



January 16, 2023

Mr. Mark J. Cuilla, EIT  
Chief, Permitting Section  
NCDEQ  
1641 Mail Service Center  
Raleigh, NC 27699-1641

SUBJECT: Response to Request  
Modification of Permit No. 03735T48  
Application No. 0900009.22B  
Chemours Company - Fayetteville Works  
Facility ID: 0900009, Fayetteville, Bladen County

Dear Mr. Cuilla:

Chemours Company (Chemours) is providing this response to your letter dated December 16, 2022, to Dawn Hughes regarding the recently submitted air permit application for the modifications at the Fayetteville Works facility. Chemours is requesting authorization to modify the Vinyl Ethers North (VEN) and Vinyl Ethers South (VES) plants and the IXM Membrane Process Area (ID Nos. NS-B, NS-C, and NS-H, respectively). The responses to the questions in the Division of Air Quality's (DAQ) letter are provided in the same order of the December 16, 2022 letter. The italic portions in the following sections is a summary or snippet of the DAQ question in the December 16, 2002 letter and does not contain all the narrative, charts and tables.

#### **Fugitive Emissions of Methylene Chloride**

*Chemours calculated potential fugitive emissions of methylene chloride (MeCl) (ID No. I-03) by increasing the 2021 emissions by 20%. This percentage was selected assuming emissions would increase proportionally to the additional equipment / components that will be added as a result of the Proposed Project. This methodology is appropriate, but the use of 2021 data may underestimate emissions of MeCl.*

*Please explain why 2021 emissions are appropriate as a basis for potential emissions from this source. If necessary, please provide updated potential emissions from the Proposed Project including revised fugitive MeCl emissions.*

**Response:** While Chemours believes that 2021 data is more representative of typical operation, the potential emission calculations for MeCl have been revised to assume a 20% increase from the average of the last five years reported emissions. Refer to the attachments for a revised MeCl emissions summary.

#### **Baseline Actual Emissions**

*Thermal Oxidizer (ID No. NCD-Q1), Lime Silo (ID No. NS-R1) and Lime Slaker (ID No. NS-R2)*

*Because the thermal oxidizer, the lime silo, and lime slaker were not operating in 2018 and 2019, Chemours used 2021 emissions for the BAE for these sources. This approach is not acceptable. For a new emission unit, which is defined in 40 CFR 51.166(b)(7)(i) "as any*

*emissions unit that is (or will be) newly constructed and that has existed for less than 2 years from the date such emissions unit first operated," BAE are set to zero in accordance with 40 CFR Part 51.166 (b)(47)(iii). If these emission sources have been operating more than two years such that they are no longer considered new emission units, the BAE would still be set to zero because they were not operating during the baseline period (i.e., calendar years 2018 and 2019).*

*Please provided a revised PSD applicability determination that includes the appropriate BAE for the thermal oxidizer (ID No. NCD-Q1), the lime silo (ID No. NS-R1), the lime slaker (ID No. NS-R2), and the boiler (ID No. PS-A).*

**Response:** Since the Thermal Oxidizer and Associated Equipment was not operating during the chosen baseline period calendar years 2018 and 2019, Chemours has removed the Thermal Oxidizer (ID No. NCD-Q1), Lime Silo (ID No. NS-R1) and Lime Slaker (ID No. NS-R2) from the baseline and set these emissions to zero. The revised calculations (see attached) incorporate this change.

*Boilers (ID Nos. PS-A and PS-B)*

*Emissions from boilers (ID Nos. PS-A and PS-B) – The boilers at Chemours are used to produce steam for the Kuraray America, Inc. – Fayetteville facility (FID 0900091) and the DuPont Company - Fayetteville Works (FID 0900092), in addition to the Chemours site. The BAE were based on emissions for the operation of both boilers (ID Nos. PS-A and PS-B) in calendar years 2018 and 2019 and accounted for steam production for all three facilities.*

**Response:** Post-project emissions from the proposed project included both the emissions from steam production supporting other onsite sources (Kuraray and DuPont) and the increase in emissions from the expansion project at Chemours. For the Project, the emissions from Kuraray and DuPont's contributions were assumed to remain unchanged from the CY2021 usage. However, the 2021 steam usage from Kuraray and DuPont was significantly less than it was in the baseline calendar years of 2018 and 2019 due to process unit shutdowns. This resulted in lower future emissions from the Chemours boilers due to the lower steam usage at those two facilities.

To avoid the confusion and clarify the potential increases associated with this project, Chemours has recalculated the emissions from the boilers by using emission increases based only on the potential increased steam demand due to the project. The total Chemours (not including Kuraray or DuPont) steam demand from the boilers (in thousand pounds per hour [kpph]) was reviewed for each month from January 2021 to August 2022. Table 1 shows the maximum Chemours steam demand of 16.75 kpph occurred in February of 2021. Chemours initially assumed that this steam demand would increase by 50% due to the project. After further review with project engineers and utilities personnel, Chemours has estimated the increase to be 25%. This results in 4.19 kpph, or assuming 8,760 hours per year, 36,688 thousand pounds of steam per year (klb/yr). Using a maximum conversion of 1.48 standard cubic feet of natural gas per pound of steam produced in the boilers (see Table 2), an increase of 54.3 million standard cubic feet of natural

gas per year was calculated<sup>1</sup>. Using the Division of Air Quality's emission calculator for large natural gas boilers, the resulting emissions in tons per year (tpy) for both the originally proposed 50% increase and the revised increase of 25%, are shown in Table 3. As detailed in the table, the emission increases do not exceed PSD thresholds. See attachment for the emission calculation workbook.

**Table 1. Monthly Maximum Hourly Steam Demand (kpph)**

Month	2021	2022
January	15.00	15.54
February	16.75	16.70
March	14.43	14.22
April	14.14	13.82
May	13.22	14.01
June	13.20	13.99
July	12.16	13.73
August	11.41	13.43
September	11.96	-
October	9.54	-
November	12.84	-
December	15.00	-

**Table 2. Standard Cubic Feet of Natural Gas per Thousand Pounds of Steam**

Month	2021			2022		
	MMscf/mo <sup>a</sup>	klb/mo <sup>b</sup>	scf/lb <sup>c</sup>	MMscf/mo <sup>a</sup>	klb/mo <sup>b</sup>	scf/lb <sup>c</sup>
January	57.64	48,990	1.18	45.24	31,671	1.43
February	53.86	40,479	1.33	43.34	33,455	1.30
March	49.50	45,143	1.10	49.88	37,016	1.35
April	41.33	34,011	1.22	38.74	32,782	1.18
May	38.17	33,227	1.15	40.36	39,251	1.03
June	35.57	27,016	1.32	35.21	29,821	1.18
July	32.91	27,517	1.20	38.12	28,963	1.32
August	37.06	27,287	1.36	40.96	29,821	1.37
September	36.41	29,239	1.25	-	-	-
October	19.17	22,320	0.86	-	-	-
November	40.44	27,320	1.48	-	-	-
December	44.36	34,603	1.28	-	-	-

<sup>a</sup> Million standard cubic feet of natural gas per month.

<sup>b</sup> Thousand pounds of steam per month.

<sup>1</sup> This conservatively takes the maximum hourly steam demand multiplied by the maximum conversion factor and assumes those conditions for 8,760 hours per year.

<sup>c</sup> Standard cubic feet of natural gas per pound of steam.

**Table 3. Project Emissions from the Increased Steam Demand for the Boilers.**

Pollutant	Annual Emissions (50% Increase) (tpy)	Annual Emissions (25% Increase) (tpy)
PM	0.028	0.014
PM <sub>10</sub>	0.023	0.012
PM <sub>2.5</sub>	0.023	0.012
SO <sub>2</sub>	0.033	0.016
NO <sub>x</sub>	10.32	5.16
CO	4.56	2.28
VOC	0.30	0.15

With the above modifications to the emission calculations, Table 4 provides the revised PSD evaluation for criteria pollutants and sulfuric acid (H<sub>2</sub>SO<sub>4</sub>). The associated project emission increases will not exceed the PSD thresholds.

**Table 4. Revised PSD Evaluation.**

Pollutant	Baseline CY2018/19 (lb/yr) <sup>a</sup>	Post-Project Emissions (lb/yr) <sup>b</sup>	Boiler Increase (lb/yr)	Total Project Increase (lb/yr)	Project Increase – Baseline (tpy)	PSD Threshold (tpy)
PM	214	2,598	28.24	2,626	1.21	25
PM <sub>10</sub>	214	2,589	23.36	2,612	1.20	15
PM <sub>2.5</sub>	214	2,589	23.36	2,612	1.20	10
SO <sub>2</sub>	9.20	60.99	32.59	93.58	0.04	40
NO <sub>x</sub>	0.00	8,540	10,320	18,860	9.43	40
CO	0.00	7,172	4,562	11,734	5.87	100
VOC	332,168	376,302	299	376,601	22.22	40
H <sub>2</sub> SO <sub>4</sub>	195	960	0.00	960	0.38	7

<sup>a</sup> Excludes emissions from the TO and associated equipment and the boilers.

<sup>b</sup> Includes the increase from the thermal oxidizer and the associated equipment.

### **Emissions of Fluorinated Organic Compounds (FOC)**

*Chemours compared emissions of Fluorinated Organic Compounds (FOC) from the Proposed Project with 2021 emissions to demonstrate that the Proposed Project did not result in an increase in FOC. The FOC emissions used for this comparison represent proposed emissions, not potential emissions, from the modified processes. Potential emissions of FOC from the Proposed Project were also provided in the permit application and were based on 2021*

*emissions, adjusted for maximum production volume and hours of operation. The methodology for determining proposed emissions was not well documented in the permit application. Please provide a detailed explanation of how the proposed emissions of FOC were determined.*

*As part of the application review, DAQ compared the potential emissions of FOC to the proposed emissions. Potential emissions of FOC were larger for all emissions sources included as part of the Proposed Project with the exception of the VEN plant (ID No. NS-B). As shown in the table below, created by DAQ, the total potential emissions of FOC (4,143.9 lb/yr) from the VEN plant are larger than the total proposed emissions (3,285.7 lb/yr). However, the proposed emissions for several specific FOC are larger than the potential emissions.*

**Response:** Chemours provides the following explanation of the calculations of FOC. Since the calculations are complex, we did have a conversation with the permit writer January 13, 2023.

As detailed in the emission calculations summary in the permit application, the potential emissions of FOC were calculated based on 2021 emissions, adjusted for maximum production rates (process emissions) and hours of operation (equipment emissions). Total hours of operation (8,760 hours per year) were allocated to campaigns based on the proposed maximum production rates for EVE, PSEPVE, and PPVE.

To determine proposed emissions, the actual production demand and hours of operation, by campaign, for the next five years were utilized to calculate emissions from the VE-North process unit. The assumed 'worst-case' campaign mix and associated hours of operation was used to calculate proposed emissions. The individual FOCs will be different based on the campaign mix/split, which may result in the proposed emissions being greater than the potential emissions for an individual FOC; however, as noted in your letter, the overall FOCs for the proposed operation are less than that of the potential operation.

### **HFPO-DA Emissions**

*It should be noted that GenX does not appear in the table of FOC emissions. Chemours provided a separate table in the permit application specifically for GenX emissions, which remain below the emission limit of 23.027 pounds per year after the Proposed Project. Please include GenX emissions in the table of FOC emissions from the project for completeness.*

**Response:** Chemours has added the HFPO-DA (GenX) emissions to the table of FOC emissions. This was presented separately since the HFPO-DA is specified in the existing permit.

### **Water Resources – Transport Modeling**

*DAQ continues to evaluate Chemours current FOC emissions from the facility as a whole and their impact on the environment. This evaluation is informed by DAQ's prior confirmation of a causal link between FOC emissions from Chemours and widespread degradation of groundwater quality, DAQ's analysis of deposition data nearby the facility, and an expanding area of groundwater and surface water quality impacts, including in downstream communities. With regard to the Proposed Project, and Chemours' representation of FOC emission increases for some specific compounds, DAQ does not have sufficient information to ensure protection of the*

*State's water resources. DAQ requests that Chemours provide information sufficient to demonstrate that emissions from the project will not cause further degradation of the State's water resources in violation of applicable laws and regulations, including but not limited to a full fate and transport modeling analysis.*

**Response:** As reference, the proposed project is an expansion of existing operations at the Fayetteville Works facility and Chemours has submitted information to NCDEQ in connection with environmental concerns that have been raised concerning the facility's operations, including the below two documents and associated modeling discussions, as well as entering the 2019 Consent Order with NCDEQ:

- Modeling Report: HFPO-DA – Atmospheric Deposition and Screening Groundwater Effects dated April 27, 2018
- Consent Order Paragraph 27 – Site Associated PFAS Fate and Transport Study dated June 2019.

Through a conversation with the permit writer, Chemours understands the scope of the Fate and Transport modeling is to ensure any increases in emissions will not further degrade groundwater around the facility. This request is not included in the DAQ regulations (15 NCAC) or permitting process and is not included in the Title V Permit Application Checklist, provided on the DAQ website. While Chemours will develop a fate and transport modelling analysis for the proposed project per the DAQ request, it reserves all rights with respect to this request, including to the extent the request is inconsistent with applicable law or the 2019 Consent Order.

\*\*\*\*\*

Chemours is providing answers within the 30-day time frame and requests that the DAQ continue to review the permit application while we develop and complete the fate and transport model for the project.

In addition, Chemours and DAQ have set up reoccurring meetings on the permit application and many of the emissions related requests may be addressed in these meetings and we request that we continue to follow this process as the permitting process moves forward.

Please contact me if you wish to discuss any of the above items before our next scheduled meeting.

Sincerely,



Christel Compton  
Program Manager



January 16, 2023

cc: Dawn Hughes, Chemours  
Kevin Eldridge, ERM NC, Inc.  
Christy Richardson, ERM NC, Inc.