29 June 2018

Heather Carter
Regional Supervisor
Fayetteville Regional Office
Department of Environmental Quality
225 Green Street, Suite 714
Fayetteville, NC 28301-5095

Subject: **The Chemours Company FC, LLC**
Air Permit Modification Application – Add-on Controls
Fayetteville, Bladen County, North Carolina

Dear Ms. Carter:

The Chemours Company FC, LLC (Chemours) is submitting herewith two (2) copies of an Application for an Air Permit to Construct/Operate for approval by the North Carolina Department of Environmental Quality (DEQ). The application was prepared by ERM NC, Inc. (ERM). With this enclosed application, Chemours is requesting authorization to construct and operate additional add-on air pollution controls at the facility located at 22828 NC Highway 87 West, Fayetteville, Bladen County, North Carolina (the facility). The controls will include a thermal oxidizer, an acid gas scrubber, and a scrubber on a lime slaker. Additional emissions equipment will include an emergency generator and a cooling tower.

This Application package includes a narrative discussion of the project, project emissions and a regulatory applicability analysis. Completed Application Forms are included as Appendix A. A facility location map is included in Appendix B. Emission calculations are included in Appendix C. Vendor Specifications are included in Appendix D. In addition, a request for a Zoning Consistency Determination is being submitted to the Bladen County Planning Department.

We look forward to working with the NC DEQ through the application review process and issuance of the permit for the facility. Chemours requests the opportunity to review the draft permit before it is issued in final form. As you know, Chemours has committed to NC DEQ to have these air pollution controls, including the thermal oxidizer which is expected to capture and control VOCs and PFAS emissions from a large number of streams at an overall efficiency of 99.99%, installed and operational by the end of 2019. NC DEQ had identified this milestone to us as of the highest priority. The thermal oxidizer equipment has been ordered and is being built off-site, for which we were informed no construction permit was required. Chemours was recently able to obtain agreement from the thermal oxidizer manufacturer to expedite the delivery schedule by three months, so that Chemours was able to make its commitment to NC DEQ to have the equipment installed and operational by the end of 2019. However, to meet that commitment, we will need to begin on-site preparatory work by October 1, 2018. We therefore request that NC DEQ issue the requested air permit by that date, or authorize Chemours to

proceed with such preparatory work, at Chemours's own risk, prior to the issuance of the air permit. Please let us know as soon as possible if you should identify any problems with that timetable.

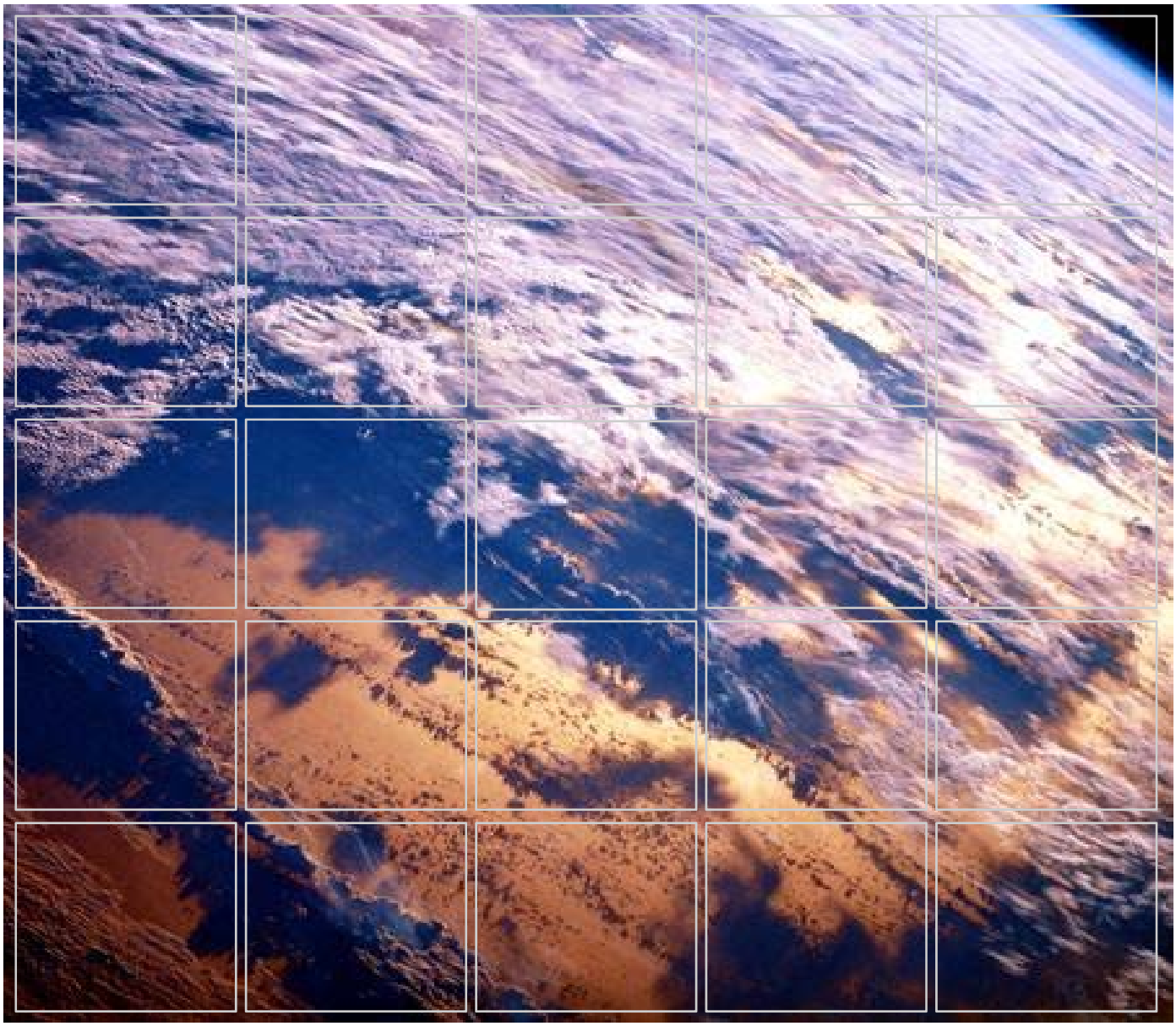
We believe it would be mutually beneficial to schedule a meeting as soon as possible to discuss the air permit application, the proposed schedule for construction of the thermal oxidizer and other equipment (which is included in the application), and the schedule for NC DEQ's consideration of the application and for its providing required authorizations. I will contact NC DEQ promptly to schedule such a meeting.

In the meantime, if you have any questions or concerns, please contact me by phone at 910.678.1213 or by email at christel.e.compton@chemours.com. We appreciate your consideration of our application.

Sincerely,

Christel Compton
Program Manager

Enclosures



Air Permit Modification Application – Thermal Oxidizer System

The Chemours Company - Fayetteville Works
Permit No. 03735T43
Fayetteville, Bladen County, North Carolina

June 2018

www.erm.com

ERM

The Chemours Company FC, LLC

Air Permit Modification Application – Thermal Oxidizer System

June 2018
ERM Project No. 0458829

The Chemours Company - Fayetteville Works
Permit No. 03735T43
Fayetteville, Bladen County, North Carolina

Jeffrey Twaddle, P.E.
Partner

Kevin Eldridge, QEP, GHG-IQ
Project Manager

Christy Richardson, P.E.
Senior Consultant

Environmental Resources Management
4140 Parklake Avenue, Suite 110
Raleigh, North Carolina 27612
T: 919-233 4501
F: 919-578 9044

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LIST OF ACRONYMS

ABR	Agitated Bed Reactor
BACT	Best Available Control Technologies
Btu	British thermal units
^{o}C	degrees Celsius
CaF_2	calcium fluoride
$C_3F_7OCHFCF_3$	E-1
CFR	Code of Federal Regulations
CH_4	methane
CHF_3	HFC-23
CH_2F_2	HFC-32
CHF_2CF_3	HFC-125
CHF_2OCF_3	HFC-125 Ether
CH_3OH	Methanol
CI	compression ignition
CO	carbon monoxide
CO_2	carbon dioxide
CO_{2e}	carbon dioxide equivalent
COF_2	carbonyl fluoride
DAQ	Division of Air Quality
DEQ	Department of Environmental Quality
EVE	propanoic acid, 3-[1-[difluoro [(trifluoroethenyl oxy] methyl]-1,2,2,2-tetrafluoroethoxy] -2,2,3,3-tetrafluoro-, methyl ester
gal	gallons
GHG	greenhouse gases
gph	gallons per hour
gpm	gallons per min
HF	hydrogen fluoride
HFPO	hexafluoropropylene oxide
hp	horsepower
hr	hour(s)
H_2O	water
H_2SO_4	sulfuric acid
ICE	internal combustion engine
KF	potassium fluoride
$KHCO_3$	potassium bicarbonate
K_2CO_3	potassium carbonate
lb	pounds
LDAR	leak detection and repair
MACT	Maximum Achievable Control Technology
MCPU	miscellaneous organic chemical manufacturing process units
MM	million

NAAQS	National Ambient Air Quality Standards
MON	Miscellaneous Organic Chemical Manufacturing NESHAP
NCAC	North Carolina Administrative Code
NCDEQ	North Carolina Department of Environmental Quality
NESHAP	National Emission Standards for Hazardous Air Pollutants
N_2O	nitrous oxides
NOCS	Notice of Compliance Status
NNSR	Non-Attainment New Source Review
NO_x	nitrogen oxides
N_2O	nitrous oxides
NSPS	New Source Performance Standards
NSR	New Source Review
MON	miscellaneous organic NESHAP
PAF	perfluoroacetyl fluorides
PMCP	perfluoromethylcyclopentane
PFAS	poly-fluorinated compounds
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than 10 microns
$PM_{2.5}$	particulate matter with an aerodynamic diameter less than 2.5 microns
PPA	polymer processing aid
ppmv	parts per million by volume
PPVE	perfluoropropyl vinyl ether
PSEPVE	perfluoro-2-(2-fluorosulfonylethoxy) propyl vinyl ether
PSD	Prevention of Significant Deterioration
RSU	Rearranged Sultone
scmm	standard cubic meters per minute
SER	significant emission rate
SO_2	sulfur dioxide
TAP	toxic air pollutant
TFE	trifluoroethylene
TPER	toxic pollutant emission rate
TRE	total resource effectiveness
tpy	tons per year
VE	vinyl ethers
VEN	vinyl ethers north
VES	vinyl ethers south
VOC	volatile organic compounds
WWTP	wastewater treatment plant

1.0 INTRODUCTION

The Chemours Company FC, LLC (Chemours) manufactures chemicals, plastic resins, plastic sheeting and plastic film at its facility located at 22828 NC Highway 87 West, Fayetteville, Bladen County, North Carolina (the facility). The facility operates under Air Quality Permit 03735T43, effective 14 December 2016. The facility is a major source of criteria pollutants under the Part 70 (Title V) Operating Permit Program and a major source of Hazardous Air Pollutants (HAP).

As has been discussed for several months with the North Carolina Department of Environmental Quality (NCDEQ), Chemours is in the process of making a substantial investment at the Fayetteville Works facility with respect to air emission control. The investment will include installation of an array of state-of-the-art technology, including a Thermal Oxidizer/Scrubber System (which is on order) and a Lime Processing System.

Chemours has placed an order for the Thermal Oxidizer with Linde Engineering North America, Inc., a world leading engineering company with vast experience in manufacturing thermal oxidizers. Delivery is expected in May of 2019. In addition, NCDEQ informed Chemours that a construction permit was not required to place the order, however a permit will be required before the Thermal Oxidizer/Scrubber System and associated equipment can be installed. Accordingly, Chemours is submitting this permit application.

Chemours is requesting authorization to construct and operate a Thermal Oxidizer/Scrubber System and a Lime Processing System. The permit modification will not change the status of the facility with respect to the applicability of the Title V program or the National Emission Standards for Hazardous Air Pollutants (NESHAP).

Chemours requests that the NC Division of Air Quality (DAQ) process this 15A North Carolina Administrative Code (NCAC) 02Q .0300 permit application using the two step permitting process outlined in 15A NCAC 02Q .0501(c)(1). To satisfy the requirements of 15A NCAC 02Q .0501(c)(2), Chemours will submit the Part 2 permit application within twelve (12) months after commencing operation to request incorporation of the new sources into the Title V Permit and associated permit shield. A check for the required 2Q .0300 Minor Modification application processing fee is enclosed with the original copy of the permit application. Please note that Chemours requests the opportunity to review the draft permit before it is issued for public comment.

This application is organized as follows:

- Section 2.0 includes a description of facility processes and permit actions requested in this application.
- Section 3.0 includes a description of emission estimation methodologies.
- Section 4.0 includes an air regulatory applicability analysis.
- Section 5.0 includes recommended permit conditions.
- Appendix A includes NCDEQ Permit Application Forms.
- Appendix B contains a facility location map.
- Appendix C contains the emission calculations.
- Appendix D contains vendor specifications.

2.0 FACILITY AND PROJECT DESCRIPTION

2.1 CURRENT FACILITY DESCRIPTION

The Chemours Fayetteville Works facility is located near Duart Township in Bladen County, North Carolina. The Site is located approximately 15 miles southeast of the City of Fayetteville on NC Highway 87, south of the Bladen-Cumberland county line. Currently, the facility manufactures chemicals, plastic resins, plastic sheeting and plastic film.

Specific materials produced at the Fayetteville facility are:

- Nafion® Fluorocarbon membrane,
- Fluorocarbon intermediates for Nafion® membranes and other fluorocarbon products, and
- Fluoropolymer Processing Aids.

In addition to the manufacturing operations, Chemours operates two natural gas-fired boilers and a wastewater treatment plant (WWTP) for the treatment of process and sanitary wastewaters from Chemours, Kuraray, and DuPont (both Kuraray and DuPont are also located on the site). Currently no wastewater from the Chemours facility is discharged to the WWTP, except reject water from making filtered, deionized/de-gassed water at the power plant.

2.2 REQUESTED PERMITTING ACTIONS

Chemours is submitting this permit application to modify existing Permit Number 03735T43 for the inclusion of the Thermal Oxidizer/Scrubber System and Lime Processing System along with other ancillary equipment. Table 2-1 provides a listing and description of the air emission sources and/or control devices and other equipment associated with this project. A simplified schematic of the proposed system is shown in Figure 2-1.

Table 2-1: Proposed Air Emission Sources and/or Control Devices

System	Source/Control Device	Emission Source or Control Device ID	Description
Thermal Oxidizer/ Scrubber System	2 Gas Accumulation Tanks	N/A	Hold up tank allows for pressure swings for feed into thermal converter injection. Sized to allow for a 1 hour hold up in the event of a flame out situation to allow process to shut down and come to steady state atmospheric hold up condition. This equipment does not generate air emissions.
	Thermal Converter/Oxidizer	NCD-Q1	High temperature (1,100 degrees Celsius [°C]) conversion unit for fluorinated hydrocarbon waste with 99.99% overall efficiency rating.
	Liquid Mist Separator	N/A	Separates rapid quench spray via a packed bed scrubber/demister pad from gaseous combustion products (carbon dioxide [CO_2] & water). This equipment does not generate air emissions.
	Catch Tank	N/A	Collects aqueous hydrogen fluoride (HF) acid (18 wt %) generated during the thermal conversion of fluorinated hydrocarbons. This equipment does not generate air emissions.
	1 Acid Recirculation Coolers	N/A	Heat exchangers used to cool the recirculation acid used in the spray quench via cooling tower water. This equipment does not generate air emissions.
	Acid Storage Tank	N/A	Storage tank for 18 wt % aqueous HF acid prior to being pumped to the lime neutralization/ CAF_2 recovery system. Vessel sized to maintain thermal conversion operation during any minor process upsets in neutralization. This equipment does not generate air emissions.
	Caustic Scrubber	NCD-Q2	Four-stage packed column to neutralize any residual HF vapor carried over from the liquid mist separator. The lower three stages utilize countercurrent scrubbing with demineralized water. Demineralized water is added to Stage 3 and Stage 3 overflows to Stage 2. Stage 2 overflows to Stage 1. In this manner the HF is efficiently recovered from the flue gas. The bottom of Stage 1 contains 10% aqueous HF, stage 2 reduces concentration to 1%, Stage 3 reduces concentration to 0.1%. Stage 4 utilizes recirculated scrubbing with a pH basic solution with pH controlled by addition of sodium hydroxide (caustic). Stage 4 removes residual HF not recovered by countercurrent water scrubbing and also effectively captures SO_2 combustion by-product.

Table 2-1: Proposed Air Emission Sources and/or Control Devices

System	Source/Control Device	Emission Source or Control Device ID	Description
Lime Processing System	Lime Silo with Bin Vent	I-NS-R1	Storage silo for pebble lime or hydrated lime. The baghouse associated with the bin vent is an integral part of the silo. This source is an insignificant activity.
	Lime Slaker with Scrubber	NS-R2 NCD-R2	Mixing vessel for pebble lime and water to form lime slurry.
	Crystallizer	N/A	Agitated vessel for formation of Calcium Fluoride crystals during the mixing of aqueous 18 wt% HF acid with a lime slurry (Calcium Hydroxide in water). This equipment does not generate air emissions.
	Filter Feed Tank	N/A	Batch hold up tank for CaF_2 slurry to filter press. Separates system from continuous operation to batch operation. This equipment does not generate air emissions.
	Filter Press and Truck Loading	N/A	Separates CaF_2 solids from filtrate (water) which is then loaded into trucks.
	Filtrate Tank	N/A	Allows for sampling of filtrate prior to discharge to outfall or to pump for off-site disposal.
Ancillary Systems	Emergency Generator	I-RICE 4	320 horsepower (hp) Diesel-Fired Emergency Engine. This source is an insignificant activity.
	Cooling tower	I-CT	Circulation rate of 6,000 gallons per minute (gpm), expandable to 8,000 gpm. This source is an insignificant activity.

2.2.1 *Thermal Oxidizer/Scrubber System*

The Thermal Oxidizer/Scrubber System will be used to control emissions from existing sources at the Fayetteville facility. The system will include a Thermal Oxidizer to control volatile organic compounds (VOC), per-fluorinated and poly-fluorinated (PFAS) emissions. The system also includes a Caustic Scrubber which will be utilized to remove residual hydrogen fluoride vapor and other acid gases from the discharge of the Thermal Oxidizer and Liquid Mist Separator. This system will replace the currently permitted baffle-plate scrubbers (ID Nos. NCD-Hdr1 and NCD-Hdr2).

The Thermal Oxidizer/Scrubber system consists of two Gas Accumulation Tanks, Thermal Converter, Liquid Mist Separator, Catch Tank, and Acid Storage Tank. A process flow diagram for the Thermal Oxidizer/Scrubber System is provided in Figure 2-2.

The processes and emission units detailed in in Table 2-2 will be vented to the Thermal Oxidizer/Scrubber system as is shown in Figure 2-3. This System will not accept any waste streams outside of the Fayetteville Works site boundary.

Table 2-2: Processes to be Controlled by the Thermal Oxidizer/Scrubber System

Emission Source ID	Unit Name
NS-A	HFPO Process
NA-B	Vinyl Ethers-North Process
NS-C	Vinyl Ethers-South Process
NS-D	RSU Process
NS-E	FPS Liquid Waste Stabilization
NF-F	MMF Process
NS-G	IXM Resins Process
NS-K	E-2 Process
NS-M	TFE/CO_2 Separation Process
NS-N	HFPO Product Container Decontamination
NS-O	VE-N Product Container Decontamination
NS-P	VE-S Product Container Decontamination

2.2.2 *Lime Processing System*

The lime processing system will receive pebble or hydrated lime in the Lime Silo (I-NS-R1) and will mix into a wet slurry in the Lime Slaker (NS-R2). A bin vent on the Lime Silo collects dust generated during truck unloading. This baghouse is an integral part of the process and is not considered an air pollution control device and therefore, the Lime Silo will be an insignificant source. The Lime Slaker will mix water and calcium oxide (pebble lime or hydrated lime) to form a calcium hydroxide lime slurry. Fugitive dusts from mixing pebble lime and water in the Lime Slaker will be controlled by a wet scrubber. The lime slurry will then be introduced into the Crystallizer, along with the

aqueous 18 wt% HF acid from the Thermal Oxidizer/Scrubber System. Calcium fluoride (CaF2) crystals will form in the Crystallizer and be fed to the batch hold-up or Filter Feed Tank. Prior to loading, the CaF2 mixture will be sent to the Filter Press where filtrate (water) will be separated from the CaF2 solids. The solids will be loaded into trucks for off-site disposal and the water will be sent to the Filtrate Collection Tank, checked for turbidity, and then sent to the plant outfall or offsite.

A process flow diagram for the Lime Processing System is provided in Figure 2-4.

2.2.3 *Ancillary Systems*

Emergency Generator (I-RICE 4)

A 320 horsepower (hp) diesel fired emergency engine will be installed as part of this project. It will meet the Tier 3 emission standards and will emit small amounts of air pollution due to the combustion of diesel fuel. The engine will be utilized for emergency purposes only and will be an insignificant source.

Cooling Tower (I-CT)

The cooling tower will be used to remove heat from the recirculating acid produced in the natural gas-fired Thermal Oxidizer. A graphite heat exchanger is used to cool the recirculated acid. The heat removed is from the heat of combustion and heat of solution to absorb the HF produced into the aqueous HF acid produced. The cooling tower water will also be used to remove the heat of neutralization to react aqueous HF with calcium hydroxide and produce calcium fluoride. The cooling tower system will also be used to cool various air compressors including plant air compressors, breathing air compressors and atomizing air compressors. The plan is to install a concrete basin that can support a 4-cell tower capable of cooling 8,000 gpm; Chemours will install a 3-cell tower capable of cooling 6,000 gpm, so the concrete basin will be sufficient. The Cooling Tower will be an insignificant source.

Figure 2-1: Project Schematic

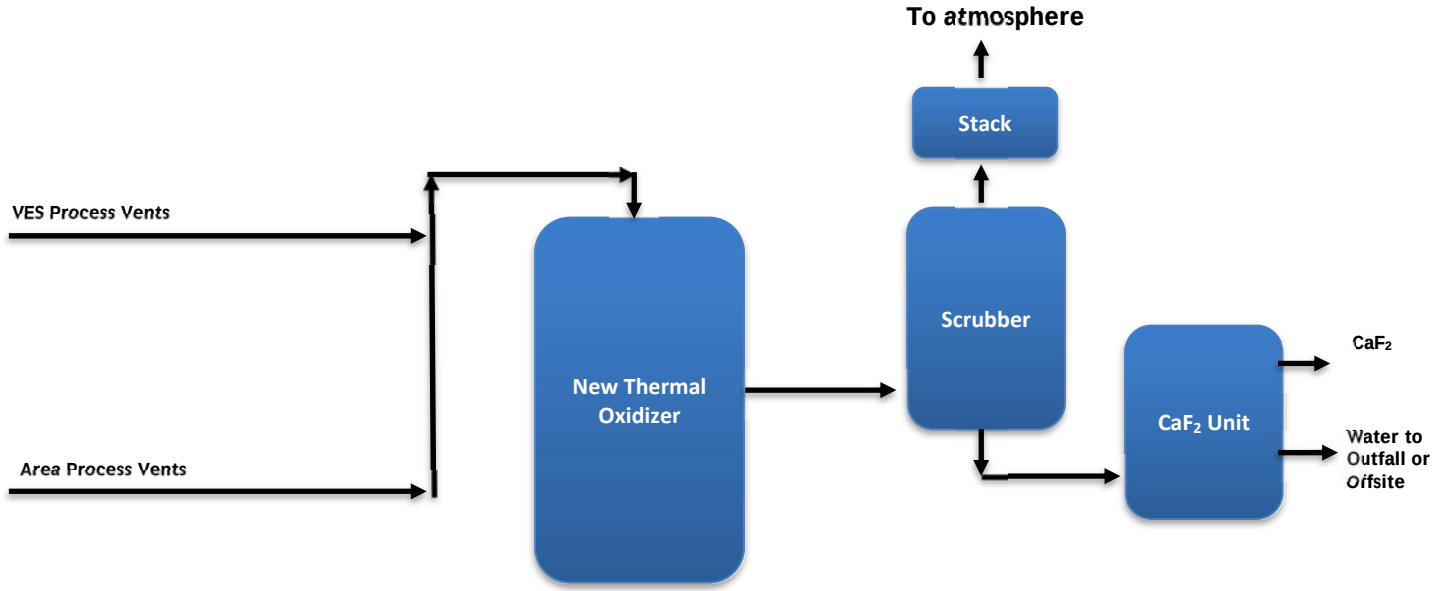


Figure 2-2: Thermal Oxidizer/Scrubber System Diagram

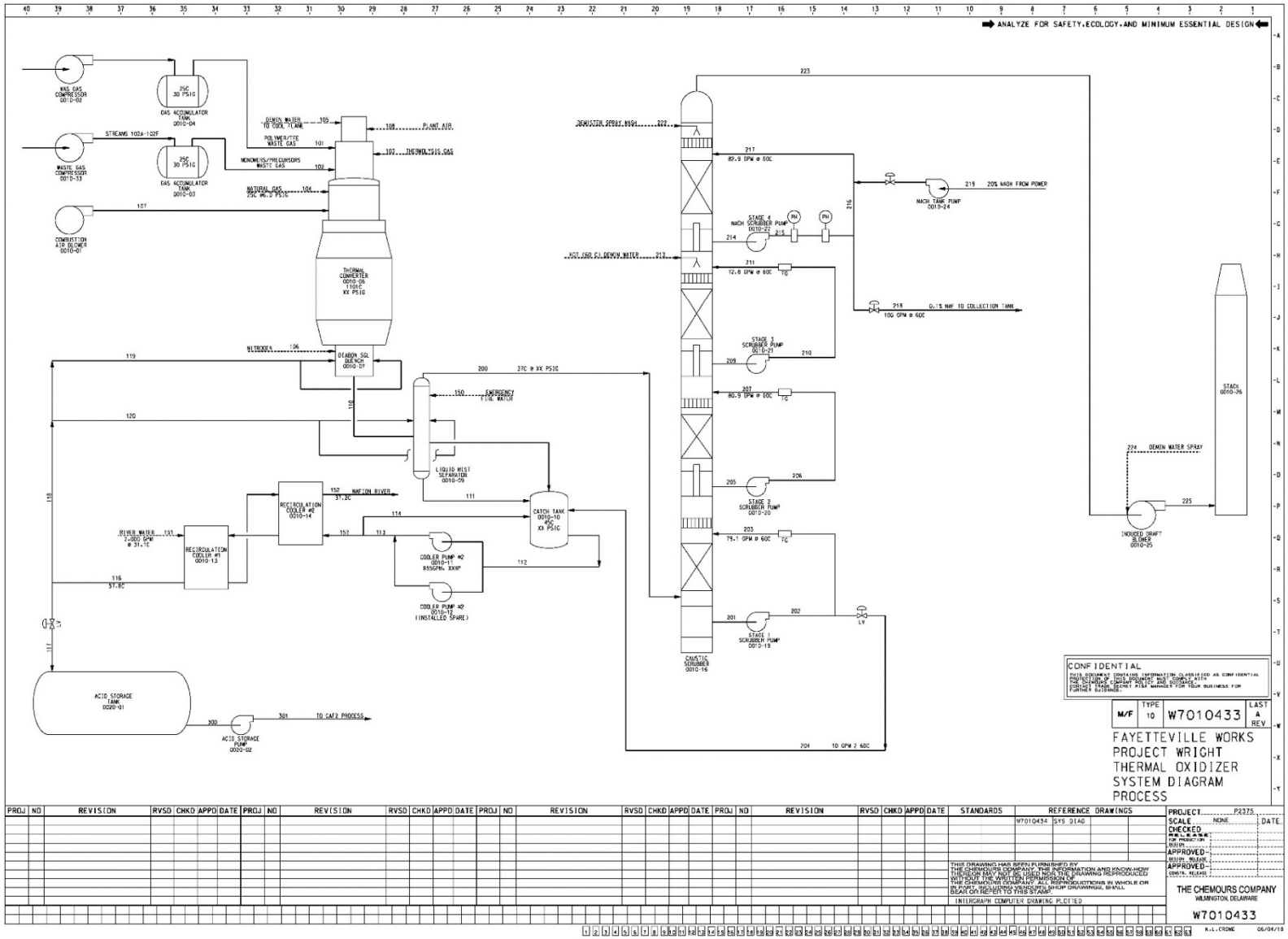


Figure 2-3: Sources Venting to Thermal Oxidizer System

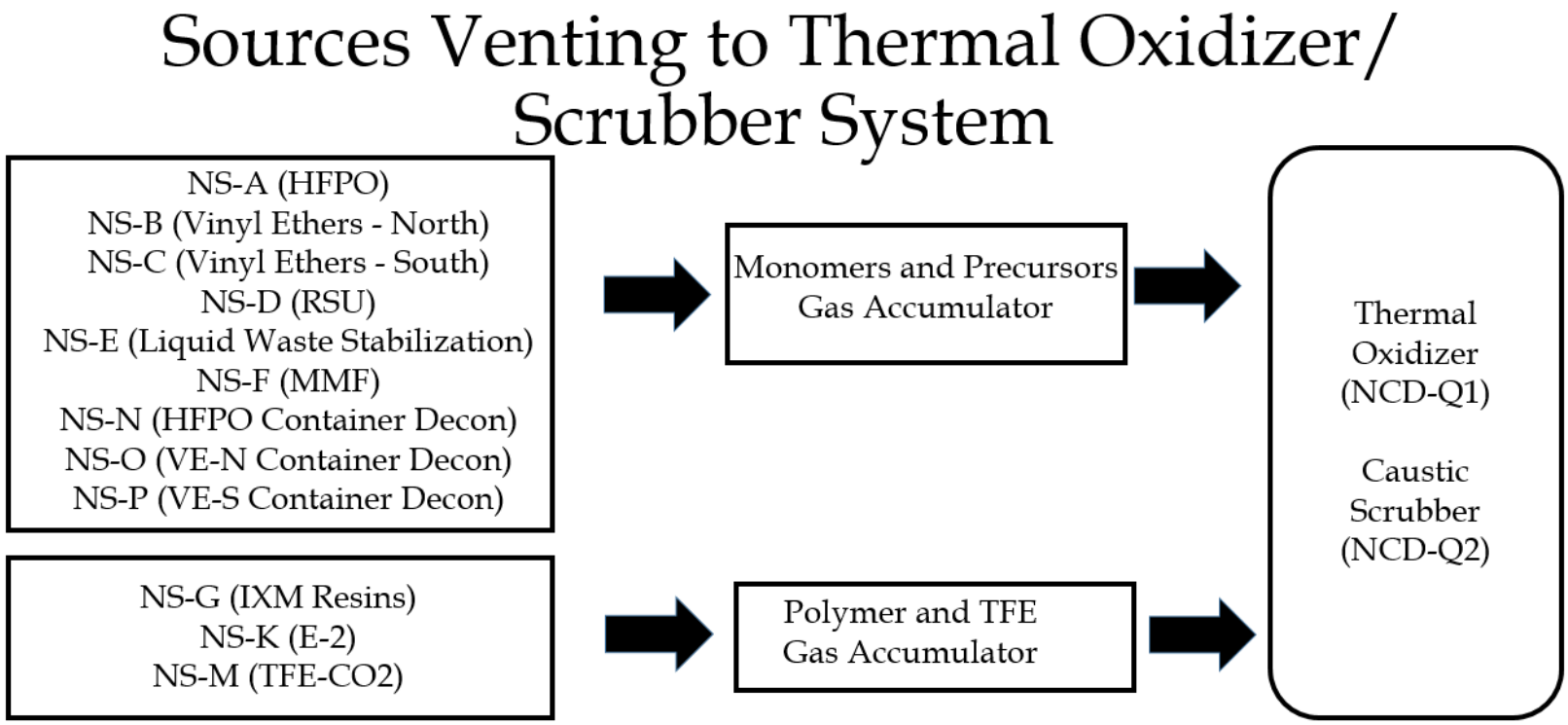
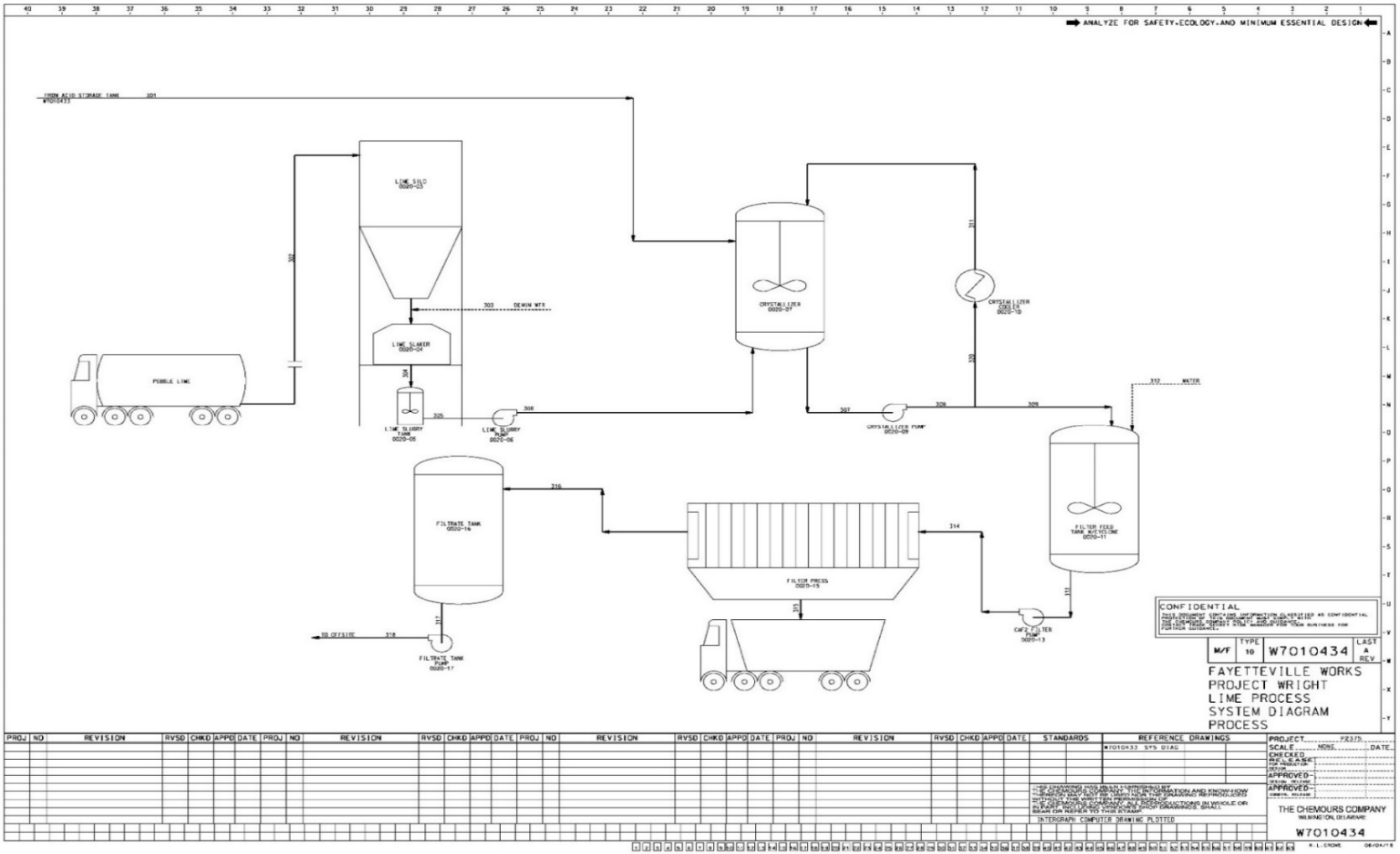


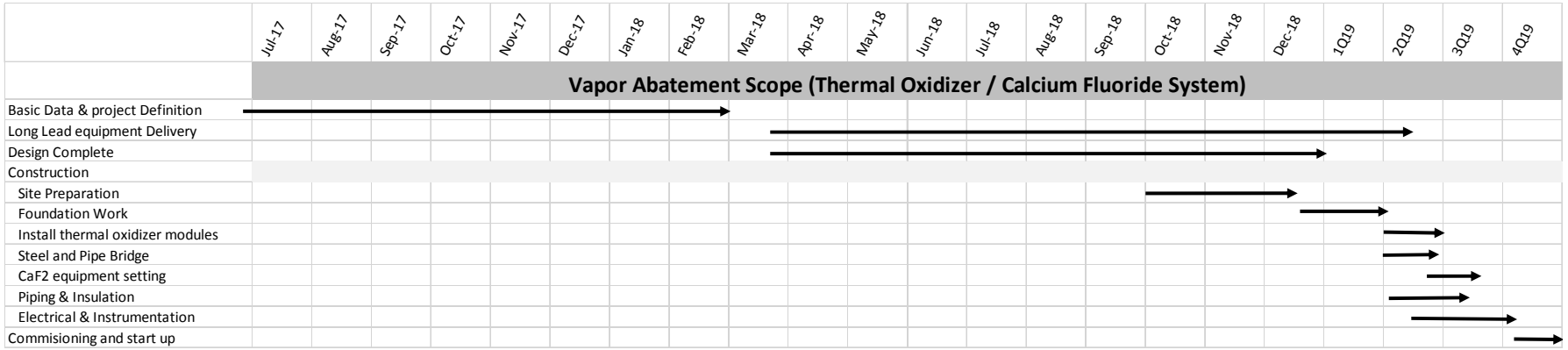
Figure 2-4: Lime Handling System Diagram



2.3 PROJECT SCHEDULE

As previously discussed with the NCDEQ, Chemours is committed to the installation of the Thermal Oxidizer System for the reduction of VOCs and PFAS. Chemours has placed an order for the construction of the Thermal Oxidizer with Linde Engineering North America, Inc. The system is expected to be delivered in May of 2019. This technology consists of custom-designed, specialized equipment that must be custom-built and will take approximately 18-24 months to manufacture and install. By the end of 2019, Chemours expects to install the Thermal Oxidizer to reduce overall process emissions of VOCs and PFAS by 99.99%. Chemours has expedited this schedule to the maximum extent possible, and will make all efforts to expedite it further. At the same time, Chemours plans to construct a Caustic Scrubber to remove the HF that will be created by the Thermal Oxidizer. Refer to Figure 2-5 for the proposed project schedule.

Figure 2-5: Project Schedule



3.0 EMISSIONS ESTIMATES

3.1 THERMAL OXIDIZER/SCRUBBER SYSTEM

3.1.1 Thermal Oxidizer

The existing emission units will be vented to the Thermal Oxidizer/Scrubber System. Overall process emissions of VOCs and PFAS compounds are assumed to be controlled by 99.99% in the Thermal Oxidizer. Hourly VOC emissions are based on highest-case loading to the Thermal Oxidizer/Scrubber system and projected control efficiencies.

The Thermal Oxidizer will generate emissions associated with the combustion of natural gas. The Thermal Oxidizer will also generate HF and CO_2 emissions due to combustion of the organic hydrocarbons. SO_2 will be generated in the thermal oxidizer from the combustion of sulfur containing organic hydrocarbons. The emissions of HF, CO_2, and SO_2 will be further controlled in the scrubber.

3.1.2 Caustic Scrubber

The emissions from the Thermal Oxidizer are then vented to the scrubber. The scrubber will control the emissions of HF and SO_2 generated in the Thermal Oxidizer by 99.95%. The thermal oxidizer will also generate CO_2 that will not be further reduced by the Scrubber; therefore, no control efficiencies have been assumed for CO_2. Hourly emissions of HF, SO_2 and CO_2 were based on the highest-case load to the Thermal Oxidizer and the conversion of compounds to HF, SO_2 and CO_2 using the methodology described in Appendix C.

3.2 LIME PROCESSING SYSTEM

3.2.1 Lime Silo

The emissions from the lime silo were based on a load factor provided by the vendor of the baghouse and the maximum air flow rate. Appendix C provides additional emission calculations.

3.2.2 Lime Slaker

Emissions from the Lime Slaker scrubber are calculated based on a preliminary inlet emission rate supplied by the vendor of 6.17 lb/hr and a vendor guaranteed control efficiency of 99.7%. Appendix C provides emisison calculations.

3.3 ANCILLARY EQUIPMENT

3.3.1 Emergency Generator

Chemours plans to purchase a 320 HP emergency generator. The generator will be subject to Tier 3 emission standards for emergency generators. Emissions for carbon monoxide (CO), particluate matter with an aerodynamic diameter less than 10 microns (PM_{10}), and particulate matter with an aerodynamic diameter less than 2.5 microns ($PM_{2.5}$) are based on the Tier 3 emission limits. Emissions for VOC and nitrogen oxides (NO_x) were based on the ratio of the emission standard to the appropriate AP-42 emission factors for VOC (2.53E-03 lb/hp-hr) and NO_x (0.031E-02 lb/hp-hr). Emission factors for sulfur dioxide (SO_2) were obtained from AP-42 and an assumed sulfur content of 0.0015%. Emission factors for greenhouse gases (GHG) were obtained using methodologies in 40 CFR 98. Emission factors for HAPs were obtained from the NCDAQ spreadsheet[1]. Appendix C provides emission calculations.

3.3.2 Cooling Tower

Emissions from the cooling tower were based on the cooling water recirculation rate, the drift factor, makeup water total dissolved solids, and cycles of the concentration. Appendix C provides emission calculations.

3.4 PROJECT EMISSION SUMMARY

Table 3-1 provides a summary of the uncontrolled potential criteria pollutant and carbon dioxide equivalent (CO_{2e}) emissions associated with the project in tons per year (tpy). Table 3-2 provides a summary of the controlled potential criteria pollutant and carbon dioxide equivalent (CO_{2e}) emissions associated with this project. Fluorinated hydrocarbon compounds and hydrogen fluoride are not considered PSD compounds[2]. Emissions are presented in tons per year. Since this is a pollution control project (PCP) for processes that will be vented to the thermal oxidizer/scrubber system, those emissions are not counted towards the project total (existing unmodified Sources). No additional power will be generated in order to operate the new systems.

[1] https://deq.nc.gov/about/divisions/air-quality/air-quality-permits/application-forms-instructions/application-forms-air-quality-permit-construct-operate-non-title-v-title-v-facilities/spreadsheets

[2] Letter from Donald van der Vaart, Chief, Permits Section, NCDENR to Michael Johnson, Environmental Engineer, DuPont Fluoroproducts, 17 July 2008.

Table 3-1: Summary of Uncontrolled Project Emissions (tpy)

Emission Source	VOC	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_{2e}
Lime Silo with Bin Vent (I-NS-R1)	0.00	0.00	0.00	0.00	0.75	0.75	0.00
Lime Slaker (NS-R2)	0.00	0.00	0.00	0.00	27.02	27.02	0.00
Thermal Oxidizer (NCD-Q1) *[Fuel Combustion + Conversion of Sulfonated Components]*	0.24	4.27	3.59	16.63	0.32	0.32	10,412
Scrubber (NCD-Q2) *[CO_2 Generation from Organic Compounds]*	0.00	0.00	0.00	0.00	0.00	0.00	4,724
I-RICE 4	0.04	0.49	0.46	0.0015	0.026	0.026	61
I-CT	0.00	0.00	0.00	0.00	0.79	0.79	0.00
Total	**0.28**	**4.8**	**4.1**	**16.6**	**28.9**	**28.9**	**15,197**
SER	40	40	100	40	15	10	75,000

Table 3-2: Summary of Controlled Project Emissions (tpy)

Source	VOC	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_{2e}
Lime Silo with Bin Vent (I-NS-R1)	0.00	0.00	0.00	0.00	0.75	0.75	0.00
Lime Slaker (NS-R2)	0.00	0.00	0.00	0.00	0.081	0.081	0.00
Thermal Oxidizer *[Fuel Combustion + Conversion of Sulfonated Components]*	0.24	4.27	3.59	0.04	0.32	0.32	10,412
Scrubber Outlet *[CO_2 Generation from Organic Compounds]*	0.00	0.00	0.00	0.00	0.00	0.00	4,724
I-RICE 4	0.040	0.49	0.46	0.0015	0.026	0.026	61
I-CT	0.00	0.00	0.00	0.00	0.79	0.79	0.00
Total	**0.28**	**4.8**	**4.1**	**0.042**	**1.97**	**1.97**	**15,197**
PSD SER	40	40	100	40	15	10	75,000

[a] Controlled by Thermal Oxidizer/Scrubber System

[b] The threshold shown is for $PM_{2.5}$, which is the lowest PM threshold.

4.0 AIR REGULATORY APPLICABILITY ANALYSIS

The applicability determinations made for potentially applicable federal and state air quality regulations are described in this section for addition of the proposed Thermal Oxidizer/ Scrubber System and Lime Processing System, as well as the ancillary equipment.

The Code of Federal Regulations and the North Carolina Department of Environmental Quality, Division of Air Quality, Rules and Regulations were reviewed to determine applicability to the proposed plant. Section 4.1 addresses federal regulatory applicability and Section 4.2 addresses the applicability of state rules to the proposed project.

4.1 FEDERAL REQUIREMENTS

Federal regulations have been promulgated that direct both the process of applying for a permit and the performance standards of various types of emission units. The EPA has delegated the authority to implement the Federal NSR to the NCDEQ. A review of the federal performance standards that may apply to the proposed operations is provided below. The applicable regulations are discussed in the following subsections in the order that they appear in the Code of Federal Regulations (CFR). The Federal Requirements section is broken into the following categories: Permitting Programs, 40 CFR 60, 40 CFR 61, 40 CFR 63, and 40 CFR 64.

4.1.1 Permitting Programs

4.1.1.1 Title V Operating Permit Program

A Title V (Part 70) operating permit is required for facilities that meet the definition of a major source according to 40 CFR Part 70.2. A facility with criteria pollutant emissions greater than 100 tpy, 10 tpy of a single HAP, or 25 tpy of the combination of HAPs is considered a major source under the Title V permitting program. The facility is considered a major source with respect to the Title V permitting program and operates under Permit 03735T43. Chemours will submit the Part 2 permit application within twelve (12) months after commencing operation of the proposed Thermal Oxidizer/Scrubber System and Lime Processing System to request incorporation of the new sources into the Title V Permit.

4.1.1.2 PSD

The federal PSD program, codified in 40 CFR Part 52.21, requires any new major stationary source of air pollutants to obtain a major source air construction permit before commencing construction. North Carolina has incorporated the federal PSD program in 15A NCAC 2Q .0300. The PSD program applies to a facility if potential

emissions exceed applicable major source thresholds. The facility is considered a chemical process plant, which is one of the 28 listed PSD source categories specified in §52.21(b)(1)(i)(a) with a 100-tpy PSD major source threshold for regulated New Source Review (NSR) pollutants. Since the existing facility is a major source with respect to the PSD program, modifications at the facility must undergo major source review if the proposed project will increase emissions of one of the PSD regulated pollutants in excess of the applicable pollutant Significant Emission Rate (SER) threshold.

The uncontrolled emissions from the new sources associated with this project are shown in Table 4-1. Since the uncontrolled emissions of PM_{10} and $PM_{2.5}$ will exceed the PSD SER, Chemours is requesting a PSD avoidance limit for the Lime Slaker unit for PM_{10} and $PM_{2.5}$. As indicated in Tables 3-2 and 4-1, the controlled potential emissions from the Lime Slaker are significantly less than the PSD SERs.

Table 4-1: PSD Comparison to SERs for Project Emissions (tpy)

Emission Source	VOC	NOx	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_{2e}
Total Uncontrolled Potential Project Emissions	0.28	4.8	4.1	16.6	28.9	28.9	15,197
Total Controlled Potential Project Emissions	0.28	4.8	4.1	0.042	1.97	1.97	15,197
SER	**40**	**40**	**100**	**40**	**15**	**10**	**75,000**

4.1.1.3 Nonattainment Area New Source Review (NNSR)

NNSR is applicable to construction of a new major stationary source or a project that is a major modification at an existing major stationary source in an area designated as nonattainment for the National Ambient Air Quality Standards (NAAQS). The facility is located in Bladen County which is classified as an attainment or unclassifiable county for NSR pollutants. Thus, the facility is not subject to NNSR.

4.1.2 New Source Performance Standards, 40 CFR Part 60

New Source Performance Standards (NSPS), codified in Title 40 CFR Part 60, establish pollutant emission limits and monitoring, reporting, and recordkeeping requirements for various emission sources based on source type and size. The NSPS apply to new, modified, or reconstructed sources as defined by particular NSPS. North Carolina has incorporated the federal NSPS in 15A NCAC 02D.0524.

40 CFR 60 Subpart IIII, "Standards of Performance for Stationary Compression Ignition Internal Combustion Engines," (CI ICE NSPS) applies to the proposed emergency generator to be installed with the project. The applicable requirements are detailed in the following sections.

4.1.2.1 40 CFR 60, Subpart IIII, CI ICE NSPS

The 320 HP diesel-fuel fired emergency generator (ID No. I-RICE 4) is subject to the requirements of 40 CFR 60, Subpart IIII since it is a stationary compression ignition (CI) internal combustion engine (ICE) that was constructed after July 11, 2005. The unit will be subject to the Tier 3 emission limits and Chemours plans purchase a Tier 3 compliant unit. The unit will be used for emergency purposes only; therefore the facility must track the hours of operation on a non-resettable hour meter to ensure operation less than 100 hours per year. The facility must maintain documentation that demonstrates that the unit meets the applicable emissions standards. The engine is also restricted to only combusting diesel fuel with a sulfur content equal to or less than 15 parts per million by volume (ppmv) and is required to be maintained and operated per manufacturer's specifications.

4.1.3 National Emission Standards for Hazardous Air Pollutants, 40 CFR Part 61 And 40 CFR Part 63

National Emission Standards for Hazardous Air Pollutants (NESHAP) are generally applicable to sources of HAP. The NESHAP regulations in 40 CFR 61 are pollutant-specific while the NESHAP regulations in 40 CFR 63 are established based on Maximum Achievable Control Technology (MACT) determinations for particular source types. NESHAP 40 CFR 63 Subpart ZZZZ, "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines," (RICE MACT) applies to the proposed emergency generator to be installed with the project. The associated requirements are discussed in the following sections.

The facility is also subject to 40 CFR 63 Subpart FFFF, "National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing" (MON). The applicability, with regards to this project, is detailed in the following sections.

4.1.3.1 40 CFR 63 Subpart ZZZZ, National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines

The 320 HP diesel fuel-fired emergency generator (ID No. I-RICE 4) meets the definition of a stationary reciprocating internal combustion engine (RICE) and is therefore subject to 40 CFR 63 Subpart ZZZZ, "National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines." However, since this unit is also subject to the requirements of 40 CFR 60 Subpart IIII and has a site rating of less than 500 brake HP, this unit complies with the requirements of this subpart by meeting the requirements in 40 CFR 60 Subpart IIII in accordance with 40 CFR 63.6590(c)(6).

4.1.3.2 40 CFR 63 Subpart FFFF, National Emissions Standards for Hazardous Air Pollutants for Miscellaneous Organic Chemical Manufacturing

The Chemours facility consists of four process units that are subject to the requirements of 40 CFR 63 Subpart FFFF, "National Emission Standards for Hazardous Air Pollutants: Miscellaneous Organic Chemical Manufacturing." The four miscellaneous organic chemical manufacturing process units (MCPU) are:

- MCPU-1 (NS-A, HFPO),
- MCPU-2 (NS-B, Vinyl Ethers – North),
- MCPU-3 (NS-C, Vinyl Ethers – South), and
- MCPU-4 (NS-G, Resins).

As detailed in the site's Notice of Compliance Status (NOCS), there are no Group 1 storage tanks, transfer racks, Group 1 wastewater streams, or halogenated vent streams within the four MCPUs. There will be no additional MON applicable process vents, wastewater streams, storage tanks, transfer racks, heat exchangers or equipment as a result of this project

While the four MCPUs have continuous process vents, the vents are not required to be controlled since the vent streams either contain less than 0.005% by weight total HAP or the flowrate is less than 0.005 standard cubic meters per minute (scmm) and the total resource effectiveness (TRE) is greater than 1.9. Therefore, the thermal oxidizer is not required by the MON and is not subject to any requirements.

4.1.4 Compliance Assurance Monitoring, 40 CFR Part 64

Under 40 CFR Part 64, Compliance Assurance Monitoring (CAM), facilities are required to prepare and submit monitoring plans for certain emission units with certain Title V permit applications. Specifically CAM applies to any unit that meets all three of the following criteria:

- be subject to an emission limitation or standard,
- use a control device to achieve compliance, and
- have pre-control emissions that exceed or are equivalent to the major source threshold.

The CAM plan will be updated, as applicable, with the Part 2 Title V Permit Application.

4.2 STATE OF NORTH CAROLINA REGULATIONS

The proposed operations were also evaluated for applicability to state regulations. Applicable state regulatory requirements and standards as they pertain to planned operations at the facility are detailed in the following sections. Also, applicability of each state regulation is presented in Table 4-4 by individual source.

4.2.1 15A NCAC 2D .0515: Particulates from Miscellaneous Industrial Processes

The proposed systems will be subject to the requirements of 15A NCAC 2D .0515, "Particulates from Miscellaneous Industrial Processes." Each affected source, as indicated in Table 4.2, must comply with the allowable PM emission rates determined using the following equations.

$$For\ Process\ Rates \leq 30\ TPH: \quad E = 4.10 \times P^{0.67} \qquad \text{Equation 4-1}$$

$$For\ Process\ Rates > 30\ TPH: \ E = 55.0 \times P^{0.11} - 40 \quad \text{Equation 4-2}$$

For the purposes of these equations, "E" is the maximum allowable emission rate in pounds per hour and "p" is the process rate in tons per hour. The following table provides the calculated allowable emission rates for the Lime Silo and Lime Slaker that are subject to this regulation.

Table 4-2: PM Emission Limitations from Miscellaneous Industrial Processes

Emission Source ID	Emission Source Description	Process Rate (ton per hour)	PM Emission Limit (lb/hr)	Projected PM Emissions (lb/hr)
I-NS-R1	Lime Silo	0.54	2.71	0.17
NS-R2	Lime Slaker	3.75	9.94	0.02

4.2.2 15A NCAC 2D .0516: Sulfur Dioxide Emissions from Combustion Source

Sulfur dioxide emissions from the thermal oxidizer shall not exceed 2.3 pounds per million British thermal units (lb/MMBtu). Chemours will demonstrate compliance with the SO_2 emission limits by combusting low sulfur fuels (i.e., natural gas) in the thermal oxidizer.

Chemours will only burn diesel fuel that has less than 15 ppmv in the emergency engine. Using this sulfur content and the AP-42 SO_2 emission factor for diesel combustion, the resulting emission factor is 0.0015 lb/MMBtu, which is less than the limit of 2.5 lb/MMBtu.

4.2.3 15A NCAC 2D .0521: Control of Visible Emissions

The new sources will be subject to 15A NCAC 2D .0521, "Control of Visible Emissions" and therefore the facility must not have visible emissions of more than 20 percent opacity when averaged over a six-minute period, except as specified in 15A NCAC 02D .0521(d). Due to the nature of the operation and/or the control systems planned for these affected sources and/or the fuel combusted in the units, Chemours will comply with the visible emissions standard.

4.2.4 15A NCAC 2D .0524: New Source Performance Standards

New sources proposed as part of this project will be subject to various subparts of the New Source Performance Standards located in 40 CFR 60; therefore the requirements of 15A NCAC 2D .0524, "New Source Performance Standards" apply. Please refer to Section 4.1 for the details and requirements of applicable New Source Performance Standards.

4.2.5 15A NCAC 2D .0530: Prevention of Significant Deterioration

As discussed in Section 4.1.1.2 of this application, the Chemours facility is a major source for Prevention of Significant Deterioration applicability.

4.2.6 15A NCAC 2D .0540: Control of Fugitive Dust Emissions

The Chemours facility is subject to the requirements of 15A NCAC 2D .0540, "Control of Fugitive Dust Emissions" which prohibits the facility from causing or contributing to substantive complaints from dust emissions or causing excess visible emissions beyond the facility's boundary. Chemours plans to take appropriate actions to ensure that fugitive dust emissions from the Lime Processing System do not contribute to substantive complaints or migrate causing visible emissions beyond the facility's property boundaries. This is a facility-wide standard.

4.2.7 15A NCAC 2D .1111: Maximum Achievable Control Technology

New sources proposed as part of this project will be subject to various subparts of the National Emission Standards for Hazardous Air Pollutants located in 40 CFR 63, based on source categories; therefore the requirements of 15A NCAC 2D .1111, "Maximum Achievable Control Technology" apply. Refer to Section 4.1.3 for the details and requirements of applicable MACT Standards.

4.2.8 15A NCAC 2D .1806: Control and Prohibition of Odorous Emissions

The Chemours facility is subject to the requirements of 15A NCAC 2D .1806, "Control and Prohibition of Odorous Emissions." Chemours will ensure there are suitable

measures to control odorous emissions from the facility operations. This rule is state enforceable only and is applicable facility-wide.

4.2.9 15A NCAC 02Q.0300: Construction and Operation Permits

As noted in the Federal Regulations section, the Title V permitting program does apply to the Chemours Fayetteville Works which currently operates under Title V permit number 03735T43.

4.2.10 15A NCAC 02D.1100: Control of Toxic Air Pollutants and 02Q.0700: Toxic Air Pollutant Procedures

The Toxic Air Pollutant Procedures require a permit for any facility with emissions of an Air Toxic Pollutant in excess of the applicable Toxic Pollutant Emission Rates (TPER) presented in 15A NCAC 02Q.0711. The current permit for the Chemours facility contains facility-wide emission limits for each of the applicable pollutants emitted at the facility. The proposed Thermal Oxidizer/Scrubber System will significantly reduce emissions of air toxics emitted from the facility with the exception of HF. HF will be generated by the Thermal Oxidizer but will then be controlled by the Scrubber. HF projected emissions are shown in Table 4-3 and are detailed in Appendix C. As shown, the new projected facility-wide HF emissions are less than the current permit limits for HF. Therefore, air dispersion modeling is not required with this application.

Table 4-3: Facility-wide HF Emissions (Post Thermal Oxidizer/Scrubber System)

	Facility-wide Emissions		Current Permit Limits	
	lb/hr	lb/day	lb/hr	lb/day
Project Emissions	0.77	18.5	-	-
Current Source Emissions	0.35	8.3	-	-
Total	1.12	26.8	9.98	71.85

4.2.11 15A NCAC 02Q .0102: Activities Exempted from Permit Requirements

As specified in 15A NCAC 02Q .0102 (h)(5), sources that have potential uncontrolled emissions of PM_{10}, SO_2, NOx, VOC and CO of less than 5 tons per year each are not required to obtain a permit under 15A NCAC 02Q .0300. Therefore, since the potential uncontrolled emissions from the Lime Silo, Cooling Tower and the Emergency Generator are less than 5 tons per year for each of the applicable pollutants (see Table 3-1), a construction permit is not required for these sources.

Table 4-4: State Regulatory Summary

Source ID	Control Device ID	Source Description	15A NCAC 02D .0515	15A NCAC 02D .0516	15A NCAC 02D .0521	15A NCAC 02D .0524	15A NCAC 02D .0530	15A NCAC 02D .0540	15A NCAC 02D .1100/ 02Q .0700	15A NCAC 02D .1111	15A NCAC 02D .1806	15A NCAC 02Q .0102
Thermal Oxidizer / Scrubber System												
	NCD-Q1	Thermal Oxidizer		x	x							
	NCD-Q2	Caustic Scrubber			x							
Lime Processing System												
I-NS-R1	N/A	Lime Silo with Bin Vent	x		x							x
NS-R2	NCD R-2	Lime Slaker with Scrubber	x		x							
Ancillary Systems												
I-RICE 4	N/A	Emergency Generator		x	x	x				x		x
I-CT	N/A	Cooling Tower	x		x							x
Facility-Wide												
N/A	N/A	Facility-Wide					x	x	x		x	

5.0 REQUESTED PERMIT CONDITIONS

The section details the permit conditions that Chemours is requesting as part of this project. This section includes requirements for operational limits, monitoring and recordkeeping requirements, and stack testing requirements.

5.1 OPERATIONAL LIMITS

5.1.1 Thermal Oxidizer/Scrubber System

Chemours is requesting operational limits for the Thermal Oxidizer and the Caustic Scrubber on the proposed control devices to ensure proper operation of the units. Table 5-1 details the proposed operation limits for both the Thermal Oxidizer and the Scrubber.

Table 5-1: Proposed Operational Limits

Parameter	Value	Units
Thermal Oxidizer (NCD-Q1)		
Minimum Combustion Chamber Temperature	1,800	°F
Maximum Waste Gas Feed Rate	2,200	lb/hr
Caustic Scrubber (NCD-Q2)		
Minimum Scrubber Liquor Flow (4th Stage)	40	gal/min
Minimum Scrubber Liquor pH (4th Stage)	7.1	N/A

Chemours plans to install, calibrate, maintain, and operate the temperature monitoring device, flow monitoring devices, and pH meters to continuously measure and record the applicable parameters, as detailed in Table 5-1. The Thermal Oxidizer and Caustic Scrubber will be operated when any processes feeding the Thermal Oxidizer/Scrubber System are operating.

If during source testing, it is determined that a different operational limit is preferred, Chemours will request to modify the operational limits in writing.

5.2 MONITORING REQUIREMENTS

5.2.1 Thermal Oxidizer System

Chemours recommends the following monitoring requirements for combustion chamber temperature and maximum gas feed rate to the Thermal Oxidizer as discussed in Section 5.1.

Table 5-2: Proposed Monitoring Requirements – Thermal Oxidizer

Parameter	Monitoring Requirement	Averaging Time
Minimum Combustion Chamber Temperature	Continuous (once every 15 min)	3 hours
Maximum Waste Gas Feed Rate	Continuous (once every 15 min)	3 hours

The combustion zone temperature will be maintained at or above the minimum temperature (3-hour rolling average) during periods when the processes feeding the Thermal Oxidizer/Scrubber System are operating. The waste gas feed rate to the Thermal Oxidizer/Scrubber System will be maintained at or below the maximum feed rate (3-hour rolling average) during periods when the applicable process are operating. Chemours also requests that the following condition be included in the Permit, "The Permittee shall operate the Thermal Oxidizer in a manner in which the monitoring system uptime is at least 97% of the total operational time per semi-annual period."

5.2.2 *Scrubber System*

Chemours recommends the following monitoring requirements for scrubber liquor flow and scrubber liquor pH to the Caustic Scrubber as discussed in Section 5.1.

Table 5-3: Proposed Monitoring Requirements – Caustic Scrubber

Parameter	Monitoring Requirement	Averaging Time
Minimum Scrubber Liquor Flow (4th Stage)	Continuous (once every 15 min)	Instantaneous
Minimum Scrubber Liquor pH (4th Stage)	Continuous (once every 15 min)	3 hours

The 4th stage scrubber liquor flow rate will be maintained at or above the minimum flow rate during periods when the processes feeding the Thermal Oxidizer/Scrubber System are operating. The 4th stage scrubber pH will be maintained at or above the minimum pH (3-hour rolling average) during periods when the applicable processes are operating. Chemours also requests that the following condition be included in the Permit, "The Permittee shall operate the Caustic Scrubber in a manner in which the monitoring system uptime is at least 97% of the total operational time per semi-annual period."

5.2.3 Slaker Scrubber

Chemours proposes to take weekly visible emission readings from the slaker. Once a week, Chemours will observe the slaker scrubber exhaust for any visible emissions above normal. Chemours will establish 'normal' within 30 days after operation of the slaker scrubber.

5.3 STACK TESTING REQUIREMENTS

Chemours is proposing to conduct a source test within 90 days after normal operation of the Thermal Oxidizer/Scrubber System. The testing will be conducted on the Thermal Oxidizer/Scrubber System exhaust, as well as the inlet, to document control efficiency. Additional source tests may be required in the future if process operating conditions change.

Appendix A
NC DEQ Application Forms

Chemours Company - Fayetteville Works
Fayetteville, Bladen County, North Carolina

FORM A

GENERAL FACILITY INFORMATION

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **A**

NOTE- APPLICATION WILL NOT BE PROCESSED WITHOUT THE FOLLOWING:

- ☑ Local Zoning Consistency Determination (new or modification only)
- ☑ Appropriate Number of Copies of Application
- ☑ Application Fee (if required)
- ☑ Responsible Official/Authorized Contact Signature
- ☑ P.E. Seal (if required)

GENERAL INFORMATION

Legal Corporate/Owner Name: *The Chemours Company FC, LLC*

Site Name: *The Chemours Company - Fayetteville Works*

Site Address (911 Address) Line 1: *22828 NC Highway 87 West*

Site Address Line 2:

City: *Fayetteville* | State: *North Carolina*

Zip Code: *28306-7332* | County: *Bladen*

CONTACT INFORMATION

Responsible Official/Authorized Contact:	***Invoice Contact:***
Name/Title: *Brian D. Long/Plant Manager*	Name/Title: *Christel Compton/Program Manager*
Mailing Address Line 1: *22828 NC Highway 87 West*	Mailing Address Line 1: *22828 NC Highway 87 West*
Mailing Address Line 2:	Mailing Address Line 2:
City: *Fayetteville* State: *North Carolina* Zip Code: *28306-7332*	City: *Fayetteville* State: *North Carolina* Zip Code: *28306-7332*
Primary Phone No.: *910-678-1415* Fax No.: *910.678.1247*	Primary Phone No.: *910.678.1213* Fax No.: *910.678.1247*
Secondary Phone No.:	Secondary Phone No.:
Email Address: *Brian.D.Long@chemours.com*	Email Address: *christel.compton@chemours.com*

Facility/Inspection Contact:	***Permit/Technical Contact:***
Name/Title: *Christel Compton/Program Manager*	Name/Title: *Christel Compton/Program Manager*
Mailing Address Line 1: *22828 NC Highway 87 West*	Mailing Address Line 1: *22828 NC Highway 87 West*
Mailing Address Line 2:	Mailing Address Line 2:
City: *Fayetteville* State: *North Carolina* Zip Code: *28306-7332*	City: *Fayetteville* State: *North Carolina* Zip Code: *28306-7332*
Primary Phone No.: *910.678.1213* Fax No.: *910.678.1247*	Primary Phone No.: *910.678.1213* Fax No.: *910.678.1247*
Secondary Phone No.:	Secondary Phone No.:
Email Address: *christel.compton@chemours.com*	Email Address: *christel.compton@chemours.com*

APPLICATION IS BEING MADE FOR

- ☐ New Non-permitted Facility/Greenfield
- ☑ Modification of Facility (permitted)
- ☐ Renewal Title V
- ☐ Renewal Non-Title V
- ☐ Name Change
- ☐ Ownership Change
- ☐ Administrative Amendment
- ☐ Renewal with Modification

FACILITY CLASSIFICATION AFTER APPLICATION (Check Only One)

- ☐ General
- ☐ Small
- ☐ Prohibitory Small
- ☐ Synthetic Minor
- ☑ Title V

FACILITY (Plant Site) INFORMATION

Describe nature of (plant site) operation(s): *Manufacturer of chemicals, plastic resins, plastic sheeting and plastic film.*

Facility ID No. *900009*

Primary SIC/NAICS Code: *326113* | Current/Previous Air Permit No. *03735T43* | Expiration Date: *31-Mar-2021*

Facility Coordinates: Latitude: *34.843934* | Longitude: -78.836834

Does this application contain confidential data? ☑ **YES** ☑ **NO** | ***If yes, please contact the DAQ Regional Office prior to submitting this application.*** **(See Instructions)**

PERSON OR FIRM THAT PREPARED APPLICATION

Person Name: *Kevin Eldridge* | Firm Name: *ERM NC, Inc.*

Mailing Address Line 1: *4140 Parklake Avenue* | Mailing Address Line 2: *Suite 110*

City: *Raleigh* | State: *NC* | Zip Code: *27612* | County: *Wake*

Phone No.: *919.233.4501* | Fax No.: | Email Address: *KevinEldridge@erm.com*

SIGNATURE OF RESPONSIBLE OFFICIAL/AUTHORIZED CONTACT

Name (typed): *Brian D. Long* | Title: *Plant Manager*

X Signature(Blue Ink): | Date:

Attach Additional Sheets As Necessary

FORM A (continued, page 2 of 2)

GENERAL FACILITY INFORMATION

SECTION AA1 - APPLICATION FOR NON-TITLE V PERMIT RENEWAL

_____ (Company Name) hereby formally requests renewal of Air Permit No. _____

There have been no modifications to the originally permitted facility or the operations therein that would require an air permit since the last permit was issued.

Is your facility subject to 40 CFR Part 68 "Prevnetion of Accidental Releases" - Section 112(r) of the Clean Air Act? ☐ YES ☐ NO

If yes, have you already submitted a Risk Manage Plan (RMP) to EPA? ☐ YES ☐ NO Date Submitted: _____

Did you attach a current emissions inventory? ☐ YES ☐ NO

If no, did you submit the inventory via AERO or by mail? ☐ Via AERO ☐ Mailed Date Mailed: _____

SECTION AA2- APPLICATION FOR TITLE V PERMIT RENEWAL

In accordance with the provisions of Title 15A 2Q .0513, the responsible official of _____ (Company Name)

hereby formally requests renewal of Air Permit No. _____ (Air Permit No.) and further certifies that:

(1) The current air quality permit identifies and describes all emissions units at the above subject facility, except where such units are exempted under the North Carolina Title V regulations at 15A NCAC 2Q .0500;

(2) The current air quality permit cits all applicable requirements and provides the method or methods for determing compliance with the applicable requirements;

(3) The facility is currently in compliance, and shall continue to comply, with all applicable requiremetns. (Note: As provided under 15A NCAC 2Q .0512 compliance with the conditions of the permit shall be deemed compliance with the applicable requirements specifically identified in the permit);

(4) For applicable requirements that become effective during the term of the renewed permit that the facility shall comply on a timely basis;

(5) The facility shall fulfill applicable enhanced monitoring requirements and submit a compliance certification as required by 40 CFR Part 64.

The responsible official (signature on page 1) certifies under the penalty of law that all information and statements provided above, based on information and belief formed after reasonable inquiry, are true, accurate, and complete.

SECTION AA3- APPLICATION FOR NAME CHANGE

New Facility Name: _____

Former Facility Name: _____

An official facility name change is requested as described above for the air permit mentioned on page 1 of this form. Complete the other sections if there have been modifications to the originally premitted facility that would requie an air quality permit since the last permit was issued and if ther has been an ownership change associated with this name change.

SECTION AA4- APPLICATION FOR AN OWNERSHIP CHANGE

By this application we hereby request transfer of Air Quality Permit No. _____ from the former owner to the new owner as described below.

The transfer of permit responsibility, coverage and liability shall be effective _____ (immediately or insert date.) The legal ownership of the facility described on page 1 of this form has been or will be transferred on _____ (date). There have been no modifications to the originally permitted facility that would require an air quality permit since the last permit was issued.

Signature of New (Buyer) Responsible Official/Authorized Contact (as typed on page 1):

X Signature (Blue Ink): _____

Date:

New Facility Name:

Former Facility Name:

Signature of Former (Seller) Responsible Official/Authorized Contact:

Name (typed or print):

Title:

X Signature (Blue Ink): _____

Date:

Former Legal Corporate/Owner Name:

In lieu of the seller's signature on this form, a letter may be submitted with the seller's signature indicating the ownership change

SECTION AA5- APPLICATION FOR ADMINISTRATIVE AMENDMENT

Describe the requested administrative amendment here (attach additional documents as necessary):

FORMs A2, A3

EMISSION SOURCE LISTING FOR THIS APPLICATION - A2

112r APPLICABILITY INFORMATION - A3

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **A2**

EMISSION SOURCE LISTING: New, Modified, Previously Unpermitted, Replaced, Deleted

EMISSION SOURCE ID NO.	EMISSION SOURCE DESCRIPTION	CONTROL DEVICE ID NO.	CONTROL DEVICE DESCRIPTION
Equipment To Be ADDED By This Application (New, Previously Unpermitted, or Replacement)			
---	---	NCD-Q1 and NCD-Q2	Thermal Oxidizer/Scrubber
NS-R2	Lime Slaker	NCD-R2	Scrubber
Existing Permitted Equipment To Be MODIFIED By This Application			
NS-A, NS-B, NS-C, NS-D, NS-E, NS-F, NS-G, NS-K, NS-M, NS-N, NS-O, NS-P	HFPO, VEN, VES, RSU, Liquid Stabilization, MMP, IXM Resins, E2, TFE/CO2, HFPO Decon, VEN Decon, VES Decon[a]	NCD-Q1 and and NCD-Q2	Thermal Oxidizer/Scrubber
Equipment To Be DELETED By This Application			
---	---	NCD-Hdr1	Baffle Plate Scrubber
---	---	NCD-Hdr2	Baffle Plate Scrubber

112(r) APPLICABILITY INFORMATION **A 3**

Is your facility subject to 40 CFR Part 68 "Prevention of Accidental Releases" - Section 112(r) of the Federal Clean Air Act? ☑ Yes ☐ No

If No, please specify in detail how your facility avoided applicability:

If your facility is Subject to 112(r), please complete the following:

A. Have you already submitted a Risk Management Plan (RMP) to EPA Pursuant to 40 CFR Part 68.10 or Part 68.150?

☑ Yes ☐ No

If submitted, RMP submittal date: *Original 8 june 1999, last update 9 June 2015*

Specify required RMP submittal date: *30 June 1999*

B. Are you using administrative controls to subject your facility to a lesser 112(r) program standard?

☐ Yes ☑ No If yes, please specify:

C. List the processes subject to 112(r) at your facility:

PROCESS DESCRIPTION	PROCESS LEVEL (1, 2, or 3)	HAZARDOUS CHEMICAL	MAXIMUM INTENDED INVENTORY (LBS)
SO_3 Process	*3*	*sulfur trioxide*	*59,400*
TFE Process	*1*	*tetrafluoroethylene*	*61,000*

Attach Additional Sheets As Necessary

FORM B9

EMISSION SOURCE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **B9**

EMISSION SOURCE DESCRIPTION: *Slaker*	EMISSION SOURCE ID NO: *NS-R2*
	CONTROL DEVICE ID NO(S): *NCD-R2*
OPERATING SCENARIO: *1* OF *1*	EMISSION POINT (STACK) ID NO(S): *NEP-R2*

DESCRIBE IN DETAIL THE PROCESS (ATTACH FLOW DIAGRAM):

Mixing vessel for pebble or hydrated lime and water to form lime slurry

MATERIALS ENTERING PROCESS - CONTINUOUS PROCESS		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/HR)	LIMITATION(UNIT/HR)

MATERIALS ENTERING PROCESS - BATCH OPERATION		MAX. DESIGN	REQUESTED CAPACITY
TYPE	UNITS	CAPACITY (UNIT/BATCH)	LIMITATION (UNIT/BATCH)
Pebble or hydrated lime	*1,072*	*lb/hr*	*NA*
Water	*6,428*	*lb/hr*	*NA*

MAXIMUM DESIGN (BATCHES / HOUR):	
REQUESTED LIMITATION (BATCHES / HOUR):	(BATCHES/YR):
FUEL USED:	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR):
MAX. CAPACITY HOURLY FUEL USE:	REQUESTED CAPACITY ANNUAL FUEL USE:

COMMENTS:

Attach Additional Sheets as Necessary

FORM C8

CONTROL DEVICE (WET PARTICULATE SCRUBBER)

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **C8**

CONTROL DEVICE ID NO: *NCD-R2*	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): *NS-R2*
EMISSION POINT ID NO(S): *NEP-R2*	POSITION IN SERIES OF CONTROLS: NO. 1 OF 1 UNITS
OPERATING SCENARIO:	
___1____ OF ___1____	P.E. SEAL NEEDED (PER 2Q .0112)? ☐ YES ☑ NO

DESCRIBE CONTROL SYSTEM:

The control device is a wet particulate scrubber installed near the top of the lime slaker. The purpose of the wet particulate scrubber is to remove dust created by pebble lime being fed from the silo, and also to remove water vapor created by the slaking process. The wet particulate scrubber operates by utilizing an induced draft fan to draw dust and vapor from the top of the slaker to a small chamber, where water is sprayed to suppress the dust and vapor. Air is used to atomize the water at the spray nozzle into fine droplets. The resulting liquid water and dust stream is returned to the slaker where it combines with slaked lime. The treated air from the scrubbing chamber is vented to atmosphere.

POLLUTANT(S) COLLECTED:	$PM_{10/2.5}$		
BEFORE CONTROL EMISSION RATE (LB/HR):	6.17		
CAPTURE EFFICIENCY:	100 %	%	%
CONTROL DEVICE EFFICIENCY:	99.7 %	%	%
CORRESPONDING OVERALL EFFICIENCY:	99.7 %	%	%
EFFICIENCY DETERMINATION CODE:	2		
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	0.019		

PRESSURE DROP (IN. H_2O): _____ MIN _____ MAX	
INLET TEMPERATURE (^oF): _180_ MIN _212_ MAX	OUTLET TEMPERATURE (^oF): _____ MIN ____ MAX
INLET AIR FLOW RATE (ACFM): 280	MOISTURE CONTENT : INLET _____% OUTLET _____%
THROAT VELOCITY (FT/SEC):	THROAT TYPE: ☐ FIXED ☐ VARIABLE
TYPE OF SYSTEM: Dust and Vapor Suppresion	TYPE OF PACKING USED IF ANY: N/A
ADDITIVE LIQUID SCRUBBING MEDIUM: Water	PERCENT RECIRCULATED:
MINIMUM LIQUID INJECTION RATE (GAL/MIN): 2.9	
MAKE UP RATE (GAL/MIN):	FOR ADDITIVE (GAL/MIN):

DESCRIBE MAINTENANCE PROCEDURES:

Adjustment of inlet pressure and flow for air and water. Routine cleaning and maintenance of spray nozzles.

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:

Monitor air and water inlet press and flow to spray nozzles.

PARTICLE SIZE DISTRIBUTION

SIZE (MICRONS)	WEIGHT % OF TOTAL	CUMULATIVE %
0-1		
1-10		
10-25		
25-50		
50-100		
>100		
TOTAL = 100		

ATTACH A DIAGRAM OF THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S):

See attached sketch

COMMENTS:

Inlet dust loading is calculated based on measured outlet emission and removal efficiency.

Attach Additional Sheets As Necessary

FORM C3

CONTROL DEVICE (THERMAL OR CATALYTIC)

REVISED 09/22/16 | **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** | **C3**

AS REQUIRED BY 15A NCAC 2Q .0112, THIS FORM MUST BE SEALED BY A PROFESSIONAL ENGINEER (P.E.) LICENSED IN NORTH CAROLINA.

CONTROL DEVICE ID NO: ***NCD-Q1***	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ***See list below***
EMISSION POINT (STACK) ID NO(S): ***NEP-Q2***	POSITION IN SERIES OF CONTROLS NO. ***1*** OF ***2*** UNITS
MANUFACTURER: ***Linde***	MODEL NO: ***LV-10***
OPERATING SCENARIO:	
Max. Permit Design Basis	

TYPE ☑ AFTERBURNER ☐ REGENERATIVE THERMAL OXIDATION ☐ RECUPERATIVE THERMAL OXIDATION ☐ CATALYTIC OXIDATION

EXPECTED LIFE OF CATALYST (YRS): N/A | METHOD OF DETECTING WHEN CATALYST NEEDS REPLACMENT: N/A

CATALYST MASKING AGENT IN AIR STREA ☐ HALOGEN ☐ SILICONE ☐ PHOSPHOROUS COMPOUND ☐ HEAVY METAL ☐ SULFUR COMPOUND ☐ OTHER (SPECIFY) _____ ☑ NONE

TYPE OF CATALYST: N/A | CATALYST VOL (FT^3):N/A | VELOCITY THROUGH CATALYST (FPS): N/A

SCFM THROUGH CATALYST: N/A

DESCRIBE CONTROL SYSTEM, INCLUDING RELATION TO OTHER CONTROL DEVICES AND SOURCES, AND ATTACH DIAGRAM OF SYSTEM: ***FW fluorocarbon vent destruction unit is a natural gas-fired Thermal Oxidizer (model number LV-10 with a nominal rating of 10 MMBtu/hr burner heat release) rated for up to 11.6 MMBtu/hr max heat release with vapor feeds. The combustion chamber is followed by use of an SGL corporation rapid quench system followed by a series of packed bed scrubbing towers with the final scrubbing tower (final control device) consisting of a packed bed scrubber contact of the flue gas with dilute caustic, pH controlled.***

POLLUTANT(S) COLLECTED:	***VOC***			
BEFORE CONTROL EMISSION RATE (LB/HR):	***2,098***			
CAPTURE EFFICIENCY:	***100*** %	%	%	%
CONTROL DEVICE EFFICIENCY:	***99.99*** %	%	%	%
CORRESPONDING OVERALL EFFICIENCY:	***99.99*** %	%	%	%
EFFICIENCY DETERMINATION CODE:	***0***			
TOTAL AFTER CONTROL EMISSION RATE (LB/HR) :	***0.21***			

PRESSURE DROP (IN. H_2O) MIN MAX	OUTLET TEMPERATURE (^oF): _____ MIN ***1,800*** MAX
INLET TEMPERATURE (^oF): MIN MAX	RESIDENCE TIME (SECONDS): ***>1.2***
INLET AIR FLOW RATE (ACFM): (SCFM):	COMBUSTION TEMPERATURE (^oF): ***>1,800***
COMBUSTION CHAMBER VOLUME (FT^3):	INLET MOISTURE CONTENT (%):
% EXCESS AIR: ***10%***	CONCENTRATION (ppmv) _____ INLET _____ OUTLET
AUXILIARY FUEL USED: ***Natural Gas***	TOTAL MAXIMUM FIRING RATE (MILLION BTU/HR): ***10 MMBtu/hr (11.6 with vapor feeds)***

DESCRIBE MAINTENANCE PROCEDURES:

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:

COMMENTS: ***The following emission units will be vented to the thermal oxidizer: NS-A HFPO; NS-B VEN; NS-C VES; NS-D RSU; NS-E Liquid Stabilization; NS-F MMP; NS-G IXM Resins; NS-K E2; NS-M TFE/CO2; NS-N HFPO Decon; NS-O VEN Decon; NS-P VES Decon. Before control emission rate was determined based on highest-case hourly emissions from all applicable sources.***

Attach Additional Sheets As Necessary

FORM C9 - Thermal Converter Flue Gas Scrubber

CONTROL DEVICE (OTHER)

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **C9**

CONTROL DEVICE ID NO: **NCD-Q2**	CONTROLS EMISSIONS FROM WHICH EMISSION SOURCE ID NO(S): ***NCD-Q1***
EMISSION POINT (STACK) ID NO(S): **NEP-Q2**	POSITION IN SERIES OF CONTROLS: NO. ***2*** OF ***2*** UNITS
OPERATING SCENARIO:	
Max. Permit Design Basis	P.E. SEAL REQUIRED (PER 2Q .0112)? ☑ YES ☐ NO

DESCRIBE CONTROL SYSTEM: ***The combustion flue gas from the thermal oxidizer is rapidly quenched using a SGL Diabon open pipe spray quencher to rapidly drop the temperature of the combustion gases from 1800 deg F (nominal) to 150 deg F (nominal). The quenched flue gas is introduced into the bottom of a Liquid Mist Separator which consists of a packed bed scrubber containing 10 feet of packing height with primary purpose to remove liquid mist from the SGL Diabon open pipe spray quencher discharge. The flue gas exiting the Liquid Mist Separator is scrubbed by counter current contact with < 1 wt% HF in Stage 1 packed bed, followed by counter current scrubbing with <0.1 wt % HF in Stage 2, and 0.01 wt% HF in Stage 3 followed by counter-current scrubbing contact with dilute caustic in Stage 4 scrubber. The Stage 4 (caustic scrubber) is defined as the "Final Control Device"***

POLLUTANT(S) COLLECTED:	**HF**	**SO_2**		
BEFORE CONTROL EMISSION RATE (LB/HR):	**1,518**	**3.8**		
CAPTURE EFFICIENCY:	**100** %	**100** %	%	%
CONTROL DEVICE EFFICIENCY:	**99.95** %	**99.95** %	%	%
CORRESPONDING OVERALL EFFICIENCY:	**99.95** %	**99.95** %	%	%
EFFICIENCY DETERMINATION CODE:	**4**	**4**		
TOTAL AFTER CONTROL EMISSION RATE (LB/HR):	**0.77**	**0.002**		

PRESSURE DROP (IN. H_20): _____ MIN _____ MAX	BULK PARTICLE DENSITY (LB/FT^3)
INLET TEMPERATURE (^oF): _____ MIN _____ MAX	OUTLET TEMPERATURE (^oF): _____ MIN _____ MAX
INLET AIR FLOW RATE (ACFM):	OUTLET AIR FLOW RATE (ACFM):
INLET AIR FLOW VELOCITY (FT/SEC):	OUTLET AIR FLOW VELOCITY (FT/SEC):
INLET MOISTURE CONTENT (%):	☐ FORCED AIR ☐ INDUCED AIR
COLLECTION SURFACE AREA (FT^2):	FUEL USED: / FUEL USAGE RATE:

DESCRIBE MAINTENANCE PROCEDURES:

DESCRIBE ANY AUXILIARY MATERIALS INTRODUCED INTO THE CONTROL SYSTEM:

DESCRIBE ANY MONITORING DEVICES, GAUGES, TEST PORTS, ETC:

ATTACH A DIAGRAM OF THE RELATIONSHIP OF THE CONTROL DEVICE TO ITS EMISSION SOURCE(S): ***See flow diagram in enclosed report.***

COMMENTS: ***The thermal oxidizer is vented to the scrubber to control acid gas, HF and SO_2.***

Attach manufacturer's specifications, schematics, and all other drawings necessary to describe this control.

Attach Additional Sheets As Necessary

FORM D1

FACILITY-WIDE EMISSIONS SUMMARY

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **D1**

CRITERIA AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

	EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
AIR POLLUTANT EMITTED	tons/yr	tons/yr	tons/yr
PARTICULATE MATTER (PM)	*<20*	*<100*	*<100*
PARTICULATE MATTER < 10 MICRONS (PM_{10})	*<20*	*<100*	*<100*
PARTICULATE MATTER < 2.5 MICRONS ($PM_{2.5}$)	*<20*	*<100*	*<50*
SULFUR DIOXIDE (SO_2)	*<1*	*<5*	*<5*
NITROGEN OXIDES (NOx)	*<100*	*>100*	*>100*
CARBON MONOXIDE (CO)	*<100*	*>100*	*>100*
VOLATILE ORGANIC COMPOUNDS (VOC)	*>100*	*>100*	*>100*
LEAD	*<1*	*<1*	*<1*
GREENHOUSE GASES (GHG) (SHORT TONS)	*>100,000*	*>100,000*	*>100,000*
OTHER			

		EXPECTED ACTUAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (BEFORE CONTROLS / LIMITATIONS)	POTENTIAL EMISSIONS (AFTER CONTROLS / LIMITATIONS)
HAZARDOUS AIR POLLUTANT EMITTED	CAS NO.	tons/yr	tons/yr	tons/yr
hydrogen fluoride	*7664-39-3*	*<5*	*>10*	*<5*
methanol	*67-56-1*	*<1*	*<1*	*<1*
acetenitrile	*75-05-8*	*<1*	*<2*	*<1*
diethylene glycol dimethyl ether	*111-96-6*	*<1*	*<1*	*<1*
ammonia	*7664-41-7*	*<5*	*<10*	*<10*
sulfuric acid	*7664-93-9*	*<1*	*<1*	*<1*
benzene	*71-43-2*	*<1*	*<1*	*<1*
methylene chloride	*74-43-2*	*<1*	*<1*	*<1*
toluene	*108-88-3*	*<1*	*<10*	*<10*
acetic acid	*64-19-7*	*<1*	*<5*	*<5*
other HAPs		*<1*	*<25*	*<25*
Total HAPs		*<10*	*>25*	*>25*

TOXIC AIR POLLUTANT EMISSIONS INFORMATION - FACILITY-WIDE

INDICATE REQUESTED ACTUAL EMISSIONS AFTER CONTROLS / LIMITATIONS. EMISSIONS ABOVE THE TOXIC PERMIT EMISSION RATE (TPER) IN 15A NCAC 2Q .0711 MAY REQUIRE AIR DISPERSION MODELING. USE NETTING FORM D2 IF NECESSARY.

					Modeling Required ?	
TOXIC AIR POLLUTANT EMITTED	CAS NO.	lb/hr	lb/day	lb/year	Yes	No
hydrogen fluoride	*7664-39-3*	*1.12*	*26.8*			*x*
No other TAPs will increase as a result of this project.						

COMMENTS:

Facility-wide PTE of HF are less than the current permit limits.

Attach Additional Sheets As Necessary

FORM D4

EXEMPT AND INSIGNIFICANT ACTIVITIES SUMMARY

ACTIVITIES EXEMPTED PER 2Q .0102 OR
INSIGNIFICANT ACTIVITIES PER 2Q .0503 FOR TITLE V SOURCES

DESCRIPTION OF EMISSION SOURCE	SIZE OR PRODUCTION RATE	BASIS FOR EXEMPTION OR INSIGNIFICANT ACTIVITY
1. *I-NS-R1 - Lime Silo*		*15A NCAC 02Q .0102(h)(5)*
2. *I-RICE 4 - I - Diesel Engine for Thermal Oxidizer/Scrubber System Emergency Electrical Generator*	*320 HP*	*15A NCAC 02Q .0102(h)(5)*
3. *I-CT - Cooling Tower*	*6,000 gal/min*	*15A NCAC 02Q .0102(h)(5)*
4.		
5.		
6.		
7.		
8.		
9.		
10.		

Attach Additional Sheets As Necessary

FORM D5

TECHNICAL ANALYSIS TO SUPPORT PERMIT APPLICATION

REVISED 09/22/16 **NCDEQ/Division of Air Quality - Application for Air Permit to Construct/Operate** **D5**

PROVIDE DETAILED TECHNICAL CALCULATIONS TO SUPPORT ALL EMISSION, CONTROL, AND REGULATORY DEMONSTRATIONS MADE IN THIS APPLICATION. INCLUDE A COMPREHENSIVE PROCESS FLOW DIAGRAM AS NECESSARY TO SUPPORT AND CLARIFY CALCULATIONS AND ASSUMPTIONS. ADDRESS THE FOLLOWING SPECIFIC ISSUES ON SEPARATE PAGES:

A **SPECIFIC EMISSIONS SOURCE (EMISSION INFORMATION) (FORM B and B1 through B9) -** SHOW CALCULATIONS USED, INCLUDING EMISSION FACTORS, MATERIAL BALANCES, AND/OR OTHER METHODS FROM WHICH THE POLLUTANT EMISSION RATES IN THIS APPLICATION WERE DERIVED. INCLUDE CALCULATION OF POTENTIAL BEFORE AND, WHERE APPLICABLE, AFTER CONTROLS. CLEARLY STATE ANY ASSUMPTIONS MADE AND PROVIDE ANY REFERENCES AS NEEDED TO SUPPORT MATERIAL BALANCE CALCULATIONS.

B **SPECIFIC EMISSION SOURCE (REGULATORY INFORMATION)(FORM E2 - TITLE V ONLY) -** PROVIDE AN ANALYSIS OF ANY REGULATIONS APPLICABLE TO INDIVIDUAL SOURCES AND THE FACILITY AS A WHOLE. INCLUDE A DISCUSSION OUTING METHODS (e.g. FOR TESTING AND/OR MONITORING REQUIREMENTS) FOR COMPLYING WITH APPLICABLE REGULATIONS, PARTICULARLY THOSE REGULATIONS LIMITING EMISSIONS BASED ON PROCESS RATES OR OTHER OPERATIONAL PARAMETERS. PROVIDE JUSTIFICATION FOR AVOIDANCE OF ANY FEDERAL REGULATIONS (PREVENTION OF SIGNIFICANT DETERIORATION (PSD), NEW SOURCE PERFORMANCE STANDARDS (NSPS), NATIONAL EMISSION STANDARDS FOR HAZARDOUS AIR POLLUTANTS (NESHAPS), TITLE V), INCLUDING EXEMPTIONS FROM THE FEDERAL REGULATIONS WHICH WOULD OTHERWISE BE APPLICABLE TO THIS FACILITY. SUBMIT ANY REQUIRED INFORMATION TO DOCUMENT COMPLIANCE WITH ANY REGULATIONS. INCLUDE EMISSION RATES CALCULATED IN ITEM "A" ABOVE, DATES OF MANUFACTURE, CONTROL EQUIPMENT, ETC. TO SUPPORT THESE CALCULATIONS.

C **CONTROL DEVICE ANALYSIS (FORM C and C1 through C9) -** PROVIDE A TECHNICAL EVALUATION WITH SUPPORTING REFERENCES FOR ANY CONTROL EFFICIENCIES LISTED ON SECTION C FORMS, OR USED TO REDUCE EMISSION RATES IN CALCULATIONS UNDER ITEM "A" ABOVE. INCLUDE PERTINENT OPERATING PARAMETERS (e.g. OPERATING CONDITIONS, MANUFACTURING RECOMMENDATIONS, AND PARAMETERS AS APPLIED FOR IN THIS APPLICATION) CRITICAL TO ENSURING PROPER PERFORMANCE OF THE CONTROL DEVICES). INCLUDE AND LIMITATIONS OR MALFUNCTION POTENTIAL FOR THE PARTICULAR CONTROL DEVICES AS EMPLOYED AT THIS FACILITY. DETAIL PROCEDURES FOR ASSURING PROPER OPERATION OF THE CONTROL DEVICE INCLUDING MONITORING SYSTEMS AND MAINTENANCE TO BE PERFORMED.

D **PROCESS AND OPERATIONAL COMPLIANCE ANALYSIS - (FORM E3 - TITLE V ONLY)** - SHOWING HOW COMPLIANCE WILL BE ACHIEVED WHEN USING PROCESS, OPERATIONAL, OR OTHER DATA TO DEMONSTRATE COMPLIANCE. REFER TO COMPLIANCE REQUIREMENTS IN THE REGULATORY ANALYSIS IN ITEM "B" WHERE APPROPRIATE. LIST ANY CONDITIONS OR PARAMETERS THAT CAN BE MONITORED AND REPORTED TO DEMONSTRATE COMPLIANCE WITH THE APPLICABLE REGULATIONS.

E **PROFESSIONAL ENGINEERING SEAL -** PURSUANT TO 15A NCAC 2Q .0112 "APPLICATION REQUIRING A PROFESSIONAL ENGINEERING SEAL," A PROFESSIONAL ENGINEER REGISTERED IN NORTH CAROLINA SHALL BE REQUIRED TO SEAL TECHNICAL PORTIONS OF THIS APPLICATION FOR NEW SOURCES AND MODIFICATIONS OF EXISTING SOURCES. (SEE INSTRUCTIONS FOR FURTHER APPLICABILITY).

I, ***Jeff Twaddle*** *attest that this application for* ***installation of a thermal oxidizer and scrubber sytem (NCD-Q1 and Q2)*** *has been reviewed by me and is accurate, complete and consistent with the information supplied in the engineering plans, calculations, and all other supporting documentation to the best of my knowledge. I further attest that to the best of my knowledge the proposed design has been prepared in accordance with the applicable regulations. Although certain portions of this submittal package may have been developed by other professionals, inclusion of these materials under my seal signifies that I have reviewed this material and have judged it to be consistent with the proposed design. Note: In accordance with NC General Statutes 143-215.6A and 143-215.6B, any person who knowingly makes any false statement, representation, or certification in any application shall be guilty of a Class 2 misdemeanor which may include a fine not to exceed $10,000 as well as civil penalties up to $25,000 per violation.*

(PLEASE USE BLUE INK TO COMPLETE THE FOLLOWING)

NAME: Jeff Twaddle, P.E.

DATE: 6/27/2018

COMPANY: ERM

ADDRESS: 5000 Meridian Blvd., Suite 300, Franklin, TN 37067

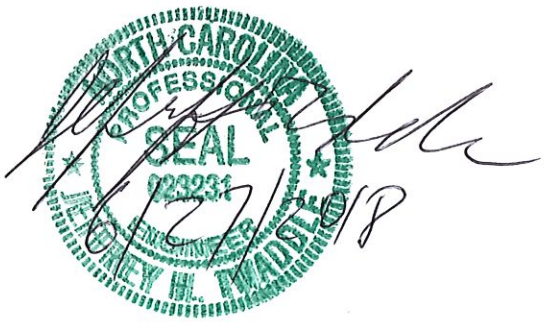
TELEPHONE: 615-656-4636

SIGNATURE:

PAGES CERTIFIED: C forms for NCD-Q1 and Q2

(IDENTIFY ABOVE EACH PERMIT FORM AND ATTACHMENT THAT IS BEING CERTIFIED BY THIS SEAL)

PLACE NORTH CAROLINA SEAL HERE



Attach Additional Sheets As Necessary

Appendix B
Site Location Maps

Chemours Company - Fayetteville Works
Fayetteville, Bladen County, North Carolina

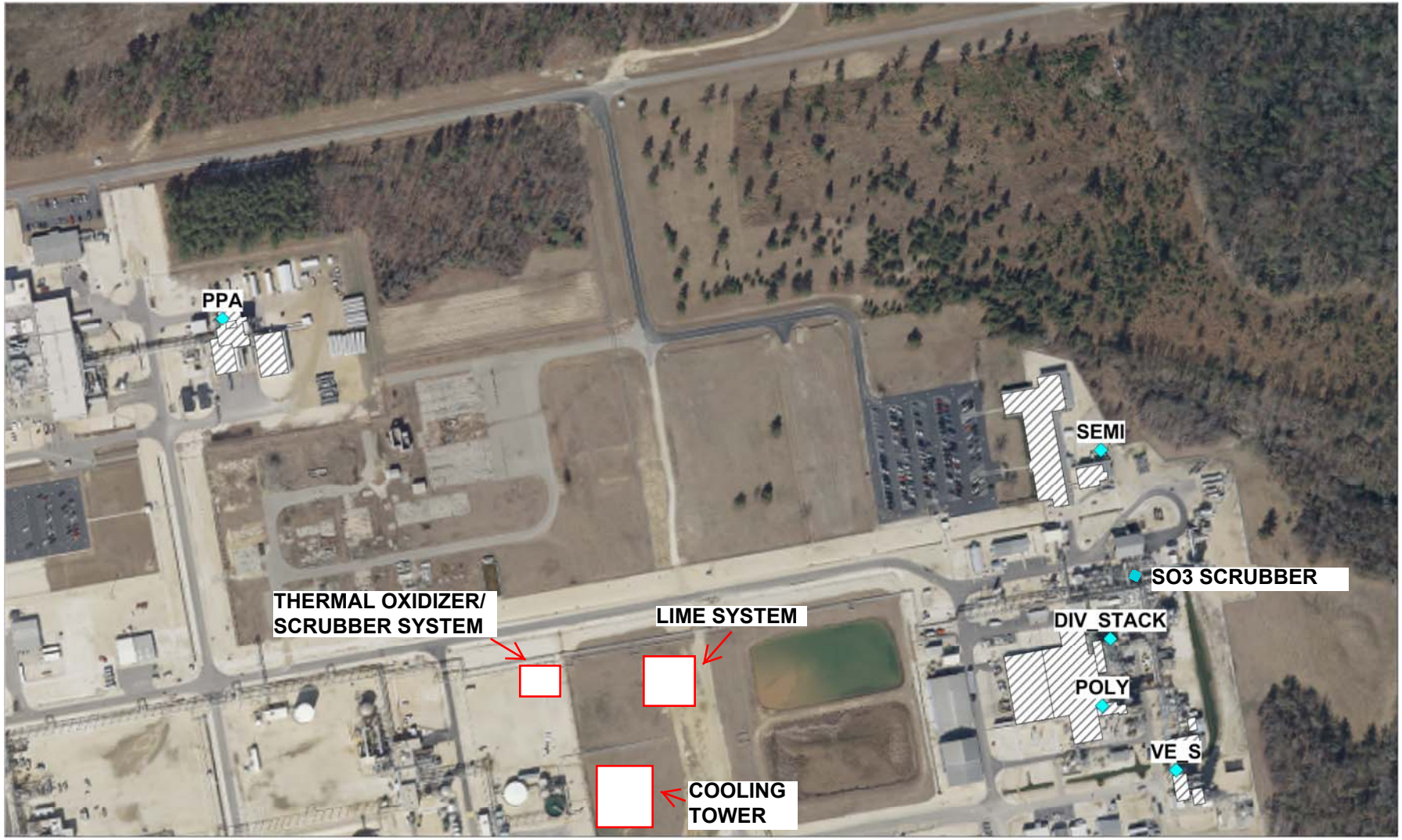


Figure B-1
Location of Emissions Sources
Chemours Fayetteville Works

Appendix C

Emission Calculations
Chemours Company - Fayetteville Works
Fayetteville, Bladen County, North Carolina

C.1 Thermal Oxidizer/Scrubber

Existing Sources

The existing emission units as indicated in Table 2-2 will be vented to the Thermal Oxidizer/Scrubber System. Overall process emissions of VOCs and PFAS compounds are assumed to be controlled by 99.99% by the Thermal Oxidizer. Hourly VOC emissions are based on highest-case loading to the Thermal Oxidizer/Scrubber system and projected control efficiencies.

Thermal Oxidizer

The thermal oxidizer will generate emissions associated with the combustion of natural gas. Table C-1 details the combustion emissions and is based on the estimated natural gas consumption of the Thermal Oxidizer. Potential emissions were based on the maximum heat input capacity of the unit (10 MMBtu/hr).

The thermal oxidizer will also generate HF and CO_2 emissions due to combustion of the organic hydrocarbons. The thermal oxidizer will also generate SO_2 due to the combustion of sulfur containing organic hydrocarbons. The emissions of HF will be further controlled in the scrubber by 99.95%.

Scrubber

The emissions from the thermal oxidizer are then vented to the scrubber. The scrubber will control the emissions of HF and SO_2 generated in the Thermal Oxidizer by 99.95%. The hourly emissions of these two pollutants are based on the estimated highest-case load to the Thermal Oxidizer. Annual emission from the Scrubber were based on 8,760 hours of operation. The thermal oxidizer will also generate CO_2. Hourly emissions of HF, SO_2 and CO_2 were based on the highest-case load to the Thermal Oxidizer and the conversion of compounds to HF, SO_2 and CO_2 using the methodology descirbed below. There were no controls assumed for CO_2 in the Scrubber. Annual emissions from the Scrubber were based on 8,760 hours of operation with highest-case load conditions and no assumed control in the Scrubber except HF and H_2SO_4.

HF will be generated in the thermal oxidizer and controlled by 99.95% in the Scrubber. For COF2, the molecular weight is 66 and there are 2 fluoride atoms. The molecular weight of HF is 20.

$$E_{HF} = E_x x \frac{C_x}{100} x NF_x \frac{MW_{HF}}{MW_x} x(1 - \frac{C_{HF}}{100})$$

Where,
E_{HF} is the emission rate of HF (lb/hr)
E_x emission rate of fluorinated compound x,
C_x control efficiency of compound x
NF_x number of fluoride atoms in compound x
MW_{HF} molecular weight of HF – 20
MW_x molecular weight of compound x
C_{HF} control efficiency of HF (99.95)

$$E_{HF} = 0.97x\frac{99.999}{100}x2x\frac{20}{66}x\left(1-\frac{99.95}{100}\right) = 0.00030\frac{lb\ HF}{hr}$$

In a similar manner, SO_2 generated in the thermal oxidizer will be controlled by the scrubber system.

Table C-1: Potential Emissions from Natural Gas Combustion (Thermal Oxidizer)

POLLUTANT	Emission Factor[a]	Emissions[b]	
	lb/10^{6}scf	lb/yr	tpy
NO_x	100	8,540	4.27
CO	84	7,172	3.59
PM_{10}	7.6	649	0.32
$PM_{2.5}$	7.6	649	0.32
SO_2	0.6	51	0.03
TOC	11	939	0.47
VOC	5.5	470	0.24
CO_2	1.20E+05	10,241,543	5,121
Methane	2.26E+03	193,127	97
Nitrous Oxide	2.26E+02	19,313	10
CO2e[c]		20,824,921	10,412
Haps/Taps			
Acetaldehyde (H,T)***	0.00E+00	0.00E+00	0.00E+00
Acrolein (H,T)***	0.00E+00	0.00E+00	0.00E+00
Ammonia (T)***	3.20E+00	2.73E+02	1.37E-01
Arsenic (H,T)	2.00E-04	1.71E-02	8.54E-06
Benzene (H,T)	2.10E-03	1.79E-01	8.96E-05
Benzo(a)pyrene (H,T)	1.20E-06	1.02E-04	5.12E-08
Beryllium (H,T)	1.20E-05	1.02E-03	5.12E-07
Cadmium (H,T)	1.10E-03	9.39E-02	4.70E-05
Chromium (VI) (H,T)	1.40E-03	1.20E-01	5.98E-05
Cobalt (H)	8.40E-05	7.17E-03	3.59E-06
Formaldehyde (H,T)****	7.50E-02	6.40E+00	3.20E-03
n-Hexane (H,T)	1.80E+00	1.54E+02	7.68E-02
Lead (H)	5.00E-04	1.42E+00	7.10E-04
Manganese (H,T)	3.80E-04	3.24E-02	1.62E-05
Mercury (H,T)	2.60E-04	2.22E-02	1.11E-05
Naphthalene (H)	6.10E-04	5.21E-02	2.60E-05
Nickel (H,T)	2.10E-03	1.79E-01	8.96E-05
Selenium (H)	2.40E-05	2.05E-03	1.02E-06
Toluene (H,T)	3.40E-03	2.90E-01	1.45E-04

[a] Emissions factors are from AP-42 except as noted.
[b] Emissions based on 10 MMBtu/hr (see Vendor specification in Appendix D) and 85.4 MMft^3/year (1,026 Btu/scf and 8,760 hours of operation).
[c] Emission factors for greenhouse gases obtained from 40 CFR 98 Subpart C. Global warming potential - 1 for CO_2, 25 for CH_4 and 198 for N_2O.

C.2 Lime Processing System

PTE for the Lime Processing System equipment are also shown in Table 3-1.

Lime Silo

The PTE emissions of PM were based on a vendor supplied emission factor of 0.02 grains/standard cubic feet (scf) and an maximum flow rate of 1,000 standard cubic feet per minute (scfm). Emissions were calcualted as follows:

$$E_{PM} = \frac{0.02\,\frac{grains}{ft^3}\,x1{,}000\,\frac{ft^3}{min}\,x60\,\frac{min}{hr}}{7{,}000\,\frac{grains}{lb}} = 0.17\,\frac{lb}{hr}\,x\,\frac{8{,}760\,\frac{hr}{yr}}{2{,}000\,\frac{lb}{ton}} = 0.75tpy$$

Emissions of PM_{10} and $PM_{2.5}$ are assumed to equal the emissions of PM.

Lime Slaker

The PTE emissions of PM were based on a vendor supplied inlet emission rate to the scrubber of 6.17 lb/hr and a control efficiency of 99.7% as follows :

$$E_{PM} = 6.17\,\frac{lb}{hr}\,inlet\;x\;(1 - 0.997) = 0.019\;\frac{lb}{hr}\;x\;\frac{8{,}760\,\frac{hr}{yr}}{2{,}000\,\frac{lb}{ton}} = 0.08\;tpy$$

Emissions of PM_{10} and $PM_{2.5}$ assumed to equal the emissions of PM.

C.3 Ancillary Equipment

Emergency Generator

Chemours plans to purchase a 320 HP emergency generator. The generator will be subject to Tier 3 emission standards for emergency generators. These limits are shown in Table C-2. Emissions for VOC and NO_x were based on the ratio of the emission standard to the appropriate AP-42 emission factors for VOC (2.53E-03 lb/hp-hr) and NO_x (0.031E-02 lb/hp-hr) as follows :

$$EF_{NOx} = 3.0\ \frac{g}{hp-hr}\ x\ \frac{0.031}{(0.031+0.00253)} = 2.77\ \frac{g}{hp-hr}$$

$$EF_{VOC} = 3.0\ \frac{g}{hp-hr}\ x\ \frac{0.00253}{(0.031+0.00253)} = 0.23\ \frac{g}{hp-hr}$$

Emission factors for SO_2 were obtained from AP-42 and an assumed sulfur content of 0.0015%. Emission factors for greenhouse gases were obtained from 40 CFR 98. Emission factors for HAPs were obtained from the NCDAQ spreadsheet available at https://deq.nc.gov/about/divisions/air-quality/air-quality-permits/application-forms-instructions/application-forms-air-quality-permit-construct-operate-non-title-v-title-v-facilities/spreadsheets. Table C-3 provides calculations. Annual PTE were based on 100 hours per year of operation.

Table C-2: Tier 3 Emission Standards

Pollutant	Emission Standards g/hp-hr
CO	2.6
NMHC/NOx	3.0
PM	0.15

Table C-3: Potential to Emit – Emergency Generator

Source	Stack ID	Heat Rating				Total Hrs of Operation	Total million Btu/yr	Total MW/yr
		kW	MW	HP	MMBtu/hr			
I-RICE-4	NEP-RICE 4	200	0.20	320	2.1	500	1,043	100

NO_x					CO				
EF Source	g/hp-hr	(lb/hr)	(lb/yr)	(tons/yr)	EF Source	g/hp-hr	(lb/hr)	(lb/yr)	(tons/yr)
Tier 3 Std[a]	2.77	1.96	979	0.49	Tier 3 Std	2.60	1.83	917	0.46
PM_{Total}					PM_{10}				
EF Source	g/hp-hr	lb/hr	(lb/yr)	(tons/yr)	EF Source	g/hp-hr	(lb/hr)	(lb/yr)	(tons/yr)
Tier 3 Std	0.15	0.106	53	0.026	Tier 3 Std[b]	0.15	0.106	53	0.026
$PM_{2.5}$					SO_2				
EF Source	g/hp-hr	(lb/hr)	(lb/yr)	(tons/yr)	EF Source	lb/MMBtu	(lb/hr)	(lb/yr)	(tons/yr)
Tier 3 Std[b]	0.150	0.11	53	0.026	NCDAQ[c]	1.52E-03	6.06E-03	3.0	1.52E-03
VOC					CO_2				
EF Source	g/hp-hr	(lb/hr)	(lb/yr)	(tons/yr)	EF Source	kg/MMBtu	(lb/hr)	(lb/yr)	(tons/yr)
Tier 3 Std[a]	0.23	0.16	79	0.040	40 CFR 98	53.06	244	122,053	61
CH_4					N_2O				
EF Source	kg/MMBtu	(lb/hr)	(lb/yr)	(tons/yr)	EF Source	kg/MMBtu	(lb/hr)	(lb/yr)	(tons/yr)
40 CFR 98	1.00E-03	9.47E-04	0.095	4.74E-05	40 CFR 98	1.00E-04	9.47E-05	0.05	2.37E-05
Total HAPs					CO_{2e}				
EF Source	g/hp-hr	(lb/hr)	(lb/yr)	(tons/yr)			(lb/hr)	(lb/yr)	(tons/yr)
NCDAQ[c]	8.98E-03	6.33E-03	3.2	1.58E-03			244	122,079	61

[a] The emission factor for NO_x and VOC was based on the Tier 3 emission limit of 3.0 g/hp-hr and the ratio of the AP-42 emission factors.

[b] PM10 and PM2.5 assumed to be equal to the Tier 3 emission limit of 0.15 g/hp-hr.

[c] HAP emissions based on the DAQ spreadsheet obtained from - https://deq.nc.gov/about/divisions/air-quality/air-quality-permits/application-forms-instructions/application-forms-air-quality-permit-construct-operate-non-title-v-title-v-facilities/spreadsheets

Cooling Tower

Emissions from the cooling tower were based on the following input:

Cooling tower circulation rate – 6,000 gallons per minute
Drift factor (%) – 0.005%
Makeup water total dissolved solids– 200 parts per million
Cycles if concentration – 6
Density of water – 8.34 lb/gal

At the Fayetteville Works facility, the maximum conductivity of the filtered river water that will be used for cooling tower make-up water and is about 200 micromhos. Typical conductivity is 180 to 190 micromhos. The site's local water treatment vendor expects that the cooling tower can operate at 6 cycles.

Emissions of PM are calculated as follows :

$$E_{PM} = \frac{6{,}000\,\frac{gal}{min}\,x\,0.005\%\,x\,200\,ppm\,x\,6\,cycles\,x\,8.34\,\frac{lb}{gal}\,x\,60\,\frac{min}{hr}}{1{,}000{,}000} = 0.18\,\frac{lb}{hr}$$

$$E_{PM} = 0.18\,\frac{lb}{hr}\,x\,\frac{8{,}760\,\frac{hr}{yr}}{2{,}000\,\frac{lb}{ton}} = 0.79\,tpy$$

Emissions of PM_{10} and $PM_{2.5}$ assumed to equal the emissions of PM.

Appendix D

Vendor Specifications
Chemours Company - Fayetteville Works
Fayetteville, Bladen County, North Carolina

THE LINDE GROUP

Technical Proposal

for

THE CHEMOURS COMPANY
At
Fayetteville, NC, USA

Project Wright P-2817
Thermal Converter and Quench System

by
Selas Linde North America
Proposal No.: P7718004 Tech, Iss.4

May 15, 2018

SECTION 5

Emissions Guarantees

The following emission guarantees only are offered with the proposed equipment when the equipment is operated at steady state conditions as outlined in SLNA's operating and maintenance manuals. The waste composition must be within the specified elemental analysis. No emission reduction is accounted for ambient dust, fumes, particles being introduced into the system by the combustion air blower, etc. Emission reduction is based strictly on the designated waste feed. Minimum concentrations, test parameters, and methodology must be mutually agreed upon for performance testing. The purchaser is responsible for compliance to all federal, state, and local laws, codes and regulations. The Seller makes no claim to such compliance and provides only the specifically stated performance guarantees below:

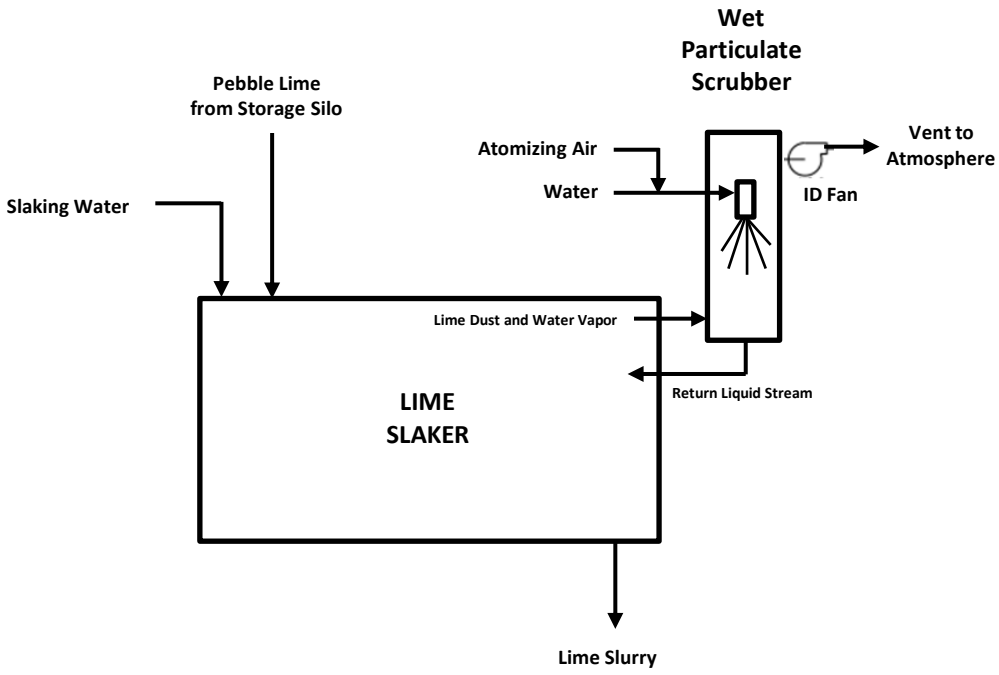
Flue Gas Effluents

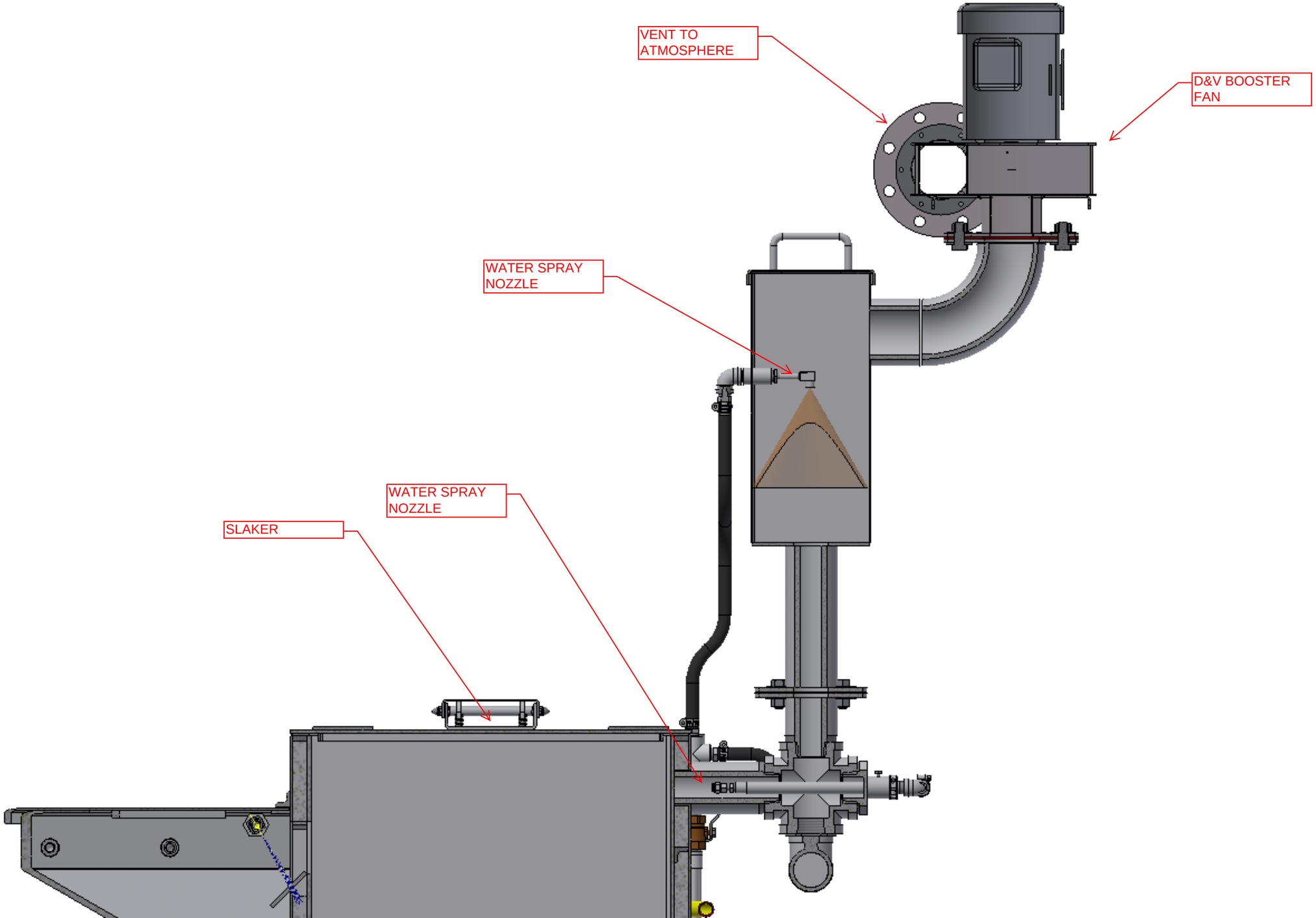
VOC ..... 99.99% Destruction & Removal Efficiency (DRE)
NOx ..... 100 ppm @ 7% O2 vdb
CO ..... 50 ppm @ 7% O2 vdb

Selas Linde's guarantees are contingent upon providing a complete offering (engineering + material procurement) of the system as described in the proposal package.

Attachment to C8 Form

Process Sketch – Slaker – Wet Particulate Scrubber




VENT TO
ATMOSPHERE
D&V BOOSTER
FAN
WATER SPRAY
NOZZLE
WATER SPRAY
NOZZLE
SLAKER

From: Senra Duque Junior Jose [mailto:jsenra@sttenvirocorp.com]
Sent: Wednesday, May 16, 2018 1:52 PM
To: Victor Ciarlante
Subject: [External] FW: [EXT] RE: Cao / Ca(OH)2 System - Request for Budget Quote

Dear Victor,

Good afternoon.

Please find below and attached the comments of our technicians.

QUOTED

Hello all.

Here is something we have written that we can stand behind. Based on our EPA approved standard emissions testing and some calculations.

This test was based on slaking quicklime. We have not tested the scrubber in a hydrated lime make up scenario.

If you believe the dust loading that your lime vendor is implying (at 1%) you would be OK for a small 1,000 lbs./hr. make up system but would be in trouble with a large make up system.

I don't believe the 1% 'dusting' estimate. Seems high to me.

The expected scrubbing efficiency of the STT Enviro Corp Induced Draft Wet Dust Scrubber would be 99.7% removal.

This efficiency can be achieved if the scrubber is installed correctly and if appropriately adjusted.

Appropriate adjustment includes two areas.

1. ***The water flow for the two spray nozzles needs the correct feed pressure and flow (40 psig and 2.9 US gpm per scrubber unit).***
2. ***The air flow though the scrubber body must also be correctly adjusted by means of the included air flow damper on the fan discharge (target between 260 and 320 scfm).***

This efficiency calculation was determined using the worst case emissions rate that was recently tested according to standard EPA approved procedures and is based on an approximation of the typical inlet loading that would be expected for a typical lime slaker using a wetting bowl feed system and also for a recycled ash slurry tank.

STT Enviro Corp would be pleased to assist with the installation and set-up / adjustment of the Induced Draft Wet Dust Scrubbers.

UNQUOTED

Any doubt let us know.

Best regards,

José Senra

Capital Sales Representative, STT Enviro Corp

Direct: +1 905-875-5566 | Main: +1 905-693-9301 Ext.241 | Mobile: +1 778-384-2838 | Fax: +1 905-693-9432
jsenra@sttenvirocorp.com | Website | LinkedIn