-006	2.3	0.000588
ES-C-009	2.3	0.000588
ES-C-012	2.3	0.000588

The potential emission rate for each laydown process is well below the allowable emission rate of 2.3 lb/million Btu. No monitoring, record keeping, or reporting is required. The current permit also does not include any monitoring requirement for the existing laydown processes (ES-C-001, ES-C-002, ES-C-005, ES-C-006, and ES-C-009). The DAQ proposes to require no monitoring/recordkeeping/reporting for the new laydown process (ES-C-012).

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

The intent of this Rule is to prevent, abate and control emissions generated from fuel burning operations and industrial processes where visible emissions can be reasonably expected to occur, except during startup, shutdowns, and malfunctions, approved as such, according to the procedures approved under 15A NCAC 02D .0535.

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources required to install, operate, and maintain continuous opacity monitoring systems (COMS), compliance with the 20 percent opacity limit shall be determined as follows:

i. No six-minute period exceeds 87 percent opacity;

[9] Id. at 7.
[10] Id. at 7.

ii. No more than one six-minute period exceeds 20 percent opacity in any hour; and
iii. No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

Excess emissions during startup and shutdown shall be excluded from the determinations in paragraphs i. and ii. above, if the excess emissions are exempted according to the procedures set out in 2D .0535(g). Excess emissions during malfunctions shall be excluded from the determinations in paragraphs i. and ii. above, if the excess emissions are exempted according to the procedures set out in 02D .0535(c).

All periods of excess emissions shall be included in the determinations in paragraphs i. and ii. above, until such time that the excess emissions are exempted according to the procedures in 02D .0535.

All existing (ES-C-001, ES-C-002, ES-C-005, ES-C-006, and ES-C-009) and the proposed new (ES-C-012) laydown processes are subject to an opacity limit of 20%.

For these existing sources, the current permit includes a monthly visible emissions monitoring requirement and a record keeping requirement for each observation including corrective actions taken (if any). Finally, the permit includes a semi-annual reporting requirement for all visible emissions observations made during the period.

For the above new laydown process, the DAQ proposes to require establishment of "normal" visible emissions within 30 days from commencement of operation, monthly visible emissions monitoring, and the reporting on a semi-annual basis for visible emissions observations.

15A NCAC 02D .0530 "Prevention of Significant Deterioration"

Refer to Section 5.0 below for details.

15A NCAC 02D .0614 "Compliance Assurance Monitoring"

The Compliance Assurance Monitoring (CAM) regulation generally applies to any pollutant-specific emissions unit (PSEU) that meets the following criteria:

- The emission unit must be located at a major source for which a Part 70 or Part 71 permit is required.

- The emission unit must be subject to an emission limitation or standard.

- The emission unit must use an (active) control device to achieve compliance with the emission limitation or standard.

- The emission unit must have potential, pre-controlled emissions of the pollutant of at least 100 percent of the major source threshold.

It should be noted that for the purposes of this Part (40 CFR 64), "a control device does not include passive control measures that act to prevent pollutants from forming, such as the use of seals, lids, or roofs to prevent the release of pollutants, use of low-polluting fuel or feedstocks, or the use of combustion or other process design features or characteristics."

There are some exemptions to this regulation. For example, the rule does not apply to emission limitations or standards proposed after November 15, 1990, pursuant to section 111 or 112 of the Clean Air Act (e.g., post-1990 NSPS or NESHAP) or where a continuous compliance determination method (e.g., CEMS) is used.

The applicability of CAM needs to be performed during the processing of a Title V renewal application on a pre-control basis, or a significant modification to a Title V permit on a post-control basis. For significant modifications, only "large" pollutant-specific emissions units (PSEUs) need to be evaluated for applicability. Large PSEU has an after-control emission rate, equal to or exceeding the major source threshold.

As stated in Section 1 above, the application is processed in accordance with 02Q .0516 "significant permit modification".

As seen in the Table 4.1-1 above, only for NOx, the potential emissions (after control) for PSEU ES-C-002, ES-C-006, ES-C-009, and ES-C-012, are larger than the 100 tons major source threshold. Hence, it appears that a CAM plan is required to be developed and submitted by the applicant for each of these large PSEUs. However, the NOx emissions are controlled by an oxy-fire technology, a combustion design technique. Thus, CAM is not applicable for the subject sources for the emissions of NOx at this time.

Finally, it should be noted that the current permit in Section 2.1.A.4. includes a CAM plan for PM emissions for "active control" devices (bagfilters) on each of the existing laydown processes (ES-C-001, ES-C-002, ES-C-005, ES-C-006, and ES-C-009). It is presumed that this CAM plan was required and approved on a pre-control basis through the previously processed Title V renewal application.

15A NCAC 02D .1100 "Control of Toxic Air Pollutants"

The current permit in Section 2.2.A.1. includes approved emissions rates for emissions of HCl and Cl_2 for some of the existing laydown processes (ES-C-001 and ES-C-005). Due to the modifications discussed in the application, resulting in a net emission increase for these pollutants, the applicant has performed a new modeling demonstration to comply with the requirements of this regulation. For further discussions, refer to Section 11.0 below.

15A NCAC 02D .1413 "Sources Not Otherwise Listed in this Section"

The owner or operator of any source of nitrogen oxides, except boilers, indirect-fired process heaters, stationary combustion turbines, or stationary internal combustion engines, at a facility that has a potential to emit 100 tons per year or more of nitrogen oxides or 560 pounds per calendar day or more from May 1 through September 30 shall apply RACT according to Paragraph (b) of this Rule.

The current permit in Section 2.1.A.5. includes a RACT determination in the form of use of gas-oxy burners for each of the existing laydown processes (ES-C-001, ES-C-002, ES-C-005, ES-C-006, and ES-C-009).

For the new optical waveguide process (ES-C-012), the Permittee has submitted a RACT analysis, mimicking the BACT analysis discussed for the same waveguide laydown process in Section 6.1 below.

The EPA defines RACT as "the lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."[11] Moreover, as per EPA, "RACT for a particular source is determined on a case-by-case basis, considering the technological and economic circumstances of the individual source."[12] Finally, EPA has opined that "the determination of RACT and the corresponding emission rate, ensuring the proper application and operation of RACT, may vary from source to source due to source configuration, retrofit feasibility, operation procedures, raw materials, and other technical or economic characteristics of an individual source or group of sources."[13]

It is generally understood that RACT may be less stringent than the BACT for the same source, as can be seen in the respective definitions: "reasonabl[e]" (RACT) v. "best" (BACT). It is also noteworthy that both provisions prescribe the degree of emission reductions required: "lowest emission limit" (RACT) v. "maximum degree of [emission] reduction" (BACT). Finally, both include considerations of technical and economic feasibilities, although, BACT also requires considerations of energy and environmental impacts.

The DAQ has reviewed the RACT analysis, and considering all above, determined that the NOx RACT for the new waveguide operation equals the NOx BACT for the same source. That is, the proposed NOx RACT is 45.6 lbs/hr,

[11] 44 FR 53761, at 53762 (September 17, 1979), quoting "Guidance for Determining Acceptability of SIP regulations in Non-attainment Areas", Roger Strelow, Assistance Administrator for Air and Waste Management, EPA, December 9, 1976.
[12] 44 FR 53762 (September 17, 1979).
[13] Id. at 11.

using oxy-fire technology, taking into account the technical and economic considerations. Technical and economic feasibility analysis for RACT can be seen in Section 6.1 below. The applicant is required to comply with the new source RACT upon start-up.

Finally, the proposed RACT is to apply during all periods of operation, including start-up, shut-down, and malfunctions. The DAQ believes that the complying with the NOx BACT shall be sufficient to ensure compliance with the NOx RACT and no additional compliance verification will be required.

4.2 Glass drying operations (ID No. ES-C-003) with associated one of two packed tower scrubbers (ID Nos. CD-C-CL-3 or CD-C-CL-4)

Glass drying operations (ID No. ES-C-007) with associated two of three packed tower Cl scrubbers operating in parallel (ID Nos. CD-C-CL-8, CD-C-CL-9 or CD-C-CL-10)

Glass drying operations (ID No. ES-C-010) with associated two of three packed tower Cl scrubbers operating in parallel (ID Nos. CD-C-CL-8, CD-C-CL-9 or CD-C-CL-10)

Glass drying operations (ID No. ES-C-011) with associated two of three packed tower Cl scrubbers operating in parallel (ID Nos. CD-C-CL-8, CD-C-CL-9 or CD-C-CL-10)

Glass drying operations (ID No. ES-C-014) with associated two of three packed tower Cl scrubbers operating in parallel (ID Nos. CD-C-CL-8, CD-C-CL-9 or CD-C-CL-10)

Emissions of PM, PM_{10}, $PM_{2.5}$, and various hazardous air pollutants (HAPs) and NC-regulated toxic air pollutants are expected from the glass drying operations. The following Table 4.2-1 provides a summary of potential emissions rates for each optical waveguide laydown process:

Table 4.2-1

Pollutant	Emission Rate, Tons/Yr									
	ES-C-003		ES-C-007		ES-C-010		ES-C-011		ES-C-014	
	U	C	U	C	U	C	U	C	U	C
PM	73.98	1.91	40.34	3.04	141.17	3.04	33.64	1.91	26.89	1.91
PM_{10}	73.98	1.91	40.34	3.04	141.17	3.04	33.64	1.91	26.89	1.91
$PM_{2.5}$	73.98	1.91	40.34	3.04	141.17	3.04	33.64	1.91	26.89	1.91
Single Largest HAP (Cl_2)	138.41	4.42	102.05	3.29	153.30	4.91	36.44	1.18	29.17	0.92
HCl (HAP)	246.43	1.97	134.55	1.08	469.89	3.77	111.88	0.88	89.50	0.70
Total HAPs	384.84	6.39	236.61	4.36	623.19	8.68	148.32	2.06	118.67	1.62

U = Uncontrolled, C = Controlled

In general, pollutant gas flow rates into the scrubber are based on design values of raw material flow rates, and a mass-balance to determine its conversion to pollutant gases. PM emissions (both uncontrolled and controlled) are based upon the DAQ approved testing from July 28-29, 2016. The highest individual test run emission rate for filterable and condensable emissions were summed to get a total PM emission rate. Emissions were scaled by factors to account for peak dopant flow rates and utilization increases.

The removal efficiencies (for HCl, and Cl_2) included in the application for all existing scrubbers are based on scrubber manufacturer documentation submitted with prior approved applications, showing that the permitted efficiencies are slightly lower than the manufacturer's guaranteed efficiencies. Removal efficiencies are 96.8 percent for Cl_2 and 99.2 percent for HCl.

The glass drying operations are subject to the requirements in 02D .0515, .0521, .0530, and .1100, which are discussed below:

15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes"

This rule sets emissions limits for PM resulting from any industrial process for which no other emission control standards are applicable according to the following formula for sources with production rates less than or equal to 30 tons per hour (tph):

$$E = 4.1 \times (P^{0.67})$$

Where:
E = the allowable emission rate in lb/hr
P = process weight rate in tph

The rule also sets emissions limits for particulate matter (PM) for process weight rates greater than 30 tph as following:

$$E = 55.0 \times (P)^{0.11} - 40$$

Where:
E = allowable emission rate in lbs/hr
P = process weight rate in tph

The regulation specifies that solid fuels charged are considered as part of the process weight, but liquid and gaseous fuels and combustion air are not. As per Corning, predetermined amounts of various raw materials[14] are introduced in gaseous form to produce the soot for conversion to glass and final fiber optics product. The Permittee has argued that without these raw materials, there would be no process to make optical fibers; thus, the DAQ had previously allowed the gaseous raw materials to be accounted for in calculating process weight rate.

The following Table 4.2-2 includes information on process weight rates, allowable emission rates, and potential emission rates, for each glass drying operation.

Table 4.2-2

Emission Source	Process Weight Rate ton/hr	Allowable Emission Rate lb/hr	Uncontrolled Potential Emission Rate lb/hr	Controlled Potential Emission Rate lb/hr
ES-C-003	50.33	44.64	16.89	0.44
ES-C-007	12.21	21.92	9.21	0.70
ES-C-010	44.57	43.51	32.23	0.70
ES-C-011	9.27	18.23	7.68	0.44
ES-C-014	9.27	18.23	6.14	0.44

Particulate matter emissions from each of the above sources are controlled by packed tower scrubbers. As shown above, potential emission rate, considering operation of associated control devices for each source, is much lower than the respective allowable emission rate. However, without the use of control devices, the emissions from each would be much larger, but, less than the allowable emissions rates. Both uncontrolled and controlled particulate emissions rates are based upon the actual emissions observed during stack testing on existing drying operations as stated above.

The DAQ believes that with a proper operation and regular maintenance of each of the control devices, compliance with the requirements in 02D .0515 is expected.

[14] Id. at 8.

For the existing glass drying operations (ES-C-003, ES-C-007, ES-C-010, and ES-C-011), the current permit in Sections 2.1.B.1.c. and d. includes inspection and maintenance requirements per manufacturer's recommendations or established by Permittee via his/her operational experience. The permit also includes recordkeeping for each action and inspection. Finally, the permit includes a semi-annual reporting for all monitoring including record keeping activities.

It needs to be noted that the new glass drying operation (ES-C-014) will be utilizing the existing scrubbers (CD-C-CL-8, CD-C-CL-9, or CD-C-CL-10) for controlling the emissions of particulates (in addition to Cl_2 and HCl).

Thus, the same monitoring, recordkeeping and reporting requirements, as stated above, will apply to the above new glass drying operation.

<u>15A NCAC 02D .0521 "Control of Visible Emissions"</u>

The intent of this Rule is to prevent, abate and control emissions generated from fuel burning operations and industrial processes where visible emissions can reasonably be expected to occur, except during startup, shutdowns, and malfunctions, approved as such, according to the procedures approved under 15A NCAC 02D .0535.

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources required to install, operate, and maintain continuous opacity monitoring systems (COMS), compliance with the 20 percent opacity limit shall be determined as follows:

i. No six-minute period exceeds 87 percent opacity;
ii. No more than one six-minute period exceeds 20 percent opacity in any hour; and
iii. No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

Excess emissions during startup and shutdown shall be excluded from the determinations in paragraphs i. and ii. above, if the excess emissions are exempted according to the procedures set out in 02D .0535(g). Excess emissions during malfunctions shall be excluded from the determinations in paragraphs i. and ii. above, if the excess emissions are exempted according to the procedures set out in 02D .0535(c).

All periods of excess emissions shall be included in the determinations in paragraphs i. and ii. above, until such time that the excess emissions are exempted according to the procedures in 02D .0535.

All existing (ES-C-003, ES-C-007, ES-C-010, and ES-C-011) and the proposed new (ES-C-014) glass drying operations are subject to an opacity limit of 20%.

For the above existing sources, the current permit includes a monthly visible emissions monitoring requirement and a record keeping requirement for each observation including corrective actions taken (if any). Finally, the permit includes a semi-annual reporting requirement for all visible emissions observations made during the period.

For the above new glass drying operation, the DAQ proposes to require the establishment of "normal" visible emissions within 30 days from commencement of operation, monthly visible emissions monitoring, and the reporting on a semi-annual basis for visible emissions observations.

<u>15A NCAC 02D .0530 "Prevention of Significant Deterioration"</u>

Refer to Section 5.0 below.

<u>15A NCAC 02D .1100 "Control of Toxic Air Pollutants"</u>

The current permit in Section 2.2.A.1. includes approved emissions rates for emissions of HCl and Cl_2 for all existing glass drying operations (ES-C-003, ES-C-007, ES-C-010, and ES-C-011). Due to the modifications discussed in the application, resulting into a net increase in emissions for these pollutants, the applicant has performed a new modeling demonstration to comply with the requirements of this regulation. For further discussions, refer to Section 11.0 below.

4.3 Miscellaneous small source exhausts (including, but not limited to, laboratory hoods, the acid tank vent, emergency relief rupture discs, emergency vents, chlorine cylinder change out/header maintenance and bulk tank vents; ID No. ES-C-004) with associated one of two vertical spray chamber/venturi wet scrubbers (ID Nos. CD-C-HCL-3 and CD-C-HCL-4)

Various small sources exhaust to the one of the two scrubbers. Normally, emissions and flow from these sources do not occur; however, the scrubber is designed to handle potential losses of Cl_2 and HCl, and releases of them due to occasional minor process operations.

The following Table 4.3-1 provides a summary of potential emissions:

Table 4.3-1

Pollutant	**Emission Rate, Tons/Yr**	
	ES-C-004	
	U	**C**
PM	9.46	0.95
PM_{10}	9.46	0.95
$PM_{2.5}$	9.46	0.95
HAP (Cl_2)	0.05	0.01
Single Largest HAP (HCl)	31.49	0.28
Total HAPs	31.54	0.29

U = Uncontrolled, C = Controlled

The emissions rates are based upon mass balance approach using confidential equipment operational data and raw material flow rates and durations. Controlled emissions rates account for control efficiencies for various pollutants (90 percent for PM/PM_{10}/$PM_{2.5}$, 85 percent for Cl_2, and 99.1 percent for HCl). The above control efficiencies are based on either stack testing (Cl_2, HCl) or vendor provided information (PM/PM_{10}/$PM_{2.5}$).

The miscellaneous small sources are subject to the requirements in 02D .0515, .0521, .0530, and .1100, which are discussed below:

15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes"

This rule sets emissions limits for particulate matter (PM) resulting from any industrial process for which no other emission control standards are applicable according to the following formula for sources with production rates less than or equal to 30 tons per hour (tph):

$E = 4.1 \times (P^{0.67})$

Where:
E = the allowable emission rate in lb/hr
P = process weight rate in tph

The rule also sets emissions limits for PM for process weight rates greater than 30 tph as following:

$E = 55.0 \times (P)^{0.11} - 40$

Where:

E = allowable emission rate in lbs/hr
P = process weight rate in tph

The regulation specifies that solid fuels charged are considered as part of the process weight, but liquid and gaseous fuels and combustion air are not. As per Corning, predetermined amounts of various raw materials[15] are introduced in gaseous form to produce the soot for conversion to glass and final fiber optics product. The Permittee has argued that without these raw materials, there would be no process to make optical fibers; thus, the DAQ had previously allowed the gaseous raw materials to be accounted for in calculating process weight rate.

The following Table 4.3-2 includes information on process weight rate, allowable emission rate, and potential emission rates:

Table 4.3-2

Emission Source	Process Weight Rate ton/hr	Allowable Emission Rate lb/hr	Uncontrolled Potential Emission Rate lb/hr	Controlled Potential Emission Rate lb/hr
ES-C-004	7.15	15.32	4.41	0.44

Due to the nature of this source and small emissions, the current permit in Section 2.1.C.1. does not require any monitoring including record keeping and reporting for PM emissions. The DAQ believes that no change to this existing requirement is justified due to minor source of emissions and considering potential uncontrolled emission rate much less than the allowable emission rate as above.

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

The intent of this Rule is to prevent, abate and control emissions generated from fuel burning operations and industrial processes where visible emissions can be reasonably expected to occur, except during startup, shutdowns, and malfunctions, approved as such, according to the procedures approved under 15A NCAC 02D .0535.

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources required to install, operate, and maintain continuous opacity monitoring systems (COMS), compliance with the 20 percent opacity limit shall be determined as follows:

i. No six-minute period exceeds 87 percent opacity;
ii. No more than one six-minute period exceeds 20 percent opacity in any hour; and
iii. No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

Excess emissions during startup and shutdown shall be excluded from the determinations in paragraphs i. and ii. above, if the excess emissions are exempted according to the procedures set out in 02D .0535(g). Excess emissions during malfunctions shall be excluded from the determinations in paragraphs i. and ii. above, if the excess emissions are exempted according to the procedures set out in 02D .0535(c).

All periods of excess emissions shall be included in the determinations in paragraphs i. and ii. above, until such time that the excess emissions are exempted according to the procedures in 02D .0535.

The source is subject to an opacity limit of 20%.

Due to the nature of this source and small emissions, the current permit in Section 2.1.C.2. does not require any monitoring including record keeping and reporting for visible emissions. The DAQ believes that no change to this existing requirement is justified.

[15] Id. at 8.

15A NCAC 02D .0530 "Prevention of Significant Deterioration"

Refer to Section 5.0 below.

15A NCAC 02D .1100 "Control of Toxic Air Pollutants"

The current permit in Section 2.2.A.1. includes approved emissions rates for emissions of HCl and Cl_2 for the source. Due to the modifications discussed in the application, resulting into a net increase in emissions for these pollutants, the applicant has performed a new modeling demonstration to comply with the requirements of this regulation. For further discussions, refer to Section 11.0 below.

4.4 Six diesel fuel-fired emergency generators (ID Nos. ES-C-PG1a, ES-C–PG1b, ES-C-PG2a, ES-C-PG2b, ES-C–PG2c, and ES-C-PG2d)

These are diesel-fired emergency generators. All above, except ES-C-PG2d, are existing permitted generators. That is, emergency generator ES-C-PG2d is an unpermitted new emergency generator. Emissions of PM, PM_{10}, $PM_{2.5}$, CO, NOx, SO_2, VOC, and various HAPs and NC-regulated toxic air pollutants are expected due to burning of diesel fuel in these generators. The following Table 4.4-1 provides a summary of potential emissions rates for each emergency generator:

Table 4.4-1

Pollutant	Emission Rate, Tons/Yr					
	ES-C-PG1a **2,000 kW generator output, 2935 HP engine output**	**ES-C-PG1b** **2,000 kW generator output, 2935 HP engine output**	**ES-C-PG2a** **2,000 kW generator output, 2935 HP engine output**	**ES-C-PG2b** **2,000 kW generator output, 2935 HP engine output**	**ES-C-PG2c** **2,000 kW generator output, 2935 HP engine output**	**ES-C-PG2d** **2,000 kW generator output, 2935 HP engine output**
PM	0.51	0.51	0.65	0.24	0.24	0.24
PM_{10}	0.51	0.51	0.65	0.24	0.24	0.24
$PM_{2.5}$	0.51	0.51	0.65	0.24	0.24	0.24
SO_2	0.01	0.01	0.01	0.01	0.01	0.01
CO	4.04	4.04	13.75	4.22	4.22	4.22
VOC	0.52	0.52	1.57	0.39	0.39	0.39
NOx (as NO_2)	17.61	17.61	11.10	7.33	7.33	7.33
GHG (as CO_{2e})	840.36	840.36	840.36	840.36	840.36	840.36
Single Largest HAP (Benzene)	0.0039	0.0039	0.0039	0.0039	0.0039	0.0039
Total HAPs	<25	<25	<25	<25	<25	<25

Potential emissions rates for each emergency generator is based upon 500 hours of operation[16] and applicable emissions factors using either AP-42[17] and/or NSPS Subpart IIII for various pollutants. For emissions of GHG, applicable emissions factors from Part 98 (40 CFR) for diesel fuel have been utilized.

[16] "Calculating Potential to Emit (PTE) for Emergency Generators", John Seitz, Director, OAQPS, EPA, September 6,1995.
[17] "Large Stationary Diesel And All Stationary Dual-fuel Engines", AP-42, 10/96.

The emergency generators are subject to the requirements in 02D .0516, .0521, .0524, .0530, and .1111, as discussed below:

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

Sulfur dioxide emissions from emergency generators (ES-C-PG1a, ES-C-PG1b, and ES-C-PG-2a) are subject to an emission limit of 2.3 lb/million Btu. The estimated SO_2 emissions for each are low as compared to this limit, as shown below in table 4.4.-2. They are based upon engine output capacity, an AP-42 emission factor of 0.00809S lb/hp-hr[18], and a brake-specific fuel consumption of 7000 Btu/hp-hr.

Table 4.4-2

Emission Source	Emission Standard lb/million Btu	Potential Emission Rate lb/million Btu
ES-C-PG1a	2.3	0.00173
ES-C-PG1b	2.3	0.00173
ES-C-PG2a	2.3	0.00173

The potential emission rate for each emergency generator is well below the allowable emission rate of 2.3 lb/million Btu, as shown kin Table 4.4-2 above. No monitoring including record keeping is justified; thus, no reporting can be required as well. The current permit, therefore, does not include any monitoring requirement for these existing emergency generators.

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

The intent of this Rule is to prevent, abate and control emissions generated from fuel burning operations and industrial processes where visible emissions can be reasonably expected to occur, except during startup, shutdowns, and malfunctions, approved as such, according to the procedures approved under 15A NCAC 02D .0535.

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources required to install, operate, and maintain continuous opacity monitoring systems (COMS), compliance with the 20 percent opacity limit shall be determined as follows:

i. No six-minute period exceeds 87 percent opacity;
ii. No more than one six-minute period exceeds 20 percent opacity in any hour; and
iii. No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

Excess emissions during startup and shutdown shall be excluded from the determinations in paragraphs i. and ii. above, if the excess emissions are exempted according to the procedures set out in 02D .0535(g). Excess emissions during malfunctions shall be excluded from the determinations in paragraphs i. and ii. above, if the excess emissions are exempted according to the procedures set out in 02D .0535(c).

All periods of excess emissions shall be included in the determinations in paragraphs i. and ii. above, until such time that the excess emissions are exempted according to the procedures in 02D .0535.

The emergency generators are subject to the opacity limit of 20%. Due to relatively cleaner fuel (15 ppm sulfur diesel), visible emissions are expected to be low. The DAQ has determined that no monitoring, record-keeping or reporting shall be required to ensure compliance.

15A NCAC 02D .0524 "New Source Performance Standards"

[18] Id at 17.

Both the existing (permitted) emergency generators (ES-C-PG2b and ES-C-PG2c) and the new (unpermitted) emergency generator (ES-C-PG2d) are subject to the requirements of NSPS Subpart IIII "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines".

In general, owners/operators of stationary emergency compression ignition engine are subject to this NSPS, if he/she commences construction after July 11, 2005 and if the engine is manufactured after April 1, 2006.

The following requirements shall apply:

Emissions Standards

NMHC and NOx (combined): 6.4 g/kW-hr [4.77 g/hp-hr]
CO: 3.5 g/kW-hr [2.60 g/hp-hr]
PM: 0.20 g/kW-hr [0.15 g/hp-hr]

[§§60.4205(b) and 60.4202(a)(2)]

Fuel Requirements

The Permittee shall use diesel fuel in the CI engine of each emergency generator and fire pump with a sulfur content of less than 15 ppm beginning October 1, 2010. [§60.4207(b) and §80.510 (b)]

Monitoring Requirements

- The compression ignition (CI) internal combustion engine (ICE) of each emergency generator shall be equipped with a non-resettable hour meter prior to startup, if the CI ICE does not meet the standards in §60.4204. [§60.4209(a)]

- If the emergency generators are equipped with diesel particulate filters to comply with the above emissions standards, the Permittee shall install a backpressure monitor on each diesel particulate filter that notifies the Permittee when the high backpressure limit of the engine is approached. [§60.4209(b)]

- The Permittee shall operate and maintain each stationary CI ICE that achieves the emission standards in §60.4205 over the entire life of the engine according to the manufacturer's emission-related written instructions or procedures developed by the Permittee that are approved by the engine manufacturer. The Permittee may only change engine settings that are permitted by the manufacturer. The Permittee shall also meet the requirements of 40 CFR 89, 94 and/or 1068 as applicable. [§60.4206 and §60.4211(a)]

- The Permittee shall comply with the above emission standards by purchasing the emergency generators (ID Nos. ES-C-PG2b and ES-C-PG2c) for the model year 2007 and later, certified to meet these standards for the same model year and maximum engine power. [§60.4211(c)]

- The Permittee shall operate the emergency stationary ICE according to the requirements in paragraphs (f)(1) through (3) of §60.4211. In order for the engine to be considered an emergency stationary ICE under this Subpart, any operation other than emergency operation, maintenance and testing, emergency demand response, and operation in nonemergency situations for 50 hours per year, as described in paragraphs (f)(1) through (3) of §60.4211, is prohibited. If you do not operate the engine according to the requirements in paragraphs (f)(1) through (3) of §60.4211, the engine will not be considered an emergency engine under this Subpart and shall meet all requirements for non-emergency engines.

    (A) There is no time limit on the use of emergency stationary ICE in emergency situations.

    (B) The Permittee may operate your emergency stationary ICE for any combination of the purposes specified in paragraphs (f)(2)(i) through (iii) of §60.4211 for a maximum of 100 hours per calendar year. Any operation for non-emergency situations as allowed by paragraph (f)(3) of §60.4211 counts as part of the 100 hours per calendar year allowed by this paragraph (f)(2).

(i) Emergency stationary ICE may be operated for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine. The Permittee may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that federal, state, or local standards require maintenance and testing of emergency ICE beyond 100 hours per calendar year.

(ii) Emergency stationary ICE may be operated for emergency demand response for periods in which the Reliability Coordinator under the North American Electric Reliability Corporation (NERC) Reliability Standard EOP–002–3, Capacity and Energy Emergencies (incorporated by reference, see § 60.17), or other authorized entity as determined by the Reliability Coordinator, has declared an Energy Emergency Alert Level 2 as defined in the NERC Reliability Standard EOP–002–3.

(iii) Emergency stationary ICE may be operated for periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency.

(C) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response provided in paragraph (f)(2) of this section. Except as provided in paragraph (f)(3)(i) of §60.4211, the 50 hours per calendar year for nonemergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

(i) The 50 hours per year for non-emergency situations can be used to supply power as part of a financial arrangement with another entity if all of the following conditions are met:

(AA)The engine is dispatched by the local balancing authority or local transmission and distribution system operator;

(BB)The dispatch is intended to mitigate local transmission and/or distribution limitations so as to avert potential voltage collapse or line overloads that could lead to the interruption of power supply in a local area or region.

(CC)The dispatch follows reliability, emergency operation or similar protocols that follow specific NERC, regional, state, public utility commission or local standards or guidelines.

(DD)The power is provided only to the facility itself or to support the local transmission and distribution system.

(EE)The owner or operator identifies and records the entity that dispatches the engine and the specific NERC, regional, state, public utility commission or local standards or guidelines that are being followed for dispatching the engine. The local balancing authority or local transmission and distribution system operator may keep these records on behalf of the engine owner or operator.

It needs to be noted that the modified court decision (August 14, 2015) in *Delaware v. EPA*, 785 F.3d (D.C. Cir. 2015) instructed that the mandate for the vacated portions in §60.4211(f)(2)(ii) and (iii), as discussed above, would become effective on May 1, 2016. Therefore, these affected provisions with respect to operation of an emergency engine in demand response program and for periods in which there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency, within the 100 hours per calendar year allowance, do not have any legal effect (even though they are still part of the promulgated regulation). Refer to the “Guidance on Vacatur of RICE NESHAP and NSPS Provisions for Emergency Engines”, Peter Tsirigotis, Office of Air Quality Planning and Standards, U.S. EPA, RTP, NC, April 15, 2016.

[§60.4211(f]

- If the Permittee does not install, configure, operate, and maintain the IC engine and control device according to the manufacturer's emission-related written instructions, or you change emission-related settings in a way that is not permitted by the manufacturer, the Permittee shall demonstrate compliance as follows:

  (1) If you are an owner or operator of a stationary CI internal combustion engine greater than 500 HP, you must keep a maintenance plan and records of conducted maintenance and must, to the extent practicable, maintain and operate the engine in a manner consistent with good air pollution control practice for minimizing emissions. In addition, you must conduct an initial performance test to demonstrate compliance with the applicable emission standards within 1 year of startup, or within 1 year after an engine and control device is no longer installed, configured, operated, and maintained in accordance with the manufacturer's emission-related written instructions, or within 1 year after you change emission-related settings in a way that is not permitted by the manufacturer. You must conduct subsequent performance testing every 8,760 hours of engine operation or 3 years, whichever comes first, thereafter to demonstrate compliance with the applicable emission standards.

  [§60.4211(g)]

Recordkeeping Requirements

- Starting with the emergency engine model year 2011, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the Permittee shall keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The Permittee shall record the time of operation of the engine and the reason the engine was in operation during that time. [§60.4214(b)]

- If the stationary CI internal combustion engine is equipped with a diesel particulate filter, the Permittee shall keep records of any corrective action taken after the backpressure monitor has notified the Permittee that the high backpressure limit of the engine is approached. [§60.4214(c)]

Reporting Requirements

- No initial notification under §60.7 is required for the emergency stationary CI internal combustion engines. Starting with the model years in Table 5 to this Subpart, if the emergency engine does not meet the standards applicable to non-emergency engines in the applicable model year, the Permittee shall keep records of the operation of the engine in emergency and non-emergency service that are recorded through the non-resettable hour meter. The Permittee shall record the time of operation of the engine and the reason the engine was in operation during that time.

  [§60.4214(b)]

- If the Permittee owns or operates an emergency stationary CI ICE with a maximum engine power more than 100 HP that operates or is contractually obligated to be available for more than 15 hours per calendar year for the purposes specified in §60.4211(f)(2)(ii) and (iii) or that operates for the purposes specified in §60.4211(f)(3)(i), the Permittee must submit an annual report according to the requirements in paragraphs (d)(1) through (3) of §60.4214. However, as per the above referred Guidance from EPA, this reporting requirement has no legal effect starting May 1, 2016 and owners or operators are not required to submit annual report for calendar year 2016 (by March 31, 2017), with respect to provisions in §60.4211(f)(2)(ii) and (iii).

15A NCAC 02D .0530 "Prevention of Significant Deterioration"

Refer to Section 5.0 below.

15A NCAC 02D .1111 "Maximum Achievable Control Technology"

The EPA has promulgated National Emission Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines in 40 CFR 63 Subpart ZZZZ (69 FR 33474, June 15, 2004). This NESHAP was lastly revised on January 30, 2013 (78 FR 6674).

This facility is a "major source" of HAP emissions on a potential to emit basis (single largest HAP of 17.7 tons/yr (Cl_2), aggregate HAPs of 34.8 tons/yr).

Emergency generators (ES-C-PG1a, 1b, and 2a) are deemed "existing" sources, because, their commencement of construction is before December 19, 2012. The Permittee is not required to meet any NESHAP requirement including initial notification requirement.

Emergency generators (ES-C-PG2b, 2c, and 2d) are deemed "new" sources, because, they have commenced (or will commence) construction on or after December 19, 2012. The Permittee is required to meet only initial notification requirement.

4.5 Acrylate Coating Process (ID No. ES-C-ACP)

The final fiber product is coated before final packaging and shipment. Potential VOC emission rate (26.67 tons/yr) is estimated based upon a mass balance approach by multiplying the potential coating usage to the VOC content of the coatings.

The source is subject to the requirements in 02D .0958 and .0530. With respect to 02D .0958, the Permittee must, among others, (i) store all material, including waste material, containing VOCs in tanks or in containers covered with a tightly fitting lid that is free of cracks, holes, or other defects, when not in use, (ii) clean up spills of VOCs as soon as possible following proper safety procedures, (iii) store wipe rags containing VOCs in closed containers. The Permittee will be required to continue complying with this requirement.

For 02D .0530 applicability, please refer to Section 5.0 below.

4.6 Soot Handling System, Silo 1 (ID No. ES-C-SHP1) with associated bin vent filter (ID No. CD-C-BH-3)

Soot Handling System, Silo 2 (ID No. ES-C-SHP2) with associated bin vent filter (ID No. CD-C-BH-4)

Soot Handling System, Bagging Operations (ID No. ES-C-SHP3) with associated bin vent filter (ID No. CD-C-BH-5)

Silo 1 (ES-C-SHP1) and Silo 2 (ES-C-SHP2) are for storage of amorphous silicon dioxide (SiO_2). Particulate emissions due to pneumatic transfer of this material in each silo is captured via dedicated bag filters.

This SiO_2 from the storage silos is unloaded to the soot handling system bagging operations (ES-C-SHP3), which is controlled by a dust collector.

The following Table 4.6-1 provides an emission summary for each of these sources:

Table 4.6-1

Pollutant	Emission Rate, Tons/Yr					
	ES-C-SHP1		ES-C-SHP2		ES-C-SHP3	
	U	C	U	C	U	C

PM	88.61	0.008	88.61	0.008	35.66	0.0032
PM_{10}	88.61	0.008	88.61	0.008	35.66	0.0032
$PM_{2.5}$	88.61	0.008	88.61	0.008	35.66	0.0032

U = Uncontrolled, C = Controlled

Emissions rates are based upon flow rates and worst-case grain loading (inlet 20 grain/scf, outlet 0.0018 grain/scf).

These sources are subject to the requirements in 02D .0515, .0521 and .0530, and 02Q. 0317.

15A NCAC 02D .0515 "Particulates from Miscellaneous Industrial Processes"

This rule sets emissions limits for PM resulting from any industrial process for which no other emission control standards are applicable according to the following formula for sources with production rates less than or equal to 30 tons per hour (tph):

$E = 4.1 \times (P^{0.67})$

Where:
E = the allowable emission rate in lb/hr
P = process weight rate in tph

The rule also sets emissions limits for particulate matter (PM) for process weight rates greater than 30 tph as following:

$E = 55.0 \times (P)^{0.11} - 40$

Where:
E = allowable emission rate in lbs/hr
P = process weight rate in tph

The regulation applies to the above storage silos and bagging system. It specifies that solid fuels charged are considered as part of the process weight, but liquid and gaseous fuels and combustion air are not.

The following Table 4.6-2 includes information on process weight rates, allowable emission rates, and potential emission rates. It should be noted that the process weight rate for bagging operation (ES-C-SHP3) as below is based upon weight per bag (70 lbs), numbers of shifts per week (1), numbers of hours per shift (20 hours), and numbers of bags per shift (13).

Table 4.6-2

Emission Source	**Process Weight Rate ton/hr**	**Allowable Emission Rate lb/hr**	**Uncontrolled Potential Emission Rate lb/hr**	**Controlled Potential Emission Rate lb/hr**
ES-C-SHP1	0.28	1.73	20.23	0.00182
ES-C-SHP2	0.28	1.73	20.23	0.00182
ES-C-SHP3	0.23	1.52	68.57	0.00617

The current permit in Section 2.1.F.c. includes inspection and maintenance requirements for each bag filter associated with these sources. It consists of monthly visual inspections of the system duck-work and annual internal inspection of the bag filters.

The permit also includes recordkeeping for each action and inspection. Finally, the permit includes a semi-annual reporting for all monitoring including record keeping activities.

These existing requirements for each of the sources are sufficient to ensure compliance with the requirement. Thus, no changes can be justified.

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

The intent of this Rule is to prevent, abate and control emissions generated from fuel burning operations and industrial processes where visible emissions can be reasonably expected to occur, except during startup, shutdowns, and malfunctions, approved as such, according to the procedures approved under 15A NCAC 02D .0535.

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources required to install, operate, and maintain continuous opacity monitoring systems (COMS), compliance with the 20 percent opacity limit shall be determined as follows:

i. No six-minute period exceeds 87 percent opacity;
ii. No more than one six-minute period exceeds 20 percent opacity in any hour; and
iii. No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

Excess emissions during startup and shutdown shall be excluded from the determinations in paragraphs i. and ii. above, if the excess emissions are exempted according to the procedures set out in 02D .0535(g). Excess emissions during malfunctions shall be excluded from the determinations in paragraphs i. and ii. above, if the excess emissions are exempted according to the procedures set out in 02D .0535(c).

All periods of excess emissions shall be included in the determinations in paragraphs i. and ii. above, until such time that the excess emissions are exempted according to the procedures in 02D .0535.

Both storage silos (ES-C-SPH1 and ES-C-SPH2) and the soot handling bagging system (ES-C-SPH3) are subject to an opacity limit of 20%.

For all above existing sources, the current permit includes a monthly visible emissions monitoring requirement and a record keeping requirement for each observation including corrective actions taken (if any). Finally, the permit includes a semi-annual reporting requirement for all visible emissions observations made during the period.

These requirements are adequate to ensure compliance with the applicable requirement in 02D .0521. Thus, no changes will be made to the existing requirements.

15A NCAC 02D .0530 "Prevention of Significant Deterioration"

Refer to Section 5.0 below.

15A NCAC 02Q .0317 "Avoidance Conditions" for 02D .0614 "Compliance Assurance Monitoring"

The current permit includes an avoidance condition for applicability of CAM regulation (02D .0614) for soot handling system bagging operation (ES-C-SHP3). The permit restricts the operating hours to not more than 2900 hours per consecutive 12-months period to avoid applicability of CAM (by limiting the PM emissions to less than 100 tons per consecutive 12-months period). The Permittee is required to maintain daily records of operational hours for this source. The permit requires semi-annual reporting of monthly operating hours during each of the previous 17-months and total operational hours of the source during each of the consecutive 12-months periods. No changes to the above requirements are required as they are accurate.

4.7 Four natural gas-fired humidification boilers (ID Nos. ES-C-HB1a, ES-C-HB1b, ES-C-HB2a, and ES-C-HB2b)

These natural gas-fired boilers are used for humidification of the process area during cold weather.

The following Table 4-7.1 provides potential emissions estimates for each of the boilers: They are based upon heat input rate for each as above, 8,760 hours of operation, natural gas heating value of 1,033 Btu/sft^3, and AP-42 emissions factors, as referenced previously at footnote 7 above.

Table 4.7-1

Pollutant	**ES-C-HB1a** **tons/yr**	**ES-C-HB1b** **tons/yr**	**ES-C-HB2a** **tons/yr**	**ES-C-HB2b** **tons/yr**
PM	0.16	0.16	0.27	0.27
PM-10	0.16	0.16	0.27	0.27
PM-2.5	0.16	0.16	0.27	0.27
NOx	2.16	2.16	3.59	3.59
VOC	0.12	0.12	0.20	0.20
CO	1.81	1.81	3.02	3.02
SO_2	0.01	0.01	0.02	0.02
Single HAP	0.038 (hexane)	0.038 (hexane)	0.064 (hexane)	0.064 (hexane)
Total HAPs	0.04	0.04	0.067	0.067

As can be seen in the above Table 4.7-1 above, the potential uncontrolled emissions for each criteria pollutant are less than 5 tons/yr and potential uncontrolled emissions for each hazardous air pollutant are less than 1000 lbs/yr. Hence, as per 02Q .0508 "Insignificant Activities Because of Size or Production Rate", each of the boilers can be deemed an insignificant activity. However, as discussed in Section 5.0 below, the boilers are subject to PSD requirements in 02D .0530; hence, the DAQ has decided that it is appropriate to continue including them in the permit (and not as a listed insignificant activity as an attachment to the cover letter of the permit) for all applicable requirements as below. As such, the boilers are subject to the requirements in 02D .0503, .0516, .0521, .0530, .1404, .1111, and .1407.

15A NCAC 02D .0503 "Particulates from Fuel Burning Indirect Heat Exchangers"

This regulation applies to particulate matter (PM) emissions from indirect heat exchangers, except the PM emissions from electric steam generating units are subject to 02D .0536.

Emissions of PM from combustion of natural gas and No. 2 fuel oil that are discharged from the boiler into the atmosphere, shall not exceed PM emission rate as derived using 02D .0503(c).

Accordingly, allowable emissions of particulate matter (PM) from burning of natural gas and No. 2 fuel oil shall be calculated as follows.

$E = 1.090 \times Q^{-0.2594}$ Where: E = allowable PM emission rate in lbs/million Btu heat input
Q = maximum heat input rate in million Btu/hour at the plant site

The maximum heat input rates of all permitted boilers have been considered for estimating the PM emission rate of each of these new sources, as per 02D .0503(e).

As per the initial Title V application review (08436T05, October 24, 2001), boilers (ES-C-HB1a and 1b) were installed in July 1999 with the allowable emission rate determined to be 0.60 lb/million Btu each, and boilers (ES-C-HB2a and 2b) were to be installed by November 2001 with the allowable emission rate determined to be 0.46 lb/million Btu each. As per the last DAQ inspection report (10/25/18), one of the installed boilers (ES-C-HB2a or 2b) have been modified so that it could provide only 5.23 million Btu/hr heat input instead of 8.37 million Btu/hr. In addition, boiler (ES-C-HB1b) has not been installed as per this inspection report.

The potential particulates emission rate for natural gas firing for these boilers is 0.00745 lb/million Btu[19]. Hence, compliance with the above allowable emission standards is expected for each of these boilers. This potential emission rate is much lower than the allowable emissions standards. Thus, no monitoring / record keeping / reporting is required for PM emissions from natural gas firing in the boilers, in accordance with Section 2.1.G.1.d. Further, no change(s) to the existing permit requirement is justified.

15A NCAC 02D .0516 “Sulfur Dioxide Emissions from Combustion Sources”

Emission of sulfur dioxide from any source of combustion that is discharged from any vent, stack, or chimney shall not exceed 2.3 pounds of sulfur dioxide per million BTU input. Sulfur dioxide formed by the combustion of sulfur in fuels, wastes, ores, and other substances shall be included when determining compliance with this standard.

Sulfur dioxide formed or reduced because of treating flue gases with sulfur trioxide or other materials shall also be accounted for when determining compliance with this standard.

A source subject to an emission standard for sulfur dioxide in Rules .0524, .0527, .1110, .1111, .1205, .1206, .1210, or .1211 of 15A NCAC shall meet the standard in that particular rule, instead of 2.3 lb/million Btu emission standard under 02D .0516. None of the existing boilers (ID Nos. ES-C-HB1a, ES-C-HB1b, ES-C-HB2a, and ES-C-HB2b) are subject to any of these listed regulations; hence, they are subject to 02D .0516.

Natural gas has a very negligible sulfur content. As per AP-42, the potential emission rate (factor) when burning natural gas is only 0.001 lb/million Btu[20]. Hence, compliance with the SO_2 standard of 02D .0516 is expected. Because, the potential emission rate is significantly lower than the emission standard, no monitoring / record keeping / reporting requirements shall apply for SO_2 emissions from the existing boilers when burning natural gas.

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

For sources manufactured after July 1, 1971, visible emissions shall not be more than 20 percent opacity when averaged over a six-minute period. However, except for sources required to install COMs, six-minute averaging periods may exceed 20 percent opacity if:

(1) No six-minute period exceeds 87 percent opacity;
(2) No more than one six-minute period exceeds 20 percent opacity in any hour; and
(3) No more than four six-minute periods exceed 20 percent opacity in any 24-hour period.

A source subject to an emission standard for visible emissions in Rules .0506, .0508, .0524, .0543, .0544, .1110, .1111, .1205, .1206, .1210, or .1211 of 15A NCAC shall meet the standard in that particular rule instead of the standard contained in 02D .0521. None of the boilers are subject to any of these regulations for visible emissions; thus, they are subject to 02D .0521.

Compliance is expected due to relatively clean fuel (natural gas). The current permit does not include any monitoring/record keeping/reporting requirements as visible emissions are not expected due to burning natural gas in the boilers. No changes are required or justified.

15A NCAC 02D .0530 “Prevention of Significant Deterioration”

Refer to Section 5.0 below.

15A NCAC 02D .1407 “Boilers and Indirect-fired Process Heaters” and 02D .1414 “Tune-up Requirements”

---

[19] Emission factor of 7.6 lb/million sft^3, heating value of 1,020 Btu/sft^3, and adjusting for a heating value of 1,033 Btu/sft^3, Table 1.4-2, Section 1.4 “Natural Gas Combustion”, July 1998, AP-42, Fifth Edition.
[20] Emission factor of 0.6 lb/million sft^3, heating value of 1,020 Btu/sft^3, and adjusting for a heating value of 1,033 Btu/sft^3, Table 1.4-2, Section 1.4 “Natural Gas Combustion”, July 1998, AP-42, Fifth Edition.

No emissions standards apply to the existing boilers per 02D .1407. However, they are subject to only annual tune-up requirements in 02D .1414. The current permit includes this requirement. It comprises of: (i) inspection and cleaning/replacement of any component of burner, and (ii) inspection of the flame pattern, combustion pattern, and any other components to improve combustion efficiency.

The permit also includes record keeping requirements for each tune-up, required to be performed. The results of the monitoring are required to be recorded in a logbook.

Finally, the permit includes a semi-annual reporting requirement for all monitoring and record keeping activities.

No changes to these existing requirements are required as they are accurate and there are no modifications requested to the boilers as a part of the application.

15A NCAC 02D .1111 “Maximum Achievable Control Technology”

All existing boilers are subject to the requirements in 40 CFR 63 Subpart DDDDD “National Emission Standards for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters”. The current permit includes all applicable requirements as below:

- The Permittee is required to complete the initial tune-up and one-time energy assessment by May 20, 2019.

- The Permittee is required to conduct a tune-up of the boiler every two years no more than 25-months after the previous tune-up.

- The energy assessment is to be performed by a qualified energy assessor.

- The Permittee is required keep (i) records of each notification and report submitted, (ii) annual report of concentrations of CO, description of any corrective action taken as a part of tune-up, and type and amount of fuel used over the 12-months prior to adjustment, as applicable.

- The Permittee is required to keep records for 5 years following the date of each occurrence, measurement, etc. The Permittee is required to keep each record for at least 2 years on site after each occurrence, measurement, etc. The Permittee can keep records off-site for the remaining 3 years.

- The Permittee is required to submit compliance reports on a 2-year basis. The first report shall cover the period beginning on the May 20, 2019 and ending on December 31, 2020. The first report shall be postmarked on or before January 30, 2021. Subsequent 2-year reports shall cover the periods from January 1 to December 31. The Permittee shall submit the subsequent compliance reports postmarked on or before January 30 for the previous 24-month period.

- The compliance report must also be submitted electronically via the Compliance and Emissions Data Reporting Interface (CEDRI).

All above requirements are accurate; thus, no changes are required for the subject existing boilers.

4.8 Miscellaneous maintenance and cleaning operations (ID No. ES-C-Cleaning)

This is a new (unpermitted) source. At intermittent steps in the glass development process, the manufacturing areas throughout the plant must be cleaned to remove any impurities. It comprises of the application of a non-photochemically reactive solvent (isopropyl alcohol (IPA)) for miscellaneous maintenance and cleaning operations. The Permittee has estimated the potential emission rate of VOC as 22.8 tons/yr, based upon a potential usage rate of 45,441 lbs/yr of IPA and assumed 100 percent (mass based) volatility of this compound. The DAQ believes that this is a conservative emission estimation approach. This source is subject to the requirements in 02D .0530 and .0958. They are discussed below:

15A NCAC 02D .0530 "Prevention of Significant Deterioration"

Refer to Section 5.0 below.

15A NCAC 02D .0958 "0958 Work Practices for Sources of Volatile Organic Compounds"

This source will be subject to the requirements in 02D .0958. As per the regulation, among others, the Permittee must (i) store all material, including waste material, containing VOCs in tanks or in containers covered with a tightly fitting lid that is free of cracks, holes, or other defects, when not in use, (ii) clean up spills of VOCs as soon as possible following proper safety procedures, (iii) store wipe rags containing VOCs in closed containers, (iv) not clean sponges, fabric, wood, paper products, and other absorbent materials with VOCs.

To ensure compliance with the above requirements, the Permittee will be required to perform a visual inspection once per month of all operations and processes utilizing VOCs. The inspections shall be conducted during normal operations. The Permittee will also be required to keep records of each date and time of each inspection, and whether any non-compliant activities were observed.

Finally, the Permittee will be required to send to the DAQ a summary report of the observations of each semi-annul reporting period.

4.9 Fourteen house vacuums (ID Nos. IES-C-1 through IES-C-14)

One furnace gas treatment (ID No. IES-CF)

Six diesel generator fuel storage tanks (6,000 gallons capacity each) (ID Nos. IES-C-DGT1 through IES-C-DGT6)

Two fire pump diesel fuel storage tanks (300 gallons capacity, each) (ID Nos. IES-C-FPDT1 and IES-C-FPDT2)

Two Diesel fuel-fired fire pumps (183 hp rating each) (ID Nos. IES-FP1 and IES-FP2)

Five glass cleaning processes (ID Nos. IES-C-GC1 through IES-C-GC5)

One maintenance paint spray booth with filter (ID No. IES-C-MFB)

Three maintenance solvent sinks (ID Nos. IES-C-MS1 through IES-C-MS3)

One die cleaning (ID No. IES-DC)

Four soot vacuums (ID Nos. IES-C-SV1 through IES-C-SV4)

Five cooling water tower units (ID No. IES-C-CWT1 through IES-C-CWT5)

The potential to emit (uncontrolled) for each of the above emission sources is equal to or less than 5 tons/yr cut-off for each criteria pollutant and less than 1000 lbs/yr cut-off for each HAP. Thus, each activity has been deemed insignificant, pursuant to 02Q .0503(8). It should be noted that only the house vacuum (ID No. IES-C-14) and five cooling water tower units (ID No. IES-C-CWT1 through IES-C-CWT5) are not currently included in the insignificant activities list (attachment to the cover letter of the permit). The following Table 4.9-1 provides PTE for each activity:

Table 4.9-1

Emission Source	PM tons/yr	PM_{10} tons/yr	$PM_{2.5}$ tons/yr	NOx tons/yr	VOC tons/yr	CO tons/yr	SO_2 tons/yr	Single HAP lbs/yr

Emission Source	PM tons/yr	PM_{10} tons/yr	$PM_{2.5}$ tons/yr	NOx tons/yr	VOC tons/yr	CO tons/yr	SO_2 tons/yr	Single HAP lbs/yr
House vacuums (ID No. IES-C-1 through IES-C-14), total	0.02	0.02	0.02	-	-	-	-	-
Furnace gas treatment (ID No. IES-CF)	-	-	-	-	-	2.60	-	-
Diesel generator and fire pump fuel storage tanks (ID Nos. IES-C-FPDT1, IES-C-FPDT2, and IES-C-DGT1 through IES-C-DGT6), total	-	-	-	-	0.00631	-	-	-
Diesel fuel-fired fire pumps (ID Nos. IES-FP1 and IES-FP2), total	0.20	0.20	0.20	2.84	0.23	0.61	0.19	1.51 (formaldehyde)
Glass cleaning processes (ID Nos. IES-C-GC1 through IES-C-GC5), total	-	-	-	-	5.0	-	-	-
Maintenance paint spray booth with filter (ID No. IES-C-MFB)	-	-	-	-	0.70	-	-	280.00 (toluene)
Maintenance solvent sinks (ID Nos. IES-C-MS1 through IES-C-MS3), total	-	-	-	-	1.13	-	-	-
Die cleaning (ID No. IES-DC)	-	-	-	-	0.07	-	-	-
Soot vacuums (ID Nos. IES-C-SV1 through IES-C-SV4), total	0.05	0.05	0.05	-	-	-	-	-
Cooling water tower units (ID No. IES-C-CWT1 through IES-C-CWT5), total	0.11	0.10	0	-	-	-	-	-

These activities are subject to the requirements in 02D .0515, .0516, .0521, 02D .0530, and .0958. Detailed regulatory review is not undertaken in this revision for any regulatory requirement (except for 02D .0530) as the PTE for each is negligible (much less than the cut-offs of 5 tons/yr and 1000 lbs/yr) and none of these activities are proposed to be modified with this revision.

5.0 PSD (As implemented through NC's SIP-Approved Regulations, 15A NCAC 02D .0530 "Prevention of Significant Deterioration" and 15A NCAC 02D .0544 "Prevention of Significant Deterioration for Greenhouse Gases")

United States (US) Congress first established the NSR program as a part of the 1977 Clean Air Act Amendments and modified the program in the 1990 amendments. The NSR program includes requirements for obtaining a pre-construction permit and satisfying all other preconstruction review requirements for major stationary sources and major modifications, before beginning actual construction, for both attainment areas and non-attainment areas. The NSR program for attainment and non-attainment areas are called "Prevention of Significant Deterioration" (PSD) and "Non-attainment New Source Review" (NAA NSR), respectively. The NSR focuses on industrial facilities, both new and modified, that create large increases in the emissions of specific pollutants.

The basic goal for PSD is to ensure that the air quality in attainment areas (e.g., Cabarrus County NC for PM_{10}, $PM_{2.5}$, NO_2, SO_2, CO, ozone, and lead) does not significantly deteriorate while maintaining a margin for future industrial growth.

Under PSD, all major new or modified stationary sources of air pollutants as defined in §169 of the CAA must be reviewed and permitted, prior to construction, by EPA and/or the appropriate permitting authority, as applicable, in accordance with §165 of CAA. A "major stationary source" is defined as any one of 28 named source categories (e.g., "fossil fuel-fired steam electric plants of more than 250 million Btu per hour heat input"), which emits or has a potential to emit (PTE) of 100 tons per year of any "regulated NSR pollutant", or any other stationary source (i.e., other than 28 named source categories), which emits or has the potential to emit 250 tons per year of any "regulated NSR pollutant".

Pursuant to the Federal Register (FR) notice on February 23, 1982 (47 FR 7836), North Carolina has a full authority from the US Environmental Protection Agency (EPA) to implement the PSD regulations in the State effective March 25, 1982. NC's SIP- approved PSD regulations have been codified in 15A NCAC 02D .0530 and 02D .0544, which implement the requirements of 40 CFR 51.166 "Prevention of Significant Deterioration of Air Quality" with a few exceptions as included in these regulations. The version of the CFR incorporated in the NC's SIP regulations are that of July 1, 2014 (for all regulated NSR pollutants except GHG, 02D .0530) and July 20, 2011 (for GHG only, 02D .0544), and they do not include any subsequent amendments or editions to the referenced material. Refer to Table 1 to §52.1770.

Corning Midland is not one of the listed 28 source categories source. Therefore, the "250 tons/yr" major stationary source classification applies. The facility is an existing PSD major stationary source; because, it emits or has a potential to emit 250 tons per year or more of at least one regulated NSR pollutant: NO_x (as NO_2).

Because the existing facility is considered a major stationary source, any modification to an existing major source resulting in both significant emission increase and net significant emissions increase for a regulated NSR pollutant, is subject to PSD review and must meet appropriate review requirements.

In addition, as stated in Section 1.0 above, the facility has requested to "relax" the existing PSD avoidance limits for both NOx and $PM_{2.5}$ for various emissions sources; requiring the Permittee to obtain a PSD permit as if the construction on the sources (covered under the avoidance limitations) has not yet occurred.

The following Table 5.1-1 includes a summary of change in emissions for the proposed modifications. The applicant has used the "actual-to-potential test" per §51.166(a)(7)(iv)(d). The baseline actual emissions for all existing (i.e., "relaxed") and new emissions units are zero, pursuant to 02D .0530(b)(1) and §51.166(r)(2). Consistent with §51.166(b)(4), the "potential to emit" estimates for all emissions units have been based upon the maximum potential emissions rates for each emission source, considering the realized efficiency gains in its manufacturing process, design capacity of the facility, control device efficiency (if applicable), and 8760 hours of operation. The appropriateness of emissions factors and emissions estimate methodology for each source have been discussed in Sections 4.1 through 4.9 above.

Table 5.1-1: Emissions Changes Due to Proposed Modifications

Regulated NSR Pollutant	Baseline Actual Emissions Tons Per Year	Potential to Emit Emissions Tons Per Year	Emissions Change Tons Per Year	Significant Emission Rate Tons Per Year	Major Modification Review Required?
PM	0	32.8	32.8	25	Yes
PM_{10}	0	32.8	32.8	15	Yes
$PM_{2.5}$	0	32.7	32.7	10	Yes
SO_2	0	0.4	0.4	40	No
NOx (as NO_2)	0	917.9	917.9	250	Yes
CO	0	53.5	53.5	100	No

Regulated NSR Pollutant	Baseline Actual Emissions Tons Per Year	Potential to Emit Emissions Tons Per Year	Emissions Change Tons Per Year	Significant Emission Rate Tons Per Year	Major Modification Review Required?
VOC	0	61.4	61.4	40	Yes
Lead	0	0.0000919	0.0000919	0.6	No
GHG as CO_{2e}	0	45,813	45,813	75000	No

In the Table 5.1-1, it should be noted that the combustion and process emissions are all stack emissions; hence, fugitive emissions are not expected. However, most of the VOCs emissions emitted from the facility are fugitive in nature. Finally, the PTE for all indicators of particulates; PM, PM_{10} and $PM_{2.5}$, include both filterable and condensable portions, pursuant to NC's SIP-approved regulations in 02D .0530 and .2609. The following can be concluded:

- Per "source relaxation" provision in §51.166(r)(2), the source (facility) becomes a major stationary source for NOx. In addition, for PM, PM_{10}, $PM_{2.5}$, and VOC, the change in emissions exceed their respective significance thresholds. Thus, major modification review is required for all these pollutants, with the presumption that the project also causes significant net emissions increase.

- The change in emissions for SO_2, CO, lead, and GHG, do not exceed the applicable significance thresholds. Therefore, the proposed project is not a major modification for these pollutants.

  It needs to be emphasized that the major modification for GHG is not triggered, consistent with the requirements in 02D .0544(a) and UARG v. EPA[21]. As shown above, the project is a major modification to an existing major stationary source of Corning Midland for at least one non-GHG pollutants, such as NOx, PM, PM_{10}, $PM_{2.5,}$ and VOC. However, the emission increase for GHG does not equal to or exceed its significance threshold.

Thus, Corning is required and has performed the following reviews and analyses for emissions of NOx, PM, PM_{10}, $PM_{2.5}$, and VOC. These reviews and analyses are required for each affected new or modified emission unit causing or contributing to a significant net emission increase of any regulated NSR pollutant, equaling or exceeding the applicable significance threshold, as per 15A NCAC 02D .0530 and .0544.

- Best Available Control Technology (BACT) analysis
- Air quality analysis
- Source impact analysis
- Additional impact analysis
- Class I analysis

Refer to Sections 6.0 through 10.0 below for discussions on these requirements.

6.0 BACT Analysis

Background

The CAA §169(3) defines:

> "The term "best available control technology" means an emission limitation based on the maximum degree of reduction of each pollutant subject to regulation under this Act emitted from or which results from any major emitting facility, which the permitting authority, on a case-by-case basis, taking into account energy, environmental, and

[21] Slip Opinion, *Utility Air Regulatory Group v. Environmental Protection Agency*, Supreme Court of the United States, June 23, 2014.

economic impacts and other costs, determines is achievable for such facility through application of production processes and available methods, systems, and techniques, including fuel cleaning, clean fuels, or treatment or innovative fuel combustion techniques for control of each such pollutant. In no event shall application of "best available control technology" result in emissions of any pollutant which will exceed the emissions allowed by any applicable standard established pursuant to section 111 or 112 of this Act. Emissions from any source utilizing clean fuels, or any other means, to comply with this paragraph shall not be allowed to increase above levels that would have been required under this paragraph as it existed prior to enactment of the federal Clean Air Act Amendments of 1990."

Given the variation between emission sources, facility configuration, local air-sheds, and other case-by-case considerations, Congress determined that it was impossible to establish a single BACT determination for a particular pollutant or source. Economic, energy, and environmental impacts are mandated in the CAA to be considered in the determination of case-by-case BACT for specific emission sources. In most instances, BACT may be defined through an emission limitation. In cases where this is impracticable, BACT can be defined using a particular type of control device, work practice, or fuel type. In no event, can a technology be recommended which would not comply with any applicable standard of performance under CAA §§111 (NSPS) or 112 (NESHAP).

The EPA developed guidance, commonly referred to as "Top-Down" BACT[22], for PSD applicants for determining BACT. This guidance is a non-binding reference material for permitting agencies, which process PSD applications pursuant to their SIP-approved regulations. As stated in Section 5.0 above, NCDAQ issues PSD permits in accordance with its SIP-approved regulations in 15A NCAC .02D .0530 and .0544. Therefore, the DAQ does not strictly adhere to EPA's "top-down" guidance. Rather, it implements BACT in accordance with the statutory and regulatory language. As such, NCDAQ's BACT conclusions may differ from those of the EPA.

As stated above, a major modification review is triggered for the project due to increases in emissions of NOx, PM, PM_{10}, $PM_{2.5}$, and VOC. Thus, each emissions unit undergoing physical or operation change (for example, new or an existing waveguide laydown process) where the net emissions increase is projected to occur, is required to apply BACT for these pollutants, as per §51.166(j)(3).

Applicant's BACT Analysis Approach

The applicant has reviewed the following documents to identify potentially applicable technologies for each triggered pollutant:

- RBLC (RACT[23]/BACT/LAER[24] Clearinghouse) database
- Various EPA reports on emissions control technologies,
- Various air pollution control technology vendors,
- Pending permit applications and issued permits for similar facilities, and
- Compilation of Air Pollution Emission Factors (AP-42) published by EPA.

With regard to RBLC information for the fiber optic cable industry emissions sources, the DAQ has searched this same database for a period 2009-Present for SIC Code 3229 "Pressed and Blown Glass and Glassware, Not Elsewhere Classified". The DAQ findings indicate that there are a few determinations (one or two) for this industry sources (this SIC code) for different pollutants.[25] They have been discussed in the following Sections 6.1 through 6.9, as applicable.

[22] "Improving New Source Review (NSR) Implementation", J. Craig Potter, Assistant Administrator for Air and Radiation US EPA, Washington D.C., December 1, 1987, and "Transmittal of Background Statement on "Top-Down" Best Available Control Technology", John Calcagni, Director, Air Quality Management Division, US EPA, OAQPS, RTP, NC, June 13, 1989.

[23] Reasonably Available Control Technology.

[24] Lowest Achievable Control Technology.

[25] This may be correct as the applicant's consultant stated that none of the fiber optics cable manufacturing facility had triggered PSD (or NA NSR) during a face-to-face meeting with the DAQ on July 16, 2019. The Permittee

6.1 Two optical waveguide laydown processes (ID Nos. ES-C-001 and ES-C-005) with gas-oxy firing with associated bagfilter (ID No. CD-C-BH-6) in series with one of two sieve tray scrubbers operating in parallel (ID Nos. CD-C-HCL-5 or CD-C-HCL-6) in series with one of two sieve tray scrubbers operating in parallel (ID Nos. CD-C-CL-5 or CD-C-CL-6)

One optical waveguide laydown process (ID No. ES-C-002) with gas-oxy firing with associated cartridge filter (ID No. CD-C-BH-2)

One optical waveguide laydown process (ID No. ES-C-006) with gas-oxy firing with associated bagfilter (ID No. CD-C-BH-7)

One optical waveguide laydown process (ID No. ES-C-009) with gas-oxy firing with associated bagfilters (ID Nos. CD-C-BH-7 and CD-C-BH-10) in series with De-NOx system (ID No. CD-C-NOx-9)

One optical waveguide laydown process (ID No. ES-C-012) with gas-oxy firing with associated bagfilter (ID No. CD-C-BH-11)

BACT Analysis for PM/PM_{10}/$PM_{2.5}$

As stated in Section 4.1 above, particulate emissions from the laydown processes are primarily due to conversion of dopant to particulates within the process. Due to the kind of dust generated at the facility, the applicant has assumed the particulates size as PM equals PM_{10}, which in turn equals to $PM_{2.5}$.

Possible particulate add-on controls for combustion emissions include electrostatic precipitators (ESP), baghouses, and scrubbers. The facility is currently using state-of-the art baghouses on all existing laydown processes, which are high efficiency Gore-Tex filters (or other comparable filter). The new laydown process will also be controlled by a dedicated baghouse (Gore-Tex or similar filter). The exit grain loading for each baghouse (existing or new) is 0.0018 grain/dscf (filterable particulates only). These baghouses are typically considered the top tier control for particulate emissions (especially PM_{10}/$PM_{2.5}$) control for different type of industries. Thus, Corning has proposed the following BACTs for both filterable only and total particulates (filterable and condensable), using baghouses for optical waveguide laydown processes. The baghouses are not expected to control emissions of condensable particulates. The BACT for total particulates account for a small amount associated with condensable portion, considering the process engineering data.

Table 6.1-1

Emission Source	**Proposed BACT**	
	Filterable Only **grain/dscf**	**Both filterable and condensible** **grain/dscf**
ES-C-002	0.0018	0.00186
ES-C-001 and ES-C-005	0.0018	0.00196
ES-C-006 and ES-C-009	0.0018	0.00186
ES-C-009	0.0018	0.00190
ES-C-012	0.0018	0.00190

There are no RBLC determinations for PM/PM_{10}/$PM_{2.5}$ emissions from waveguide laydown processes at optical fiber manufacturing industry (SIC 3229). The DAQ believes that the applicant-proposed BACTs, as included in Table 6.1-1 above, for PM/PM_{10}/$PM_{2.5}$ emissions are state-of-the art control levels, using baghouses, and any further reduction in particulate emissions (i.e., beyond controlled by each baghouse) would likely exhibit unreasonable economic impact (for example, use of ESP, scrubber, or another baghouse in series) as remaining emissions are

confirmed that they are not aware of any other fiber optic facilities that have undergone PSD for any pollutant through a Corning submission dated October 11, 2019.

small. It should be noted that, as per EPA, unrealistic options such as placing in series the same or similar control technology need not be considered.[26] In addition, energy or environmental impacts associated with any additional particulates control cannot be ignored (for example, significant energy use associated with operation of an ESP, ash disposal in a landfill with operation of ESP if it cannot be sold for a beneficial use, significant amount of water (or other scrubbing liquid) use for a wet scrubber, or a need for wastewater treatment for scrubber wastewaters). Thus, after considering the economic, energy, and environmental impacts, the DAQ proposes to approve the above (Table 6.1-1) as BACTs for optical waveguide laydown processes. These BACTs apply during all periods of operation, including start-up, shut-down and malfunctions. Compliance will be based upon 3-run stack test average.

BACT Analysis for NOx (as NO_2)

NOx emissions result from the combustion of natural gas and a dopant as a raw material for waveguide laydown processes. The Permittee states that no RBLC determinations are available for this process type for optical fiber industry. Thus, it has referenced the USEPA document "Alternative Control Techniques (ACT) Document – NOx Emissions from Glass Manufacturing", June 1994, to aid in its BACT analysis preparation to analyze potentially available technologies for determining BACT for laydown processes. It needs to be stated that this ACT document provides technical information for State and local agencies to develop and implement regulatory programs to control NOx emissions from glass melting furnaces, for ozone non-attainment areas, pursuant to Subpart 2 of Part D "Plan Requirements for Nonattainment Areas" to Title I of CAA.

The following control devices have been discussed for technical feasibility, and, if applicable, for determining economic, energy, and environmental impacts:

- Gas/Oxy-Firing
- Low-NOx Burners
- Selective Catalytic Reduction (SCR)
- Selective Non-Catalytic Reduction (SNCR)
- Wet Scrubber

Per the ACT document, gas/oxy-firing, which is a fuel firing technique, provides the highest NOx reduction at 85%, followed by the following add-on control technologies - SCR (75%), SNCR (40%), and a low NOx burner retrofit (40%). The ACT also includes furnace modifications as an option to reduce NOx emissions (75%).

The technical feasibility for each of the above technologies are discussed below:

Gas/Oxy-Firing

Oxy-fuel combustion is the process of burning a fuel using pure oxygen instead of air as the primary oxidant. Since the nitrogen component of air is not heated (because nitrogen is eliminated), fuel consumption is reduced, and higher flame temperatures are possible. The sizing for air intakes, blowers, furnace spaces, heat recovery accessories, emissions treatment systems, and exhaust piping, is expected to reduce dramatically, as combustion is supported by oxygen only. Moreover, by employing the oxy-fuel technology (v. air-fuel firing), the furnace output (or product throughput) is increased.

With respect to emissions, a major advantage of oxy-fuel over air-fuel is the potential for reduction of total NOx emissions. Since nitrogen is removed as combustion air is eliminated, total NOx produced per ton of product is reduced significantly, as pointed out earlier, up to 85 to 90 percent.

It should be noted that Gas-oxy firing is the only fuel firing technology that has been utilized in the existing optical waveguide laydown processes at the facility since commencement of plant operations and is planned to be utilized in the new optical waveguide process. Thus, gas oxy-firing is considered the baseline technology for the plant for BACT determination. It should also be stated that the same technology was previously determined by DAQ to be RACT for the existing waveguide laydown processes.

[26] Page 6, *Guidance for Determining BACT Under PSD,* David G. Hawkins, Assictant Administrator for Air, Noise, and Radiation, EPA, January 4, 1979.

Low-NOx Burners

Low-NOx burners use several approaches to reduce NOx formation. One approach involves the creation of fuel rich and air-rich combustion zones. But, because the temperature and residence time associated with the optical waveguide laydown process are crucial to the final product, these parameters cannot be varied for the purpose of emission reductions. Therefore, low-NOx burners are deemed to be technically infeasible. Additionally, a control efficiency of 40% for Low-NOx burners at glass making facilities, is much lower than the 85% achieved by gas/oxy-firing.

SCR

SCR is a post-combustion control technique which typically allow reductions of NOx at lower temperature (approximately 500^0 F) in the presence of catalyst. It needs to be noted that one of the existing laydown processes has been permitted with an optional SCR system to control NOx. In an effort to address the feasibility of SCR control, Corning conducted on-site testing (February 2001 to April 2001) at the Concord Plant. Results showed an extremely low catalyst life, of approximately two to four weeks due to silica fowling. Due to the short catalyst life when implemented at this process, an SCR was determined to be technically infeasible. Thus, for this application, SCR will not be evaluated further for BACT determination.

SNCR

SCNR technology involves an extremely high capital expense and high operating costs. Its fuel consumption and high ammonia slip is counteractive to the emission reduction goal. Additionally, the SNCR process operates at a high temperature, between $1,600^0$F and $2,200^0$F. This operating temperature is not compatible with Corning manufacturing process; thus, the applicant has eliminated this technique from further consideration. Additionally, a control efficiency of 40% for SNCR at glass making facilities is much lower than the 85% achieved by gas/oxy-firing.

Wet Scrubbers

Wet scrubbing employs liquid absorbent to absorb NOx gases. Wet scrubbers rely on the creation of large surface areas of scrubbing liquid that allow intimate contact between the liquid and gas. The creation of large surface areas can be accomplished by passing the liquid over a variety of media (packing, meshing, grids, trays) or by creating a spray of droplets. There are several types of wet scrubber designs, including spray tower, tray-type, and packed-bed wet scrubbers.

Wet scrubbing is a technically feasible option for NOx emissions removal for waveguide laydown processes at Corning.

The applicant has evaluated the economic, energy, and environmental impacts, for determining its feasibility for using the technology for reduction of NOx emissions from waveguide laydown processes at Corning.

With respect to economic impact, the applicant has utilized capital and operating costs of installed scrubber and EPA's Air Pollution Control Cost Manual (CCM, 6th Edition, January 2002). The detailed capital cost analysis, operating cost analysis, summary table, and supporting information are included in Appendix B of the application. The following Table 6.2-2 provides a summary of economic impacts (cost effectiveness in $ per ton of pollutant removed) for each of the scrubbers associated with optical waveguide laydown processes. These impacts are based upon a cost recovery factor, which the applicant estimated, using an interest rate of 7 percent and a control equipment life of 10 years. The DAQ believes that this interest rate is consistent with the CCM guidance. However, for control equipment life, this manual indicates control equipment life to be 15-20 years, depending upon the type of control device. The DAQ has ran the economic impact analysis based upon the 7 percent interest rate and 15-year equipment life, but, the economic impact estimates do not change significantly as below (reduce little, but not much).

Table 6.1-2

Emission Source(s)	Baseline Emission Rate Lbs/hr	Baseline Emission Rate Tons/yr	Emission Reduction (assuming 80% removal with wet scrubber) Tons/yr	Total Capital Cost $	Total Annualized Cost $/yr	Economic Impact $/Ton of Pollutant Removed
Optical waveguide laydown process ES-C-002	76.0	184.7	147.8	$10,763,994	$2,910,732	$19,697
Optical waveguide laydown processes ES-C-001 and ES-C-005	7.4 (001) 7.4 (005)	65.2	52.2	$6,849,626	$1,882,111	$36,072
Optical waveguide laydown processes ES-C-006 and ES-C-009	45.6 (006) 152.0 (009)	369.4	295.6	$16,315,164	4,369,474	$14,784
Optical waveguide laydown process ES-C-009	152.0	110.8	88.7	$6,255,922	$1,726,097	$19,467
Optical waveguide laydown process ES-C-012	45.6	110.8	88.7	6,255,922	$1,726,097	$19,468

Upon DAQ's request the Permittee has also prepared the economic impact analysis for wet scrubbing technology for an assumed removal efficiency as high as 95 percent. The revised economic analysis is shown below in Table 6.1-3 below:

Table 6.1-3

Emission Source(s)	Baseline Emission Rate Lbs/hr	Baseline Emission Rate Tons/yr	Emission Reduction (assuming 95% removal with wet scrubber) Tons/yr	Total Capital Cost $	Total Annualized Cost $/yr	Economic Impact $/Ton of Pollutant Removed
Optical waveguide laydown process ES-C-002	76.0	184.7	175.5	$10,763,994	$2,910,732	$16,587
Optical waveguide laydown processes ES-C-001 and ES-C-005	7.4 (001) 7.4 (005)	65.2	62.0	$6,849,626	$1,882,111	$30,377
Optical waveguide laydown processes ES-C-006 and ES-C-009	45.6 (006) 152.0 (009)	369.4	351.0	$16,315,164	4,369,474	$12,450
Optical waveguide laydown process ES-C-009	152.0	110.8	105.3	$6,255,922	$1,726,097	$16,394
Optical waveguide laydown process ES-C-012	45.6	110.8	105.3	6,255,922	$1,726,097	$16,394

The Permittee has concluded the above economic impacts to be adverse with the use of a wet scrubber (for both 80% and 95% removal options for NOx) on each optical waveguide laydown process.

Regarding energy impact, the applicant has stated that additional energy (beyond purchasing and operating a scrubber system, accounted for in economic impact) will be required for operating a wastewater treatment plant through additional treatment units and pumps. However, the DAQ believes that the energy impact is not expected to be adverse that it would disqualify the option from further consideration.

With respect to environmental impact, the applicant has stated that wastewater treatment facility would have to be constructed to adequately treat the scrubber effluent and dispose of sludge produced. These treatment systems are not currently available. The DAQ, however, believes that environmental impact is not expected to be adverse that it would disqualify the option from further consideration.

BACT Determination

The DAQ review of the RBLC data indicates only one determination for SIC code 3229. This determination (NY-0109) for Corning's Canton Plant in New York, the NY's environmental agency (NYSDEC) determined the use of oxy-firing control technique for controlling NOx emissions from its glass furnaces as the LAER (least achievable emission rate).

The DAQ believes that economic impacts stated above with the wet scrubber option are unreasonable for NOx emissions reductions for use of scrubbers for each of the optical waveguide laydown processes, even for 95 percent removal efficiency. After careful consideration of the economic, energy, and environmental impacts, as discussed above, the DAQ proposes to approve the following (Table 6.1-4) as BACT using the oxy-fire technology, for each of the laydown processes.

Table 6.1-4

Emission Source(s)	Proposed NOx BACT	Control Method
Optical waveguide laydown process ES-C-001	7.4 lbs/hr	Oxy-firing
Optical waveguide laydown process ES-C-002	76.0 lbs/hr	Oxy-firing
Optical waveguide laydown process ES-C-005	7.4 lb/hr	Oxy-firing
Optical waveguide laydown process ES-C-006	45.6 lb/hr	Oxy-firing
Optical waveguide laydown process ES-C-009	152.0 lbs/hr	Oxy-firing
Optical waveguide laydown process ES-C-012	45.6 lbs/hr	Oxy-firing

These BACTs apply during all periods of operation (normal, startup, shutdown, and malfunctions). Compliance will be determined by stack testing.

BACT Analysis for VOCs

VOC emissions from the laydown processes are primarily due to natural gas combustion and are negligible. Potentially available techniques include thermal oxidation and catalytic oxidation. Due to small size of each of the combustion units (confidential information) for the laydown processes and very low emission rate of each (as shown in Table 6.1-5 below based on AP-42 emission factor[27]), the applicant has concluded that all of the above options are infeasible. The applicant has proposed the use of clean fuel such as natural gas and the use of good combustion practices, which are types of work practice standards, as BACT, for each of these laydown sources.

Table 6.1-5

Emission Source(s)	Uncontrolled VOC Emission Rate
Optical waveguide laydown process ES-C-001	0.0211 lbs/hr
Optical waveguide laydown process ES-C-002	0.0289 lbs/hr
Optical waveguide laydown process ES-C-005	0.0211 lb/hr
Optical waveguide laydown process ES-C-006	0.0173 lb/hr
Optical waveguide laydown process ES-C-009	0.0578 lbs/hr
Optical waveguide laydown process ES-C-012	0.0173 lbs/hr

The regulatory definition of BACT in 40 CFR 51.166(b)(12) provides that if the reviewing authority (such as DAQ) determines that technological or economic limitations on the application of measurement methodology to a

[27] Id. at 7.

particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard or combination thereof, may be prescribed.

There are no RBLC determinations for VOCs emissions from laydown processes at optical fiber manufacturing industry (SIC 3229). However, the RBLC database does indicate use of natural gas and good combustion practices as typical control methods for many determinations for small boilers and combustion sources (typically less than 10 million Btu/hr). The DAQ believes that establishing such a small numerical limit (for example, 0.0211 lb/hr for waveguide laydown process ESS-C-001 above) for VOCs emissions and then, requiring a verification using stack testing, is impractical and onerous, considering the estimated cost of a few to several thousand dollars for each stack test for each source. This cost is excessive given the statutory factors that must be considered for each BACT limit and therefore the DAQ – the permitting authority – concludes that imposing numerical limitations, as BACT, on these laydown processes for emissions of VOCs is not feasible.

In summary, the DAQ agrees with the applicant that use of any add-on control techniques would be impractical and infeasible, considering the small size of the combustion units and very low VOC emission rates. The DAQ also believes that it is economically unreasonable to impose numerical limit with the stack testing to verify compliance where each laydown process emits negligible VOCs emissions (between 0.0173 lb/hr to 0.0578 lb/hr as stated above). In summary, DAQ proposes to establish the use of good combustion control and natural gas as BACT for VOC emissions from all waveguide laydown processes (all existing and one new).

6.2 Glass drying operations (ID No. ES-C-003) with associated one of two packed tower scrubbers (ID Nos. CD-C-CL-3 or CD-C-CL-4)

Glass drying operations (ID No. ES-C-007) with associated two of three packed tower Cl scrubbers operating in parallel (ID Nos. CD-C-CL-8, CD-C-CL-9 or CD-C-CL-10)

Glass drying operations (ID No. ES-C-010) with associated two of three packed tower Cl scrubbers operating in parallel (ID Nos. CD-C-CL-8, CD-C-CL-9 or CD-C-CL-10)

Glass drying operations (ID No. ES-C-011) with associated two of three packed tower Cl scrubbers operating in parallel (ID Nos. CD-C-CL-8, CD-C-CL-9 or CD-C-CL-10)

Glass drying operations (ID No. ES-C-014) with associated two of three packed tower Cl scrubbers operating in parallel (ID Nos. CD-C-CL-8, CD-C-CL-9 or CD-C-CL-10)

BACT Analysis for PM/PM_{10}/$PM_{2.5}$

The process involves a short-term doping of raw material in the drying operations, with PM emissions generated downstream. The Permittee states that scrubber effluent and filter analyses, as well as scrubber exhaust particulate emissions testing (reports submitted to DAQ in May 2015 and July 2016 and approved by DAQ), indicate that the reaction of the raw material results in almost total control of PM by the scrubber. Moreover, as per the Permittee, stack testing has shown similar emission rates at the scrubber outlet with and without flow of raw material to the operations.

The Permittee has proposed the following BACTs, included in Table 6.2-1 below, for the glass drying operations with the use of existing scrubbers. For all existing drying operations (all except ES-C-014), the BACTs are based upon the highest emission rate (for both filterable and condensible portions) for the applicable drying operation's observed emission rate during any test run and scaling them by factors to account for peak dopant flow rates and utilization increases. For the proposed new glass drying operations ES-C-014, the Permittee based the BACT again on 2015 and 2016 test data (for both filterable and condensible portions) for similar drying operations and scaled them as above to account for peak dopant rates.

Table 6.2-1

Emission Source	Proposed BACT lb/hr

ES-C-003	0.44
ES-C-007	0.70
ES-C-010	0.70
ES-C-011	0.44
ES-C-014	0.44

Available particulate add-on controls include ESPs, baghouses, and scrubbers. The Permittee has argued that due to emissions testing showing high control of PM emissions from scrubbers, it would not be cost effective for additional controls. The Permittee has also stated that "unrealistic alternatives for BACT determination need not be presented such as placing in series control equipment which is normally used alone (e.g., an ESP followed by a baghouse)."[28] Thus, since emission testing on the existing scrubbers already show high control of PM, the Permittee has emphasized any addition of another control in series with the existing scrubbers would be "unrealistic". Therefore, Corning has proposed the above BACTs for each for glass drying operations with the use of existing wet scrubbers.

There are no RBLC determinations for $PM/PM_{10}/PM_{2.5}$ emissions from glass drying operations at optical fiber manufacturing industry (SIC 3229). The DAQ believes that the applicant-proposed BACTs for $PM/PM_{10}/PM_{2.5}$ emissions is based upon a state-of-the art control level using existing wet scrubbers and any further reduction in particulate emissions (i.e., beyond controlled by each scrubber) would likely exhibit unreasonable economic impact (for example, use of ESP, baghouse, or another scrubber in series) as remaining emissions are small, especially considering the above referenced stack test data. DAQ agrees that unrealistic options such as placing in series the same or similar control technology need not be considered. In addition, energy or environmental impacts associated with any additional particulates control cannot be ignored (for example, significant energy use associated with operation of an ESP, ash disposal in a landfill with operation of ESP if cannot be sold for a beneficial use, significant amount of water (or other scrubbing liquid) use for a wet scrubber, or a need for wastewater treatment for scrubber wastewaters). Thus, after considering the economic, energy, and environmental impacts, the DAQ proposes to approve the above as BACTs for $PM/PM_{10}/PM_{2.5}$ emissions from glass drying operations. It should be noted that the proposed BACTs consist of emissions of both filterable and condensable portions. The BACTs apply during all periods of operation, including start-up, shut-down and malfunctions. Compliance will be based upon 3-run stack test average.

6.3 Miscellaneous small source exhausts (including, but not limited to, laboratory hoods, the acid tank vent, emergency relief rupture discs, emergency vents, chlorine cylinder change out/header maintenance and bulk tank vents; ID No. ES-C-004) with associated one of two vertical spray chamber/venturi wet scrubbers (ID Nos. CD-C-HCL-3 and CD-C-HCL-4)

BACT Analysis for $PM/PM_{10}/PM_{2.5}$

PM emissions result from various small source exhausts, including but not limited to laboratory hoods, tank venting, emergency relief rupture discs, emergency vents, Cl_2 cylinder change-out and header maintenance. The emission unit currently is ducted through a wet scrubber with 90% PM control. Corning proposes the use of wet scrubber as a work practice BACT for this emission unit.

There are no RBLC determinations for $PM/PM_{10}/PM_{2.5}$ emissions from miscellaneous small sources described above for optical fiber manufacturing industry (SIC 3229). The DAQ believes that the existing scrubber provides a state-of-the-art level control for particulate emissions from such small sources at Corning and any further reduction in particulate emissions (i.e., beyond controlled by the existing scrubber) would likely exhibit unreasonable economic impact (for example, use of ESP, baghouse, or another scrubber in series) as remaining emissions are small. DAQ believes that unrealistic options such as placing in series the same or similar control technology need not be considered. In addition, energy or environmental impacts associated with any additional particulates control cannot be ignored (for example, significant energy use associated with operation of an ESP, ash disposal in a landfill with operation of ESP if cannot be sold for a beneficial use, significant amount of water (or other scrubbing liquid) use for a wet scrubber, or a need for wastewater treatment for scrubber wastewaters). Thus, after considering the economic, energy, and environmental impacts, the DAQ proposes a BACT of 0.44 lb/hr (corresponding to 90

[28] Id. at 26.

percent control level) with the use of existing scrubber, for $PM/PM_{10}/PM_{2.5}$ emissions from miscellaneous small source exhausts. It should be noted that the proposed BACT consists of emissions of both filterable and condensable portions. The BACT applies during all periods of operation, including start-up, shut-down and malfunctions. Compliance will be based upon 3-run stack test average.

6.4 Six diesel fuel-fired emergency generators (ID Nos. ES-C-PG1a, ES-C–PG1b, ES-C-PG2a, ES-C-PG2b, ES-C–PG2c, and ES-C-PG2d)

BACT Analysis for $PM/PM_{10}/PM_{2.5}$, NOx, and VOCs

As stated in Section 4.4 above, each emergency generator and fire pump engine's PTE is defined by assuming 500 hours per year operation[29]. Add-on controls are impractical given the intermittent operation of these sources. Other than maintenance and readiness testing, the emergency generators operate for emergency purposes only.

As discussed previously also in Section 4.4, the emergency generators (ES-C-PG2b, ES-C–PG2c, and ES-C-PG2d) are subject to §111 emissions standards as promulgated in NSPS Subpart IIII below:

NMHC + NOx = 6.4 g/kW-hr [4.77 g/hp-hr]
PM = 0.20 g/kW-hr [0.15 g/hp-hr]
CO = 3.5 g/kW-hr [2.60 g/hp-hr]

It should be noted that where a combined standard for VOCs and NOx (i.e., NMHC + NOx) is listed above with no individual standards for these pollutants, the apportionment may be considered as 95% NOx and 5% NMHC[30].

Although the emergency generator (ES-C-PG2a) is not subject to any NSPS, it is designed to meet the following federal Tier 1 standards for non-road diesel engines, as per the application:

NOx = 9.2 g/kW-hr [6.86 g/hp-hr]
VOC = 1.3 g/kW-hr [0.97 g/hp-hr]
PM = 0.54 g/kW-hr [0.40 g/hp-hr]
CO = 11.4 g/kW-hr [8.50 g/hp-hr]

All above particulate standards are based upon filterable portion only.

The remaining emergency generators (ES-C-PG1a and ES-C–PG1b) are not subject to any NSPS and as discussed in Section 4.4 above, their allowable emissions are based upon the applicable AP-42 emissions factors[31].

As per the AP-42, approximately 13.8 percent of total $PM_{2.5}$ emissions[32] are in the form of condensible particulates. Using the condensable emission rate of 0.0077 lb/million Btu and average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr for diesel fuel, the condensable particulates emission rate can be translated into 0.00005390 lb/hp-hr or 0.024 g/hp-hr.

Separately, all emergency generators (ES-C-PG1a, ES-C–PG1b, ES-C-PG2a, ES-C-PG2b, ES-C–PG2c, and ES-C-PG2d) listed above, are subject to §112 standards (NESHAP Subpart ZZZZ); however, none of these emergency generators are subject to any NESHAP requirements, except that emergency generators ES-C-PG2b, ES-C–PG2c, and ES-C-PG2d) are subject to initial notification requirements.

---

[29] Id. at 16.

[30] Bay Area Air Quality Management District Best Available Control Technology (BACT) Guideline for "IC Engine-Compression Ignition: Stationary Emergency, Non-Agricultural, Non-Direct Drive Fire Pump", Document No. 96.1.3, 12/22/2010. Available at http://www.baaqmd.gov/~/media/files/engineering/bact-tbact-workshop/combustion/96-1-3.pdf?la=en.

[31] Id. at 17.

[32] Considering condensable and filterable particulate (< 3 µm) emissions rates of 0.0077 lb/million Btu and 0.0479 lb/million Btu, respectively (Table 3.4-2, AP-42).

As defined, both the statutory and regulatory definitions of BACT require that the approved BACT cannot be less stringent than the applicable §111 and §112 standards.

The DAQ review of the RBLC database for emergency engines (generators) indicate that typically no add-on technology was identified for any triggered pollutants (i.e., $PM/PM_{10}/PM_{2.5}$, NOx, and VOC). The determinations also indicate the BACT were commonly based upon applicable NSPSs, other federal standards, and use of certified engines.

The DAQ agrees with the applicant that any consideration of add-on controls for the triggered pollutants will be impractical and infeasible, due to intermittent operation of Corning's emergency generators. The DAQ also believes that even if a particular technology may be found to be technically feasible, the technology's economic impact is likely to be unreasonable due to intermittent operations. Thus, the DAQ proposes the following BACTs for various pollutants for the emergency generators. They are at least as stringent as the applicable federal standards if the emergency generator is subject to either NSPS IIII or designed to meet the federal non-road diesel engine standards. Otherwise, the proposed BACT is based upon the AP-42 emissions factors. It should be noted that for $PM/PM_{10}/PM_{2.5}$, the DAQ proposes to establish BACT, considering both the filterable portion (at a level of applicable federal standard or AP-42 emission factor, as appropriate) and condensable portion (at a level of AP-42 emission factor), as discussed above.

$PM/PM_{10}/PM_{2.5}$

0.34 g/hp-hr[33] (ES-C-PG1a and ES-C-PG1b)
0.42 g/hp-hr (ES-C-PG2a)
0.17 g/hp-hr (ES-C-PG2b, ES-C-PG2c, and ES-C-PG2d)

NOx

10.9 g/hp-hr[34] (ES-C-PG1a and ES-C-PG1b)
6.86 g/hp-hr (ES-C-PG2a)
4.53 g/hp-hr (ES-C-PG2b, ES-C-PG2c, and ES-C-PG2d)

VOCs

0.32 g/hp-hr[35] (ES-C-PG1a and ES-C-PG1b)
0.97 g/hp-hr (ES-C-PG2a)
0.24 g/hp-hr (ES-C-PG2b, ES-C-PG2c, and ES-C-PG2d)

The averaging period for each of these proposed BACT limits is 3-run stack test average. However, no compliance verification will be required as most of the existing and new emergency engines are certified to meet the federal standards and the operation of each engine is intermittent and emergency nature.

6.5 Acrylate Coating Process (ID No. ES-C-ACP)

BACT Analysis for VOCs

The coatings have a VOC content, which results in fugitive VOC emissions due to the nature of the acrylate coating application process. Due to emissions being fugitive, which are not captured in a stack or vent, but, rather released inside the building itself. Therefore, the applicant argues that there is not a technically feasible way to control VOC emissions from this emission source. Moreover, the applicant states that a review of the RBLC database supports this and shows that there is not sufficient data for add-on controls for similar processes. Finally, existing operations at Corning use coatings with low VOC content, with the highest VOC coating being 5% (by weight), which

[33] Considering emissions rates of 0.000705 lb/hp-hr (filterable) and 0.0077 lb/million Btu (condensable), and average BSFC of 7,000 Btu/hp-hr for diesel fuel, Tables 3.4-1 and 3.4-2, AP-42.
[34] Equates to 0.024 lb/hp-hr, Table 3.4-1, AP-42.
[35] Equates to 0.000705 lb/hp-hr, Table 3.4-1, AP-42.

corresponds to a maximum emission rate of 26.7 tons per year. Corning is often pursuing different coating with different vendors, and therefore, it requests use of 10% (by weight) VOC content as BACT for this process.

The DAQ review of RBLC data indicate that typically use of low VOC coating is deemed BACT for various coating applications. The DAQ agrees with the applicant with regard to infeasibility of capturing fugitive VOCs released into the building; thus, its inability to install a permanent total enclosure (PTE) and route the emissions to a control device. Thus, the DAQ proposes to approve a BACT of 26.7 tons per consecutive 12-month period, with the use of low VOC content coating for the acrylate coating process. The Permittee will be required to calculate VOC emissions each month and roll them with the previous 11-months' emissions for ensuring compliance.

6.6 Soot Handling System, Silo 1 (ID No. ES-C-SHP1) with associated bin vent filter (ID No. CD-C-BH-3)

Soot Handling System, Silo 2 (ID No. ES-C-SHP2) with associated bin vent filter (ID No. CD-C-BH-4)

Soot Handling System, Bagging Operations (ID No. ES-C-SHP3) with associated bin vent filter (ID No. CD-C-BH-5)

BACT Analysis for PM/PM_{10}/$PM_{2.5}$

As stated in Section 4.6 above, PM emissions result from handling, unloading, and transfer of soot from soot storage silos. Emissions from these soot handling sources are controlled by dedicated state of the art baghouses with a control efficiency of 0.0018 gr/dscf. Thus, Corning has proposed use of baghouses on each of these sources as BACT.

Possible particulate add-on controls for soot handling equipment include ESPs, baghouses, and scrubbers. The DAQ review of RBLC database indicates that typically baghouses are utilized to control particulates from material handling and storage equipment. The DAQ believes that the applicant-proposed BACT (0.0018 grain/dscf) is a state-of-the art control level with the use of a baghouse and any further reduction in particulate emissions (i.e., beyond controlled by each baghouse) would likely exhibit unreasonable economic impact (for example, use of ESP, scrubber, or another baghouse in series) as remaining emissions are small. As previously noted, as per EPA, unrealistic options such as placing in series the same or similar control technology need not be to be considered.[36] In addition, energy or environmental impacts associated with any additional particulates control need to be considered (for example, significant energy use associated with operation of an ESP, ash disposal in a landfill with operation of ESP if cannot be sold for a beneficial use, significant amount of water (or other scrubbing liquid) use for a wet scrubber, or a need for wastewater treatment for scrubber wastewaters). Thus, after considering the economic, energy, and environmental impacts, the DAQ proposes to approve a BACT of 0.0018 grain/dscf for PM/PM_{10}/$PM_{2.5}$, as a 3-run stack test average, for all above soot handling and storage sources. The BACT applies during all periods of operation, including start-up, shut-down and malfunctions. No compliance verification will be required to demonstrate compliance with the above BACT as it is based on manufacturer's guaranteed removal efficiency.

6.7 Four natural gas-fired humidification boilers (ID Nos. ES-C-HB1a, ES-C-HB1b, ES-C-HB2a, and ES-C-HB2b)

BACT Analysis for PM/PM_{10}/$PM_{2.5}$, NOx, and VOCs

As included below in Table 6.7-1, small amounts of emissions for each triggered pollutant (i.e., PM/PM_{10}/$PM_{2.5}$, NOx, and VOC) are expected. The boilers are firing only natural gas, a clean fuel.

Table 6.7-1

Pollutant	ES-C-HB1a lbs/hr (tons/yr)	ES-C-HB1b lbs/hr (tons/yr)	ES-C-HB2a lbs/hr (tons/yr)	ES-C-HB2b lbs/hr (tons/yr)

[36] Id. at 26.

PM	0.002 (0.01)	0.002 (0.01)	0.004 (0.02)	0.004 (0.02)
PM-10	0.002 (0.01)	0.002 (0.01)	0.004 (0.02)	0.004 (0.02)
PM-2.5	0.002 (0.01)	0.002 (0.01)	0.004 (0.02)	0.004 (0.02)
NOx	0.486 (2.13)	0.486 (2.13)	0.81 (3.55)	0.81 (3.55)
VOC	0.03 (0.12)	0.03 (0.12)	0.045 (0.20)	0.045 (0.20)

The DAQ's findings of small natural gas-fired boilers (less than 10 million Btu/hr) indicates state/local agencies requiring use of low-NOx burners, clean fuels, or good combustion practices, as BACT, in various determinations. The DAQ believes that even if any add-on control equipment for any triggered pollutants is technically feasible, any add-on control method would likely exhibit unreasonable economic impact due to small amounts of emissions to be controlled, as above. In addition, energy or environmental impacts associated with any control method need to be considered and cannot be ignored (for example, significant energy use associated with operation of an ESP for controlling particulates emissions), ash disposal in a landfill with operation of ESP if cannot be sold for a beneficial use, significant energy cost with operation of thermal oxidizer (to control VOC emissions), or increased in NOx emissions from operation of thermal oxidizer).

The DAQ believes that establishing such a small numerical limit for each triggered pollutant (for example, 0.486 lb/hr for NOx for boiler ES-C-HB1a) and then, requiring a verification using stack testing, is impractical and onerous, considering the estimated cost of a few to several thousand dollars for each stack test for each pollutant and source. This cost is excessive given the statutory factors that must be considered for each BACT limit and therefore the DAQ – the permitting authority – concludes that imposing numerical limitations on these laydown processes for emissions of VOCs is not feasible.

Thus, DAQ proposes to establish good combustion control and use of natural gas as BACT for all triggered pollutants (PM/PM_{10}/$PM_{2.5}$, NOx, and VOC). The BACT applies during all periods of operation, including start-up, shut-down and malfunctions.

6.8 Miscellaneous maintenance and cleaning operations (ID No. ES-C-Cleaning)

As stated in Section 4.8 above, this activity involves application of non-photochemically reactive solvent (isopropyl alcohol (IPA)) for miscellaneous maintenance and cleaning operations. The PTE for VOCs is 22.8 tons/yr, which is based upon a potential usage rate of IPA and assumed 100 percent (mass based) volatility of this compound.

Due to these VOCs emissions being fugitive, and they are not captured in a stack or vent, but rather released inside the building itself, the applicant argues that there is not a technically feasible way to control VOC emissions from this emission source. Moreover, the applicant states a review of the RBLC database supports this conclusion and shows that there is not sufficient data for add-on controls for similar processes. Thus, Corning, proposes the work practice standards in 02D .0958, as BACT.

The DAQ review of RBLC data indicate good housekeeping practices, and use of low VOC adhesives, cleaners, and solvents, as typical BACT for plant cleaning operations. The DAQ agrees with the applicant with regard to infeasibility of capturing fugitive VOCs released into the building; thus, its inability to install a permanent total enclosure (PTE) or hood and route the emissions to any control device (e.g., carbon adsorption, thermal oxidizer). The DAQ proposes to approve a BACT of 22.8 tons per consecutive 12-month period, with the use of good housekeeping practices.

Good housekeeping practices include preventing formation of and controlling fugitive emissions, minimizing amounts of cleaners, use of water-based cleaners where practicable, and storing of all material, including waste material, containing volatile organic compounds in containers covered with a tightly fitting lid that is free of cracks, holes, or other defects, when not in use, cleaning up spills as soon as possible following proper safety procedures, and storing wipe rags in closed containers.

To demonstrate compliance with the above BACT, the Permittee will be required to calculate VOC emissions each month and roll them with the previous 11-months' emissions for ensuring compliance.

6.9 Fourteen house vacuums (ID Nos. IES-C-1 through IES-C-14)

One furnace gas treatment (ID No. IES-CF)

Six diesel generator fuel storage tanks (6,000 gallons capacity each) (ID Nos. IES-C-DGT1 through IES-C-DGT6)

Two fire pump diesel fuel storage tanks (300 gallons capacity each) (ID Nos. IES-C-FPDT1 and IES-C-FPDT2)

Two Diesel fuel-fired fire pumps (183 hp rating each) (ID Nos. IES-FP1 and IES-FP2)

Five glass cleaning processes (ID Nos. IES-C-GC1 through IES-C-GC5)

One maintenance paint spray booth with filter (ID No. IES-C-MFB)

Three maintenance solvent sinks (ID Nos. IES-C-MS1 through IES-C-MS3)

One die cleaning (ID No. IES-DC)

Four soot vacuums (ID Nos. IES-C-SV1 through IES-C-SV4)

Five cooling water tower units (ID No. IES-C-CWT1 through IES-C-CWT5)

Potential to emit for each of these emissions sources are small to negligible as included below in Table 6.9-1.

Table 6.9-1

Emission Source	**PM** tons/yr	**PM_{10}** tons/yr	**$PM_{2.5}$** tons/yr	**NOx** tons/yr	**VOC** tons/yr
House vacuums (ID No. IES-C-1 through IES-C-14), total	0.02	0.02	0.02	-	-
Furnace gas treatment (ID No. IES-CF)	-	-	-	-	-
Diesel generator and fire pump fuel storage tanks (ID Nos. IES-C-FPDT1, IES-C-FPDT2, and IES-C-DGT1 through IES-C-DGT6), total	-	-	-	-	0.00631
Diesel fuel-fired fire pumps (ID Nos. IES-FP1 and IES-FP2), total	0.20	0.20	0.20	2.84	0.23
Glass cleaning processes (ID Nos. IES-C-GC1 through IES-C-GC5), total	-	-	-	-	5.0
Maintenance paint spray booth with filter (ID No. IES-C-MFB)	-	-	-	-	0.70

Maintenance solvent sinks (ID Nos. IES-C-MS1 through IES-C-MS3), total	-	-	-	-	1.13
Die cleaning (ID No. IES-DC)	-	-	-	-	0.07
Soot vacuums (ID Nos. IES-C-SV1 through IES-C-SV4), total	0.11	0.11	0.11	-	-
Fiber stripper operation (ID No. IES-C-FS)	-	-	-	-	0.05
Cooling water tower units (ID No. IES-C-CWT1 through IES-C-CWT5), total	0.11	0.10	0	-	-

Due to small amounts of emissions, it would be infeasible to install any add-on controls on the sources. Even if, a particular technology is found to be feasible, the DAQ believes that the economic impact of that technology would likely be unreasonable. Thus, the DAQ proposes to approve good housekeeping / management practices and good combustion practices, as applicable, for the sources listed above as BACTs for all triggered pollutants ($PM/PM_{10}/PM_{2.5}$, NOx, and VOC).

Good housekeeping practices include preventing formation of and controlling fugitive emissions, minimizing amounts of cleaners, use of water-based cleaners where practicable, and storing of all material, including waste material, containing volatile organic compounds in containers covered with a tightly fitting lid that is free of cracks, holes, or other defects, when not in use, cleaning up spills as soon as possible following proper safety procedures, and storing wipe rags in closed containers. Good combustion practices include implementation of proper burner design and optimization of combustion air systems to achieve good combustion efficiency.

6.10 BACT Summary

The following Table 6.10-1 summarizes the DAQ proposed BACT for approval for all sources included in Section 6.1 through 6.9 above:

Table 6.10-1

EMISSION SOURCE	REGULATED NSR POLLUTANT	BACT	CONTROL DESCRIPTION
Optical Waveguide Laydown Processes			
ID Nos. ES-C-001 and ES-C-005	$PM/PM_{10}/PM_{2.5}$	0.0018 grain/dscf (filterable only) each, 3-run stack test average 0.00196 grain/dscf (both filterable and condensible) each, 3-run stack test average	Bagfilter
ID No. ES-C-002	$PM/PM_{10}/PM_{2.5}$	0.0018 grain/dscf (filterable only), 3-run stack test average 0.00186 grain/dscf (both filterable and condensible), 3-run stack test average	Bagfilter
ID Nos. ES-C-006 and ES-C-009	$PM/PM_{10}/PM_{2.5}$	0.0018 grain/dscf (filterable only) each, 3-run stack test average 0.00186 grain/dscf each (both filterable and condensible), 3-run stack test average	Bagfilter

EMISSION SOURCE	REGULATED NSR POLLUTANT	BACT	CONTROL DESCRIPTION
ID No. ES-C-009	$PM/PM_{10}/PM_{2.5}$	0.0018 grain/dscf (filterable only), 3-run stack test average 0.00190 grain/dscf (both filterable and condensible), 3-run stack test average	Bagfilter
ID No. ES-C-012	$PM/PM_{10}/PM_{2.5}$	0.0018 grain/dscf (filterable only), 3-run stack test average 0.00190 grain/dscf (both filterable and condensible), 3-run stack test average	Bagfilter
ID Nos. ES-C-001 and ES-C-005	NOx	7.4 lbs/hr each, 3-run stack test average	Oxy-firing
ID No. ES-C-002	NOx	76.0 lb/hr, 3-run stack test average	Oxy-firing
ID No. ES-C-006 and ES-C-012	NOx	45.6 lb/hr each, 3-run stack test average	Oxy-firing
ID No. ES-C-009	NOx	152.0 lb/hr, 3-run stack test average	Oxy-firing
ID Nos. ES-C-001, ES-C-002, ES-C-005, ES-C-006, ES-C-009, and ES-C-012	VOCs	Good combustion control* and use of natural gas	-
Glass Drying Operations			
ID Nos. ES-C-003, ES-C-011, and ES-C-014	$PM/PM_{10}/PM_{2.5}$	0.44 lb/hr (both filterable and condensible) each, 3-run stack test average	Packed Tower Scrubber
ID Nos. ES-C-007 and ES-C-010	$PM/PM_{10}/PM_{2.5}$	0.70 lb/hr (both filterable and condensible) each, 3-run stack test average	Packed Tower Scrubber
Miscellaneous Small Source Exhausts			
ID No. ES-C-004	$PM/PM_{10}/PM_{2.5}$	0.44 lb/hr (both filterable and condensible), 3-run stack test average	Wet Scrubber
Emergency Generators			
ID Nos. ES-C-PG1a and ES-C-PG1b	$PM/PM_{10}/PM_{2.5}$	0.34 g/HP-hr (both filterable and condensible) each, 3-run stack test average	-
ID No. ES-C-PG2a	$PM/PM_{10}/PM_{2.5}$	0.42 g/HP-hr (both filterable and condensible), 3-run stack test average	Use of Tier 1 Certified Engine
ID Nos. ES-C-PG2b, ES-C-PG2c, and ES-C-PG2d	$PM/PM_{10}/PM_{2.5}$	0.17 g/HP-hr (both filterable and condensible) each, 3-run stack test average	Use of Tier 2 Certified Engine
ID Nos. ES-C-PG1a and ES-C-PG1b	NOx	10.9 g/HP-hr each, 3-run stack test average	-
ID No. ES-C-PG2a	NOx	6.86 g/HP-hr, 3-run stack test average	Use of Tier 1 Certified Engine
ID Nos. ES-C-PG2b, ES-C-PG2c, and ES-C-PG2d	NOx	4.53 g/HP-hr each, 3-run stack test average	Use of Tier 2 Certified Engine
ID Nos. ES-C-PG1a and ES-C-PG1b	VOCs	0.32 g/HP-hr each, 3-run stack test average	-

EMISSION SOURCE	REGULATED NSR POLLUTANT	BACT	CONTROL DESCRIPTION
ID No. ES-C-PG2a	VOCs	0.97 g/HP-hr, 3-run stack test average	Use of Tier 1 Certified Engine
ID Nos. ES-C-PG2b, ES-C-PG2c, and ES-C-PG2d	VOCs	0.24 g/HP-hr each, 3-run stack test average	Use of Tier 2 Certified Engine
Acrylate Coating Process			
ID No. ES-C-ACP	VOCs	26.7 tons per consecutive 12-month period	Use of Low VOC Coating (less or equal to 10 percent by weight)
Soot Handling System			
ID No. ES-C-SHP1	$PM/PM_{10}/PM_{2.5}$	0.0018 grain/dscf (filterable only**), 3-run stack test average	Bagfilter
ID No. ES-C-SHP2	$PM/PM_{10}/PM_{2.5}$	0.0018 grain/dscf (filterable only**), 3-run stack test average	Bagfilter
ID No. ES-C-SHP3	$PM/PM_{10}/PM_{2.5}$	0.0018 grain/dscf (filterable only**), 3-run stack test average	Bagfilter
Boilers			
ID Nos. ES-C-HB1a, ES-C-HB1b, ES-C-HB2a, and ES-C-HB2b	$PM/PM_{10}/PM_{2.5}$	Good combustion control* and use of natural gas	-
ID Nos. ES-C-HB1a, ES-C-HB1b, ES-C-HB2a, and ES-C-HB2b	NOx	Good combustion control* and use of natural gas	-
ID Nos. ES-C-HB1a, ES-C-HB1b, ES-C-HB2a, and ES-C-HB2b	VOCs	Good combustion control* and use of natural gas	-
Miscellaneous Maintenance and Cleaning Operations			
ID No. ES-C-Cleaning	VOCs	22.8 tons per consecutive 12-month period	Good housekeeping practices***
Insignificant Activities			
ID Nos. IES-C-1 through IES-C-14	$PM/PM_{10}/PM_{2.5}$	Good housekeeping practices***	-
ID Nos. IES-C-DGT1 through IES-C-DGT6	VOCs	Good housekeeping practices***	-
ID Nos. IES-C-FPDT1 and IES-C-FPDT2	VOCs	Good housekeeping practices***	
ID Nos. IES-C-FP1 and IES-C-FP2	$PM/PM_{10}/PM_{2.5}$ NOx VOCs	Good combustion control*	-
ID Nos. IES-C-GC1 through IES-C-GC5	VOCs	Good housekeeping practices***	-
ID No. IES-C-MFB	VOCs	Good housekeeping practices***	-

EMISSION SOURCE	REGULATED NSR POLLUTANT	BACT	CONTROL DESCRIPTION
ID Nos. IES-C-MS1 through IES-C-MS3	VOCs	Good housekeeping practices***	-
ID No. IES-C-DC	VOCs	Good housekeeping practices***	-
ID Nos. IES-C-SV1 through IES-C-SV4	$PM/PM_{10}/PM_{2.5}$	Good housekeeping practices***	-
ID No. IES-C-FS	VOCs	Good housekeeping practices***	-
ID Nos. IES-C-CWT1 through IES-C-CWT5)	$PM/PM_{10}/PM_{2.5}$	Good operating practices	-

* Includes proper burner design and optimization of combustion air systems to achieve good combustion efficiency.

** Condensible particulates are not expected from the source.

*** Includes measures, as applicable, for preventing formation of and controlling fugitive emissions, minimizing amounts of cleaners, use of water-based cleaners where practicable, storing of all material, including waste material, containing volatile organic compounds in containers covered with a tightly fitting lid that is free of cracks, holes, or other defects, when not in use, cleaning up spills as soon as possible following proper safety procedures, and storing wipe rags in closed containers.

7.0 Air Quality Analysis

§51.166(m)(1) requires that the major modification application for a PSD permit include an analysis of the ambient air quality of the area where the source is located for any regulated NSR pollutant exceeding the significant net emissions increase. This analysis is called "pre-application analysis" (generally called the "preconstruction monitoring" requirement). For pollutants with NAAQS, the application must include 1 year of continuous monitoring data from the date of the receipt of the complete application. The permitting agency may accept ambient monitoring data for a shorter duration, but, data cannot be for less than 4 months. For pollutants for which no NAAQS exist, the permitting authority can require an analysis containing such data as it determines appropriate to assess the ambient air quality in the area in which the source is located.

§51.166(m)(2) includes that the owner or operator of a major modification shall, after construction of such modification, conduct such ambient monitoring, if the permitting authority determines to be necessary for determining the effect emissions from the stationary source or modification may have, or are having, on air quality in any area. This monitoring is called "post-construction monitoring".

However, §51.166(i)(5) includes that permitting authority may exempt any major modification from the requirements of §51.166(m), with respect to monitoring for a specific pollutant, if net emissions increase of the pollutant from a modification would cause, in any area, air quality impacts less than the following amounts:

Carbon monoxide - 575 ug/m^3, 8-hour average;
Nitrogen dioxide - 14 ug/m^3, annual average;
$PM_{2.5}$ - 0 $\mu g/m^3$, 24-hour average;
PM_{10} -10 $\mu g/m^3$, 24-hour average;
Sulfur dioxide - 13 ug/m^3, 24-hour average;
Lead - 0.1 $\mu g/m^3$, 3-month average.
Fluorides - 0.25 $\mu g/m^3$, 24-hour average;
Total reduced sulfur - 10 $\mu g/m^3$, 1-hour average
Hydrogen sulfide - 0.2 $\mu g/m^3$, 1-hour average; and
Reduced sulfur compounds - 10 $\mu g/m^3$, 1-hour average

The above concentration values are called "significant monitoring concentrations (SMC)".

In addition, for ozone, no *de minimis* air quality level (i.e., SMC) has been provided. As per EPA, any net emissions increase of 100 tons per year or more of volatile organic compounds or nitrogen oxides subject to PSD would be required to perform an ambient impact analysis, including the gathering of air quality data.

The same provision includes some more exemptions from this air quality analysis requirement (both "pre-construction monitoring" and "post-construction monitoring") for the source (i.e., applicant) as follows: If any regulated NSR pollutant is not listed with the associated impact level (i.e., SMC) or if the concentrations of the pollutant in the area that the major modification would affect is less than the associated SMC.

As stated above, this major modification review is for emissions of PM, PM_{10}, $PM_{2.5}$, NOx, and VOCs. Per Section 8.0 below, the predicted air quality impacts of project emissions for PM_{10} (annual) is less than the applicable SMC. Hence, no ambient monitoring (both pre- and post-construction) for PM_{10} is required for annual averaging period for this major modification. For NO_2 (annual average), PM_{10} (24-hour average only), and $PM_{2.5}$ (24-hour and annual averages), the associated project impacts are higher than the applicable SMCs. In the context of $PM_{2.5}$ and for other pollutants, the EPA has stated, "applicant[s] will generally be able to rely on existing representative monitoring data to satisfy monitoring data requirement [i.e. pre-construction monitoring]".[37] Finally, for ozone NAAQS, net significant emissions of NOx are greater than 100 tons per year. In summary, monitoring requirements (pre- and post-construction) may apply for emissions of NO_2, $PM_{2.,}$ and VOCs. Refer to Section 8.0 below for further details.

8.0 Source Impact Analysis

8.1 Class II Area Significant Impact Air Quality Modeling Analysis

As shown in Table 5.1-1 above, a significant impact analysis was conducted for those pollutants that require PSD review and that have established Class II Area Significant Impact Levels (SILs). They are PM_{10}, $PM_{2.5}$, and NOx. In addition, VOCs emissions have been evaluated under ozone impact. The modeling results were compared to the applicable Class II Area SILs as defined in the NSR Workshop Manual, NC DAQ memoranda, and EPA guidance to determine if a NAAQS and/or PSD Increment cumulative air quality impact analysis would be required for that pollutant.

The Class II SILs modeling was based on project allowable emission increases for all PSD pollutants showing emissions increases above the applicable SER. Facility emissions were modeled assuming one normal operating scenario. Emergency engine emissions were modeled using daily operation limits of 9am-5pm with one engine tested at any one time during this daily period. Note that the NO_2 SILs modeling utilized the EPA regulatory default Tier 2 method called the second version of the Ambient Ratio Method (i.e., ARM2) to account for NOx photochemical conversion to NO_2. The NO_2 emissions used for the 1-hour NO_2 SILs analysis were based on peak short-term emissions whereas the annual NO_2 SILs analysis relied on annual production assumptions. Table 8.1-1 below shows modeled project impacts from normal operations compared to Class II Area SILs for each pollutant and averaging period. As shown in Table 8.1-1 below, the maximum modeled impacts (i.e., highest-lst-high model design values) were above the applicable Class II Area SILs for NO_2, PM_{10}, and $PM_{2.5}$. Therefore, NO_2, PM_{10}, and $PM_{2.5}$ project emission impacts were evaluated under separate cumulative impact analyses for NAAQS and PSD Increments, as appropriate.

Table 8.1-1: Class II Area Significant Impact Results (μg/m^3)

Pollutant	Averaging Period	Project Maximum Model Impact	Class II SIL	% of Class II SIL
NO_2	1-hour	467.7	10	4677%
	Annual	27.3	1	2730%

[37] DC Circuit Court Decision on $PM_{2.5}$ Significant Impact Levels and Significant Monitoring Concentration, Questions and Answers, US EPA, OAQPS, March 4, 2013. Available at https://yosemite.epa.gov/oa/eab_web_docket.nsf/Attachments%20By%20ParentFilingId/48E22560DF49689685257CB70053AF8F/$FILE/EXHIBIT%2034%20-%20Q%26A%20shet%20on%20PM%20monitoring.pdf.

PM_{10}	24-hour	8.0	5	160%
	Annual	0.9	1	90%
$PM_{2.5}$	24-hour	4.3	1.2	358%
	Annual	0.9	0.2	450%

8.2 Class II Area NAAQS Cumulative Impact Modeling Analysis

A Class II Area NAAQS cumulative impact analysis was conducted for 1-hour and annual NO_2, 24-hour and annual $PM_{2.5}$, and 24-hour PM_{10}. The spatial extent of the cumulative impact analysis of each NAAQS pollutant and averaging period was based on receptor areas where project impacts were modeled above the SILs. These impacted receptor areas defined the project Significant Impact Area (SIA) for each pollutant and averaging period. The cumulative impact NAAQS analysis models included development of short-term and annual emissions scenarios, SIA receptors, nearby source inventories, representative background concentrations, and additional modeling refinements to address secondary $PM_{2.5}$ formation and NOx chemistry. Where the cumulative impact modeling results show impacts above the NAAQS, a culpability analysis was performed to determine whether project and existing facility source impacts would cause or contribute to modeled exceedances of the respective NAAQS.

Short-term (e.g., 1-hour and 24-hour) NAAQS modeling assumed Corning facility operating in normal mode and associated maximum short-term emission rates. Readiness testing emissions from all eight emergency engines were modeled with daily operating limits between 9 am to 5 pm and limited to one engine tested per day. Emergency engine emission rates were based on the maximum hourly rate multiplied by an operating factor of 20 minutes per 60-minute period given that readiness testing was assumed to last no longer than 20 minutes.

Annual NAAQS modeling assumed Corning facility normal operations and annual average emission rates for NOx based on annual production and batch processing assumptions. Therefore, annual average NOx emissions were less than the peak short-term NOx emissions modeled for the 1-hour NO_2 NAAQS demonstration. By contrast, $PM_{2.5}$ annual and 24-hour NAAQS modeling demonstrations used the same emission rates for all Corning emission units. $PM_{2.5}$ emissions were conservatively assumed to be equivalent to PM_{10} emission rates.

In general, nearby source inventories for NO_2, $PM_{2.5}$, and PM_{10} were developed from databases provided by NC DAQ and the Mecklenburg County Air Quality Commission (MCAQ); additional refinements to the inventories were developed from existing permits, relevant permit application materials for modifying facilities, and consultation with AQAB. Electronic spreadsheets submitted by Corning provide assumptions made for 20D screening, modeled emissions, source parameters, and permit references pertaining to any source emissions data refinements and changes. $PM_{2.5}$ emissions were conservatively assumed to equal PM_{10} emissions for nearby sources. In general, for nearby small or minor sources where emissions data were unavailable, Corning assumed 100 tpy emissions for 20D screening and modeling. Title V sources were assumed to emit 250 tpy where emissions data were unavailable or where PSD avoidance conditions were found from permit reviews, as appropriate. MCAQ provided actual emissions for sources included in the NAAQS modeling. Finally, refinements to NOx and PM emissions from several facilities were based on permit reviews, as provided in electronic spreadsheets from Corning.

NO_2 1-hour and Annual NAAQS Cumulative Analysis

The Class II Area NAAQS cumulative impact analysis for 1 -hour and annual NO_2 included modeling of facility-wide potential emissions under normal operations, a nearby source inventory as determined by the 20D screening approach and by receptor areas where Corning impacts were modeled above the 1-hour and annual NO_2 SILs, a single representative annual background NO_2 concentration, and AERMOD Tier 3 chemistry options (see Appendix W Section 4.2.3.4(e)) that address NOx to NO_2 conversion. EPA Region 4 reviewed and commented to NC DAQ on the Tier 3 approach proposed by Corning. Region 4 was provided the Tier 3 documentation along with the PSD application via email on February 14, 2019 and provided comments via email on March 12, 2019 indicating agreement with the Tier 3 methodologies proposed by Corning. However, Region 4 indicated they would prefer separate submittal (e.g., via email) of any Tier 3 modeling analysis package in the future to satisfy EPA regional consultation requirements under Appendix W. Details of the 1-hour and annual NO_2 Tier 3 modeling inputs are discussed in the following paragraphs.

The 1-hour NO_2 NAAQS analysis was spatially refined to include all sources and modeled receptors located within a 50-km radius (SIA) from the Corning project. This refinement is consistent with spatial application limitations of the AERMOD modeling system steady-state assumptions and 1-hour NO_2 transport and chemical transformation assumptions. As such, all permitted NOx sources located within the 50-km radius were included in the 1-hour NO_2 NAAQS nearby source inventory.

The annual NO_2 NAAQS analysis included nearby sources evaluated within a 50 km radius of Corning that could not be excluded based on the 20D screening approach. The annual NO_2 NAAQS SIA radius was determined in the SIL modeling as 6 km. All nearby sources were modeled with potential emissions as recorded in the most current NC DAQ emissions inventory database or as determined by permit review of allowable emission limits. Additional emissions inventories provided by the MCAQ and SC DHEC were evaluated for nearby sources. In all, the same 341-point sources were modeled in the 1-hour and annual NAAQS analyses. Facilities and associated sources were modeled with potential or permitted-allowable emissions scaled and assigned to each individual source according to the most-current actual emissions from each individual source. For example, a furnace with actual emissions of 64.69 tpy would be scaled to representative modeled potential emissions by dividing the 64.69 tpy by the facility-wide actual emissions total of 166.27 tpy and multiplying the scale value by the facility-wide potential emissions total of 508.26 tpy. Thus, the scaled potential emissions modeled for the example furnace would be 197.73 tpy which would then be converted to 45.14 lb/hr NOx for modeling based on 8760 hours/year operations.

The Tier 3 modeling approach for 1-hour and annual NO_2 followed all applicable EPA modeling guidelines. Corning selected the ozone limiting method (OLM) modeling option to refine 1-hour and annual NO_2 cumulative impacts predicted with AERMOD. OLM is a regulatory default Tier 3 modeling option available under the EPA-preferred AERMOD modeling system and is typically applied under conditions where there are multiple overlapping NOx plumes from facilities located in close proximity to one another such that impacts would be expected to combine and influence the NO_2 concentrations within the same modeling domain. Refinements to the OLM model option required development of an hourly ozone data file and NO_2/NOx in-stack ratio (ISR) data inputs for all modeled sources. The ozone data covers the 5-year period of analysis 2013-2017 and derives hourly ozone values from the monitoring stations located at Rockwell (Rowan County) and Garinger High School (Mecklenburg County). Ozone values missing for only one hour were filled using linear interpolation. Data missing for two hours or more were filled by direct substitution from the Garinger data or using a maximum value taken from the Rockwell dataset (i.e., 62 ppb or 121.7 ug/m^3). The ISR inputs for nearby sources greater than 1 km from the project assumed 0.2 NO_2/NOx, as per EPA Tier 3 guidance. The main processing stacks at Corning (i.e., EP-1, EP-2, and EP-3) used an ISR value of 0.05 based on stack tests. Emergency engines at Corning used an ISR value of 0.2 based on EPA guidance and the dehumidification boilers used the default ISR value of 0.5.

Representative background 1-hour and annual NO_2 concentrations were developed from Blackstone site (AQS Site ID 37-119-41) located in Lee county covering the period 2015-2017. The AQAB discussed available background concentration data with Trinity via emails exchanged on November 28 through December 3, 2018. The Blackstone data was deemed conservatively representative of the project site based on the monitoring station's similar rural locale and exposure to non-point sources. The 3-year dataset from Blackstone was reduced to the average annual 1-hour daily 7th high for the 1-hour NO_2 modeling demonstration (i.e., 8.13 ppb or 15.3 ug/m^3). The annual background design value was based on the most recent 2017 annual arithmetic mean concentration (i.e., 1.19 ppb or 2.24 ug/m^3). In summary, 1-hour and annual background concentrations were added to the modeled 1-hour and annual NO_2 concentrations predicted by AERMOD using OLM to determine cumulative impacts across the 5-year modeling period.

Model impacts using the OLM Tier 3 option from facility-wide and nearby source emissions were summed with NO_2 monitored background concentrations and then compared to the NAAQS to determine if there was a modeled violation of the 1-hour or annual NO_2 NAAQS. Results of the 1-hour and annual NO_2 NAAQS cumulative impact analyses are presented in Table 8.2-1 below. As shown, there were no modeled violations of the annual NO_2 NAAQS, however, the cumulative impacts from all sources and background 1-hour NO_2 concentrations show several modeled violations of the 1-hour NO_2 NAAQS. Therefore, a culpability analysis for 1-hour NO_2 modeled violations was conducted to demonstrate that the modeled impacts from Corning sources do not cause or significantly contribute (i.e., equal to or greater than the 1-hour NO_2 SIL) to any of the modeled violations of the NAAQS.

Table 8.2-1: NO_2 NAAQS Cumulative Impact Analysis Results (μg/m^3)

Pollutant	Averaging Period	Model Design Value Criteria	Model Concentration	Monitor Background Concentration	Total Concentration	NAAQS
NO_2	1-hour	Maximum 8th-highest Max Daily 1-hour Value Averaged Over 5 Years	373.13	15.30	**388.43**	**188**
	Annual	Maximum Annual Average of 5 Years	22.89	2.24	25.13	100

The culpability analysis was based on modeled violations of the 1-hour NO_2 NAAQS at 13 coarse-gridded receptors from the original receptor grid where the project emissions impacts were modeled above the 10 ug/m^3 SIL. Five hotspot receptor grids were centered over the 13 receptor locations where modeled violations occurred to improve concentration gradient resolution. Each hotspot grid used 100-meter spacing and were placed with a 1-km buffer over the areas where the coarse-gridded receptors were modeled above the 1-hour NO_2 NAAQS. The results of the culpability analysis using the hotspot grids is summarized in Table 8.2-2 below. As shown, there are no events (i.e., modeled times and receptor locations) where modeled violations coincided with Corning facility-wide impact contributions greater than or equal to the 1-hour NO_2 SIL. Modeled violations were analyzed for project contributions out to the 300th ranked model design value to verify that project impact contributions were below the SIL for each exceedance event, and thus, demonstrated to be insignificant. In summary, based on the culpability modeling demonstration, the Corning project and facility-wide impacts would neither contribute to nor cause a violation of the 1-hour NO_2 NAAQS.

Table 8.2-2: Culpability Analysis of 1-hour NO_2 Cumulative Impacts

Hotspot	Maximum Contribution from Corning (μg/m^3)	Maximum Nearby Source Inventory Contribution (μg/m^3)	Modeled Ranks Greater Than 188 μg/m^3 NAAQS
Concord Energy, LLC	2.3	1279.3	8th – 202nd
Hudson Brothers Trailer Mfg.	5.4	559.4	8th – 179th
Carolina Wood Products of Marshville	5.6	4407.6	8th – 281st
Anson County Waste Management	4.1	857.3	8th – 197th
Jordan Lumber Supply and Unilin Flooring	2.4	3204.6	8th – 278th

$PM_{2.5}$ 24-hour and Annual NAAQS Cumulative Analysis

The Class II Area NAAQS cumulative impact analysis for 24-hour and annual $PM_{2.5}$ included modeling of facility-wide allowable emissions from normal operations, a nearby source inventory as determined by the 20D screening approach and by receptor areas where Corning project impacts were modeled above the 24-hour and annual $PM_{2.5}$ SILs, representative background concentrations, and inclusion of secondary $PM_{2.5}$ formation impacts produced by NOx and SO_2 emissions. Details of the 24-hour and annual $PM_{2.5}$ modeling inputs are briefly discussed in the following paragraphs. $PM_{2.5}$ modeling results are summarized in Table 8.2-3 below. The model design concentrations for $PM_{2.5}$ were taken as the 5-year average of annual maximum 24-hour concentrations and 5-year average of the annual concentrations in accordance with the form of the $PM_{2.5}$ NAAQS and EPA $PM_{2.5}$ modeling guidance (Guidance for $PM_{2.5}$ Permit Modeling, May 2014, EPA-454/B14-001). As shown, project impacts do not cause or contribute to a violation of the 24-hour and annual $PM_{2.5}$ NAAQS.

Table 8.2-3: $PM_{2.5}$ NAAQS Cumulative Impact Analysis Results (µg/m³)

Pollutant	Averaging Period	Secondary $PM_{2.5}$ from NO_X and SO_2	Model Concentration	Monitor Background Concentration	Total Concentration	NAAQS
$PM_{2.5}$	24-hour	0.239	3.16	17.00	20.40	35
	Annual	0.009	1.03	8.50	9.54	12

Corning project emissions were modeled assuming normal operations with some daily operating restrictions for emergency engines readiness testing as previously discussed. $PM_{2.5}$ emissions were estimated to be equivalent to PM_{10} emissions for all Corning modeled sources.

Annual and 24-hour emissions impacts from secondary $PM_{2.5}$ formation were derived from project NOx and SO_2 emissions scaled according to emissions and secondarily formed $PM_{2.5}$ concentrations taken from appendix Tables A-2 and A-3 as provided in the US EPA draft Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier I Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program (December 2, 2016). Corning selected the hypothetical MERPs source located in Dinwiddie County, VA as the conservatively representative source for estimating project secondary $PM_{2.5}$ impacts from NOx and SO_2 emissions. Specifically, MERPs secondary $PM_{2.5}$ concentrations for 24-hour and annual averaging periods were derived from the selected MERPs source that was modeled with a low stack (20 m) and 500 tpy NOx and 500 tpy SO_2 emissions.

Competing, or "nearby", sources were included in the 24-hour and annual $PM_{2.5}$ NAAQS analysis based on the 20D screening approach. Similar to the NO_2 cumulative NAAQS modeling, all permitted $PM_{2.5}$ and PM_{10} sources located within a 50-km radius were screened for inclusion in the nearby source inventory. PM_{10} nearby sources were assumed to emit 100% of PM_{10} emissions as $PM_{2.5}$ where $PM_{2.5}$ records were unavailable. All nearby sources were modeled with potential emissions as recorded in the most current NC DAQ emissions inventory database and additional emissions inventories provided by SCDHEC and MCAQ. Otherwise, emissions were refined according to enforceable permit allowable emission rates as determined from permit reviews. In all, only two facilities and associated emission units were included in the $PM_{2.5}$ 24-hour and annual nearby source emission inventories.

Background 24-hour and annual $PM_{2.5}$ concentrations were taken from the 2015-2017 dataset compiled from the Garinger High School (Site ID: 37-119-0041) located in Charlotte, Mecklenburg County, NC. $PM_{2.5}$ data from this site is conservatively representative based on its proximity to the Corning facility and the monitoring station neighborhood scale and suburban exposure.

A hotspot grid analysis was not necessary to capture and resolve $PM_{2.5}$ maximum impact concentration gradients. The 24-hour and annual SIAs were limited to approximately 1.3 km and 1.2 km, respectively, and therefore, the receptor grids from the SILs analysis located immediately beyond the Corning fence line were deemed adequate for demonstrating that the cumulative impacts from the project and nearby sources would neither cause nor contribute to a violation of the 24-hour and annual $PM_{2.5}$ NAAQS.

PM_{10} 24-hour NAAQS Cumulative Impact Analysis

The Class II Area NAAQS cumulative impact analysis for 24-hour PM_{10} included modeling of facility-wide allowable emissions from normal operations, a nearby source inventory as determined by the 20D screening approach and by receptor areas where Corning impacts were modeled above the 24-hour PM_{10} SIL, and a representative background concentration. Details of the 24-hour PM_{10} modeling inputs are briefly discussed in the following paragraphs. Cumulative PM_{10} modeling results are summarized in Table 8.2-4 below. The model design concentration was based on the highest second highest 24-hour concentration from each of the five years modeled in accordance with the form of the PM_{10} NAAQS. As shown, cumulative impacts do not cause or contribute to a violation of the PM_{10} NAAQS.

Table 8.2-4: PM_{10} NAAQS Cumulative Impact Analysis Results (µg/m³)

Pollutant	Averaging Period	Model Concentration	Monitor Background Concentration	Total Concentration	NAAQS

PM_{10}	24-hour	5.26	42.0	47.26	150

The PM_{10} NAAQS cumulative impact analysis used identical nearby source inventory and modeling assumptions as discussed previously for the $PM_{2.5}$ NAAQS analysis with exception to the secondary $PM_{2.5}$ impacts from NOx and SO_2.

Background 24-hour PM_{10} concentrations were taken from the 2015-2017 dataset compiled from the Garinger High School (Site ID: 37-119-0041) located in Charlotte, Mecklenburg County, NC. PM_{10} data from this site is conservatively representative based on its proximity to the Corning facility and the monitoring station neighborhood scale and suburban exposure.

A hotspot grid analysis was not necessary to capture and resolve PM_{10} maximum impact concentration gradients. The 24-hour PM_{10} SIA was limited to approximately 1.0 km; therefore, the receptor grids from the SILs analysis located immediately beyond the Corning fence-line were deemed adequate for demonstrating that the cumulative impacts from the project and nearby sources would neither cause nor contribute to a violation of the 24-hour PM_{10} NAAQS.

Class II Area PSD Increment Cumulative Modeling Analysis

Based on the results of the SILs analysis and a 6 km SIA for annual NO_2, a Class II Area PSD Increment cumulative impact analysis was conducted to evaluate increment consumption in Cabarrus, Union, Mecklenburg, and Stanly Counties for annual NO_2. Given the smaller SIAs from $PM_{2.5}$ and PM_{10} SILs analyses (i.e., < 1.3 km), only Cabarrus County impacts were evaluated for 24-hour and annual $PM_{2.5}$ and 24-hour PM_{10} increment consumption. The PM_{10} minor source baseline date for Cabarrus County was set on July 3, 1978. There is currently no PM2. 5 minor source baseline date set for Cabarrus County. Therefore, the $PM_{2.5}$ minor source baseline date will be January 30, 2019 (the date of receipt of complete PSD application), based on the letter dated February 25, 2019 and sent from NC DAQ to Corning confirming that the Corning PSD application was complete. The NO_2 minor source baseline dates for Stanly County was set April 28, 2009. NO_2 minor source baseline dates have not been set for Cabarrus and Union Counties. As such, the NO_2 minor source baseline date will become the same as that used for $PM_{2.5}$ (i.e., January 30, 2019). The minor source baseline date for Mecklenburg County is unknown. In any case, Corning modeled nearby source increment emissions with the same potential or permit allowable emissions from nearby sources represented in the NAAQS analysis. This conservatively assumes that all nearby source emissions (i.e., from major and minor sources) consume increment, and therefore, effectively serves as a screening approach to demonstrating compliance with the PSD increments. The PSD Increment cumulative impact modeling analysis included Corning facility operating in normal operations scenarios, SIA receptors, nearby source inventories, increment consuming emission rates, and additional modeling refinements to address secondary $PM_{2.5}$ formation and NOx chemistry.

Increment consuming and expanding emissions and nearby source inventories for NO_2, $PM_{2.5}$, and PM_{10} were developed from databases provided by NC DAQ and from permit reviews done by Corning. With exception to the $PM_{2.5}$ emission inventory for Corning sources, all nearby sources and Corning emissions were modeled at potential or permit allowable rates and were assumed to consume increment. Thus, the same emissions were modeled for both the NAAQS and PSD increment analyses. Corning refined increment consuming emissions for $PM_{2.5}$ represent only those project emissions increases occurring after the $PM_{2.5}$ major source baseline date (October 20, 2010).

The NOx chemistry refinements (i.e., OLM and ISRs) employed for the annual NO_2 increment analysis were identical to those employed for the annual NO_2 NAAQS analysis, as previously discussed. Corning normal operations emissions assumptions were also identical to the annual NO_2 NAAQS analysis. Given that the annual NO_2 impacts were modeled at 91% of the available increment, and annual allowable emissions modeled were based on annual operating assumptions and restrictions for the various waveguide batch production configurations and utilization rates at the facility, in accordance with section 8.2 and Table 8-2 of Appendix W, the modeled NOx emission rates require supporting permit conditions or other enforceable methods of compliance (e.g., monitoring, recordkeeping, etc.) to demonstrate that the annual NO_2 increment will not be exceeded. These supporting methods of compliance could also be used to calculate more representative actual emissions increases to further refine the annual NO_2 increment consumption and increment capacities in the surrounding baseline areas (i.e., counties). In all, increment consuming nearby source NOx emissions were modeled for a total of 88 facilities with a total of 351 individual point sources.

The $PM_{2.5}$ and PM_{10} increment nearby source inventories included the same facilities and sources from the NAAQS analysis. Altogether, the $PM_{2.5}$ and PM_{10} increment analysis nearby source inventories included three facilities with a total of 76-point sources.

Table 8.2-5 below shows the modeling results from the PSD increment cumulative impact analysis for NO_2, $PM_{2.5}$, and PM1o. As shown, a culpability analysis was not required. Therefore, the PSD Increment cumulative impact analysis demonstrated that Corning project impacts would not cause or contribute to a violation of the Class II Area PSD Increments.

Table 8.2-5: Class II PSD Increment Cumulative Impact Analysis Results (µg/m^3)

Pollutant	Averaging Period	Model Concentration	Secondary $PM_{2.5}$ Contribution	Total Concentration	PSD Increment
NO_2	Annual	22.9	--	22.9	25
$PM_{2.5}$	24-hour	3.046	0.239	3.29	9
	Annual	0.718	0.009	0.727	4
PM_{10}	24-hour	5.26	--	5.26	30
	Annual	N/A	--	N/A	17

Class II Area Tier 1 Screening Analysis for Ozone Precursors

A Tier 1 screening analysis was conducted to evaluate project NOx and VOC emissions impacts on secondary formation of ozone in Class II areas. The screening analysis was based on representative ozone monitoring data paired with conservative ozone modeling data taken from Appendix A of EPA's draft Guidance on the Development of Modeled Emission Rates for Precursors (MERPs) as a Tier I Demonstration Tool for Ozone and $PM_{2.5}$ under the PSD Permitting Program (December 2, 2016). This Tier I screening approach is consistent with Section 5.3.2(b) of Appendix W. A representative 8-hour ozone design value of 64 ppb was calculated from the Rockwell monitoring station (Rowan County) located approximately 50 km north of the project covering the period 2015-2017. The 64-ppb ozone design value was added to the estimated secondary formation impacts from the Corning project NOx and VOC emissions. NOx and VOC project emissions impacts on ozone formation were scaled according to the conservatively representative MERPs hypothetical source located in Dinwiddie County, Virginia. Ozone values for NOx and VOC emissions were based on the 500-tpy, low-release hypothetical source showing modeled ozone impacts of 2.00 ppb and 0.06 ppb, respectively. These ozone impacts from the MERPs modeling were scaled to Corning project emissions as follows:

Ozone from Corning NOx Emissions = (2.00 ppb) x (917.9 tpy NOx) / (500 tpy) = 3.672 ppb
Ozone from Corning VOC Emissions = (0.06 ppb) x (61.4 tpy VOC) / (500 tpy) = 0.007 ppb

Combining the scaled modeled ozone concentrations with the Rockwell ozone design concentration results in a total 8-hour ozone concentration of 67.68 ppb. Therefore, impacts from project NOx and VOC emissions are not expected to cause or contribute to a violation of the 8-hour ozone NAAQS.

TSP State Ambient Air Quality Standard Impact Analysis

The Total suspended particulate (TSP) impact determination below is not a requirement of NC's SIP-approved PSD program.

TSP project emissions were estimated above the SER of 25 tpy as specified under 40 CFR 51.166(b)(23). While the TSP NAAQS was revised in 1987 to narrow focus on the regulation of PM_{10}, North Carolina State Ambient Air Quality Standards (SAAQS) currently still require evaluation of TSP separately in accordance with 15A NCAC 02D .0403. As such, Corning modeled facility-wide TSP project emissions using AERMOD and the same model setup as the TAPs modeling analyses to demonstrate that project impacts were below the 24-hour and annual TSP SAAQS.

Table 8.2-6 below shows the results of the modeling analyses and that the modified facility-wide emissions impacts will not cause or contribute to a violation of the TSP SAAQS. Maximum TSP modeled impacts were based on the normal operation scenario.

Table 8.2-6: TSP SAAQS Analysis Results (μg/m^3)

Pollutant	Averaging Period	SAAQS	Modeled Impacts as % of SAAQS
TSP	24-hour	150	3.5 %
	Annual	75	1.3 %

9.0 Additional Impact Analysis

The additional impacts analysis was conducted for ozone, population and infrastructure growth, soils and vegetation, and visibility impairment.

Ozone Impact Analysis

The project VOC emissions of 61.4 tons per year and NOx emissions of 917.9 tons per year exceed the ozone SERs of 40 tons per year applicable to both VOCs and NOx as specified in 40 CFR Part 51.166(b)(23)(i). Therefore, project VOC and NOx emissions impacts on ambient ozone levels were analyzed and assessed using the MERPs screening approach. MERPs screening for secondary ozone formation is discussed previously in Section 8.2 above and shows project impacts do not cause or contribute to a violation of the 8-hour Ozone NAAQS.

Population and Infrastructure Growth Impacts

No secondary growth is proposed for the project.

Soil and Vegetation

The project impacts on soils and vegetation was analyzed by comparing the maximum modeled concentrations to secondary NAAQS and screening thresholds recommended in EPA's "A Screening Procedure for Impacts of Air Pollution Sources on Plants, Soils and Animals" (EPA 450/2-81-078). The modeled concentrations from the Class II significant impact analysis were well below the secondary NAAQS and screening thresholds. Therefore, little or no significant impacts are anticipated from the project to soils and/or vegetation.

Class II Area Visibility Impact Analysis

No visibility analysis was conducted based on significant impacts from particulate emissions contained within the 1.3 km SIA modeled for $PM_{2.5}$. No state parks or other receptors sensitive to plume blight were located within the SIA, and therefore, no Class II Area visibility analysis was conducted.

10.0 Class I Area Impact Analysis and Air Quality-Related Values (AQRV) Analysis

10.1 Class I Area Significant Impact Air Quality Modeling Analysis

A significant impact screening analysis was conducted for the pollutants shown in Table 10.1-1 below that require Class I Area PSD increment analysis and that have established Class I Area SIL. The modeling results were compared to the applicable Class I Area SIL as defined in the NSR Workshop Manual and EPA guidance to determine if a Class I Area PSD Increment cumulative impact air quality analysis would be required for a regulated NSR pollutant. Project emissions from normal operations and 9 am-5 pm restrictions on emergency engines readiness testing one-at-a-time were modeled to screen for Class I Area impacts.

Comments received from EPA Region 4 via email on March 12, 2019 were forwarded to Trinity Consultants (representing Corning Inc.) for consideration. One comment from Region 4 requested that secondary $PM_{2.5}$ formation from NOx and SO_2 emissions be addressed in the Class I SILs analysis. Thereafter, Trinity responded via email on March 21, 2019 with an updated Class I SILs analysis for 24-hour and annual $PM_{2.5}$ impacts that adequately addressed Region 4 comments.

Most of the secondary $PM_{2.5}$ formation assumptions were the same as those used for the Class II NAAQS analysis (i.e., Dinwiddie County hypothetical source, 500 tpy NOx or SO_2 low level release). However, maximum secondary impacts from NOx and SO_2 were estimated at 100 km to provide more spatially refined estimates of project impacts at Class I areas located greater than 100 km from the Corning facility. AERMOD was selected to screen for modeled impacts at 50 km in all directions around the facility, consistent with screening methodology outlined in EPA guidance released with revisions to Appendix W in January 2017.

The annual NO_2 Class I SILs analysis used modeling emissions, parameters and NOx chemistry assumptions identical to the NO_2 Class II NAAQS analysis (i.e., OLM, ISRs, hourly ozone, etc.).

As shown in Table 10.1-1 below, and with exception to annual NO_2 impacts, annual and 24-hour PM_{10} and total $PM_{2.5}$ modeled impacts were below Class I SILs at 50 km. Corning provided a qualitative argument to demonstrate the annual NO_2 Class I increment would not be significantly impacted (see Corning PSD Application Section 6.8. 1.2): "There were a few receptors with modeled concentrations in excess of the annual NO_2 Class I SIL at a distance of 50 km. However, as shown in Figure D-9 of Appendix D, those receptors are in the northern wind sector, in the general direction of the James River Face Wilderness Area. Since James River Face is 277 km away from the Corning facility, there would not be any significant impacts expected at James River Face given the impact predicted in the conservative AERMOD model at a distance of only 50 km." As demonstrated by the model results summarized in Table 10.1-1 and discussed qualitatively by Corning, project impacts are not expected to cause or contribute to a violation of Class I Area PSD Increments.

Table 10.1-1: 50-km Class I Area Significant Impact Analysis Results (μg/m^3)

Pollutant	Averaging Period	Project Maximum Impact at 50 km	Secondary $PM_{2.5}$ Contribution at 100 km	Class I SILs	% of Class I SILs
NO_2	Annual	0.182	--	0.1	182 %
PM_{10}	24-hour	0.145	--	0.32	45 %
	Annual	0.007	--	0.2	4 %
$PM_{2.5}$	24-hour	0.145	0.069	0.27	54 %
	Annual	0.007	0.002	0.05	14 %

Air Quality Related Values (AQRVs) Visibility and Deposition Impact Analysis

The project includes significant emissions of pollutants with established Class I Area visibility and deposition impact thresholds, also known as Air Quality Related Values (AQRVs). AQRV pollutants from the project include NOx, SO_2, and PM_{10}. The project is also located within 300 km from the nearest Class I Area. Therefore, analysis of project impacts on Class I Area AQRVs was required.

Federal Land Managers (FLMs) were notified of the PSD project following the pre-application meeting held on October 22, 2018 at NCDEQ Headquarters in Raleigh. Notification of the PSD project was transmitted via email from NCDAQ on February 1, 2019 to FLM representatives of the U.S. Fish and Wildlife Service (FWS), U.S. Forest Service (FS), and the National Parks Service (NFS). No comments or further requests from the FLMs have been received by NC DAQ since the email notification.

Corning evaluated AQRV impacts based on screening guidance from the 2010 Federal Land Managers' (FLM) air quality related values work group (FLAG): phase I report. Under this guidance, impacts are screened by dividing the total annualized maximum 24-hour emission increases (tpy) by the project distance (km) to the closest Class I Area.

The annualized 24-hour emission increases include the sum of all AQRV pollutants, i.e., NOx, SO_2, PM_{10}, and H_2SO_4, as appropriate. The closest Class I area to the project was determined to be the Linville Gorge Wilderness, located 139 km northwest of the facility. Accordingly, the AQRV emissions increase (Q) divided by the distance to Linville Gorge Wilderness (D) was calculated as: 556 tpy / 139 km = 4.00. The 2010 FLAG guidance indicates that a Q/D value of 10 or less demonstrates project emissions will have negligible impacts with respect to Class I AQRVs. Therefore, the Corning project emissions evaluated under this PSD review are expected to have negligible impacts with respect to Class I AQRVs at the Linville Gorge Wilderness, and other Class I areas located farther away.

11.0 Facility Wide Air Toxics and State Ambient Air Quality Standards

The air toxics dispersion modeling analysis was conducted to evaluate ambient impacts from those toxic air pollutants (TAPs), whose facility-wide actual emissions exceeded applicable toxic air pollutant emission rates (TPERs) in 15A NCAC 02Q .0711. The modeling of maximum-allowable TAPs emissions adequately demonstrates compliance with Acceptable Ambient Levels (AALs) outlined in 15A NCAC 02D. 1104, on a source-by-source basis, for chlorine (Cl) and hydrogen chloride (HCl). The modeled emission rates and resulting impacts as a percentage of AALs are presented in Table 11.0-1 and 11.0-2, respectively, below.

Table 11.0-1 Emissions Limits Modeled

Stack ID No.	Emission Source ID No.	Emission Limits		
		Hydrogen Chloride (7647-01-0)	Chlorine (7782-50-5)	
		lb/hr	lb/hr	lb/day
EP-C-01	ES-C-003 ES-C-004	1.25	2.27	54.54
EP-C-02	ES-C-001 ES-C-005 ES-C-007 ES-C-010 ES-C-011 ES-C-014	6.46	6.08	145.92

Table 11.0-2 Maximum Modeled Air Toxics Impacts

Pollutant	Averaging Period	AAL (µg/m^3)	Maximum Modeled Impacts % of AAL
Chlorine	1-hour	900	0.96 %
	24-hour	37.5	9.17 %
Hydrogen Chloride	1-hour	700	1.31 %

Facility-wide TAP emissions modeled for the proposed project are the result of various metal halides oxidized in a natural gas flame in the optical waveguide process (exhausted to baghouses and scrubbers), glass drying (exhausted to baghouses and scrubbers), and miscellaneous small source exhausts. A combination of these process and combustion emissions are exhausted through one of two vertical stacks modeled as point sources (i.e., stack IDs EP1 and EP2). Modeled TAPs emissions' impacts were estimated assuming 8,760 hours per year facility operations. Facility sources (such as boilers and emergency generators) subject to requirements under 40 CFR Part 63 were excluded by Corning from the TPER analysis and modeling analysis based on NC toxics exemptions allowed under 15A NCAC 02D .0702.

AERMOD (version 18081), including five years (2013-2017) of Charlotte Douglass International Airport meteorological data (surface) and Greensboro Airport vertical profile data (upper air), was used to evaluate impacts in both simple and complex terrain. Direction-specific building downwash parameters, calculated using EPA's BPIP-PRIME program (04274), were used as input to AERMOD to determine building downwash effects on plume rise and effects on entrainment of stack emissions into the cavity and turbulent wake zones downwind of existing buildings. The building downwash analysis included 31 buildings in all. Receptors were modeled around the facility's property line at 25-meter intervals. A single receptor grid was modeled starting from the property line out to 2 km with 100-meter spacing. Building, source, and receptor elevations and receptor dividing streamline heights were calculated from 1-arc-second resolution USGS NED terrain data using the AERMOD terrain pre-processor AERMAP (version 18081). All model buildings, sources, and receptors were geo-located within the Universal Transverse Mercator (UTM) Zone 17 coordinate system based on the North American Datum of 1983 (NAD83).

It should be noted that NC's air toxics program is a risk-based program to protect human health. Even though some sources located at the Corning facility (e.g., boilers or engines subject to Part 63 Standards in 40 CFR) are exempt from air toxics program per 02Q .0702, the Director of DAQ is required to conduct an analysis of unacceptable risk to human health by determining total impact of emissions after incorporating emissions of exempt sources with the non-exempt sources.

DAQ's analysis of unacceptable risk to human health indicates that facility-wide emissions of only benzene (in addition to chlorine and hydrochloric acid as above) at a rate of 46 lbs/yr will exceed the applicable TPER of 8.1 lb/yr. Based on 0.000661 g/s (46 lb/yr converted in gm/sec using 8760 hours of operation) of benzene emissions, AERSCREEN model conservatively predicts an impact of 0.01977 ug/m^3 on an annual basis, less than the applicable AAL of 0.12 ug/m^3. Thus, DAQ believes that no unacceptable risk to human health exists for benzene, after considering the emissions of exempt sources.

Lastly, it should be noted that the revised permit will include a procedural requirement under 02Q.0711 for facility wide emissions of benzene, dichlorobenzene, formaldehyde, hexane, and toluene.

12.0 Facility Emissions Review

The first page of this application review includes facility-wide actual emissions, as reported to DAQ for calendar year 2013-2018. Potential to emit for regulated NSR pollutants is included in Section 3.3 above.

13.0 Public Notice/EPA and Affected State(s) Review

This permit application processing is conforming to the public participation requirements, pursuant to both 15A NCAC 02D .0530 "Prevention of Significant Deterioration" and 15A NCAC 02Q .0500 "Title V Procedures".

Satisfying the PSD requirements, a public notice (See Appendix A) for the availability of the preliminary determination and the draft Title V will be published in a local newspaper of general circulation for 30 days for review and comments on xx. A copy of the public notice will be provided to the EPA, and all local and state authorities having authority over the location at which the proposed modification is to be constructed. Finally, all documents will be placed on the DEQ website and a complete administrative record for the draft permit documents will be kept for public review at the DEQ's Mooresville Regional Office for the entire public notice period (30 days). Appendix B includes listing of both the entities and the documents to be sent to each listed entity for the proposed PSD major modification, satisfying the requirements in §51.166(q) "public participation".

With respect to Title V procedures for public participation, the above public participation requirement under PSD through noticing in a newspaper of general circulation would meet the Title V requirement. In addition, pursuant to 15A NCAC 02Q .0521, a notice of the DRAFT Title V Permit will be placed on NCDEQ website on xx. The notice will provide for a 30-day comment period with an opportunity for a public hearing. Copies of the public notice will be sent to persons on the Title V mailing list and EPA on xx. Pursuant to 15A NCAC 02Q .0522, a copy of the permit application and the proposed permit (in this case, the draft permit) will be provided to EPA for their 45-day review on xx. Also pursuant to 02Q .0522, a notice of the DRAFT Title V Permit will be provided to each affected State at or before the time notice provided to the public under 02Q .0521 above. A copy of the final permit will also be provided to the EPA upon issuance as per 02Q .0522.

14.0 Stipulation Review

The following changes (Table 14.0-1) were made to the Corning Incorporated, Midland, NC, Air Quality Permit No. 08436T20:

Table 14.0-1

Old Page No. Air Quality Permit No. 08436T20	**New Page No.** Air Quality Permit No. 08436T21	**Condition Number**	**Changes**
Cover Letter Attachment	Cover Letter Attachment	Insignificant Activity List	Revise the list to remove flame gas cut-off exhaust (IES-C-FC2), glass cleaning process (IES-C-GC5), and two soot vacuums (IES-C-SV5 and IES-C-SV6). Add to the list house vacuum (IES-C-14), diesel generator storage tank (IES-C-DGT6), fiber stripper operation (IES-C-FS), and five cooling tower units (IES-C-CWT1 through IES-C-CWt5). Label all insignificant activities as PSD subject sources except IES-CF. Label diesel fired pumps (IES-C-FP1 and IES-C-FP2) as MACT subject sources.
3	3	Section 1 Table	Include new sources (ES-C-012, ES-C-014, ES-C-PG2d, and ES-C-Cleaning). Label all sources PSD subject. Label source ES-C-012 RACT subject and source ES-C-PG2d as both NSPS IIII and MACT ZZZZ subject.
6	5	Section 2.1. A. Section 2.1.A. Table	Include new source ES-C-012. Clearly include all applicable requirements.
7, 8	6, 7	Section 2.1.A.1. and 2.	Include applicability for new source ES-C-012.
8	7	Section 2.1.A.3.a. and c.	Include applicability for new source ES-C-012. Revise the visible monitoring requirement to require reestablishment of "normal" for all existing optical waveguide processes within 30 days of commencement of operation of new source ES-C-012. Require establishment of normal for new source ES-C-012 within 30 days of commencement of operation.
10	9	Section 2.1.A.5.	Revise this requirement to include all provisions of RACT for new source ES-C-012.
10 11	10 10	Section 2.1.B Section 2.1.B. Table	Include new source ES-C-014. Clearly include all applicable requirements.
11 12	10 11	Section 2.1.B.1. and 2.	Include applicability for new source ES-C-014.
12	11	Section 2.1.B.2.c.	Include establishment of "normal" emissions for new source ES-C-014 within 30 days of its commencement.
13	12	Section 2.1.C. Table	Clearly include all applicable requirements.
14 14	13 13	Section 2.1.D. Section 2.1.D. Table	Include new source ES-C-PG2d. Clearly include all applicable requirements.
15	14	Section 2.1.D.2.	Include applicability for new source ES-C-PG2d.
15	14	Section 2.1.D.3.	Include applicability for new source ES-C-PG2d. Clearly include all applicable requirements for NSPS IIII for affected units.
18	18	Section 2.1.D.4.	Include applicability for new source ES-C-PG2d.
19 19	18 19	Section 2.1.E. Section 2.1.E Table	Include new source ES-C-Cleaning. Clearly include all applicable requirements.
21	20	Section 2.1.F. Table	Clearly include all applicable requirements.
23	22	Section 2.1.G. Table	Clearly include all applicable requirements.
29	27	Section 2.2.A	Include all existing and new optical waveguide

Old Page No. Air Quality Permit No. 08436T20	**New Page No.** Air Quality Permit No. 08436T21	**Condition Number**	**Changes**
NA	28	Section 2.2.A. Table	processes, all existing and new glass drying operations, and existing miscellaneous small exhausts source. Include applicability of 02D .1100.
30	29	Section 2.2.A.1.b.	Include a stack testing requirement to verify the approved emissions limits for chlorine and HCl. Require, as applicable, revisions to the liquid injection rate for each scrubber, included in Section 1 Table, after DAQ approval of stack test results.
30	-	Section 2.2.A.1.f.	Remove this requirement – MRO agreed to remove it.
32	31	Section 2.2.A.1.j.	Remove identification of instances of all deviations for this state-only (air toxics) requirement. It may be okay to require a semi-annual reporting for this state-only requirement. But, it is not okay to require identification of instances of all deviations for this air toxics requirement. The state regulation does not simply include this kind of provision.
38	-	Section 2.2.G.1	Remove applicability of 02Q .0504 for the previously approved changes requiring a 2nd step application using the significant modification process. This PSD application supersedes the changes included in the 2nd step application as the content of that application is dated; thus, there is no need to continue requiring a 2nd step application. Thus, the separately submitted 2nd step significant modification application's processing is not required, and it will simply be consolidated into the PSD application for administrative purpose without any processing.
31	32	Section 2.2.B. Table	Include applicability of 02D .0530 and .1806, and 02Q .0711.
NA	30 through 37	Section 2.2.B.1.	Include this new requirement for PSD.
31	37	Section 2.2.B.2.	Renumber this odor requirement as Section 2.2.B.2.
NA	38	Section 2.2.B.3.	Include this new requirement under 02Q .0711.
31 through 38	-	Sections 2.2.C., D., E., F., and G.	Remove these Sections in entirety, as they are non-applicable now with the processing of the PSD application.
38	38	Section 2.3.A.1.	Include a non-compliance statement as §112(r) is an applicable requirement under Part 70.

15.0 Conclusions, Comments, and Recommendations

- The application discussed in this review involves new and existing emission sources, and existing control equipment. The facility has provided professional engineer (PE) seal, pursuant to 02Q .0112. Dale Overcash (consultant for Corning Midland) has sealed the entire application, including control device forms, emissions calculations, regulatory applicability, etc. As per North Carolina Board of Examiners for Engineers and Surveyors (NCBELS)' website, Mr. Overcash's PE license is "current".

- Cabarrus County Planning and Development's Senior Zoning Enforcement Officer (Wayne Krimminger) has issued a zoning consistency determination on 12/28/2018, indicating that the "proposed operation is consistent with the applicable zoning ordinance".

- The pre-public notice version of the draft permit was emailed to Corning on December 11, 2019. Corning emailed their comments on the draft permit documents on January 20, 2020. The applicant comments and DAQ responses are memorialized below. It needs to be emphasized that only the substantive comments are discussed. Editorial comments (e.g., spelling or grammar error or sentence re-write) are not discussed and they will be taken care of as appropriate.

  Application Review Comments

  Comment 1:

  Check the current inspection date of October 25, 2018 in the first page Table.

  DAQ Response:

  The MRO conducted the last compliance inspection on December 5, 2019. This date will be included as the "date of last inspection" in the first page Table.

  Comment 2:

  Include all applicable regulations in the first page Table. For example, regulatory citations for 02D .0503, .0524, .1100 and 1407, and 02Q .0711 need to be included.

  DAQ Response:

  Agreed. These applicable regulatory citations will be included in the first page Table under "Permit Applicability".

  Comment 3:

  Correct the references for the current permit from T19 to T20 and the issuance date from June 4, 2019 to September 13, 2019, in the first page Table under "Application Data".

  DAQ Response:

  Agreed. These corrections will be made.

  Comment 4:

  In Section 1.0, state that the applicant filed the PSD application using the one-step process under significant modification provision.

  DAQ Response:

  Agreed with the applicant. However, the applicant cited a two-step procedure for the PSD application, using 02Q .0501(c)(2) (previously codified as 02Q .0501(d)(2)) in the application.

  Comment 5:

  Remove the description of the facility in Section 2.2, containing "the primary function for most fiber…is point-to-point connections… including…pigtails, and patch cords". The applicant states that it is not correct for the Corning's Midland facility.

DAQ Response:

Agreed. It will be removed. The DAQ had copied this manufacturing process description from its previous compliance inspection report.

Comment 6:

In Section 4.1, include CAM applicability for source ES-C-012 as the CAM plan will be required in future at the time of processing a renewal application.

DAQ Response:

The DAQ agrees with the applicant that the source ES-C-012 will have to comply with the CAM requirements at the time of processing a renewal application for the facility's Title permit in future. However, the DAQ does not believe that it is necessary to include in this permit revision the future requirement as a permit stipulation. Thus, DAQ will not make any changes to the permit language.

Comment 7:

Correct the uncontrolled emission rate of HCl in Table 4.2-1 from 31.49 tons/yr to 134.55 tons/yr.

DAQ Response:

Agreed. This correction will be made.

Comment 8:

In Table 4.4-1, change the GHG emissions rate from 840.36 tons/yr to 849.36 tons/yr.

DAQ Response:

Agreed. This correction will be made.

Comment 9:

In Section 4.4, with regard to applicability of 02D .0516, the applicant questions why it does not apply to NSPS subject emergency generators.

DAQ Response:

The emergency generators (ES-C-PG2b, ES-C-PG2c, and ES-C-PG2d) are subject to diesel fuel standard of 15 ppm under NSPS Subpart IIII. Thus, the requirement in 02D .0516 does not apply, pursuant to paragraph (b) of this regulation.

Comment 10:

In Section 4.4, with respect to NSPS, the applicant prefers to have the emissions standards described in g/HP-hr instead of g/kW-hr.

DAQ Response:

It should be emphasized that the applicable standards for various pollutants for emergency engines (ES-C-PG2b, ES-C-PG2c, and ES-C-PG2d), pursuant to 40 CFR 89.112, are in the unit of g/kW-hr and not g/HP-hr. However, for applicant's convenience, the DAQ will include emissions standards in both units as stated above.

Comment 11:

In Table 4.7-1, for existing natural gas fired boilers, correct the emission rates for particulates, NOx, and CO, as per the application.

DAQ Response:

It needs to be clarified that the DAQ's emission estimation spreadsheet for natural gas-fired boilers calculates emissions of particulates with differing results, even though the spreadsheet uses the same AP-42 (Section 1.4). For example, PM emission rate of 0.01 ton/yr (DAQ) v. 0.16 tons/yr (applicant) for boilers ES-C-HB1a and ES-C-HB1b. When manually calculated using the AP-42 factors, the DAQ's estimates for this pollutant matches with the applicant's estimate. Finally, for all other pollutants, the DAQ estimation using the spreadsheet is almost the same as the applicant's estimates. For example, for the same boilers referred above, the estimates are as below:

NOx: 2.13 tons/yr (DAQ) v. 2.16 tons/yr (applicant)
CO: 1.79 tons/yr (DAQ) v. 1.81 tons/yr (applicant)

In summary, the applicant provided changes to the emissions rates for various natural gas fired boilers will be made.

Comment 12:

In Table 4.9-1, change the source description for emergency generators' diesel fuel storage tanks to include insignificant activities of fire pump engine diesel fuel diesel storage tanks, specifically for VOCs emissions of 0.00631 ton/yr.

DAQ Response:

Agreed. This change will be made.

Comment 13:

Change the PM emission rate of 0.11 ton/yr to 0.05 ton/yr for soot vacuums (insignificant activities) in Table 4.9-1.

DAQ Response:

This change will be made.

Comment 14:

In Section 6.4, the applicant states that the emergency generators (ES-C-PG1a and ES-C-PG1b) are not designed to meet the federal Tier 1 standards and their potential emissions are based on AP-42 (Section 3.4); thus, it contends that DAQ cannot base BACT for any triggered pollutant on Tier 1 standards.

The applicant further argues that no averaging period be included for the proposed BACTs for any emergency generators (ES-C-PG1a, ES-C–PG1b, ES-C-PG2a, ES-C-PG2b, ES-C–PG2c, and ES-C-PG2d) since no compliance verification is required.

Moreover, the applicant contends that the proposed BACT for the NSPS-subject emergency generators (ES-C-PG2b, ES-C–PG2c, and ES-C-PG2d) is for filterable PM only, as it is based upon applicable NSPS PM standard (which covers only filterable PM only).

Finally, the applicant prefers to include the proposed BACT in the unit of g/HP-hr for all emergency generators.

DAQ Response:

As per the application, it is correct that the emergency generators (ES-C-PG1a and ES-C-PG1b) are not designed to meet the Tier 1 standards. Hence, DAQ agrees that BACT cannot be based on any Tier 1 standards and it will be based on applicable AP-42 (Section 3.4) emissions factors as per the application. This will be corrected in the application review and the draft permit.

With regard to the averaging time for the proposed BACTs, the BACT (especially if it includes a numerical limit) needs to be associated with a reasonable (appropriate) averaging period consistent with the established reference methods for federal enforceability (i.e., enforceable as a practical matter). The stringency of BACT also depends upon the underlying averaging period. It is not correct that only if there is a requirement to verify the BACT, then only, the agency can include an averaging period in the permit. In addition, since this PSD application is processed pursuant to Title V procedure as well (in addition to PSD program procedure), the permit must define compliance (or non-compliance) to meet the requirements of 40 CFR 70.6(c), if any "person" under the CAA wishes to verify (determine) compliance for the approved BACTs. The DAQ has used a reasonable averaging period consistent with the EPA reference test methods, based upon average of 3-runs of source sampling. In summary, the DAQ will not remove the averaging period for the proposed BACTs for emergency generators.

With regard to the PM2.5 BACT, it needs to be stated that as per AP-42 (Section 3.4), approximately 13.8 percent of total $PM_{2.5}$ emissions[38] are condensable particulates. The condensable PM emission rate (factor) of 0.0077 lb/million Btu, with the average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr for diesel fuel, translates into an emission rate of 0.00005390 lb/hp-hr or 0.024 g/hp-hr. Therefore, it is correct that the combustion PM emissions for emergency engines are in the form of both filterable and condensable. Thus, the DAQ will incorporate the above condensable PM emission rate with the applicable filterable PM limit (rate) for establishing $PM_{2.5}$ BACTs for each emergency generator.

Finally, the DAQ will specify the BACTs for each of the generators in the unit of g/HP-hr.

Comment 15:

In Section 8.2, 2nd paragraph, state that "at any one time during this daily period" for restriction on operation containing only one emergency engine between the hours of 9 am to 5 pm.

DAQ Response:

The applicant has provided a revised modeling, demonstrating compliance with the 24-hour and annual $PM_{2.5}$ NAAQS, and annual PM_{10} NAAQS, and all associated increments. Thus, the description in the referred paragraph will be modified to state that any emergency engine can operate as long as only one engine operates at any time, between the hours of 9 am - 5 pm.

Comment 16:

In Table 8.2.-2, the applicant requests that each culpable facility's name be removed and instead, it should be replaced with Location 1, 2, 3, etc.

DAQ Response:

Disagreed. The DAQ believes that the public deserves the total transparency of all information included in the permit documents, except the information deemed "business confidential". It needs to be emphasized that the names of these culpable facilities and their actual emissions changes are already part of DAQ's off-site source inventory database, which is a public information. So, there should not be any concern for confidentiality. In addition, if EPA is to inquire in future about these facilities with regard to what remedial steps DAQ is conducting to bring these facilities in compliance (due to projected violation of 1-hour NO_2 NAAQS), it would

[38] Id. at 32.

be easier for our state agency for practicality and administrative purpose to list them with their actual names instead of "location 1", "location 2", etc.

No change can be made.

Draft Permit Comments

Comment I:

Correct the next permit revision reference (upon completion of processing of PSD application) from T20 to T21 throughout the permit. Also, change the current permit reference from T19 to T20.

DAQ Response:

Agreed. This change will be made.

Comment II:

Remove the statement of assessment of nonattainment area RACT/LAER fee in the cover letter as the Permittee is already required to pay the above additional fees as per the previous invoices.

DAQ Response:

Disagreed. The RACT/LAER fees assessment statement in the cover page and in Section 2.1.A.5.c. will not be removed. The DAQ memorandum[39] specifically requires that for the new sources located in a maintenance or non-attainment area, the agency needs to notify the applicant of additional fee assessment with respect to RACT/LAER via a cover page statement and as a permit stipulation, and a permit requirement be included for the applicant to notify the regional office within 15 days of start-up. No changes can be made.

Comment III:

The applicant questions the accuracy of actual emissions and the type of pollutants triggered for Cabarrus County and the adjoining Union County.

DAQ Response:

After the careful review of this comment, the DAQ revises the cover letter statement for increment tracking as follows:

"Cabarrus County has triggered increment tracking under PSD for PM_{10} and SO_2. This modification will result in emissions increases of 7.5 lbs/hr for PM_{10} and 0.1 lb/hr for SO_2. In addition, the modification results in emissions increases of 7.5 lbs/hr for $PM_{2.5}$ and 209.6 lbs/hr for NOx; thus, establishing for this County, minor source baseline date of January 30, 2019 for Corning Incorporated for $PM_{2.5}$ and NO_2. The modification establishes for Union County minor source baseline date of January 30, 2019 for Corning Incorporated for NOx due to the emissions increase of 209.6 lbs/hr."

Comment IV:

Change the fire pump size from 182 HP to 183 HP for IES-C-FP1 and IES-C-FP2.

DAQ Response:

39 "Implementation of 15A NCAC 0203(e) in Nonattainment Areas (NAAs) for the Added Annual Fee in Metrolina", February 29, 2008.

Agreed. This change will be made.

Comment V:

Change the ID Nos. for five cooling towers from “IES-C-CWT” to “IES-C-CWT1 through IES-C-CWT5”.

DAQ Response:

Agreed. This change will be made.

Comment VI:

Remove all references and requirement throughout the permit for submittal of a 2nd step application for all previously approved changes.

DAQ Response:

Corning submitted a separate application (1300117.19B) to comply with the significant modification permitting requirement under Title V (i.e., 2nd step of 02Q .0501(b)(2)) for several previously approved changes as below:

Modifications to glass drying operations (ID Nos. ES-C-003, ES-C-007, and ES-C-010)
Modification to optical waveguide laydown process (ID No. ES-C-009)
New glass drying operation (ID No. ES-C-011)
New bagfilter (ID No. CD-C-BH-10)

This second-step application contains information which is dated as all of these previously approved changes are being superseded with the new information included in the PSD application as above. In brief, no processing of the 2nd step significant modification application (1300117.19B) is required by the DAQ and it will simply be consolidated into the PSD application (1300117.19A).

In summary, all references and a requirement for submittal of a 2nd step application under 02Q .0504 will be removed from the permit.

Comment VII:

Include a condition in Section 2.1.A.4. on future applicability for ES-C-012 for CAM regulation.

DAQ Response:

Refer to response to Comment 6 above.

Comment VIII:

Remove the monitoring/recordkeeping/reporting under the RACT requirement (Section 2.1.A.5) as it is redundant to the BACT requirement (Section 2.2.B.1.) for the new waveguide laydown process (ES-C-012).

DAQ Response:

The RACT stipulation simply uses the streamlining clause under §70.6.(a)(3), requiring monitoring/recordkeeping/reporting for RACT to be the same as under the PSD stipulation. There is nothing redundant under the RACT requirement and it is accurate. The DAQ will not make any changes.

Comment IX:

For Section 2.1.D. Table, the applicant questions why the NSPS-subject sources are not also subject to 02D .0516 for SO_2 emissions.

DAQ Response:

This question has been adequately addressed in response to Comment 9 above.

Comment X:

Section 2.1.D.3., the applicant prefers to include the emissions standards in the unit of g/HP-hr for NSPS-subject sources.

DAQ Response:

Please refer to response to Comment 10 above.

Comment XI:

For Section 2.2.A.1.f., the applicant requests removal of the requirement as per their discussions with the MRO.

DAQ Response:

The applicant had earlier discussed with the MRO the removal of physical audit requirement in Section 2.2.A.1.f. for all production equipment set-ups for each of the existing waveguide laydown processes. The applicant had stated that there were now digital means of checking the mass flow controllers versus physically having to check the flows. In addition, per MRO, the previous stack testing had shown that Corning was not capable of exceeding its permit limits. In summary, the MRO was in agreement to remove this requirement; thus, DAQ will remove the requirement.

Comment XII:

In Section 2.2.B.1.b. Table, the applicant states that the BACT for PM2.5 is based on only the filterable portion for emergency generators; thus, it needs to be accordingly described. The applicant further requests to remove the averaging period for all BACTs for all triggered pollutants for emergency engines. Finally, the applicant requests its preference for BACT in the unit of g/HP-hr.

DAQ Response:

These comments have been adequately addressed in response to Comment 14 above.

Comment XIII:

The PM2.5 BACT for soot blowing equipment includes filterable portion only and no condensable particulates are expected. The applicant requests that this change be made in describing the PM2.5 BACT in Section 2.2.B.1. Table.

DSQ Response:

Agreed. This change will be made.

Comment XIV:

Suggest describing BACT for cooling towers as "good operating practices" instead of "good housekeeping practices".

DAQ Response:

Agreed. This change will be made.

Comment XV:

In Section 2.2.B.1.d. and j., specify that at any given time between 9 am – 5 pm only one engine can operate for readiness testing.

DAQ Response:

Agreed. This change will be made.

Comment XVI:

The applicant questions the reasonableness of the continuous emissions monitoring and reporting requirements for NOx emissions to comply with the BACT and other limits.

DAQ Response:

The applicant and DAQ held the conference call on January 28th and met face-to-face on February 27th to discuss the alternative monitoring approach for NOx emissions.

The DAQ after discussions with the applicant agreed to require compliance demonstration for each of the optical waveguide laydown processes using source sampling approach for NOx emissions.

Both initial and subsequent annual demonstration for NOx BACT and other emissions limits (to comply with NAAQS and increments) shall be required.

To comply with the BACT, it was agreed that the initial tests be required for all existing (permitted) waveguide laydown processes within 180 days of issuance of the PSD permit. It was also agreed that for new waveguide process (ES-C-012), the initial testing must occur within 180 days of its start-up. For compliance with the other emissions limits, the Permittee will be required to sum the emissions rates (determined using emissions source testing) for the applicable sources.

The above approach will also be used for all waveguide processes, all existing and new (ES-C-014) glass drying operations, and miscellaneous source exhausts, to demonstrate compliance with both PM2.5 BACT and other emissions limits (to comply with NAAQS and increments).

Additional testing for NOx on annual basis (not more than 13 months from the previous test) must be conducted for five years to comply with the other emissions limits at the stack level for all waveguide laydown processes (existing and new). The Permittee can petition the DAQ for less frequent testing after completion of five annual tests and each showing compliance with the applicable limits.

- The pre-public notice version of the draft permit was emailed to the MRO on December 11, 2019. Melinda Wolanin of MRO emailed on January 23, 2020, stating that she did not have any comment on the draft permit documents.

- This engineer recommends issuing the revised Title V permit after completion of public comment and EPA review periods.

Appendix A
Public Notice

Appendix B
Listing of Entities and Documents To be Sent

NEWSPAPER	Independent Tribune 363 Church St. N, Ste. 140 Concord, NC 28025 (704) 789-9110 bbarker@independenttribune.com	Public Notice
OFFICIALS	Mr. Mike Downs Manager, Cabarrus County 65 Church Street Concord, NC 28025 (704) 920-2100 MKDowns@cabarruscounty.us	Public Notice
SOURCE	Mr. Don L. Hefner Plant Manager Corning Incorporated P. O. Box 1700 Concord, NC 28026 (704) 569-6041 Donald.Hefner@corning.com	Preliminary Determination, Draft Permit & Public Notice
EPA	Ms. Kelly Fortin Air Permits Section U.S. EPA Region 4 Sam Nunn Atlanta Federal Building 61 Forsyth Street, S.W. Atlanta, Georgia 30303-3104 (404) 562-9117 Preliminary Determination, Draft Permit, and Public Notice, via electronic mail to: Fortin.Kelly@epa.gov with cc to: shepherd.lorinda@epa.gov	Preliminary Determination, Draft Permit & Public Notice
FLM	Ms. Andrea Stacy National Park Service Air Resources Division 12795 W. Alameda Pkwy P. O. Box 25287 Denver, CO 80225 (303) 969-2816 Andrea_stacy@nps.gov	None
MOORESVILLE REGIONAL OFFICE	Mr. Bruce Ingle NC DAQ Air Quality Regional Supervisor 610 East Center Avenue, Suite 301 Mooresville, NC 28115 (704) 663-1699 bruce.ingle@ncdenr.gov	Preliminary Determination, Draft Permit, & Public Notice